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Las Vegas and Pahrump Field Offices Draft Resource Management Plan/Environmental Impact Statement

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BLM

Draft Resource Management Plan/Environmental Impact Statement

Las Vegas and Pahrump Field Offices

Prepared by
U.S. Department of the Interior
Bureau of Land Management
Southern Nevada District Office
Las Vegas, NV

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Table of Contents

Mission Statement ..... **xxxi**

Abstract ..... **xxxiii**

Dear Reader Letter ..... **xxxv**

Executive Summary ..... **xxxix**

1. Introduction **1**

1.1. How to Read This Chapter 1
1.2. Background 1
1.3. Purpose And Need For The Plan 1
1.3.1. Purpose 1
1.3.2. Need 2
1.4. Planning Area Description 2
1.5. Scoping/Issues 6
1.5.1. The Scoping Process 6
1.5.2. Identification of Issues 6
1.5.3. Issues Addressed 6
1.5.3.1. Issues Used to Develop Alternatives 6
1.5.4. Issues Considered but Not Further Analyzed 7
1.5.4.1. Issues Addressed Through Administrative or Policy Action 9
1.6. Planning Criteria/Legislative Constraints 9
1.7. Planning Process 11
1.7.1. Relationship to BLM Policies, Plans, and Programs 14
1.7.2. Collaboration 15
1.8. Related Plans 15

2. Alternatives **17**

2.1. How to Read This Chapter 19
2.2. General Description of Alternatives 19
2.2.1. Alternative 1 (No Action Alternative) 20
2.2.2. Alternative 2 20
2.2.3. Alternative 3 (Preferred) 20
2.2.4. Alternative 4 20
2.3. Alternatives Considered but Not Analyzed in Detail 20
2.4. Management Common to All Alternatives 21
2.5. Alternatives Tables 22
2.5.1. How to Read the Alternatives Tables 22
2.5.2. Resources 24

2.5.2.1. Air Quality 25
2.5.2.2. Soil Resources 27
2.5.2.3. Water Resources 29
2.5.2.4. Integrated Vegetation 32
2.5.2.5. Fish and Wildlife 37
2.5.2.6. Special Status Species (Threatened, Endangered, and Sensitive) 41
2.5.2.7. Wild Horses and Burros 48
2.5.2.8. Cave and Karst Management 52
2.5.2.9. Wildland Fire Management 54
2.5.2.10. Cultural Resources 60
2.5.2.11. Paleontological Resources 67
2.5.2.12. Visual Resource Management 69
2.5.2.13. Lands with Wilderness Characteristics 76
2.5.3. Resource Uses 80
2.5.3.1. Forestry and Woodland Products 81
2.5.3.2. Livestock Grazing 83
2.5.3.3. Minerals 87
2.5.3.4. Recreation 104
2.5.3.5. Travel and Transportation 149
2.5.3.6. Lands and Realty 158
2.5.4. Special Designations 179
2.5.4.1. Areas of Critical Environmental Concern 180
2.5.4.2. National Trails 257
2.5.4.3. Wild and Scenic Rivers 259
2.5.4.4. Wilderness 268
2.5.4.5. Wilderness Study Areas 270
2.5.5. Social and Economic 273
2.5.5.1. Public Health and Safety 274
2.6. Comparative Summary of Alternatives 276

3. Affected Environment 281

3.1. How to Read this Chapter 283
3.2. Resources 284
3.2.1. Air Quality 285
3.2.1.1. Regulatory Framework 285
3.2.1.2. Current Condition 287
3.2.1.3. Regional Air Quality 287
3.2.1.4. Trends 288
3.2.1.5. Forecast 288
3.2.1.6. General Climatic / Meteorological Summary 289
3.2.1.7. Temperatures 290
3.2.1.8. Local Air Quality 291
3.2.1.9. Visibility 291
3.2.1.10. Regional Haze 292
3.2.1.11. Greenhouse Gas Emissions 292
3.2.1.12. Emission Sources 293
3.2.2. Geology 294
3.2.2.1. Physiography 294

3.2.2.2. Geologic Overview 294
3.2.3. Soil Resources 299
3.2.3.1. Affected Environment 301
3.2.4. Water Resources 302
3.2.4.1. Surface Water 302
3.2.4.2. Groundwater 304
3.2.4.3. Water Quality 305
3.2.4.4. Affected Environment 307
3.2.4.5. Riparian 310
3.2.5. Integrated Vegetation 313
3.2.5.1. Vegetation 313
3.2.5.2. Riparian and Wetlands 325
3.2.5.3. Noxious / Invasive Species 329
3.2.6. Fish and Wildlife 336
3.2.6.1. Wildlife Habitats 336
3.2.6.2. Trends 336
3.2.6.3. Game Species 337
3.2.6.4. Non-Game Species 340
3.2.7. Special Status Species 342
3.2.7.1. Federally Listed and Candidate Species 342
3.2.7.2. BLM Sensitive Species 360
3.2.8. Wild Horses and Burros 384
3.2.8.1. Regional Context 384
3.2.8.2. Rangeland Resources 384
3.2.8.3. Herd Health 384
3.2.9. Cave and Karst Resources 388
3.2.10. Wildland Fire Ecology and Management 390
3.2.10.1. Wildland Fire Management 390
3.2.10.2. Hazardous Fuel Management 392
3.2.10.3. Wildland Fire History 398
3.2.11. Cultural Resources 402
3.2.11.1. Cultural History 403
3.2.11.2. Cultural Site Types 405
3.2.12. Paleontological Resources 407
3.2.13. Visual Resources 410
3.2.13.1. Gold Butte Region 411
3.2.13.2. Mormon Mesa 412
3.2.13.3. Arrow Canyon Range 413
3.2.13.4. Muddy Mountains 413
3.2.13.5. Las Vegas Valley 414
3.2.13.6. Southern Clark County 414
3.2.13.7. Southern Spring Mountains 416
3.2.13.8. Pahrump-Amargosa 416
3.2.13.9. Special Management Areas 417
3.2.14. Lands with Wilderness Characteristics 418
3.3. Resource Uses 420
3.3.1. Forestry and Woodland Products 421
3.3.2. Livestock Grazing 422
3.3.2.1. Livestock/Range Studies 425

3.3.3. Minerals 427
3.3.3.1. Leasable Minerals 427
3.3.3.2. Saleable Minerals 436
3.3.3.3. Locatable Minerals 440
3.3.4. Recreation 450
3.3.4.1. Special Recreation Management Areas 451
3.3.5. Transportation and Access 456
3.3.5.1. Off-Highway Vehicles 456
3.3.5.2. Roads/Trails 457
3.3.5.3. Regional Travel Management Efforts 459
3.3.6. Lands and Realty 460
3.3.6.1. Land Tenure 461
3.3.6.2. Land-Use Authorizations 469
3.4. Special Designations 481
3.4.1. Areas of Critical Environmental Concern 482
3.4.1.1. Existing ACECs 482
3.4.1.2. Potential ACECs Considered for ACEC Designation 489
3.4.2. Back Country Byways 492
3.4.2.1. Gold Butte Back Country Byway 492
3.4.2.2. Bitter Springs Back Country Byway 492
3.4.3. National Trails 493
3.4.3.1. Old Spanish Trail 493
3.4.4. Wild and Scenic Rivers 495
3.4.5. Wilderness 497
3.4.6. Wilderness Study Areas 499
3.5. Social and Economic Conditions 501
3.5.1. Tribal Interests 501
3.5.2. Public Safety 503
3.5.2.1. Abandoned Mines 503
3.5.2.2. Debris Flows 503
3.5.2.3. Hazardous Materials and Waste 505
3.5.2.4. Potential Hazards from Munitions, Small Arms, and Unexploded Ordnance 506
3.5.3. Social and Economic Conditions 509
3.5.3.1. Demographic Overview 509
3.5.3.2. Social and Cultural Conditions 511
3.5.3.3. Employment Trends 519
3.5.3.4. Economic Restructuring and Change 519
3.5.3.5. Economic Well-Being 519
3.5.3.6. Direct BLM Contributions to Area Economic Activity 520
3.5.3.7. Key Industries in the Planning Area Affected by BLM Management 520
3.5.3.8. Environmental Justice 525

4. Environmental Consequences 527

4.1. How to Read This Chapter 529
4.1.1. Analytical Assumptions 529
4.1.2. Types of Effects 530
4.1.3. Cumulative Impacts 530

4.1.4. Incomplete or Unavailable Information 532
4.2. Resources 533
4.2.1. Air Quality 534
4.2.2. Geologic Resources 535
4.2.3. Soil Resources 536
4.2.3.1. Summary 536
4.2.3.2. Methods of Analysis 537
4.2.3.3. Qualitative Intensity Scale 538
4.2.3.4. Resources 539
4.2.3.5. Resource Uses 549
4.2.3.6. Special Designations 561
4.2.3.7. Cumulative Impacts on Soil Resources 564
4.2.4. Water Resources 567
4.2.4.1. Summary 567
4.2.4.2. Methods of Analysis 567
4.2.4.3. Qualitative Intensity Scale 571
4.2.4.4. Resources 572
4.2.4.5. Resource Uses 583
4.2.4.6. Special Designations 600
4.2.4.7. Cumulative Impacts on Water Resources 603
4.2.5. Integrated Vegetation 608
4.2.5.1. Vegetation 608
4.2.5.2. Riparian Areas and Wetlands 638
4.2.5.3. Weeds 673
4.2.5.4. Forests & Woodlands 716
4.2.6. Fish and Wildlife 717
4.2.6.1. Summary 717
4.2.6.2. Methods of Analysis 718
4.2.6.3. Qualitative Intensity Scale 718
4.2.6.4. Resources 719
4.2.6.5. Resource Uses 736
4.2.6.6. Special Designations 751
4.2.6.7. Cumulative Impacts on Fish and Wildlife 754
4.2.7. Special Status Species 758
4.2.7.1. Summary 758
4.2.7.2. Methods of Analysis 758
4.2.7.3. Qualitative Intensity Scale 758
4.2.7.4. Resources 759
4.2.7.5. Resource Uses 772
4.2.7.6. Special Designations 791
4.2.7.7. Cumulative Impacts on Special Status Species 798
4.2.8. Wild Horse and Burros 801
4.2.8.1. Summary 801
4.2.8.2. Methods of Analysis 801
4.2.8.3. Qualitative Intensity Scale 802
4.2.8.4. Resources 802
4.2.8.5. Resource Uses 807
4.2.8.6. Special Designations 813
4.2.8.7. Cumulative Impacts on Wild Horses and Burros 814

4.2.9. Cave and Karst Resources 817
4.2.9.1. Summary 817
4.2.9.2. Methods of Analysis 817
4.2.9.3. Qualitative Intensity Scale 818
4.2.9.4. Resources 819
4.2.9.5. Resource Uses 825
4.2.9.6. Special Designations 827
4.2.9.7. Cumulative Impacts on Cave and Karst Resources 828
4.2.10. Wildland Fire Management 830
4.2.10.1. Summary 830
4.2.10.2. Methods of Analysis 831
4.2.10.3. Qualitative Intensity Scale 832
4.2.10.4. Resources 833
4.2.10.5. Resource Uses 854
4.2.10.6. Special Designations 865
4.2.10.7. Cumulative Impacts on Wildland Fire Management 869
4.2.11. Cultural Resources 873
4.2.11.1. Summary 873
4.2.11.2. Methods of Analysis 874
4.2.11.3. Qualitative Intensity Scale 874
4.2.11.4. Resources 876
4.2.11.5. Resource Uses 891
4.2.11.6. Special Designations 899
4.2.11.7. Cumulative Impacts on Cultural Resources 901
4.2.12. Paleontological Resources 903
4.2.12.1. Summary 903
4.2.12.2. Methods of Analysis 903
4.2.12.3. Qualitative Intensity Scale 904
4.2.12.4. Resources 904
4.2.12.5. Resource Uses 910
4.2.12.6. Special Designations 914
4.2.12.7. Social and Economic Impacts on Paleontological Resources 916
4.2.12.8. Cumulative Impacts on Paleontological Resources 916
4.2.13. Visual Resources 917
4.2.13.1. Summary 917
4.2.13.2. Methods of Analysis 917
4.2.13.3. Qualitative Intensity Scale 918
4.2.13.4. Resources 919
4.2.13.5. Resource Uses 928
4.2.13.6. Special Designations 934
4.2.13.7. Cumulative Impacts on Visual Resource Management 937
4.2.14. Lands with Wilderness Characteristics 940
4.2.14.1. Summary 940
4.2.14.2. Methods of Analysis 940
4.2.14.3. Qualitative Intensity Scale 942
4.2.14.4. Resources 943
4.2.14.5. Resource Uses 957
4.2.14.6. Special Designations 967
4.2.14.7. Cumulative Impacts on Lands With Wilderness Characteristics 970

4.3. Resource Uses 974
4.3.1. Forestry and Woodland Products 975
4.3.1.1. Summary 975
4.3.1.2. Methods of Analysis 976
4.3.1.3. Qualitative Intensity Scale 976
4.3.1.4. Resources 977
4.3.1.5. Resource Uses 983
4.3.1.6. Special Designations 987
4.3.1.7. Cumulative Impacts on Forestry and Woodland Products 988
4.3.2. Livestock Grazing 990
4.3.2.1. Summary 990
4.3.2.2. Methods of Analysis 990
4.3.2.3. Qualitative Intensity Scale 991
4.3.2.4. Resources 991
4.3.2.5. Resource Uses 996
4.3.2.6. Special Designations 1003
4.3.2.7. Cumulative Impacts to Livestock Grazing 1004
4.3.3. Minerals 1009
4.3.3.1. Fluid Leasable Minerals 1009
4.3.3.2. Solid Leasable Minerals 1034
4.3.3.3. Locatable Minerals 1056
4.3.3.4. Saleable Minerals 1082
4.3.4. Recreation 1105
4.3.4.1. Summary 1105
4.3.4.2. Methods of Analysis 1105
4.3.4.3. Qualitative Intensity Scale 1106
4.3.4.4. Program Areas with No Impacts on Recreation Management 1106
4.3.4.5. Resources 1106
4.3.4.6. Resource Uses 1115
4.3.4.7. Special Designations 1123
4.3.4.8. Social and Economic Impacts on Recreation 1126
4.3.4.9. Cumulative Impacts on Recreation 1127
4.3.5. Travel and Transportation 1129
4.3.5.1. Summary 1129
4.3.5.2. Methods of Analysis 1129
4.3.5.3. Qualitative Intensity Scale 1129
4.3.5.4. Assumptions 1130
4.3.5.5. Program Areas with No Impacts on Travel Management 1130
4.3.5.6. Resources 1130
4.3.5.7. Resource Uses 1136
4.3.5.8. Special Designations 1140
4.3.5.9. Cumulative Impacts on Travel and Transportation 1141
4.3.6. Lands and Realty 1143
4.3.6.1. Summary 1143
4.3.6.2. Methods of Analysis 1143
4.3.6.3. Qualitative Intensity Scale 1144
4.3.6.4. Land Tenure (Disposals and Acquisitions) 1145
4.3.6.5. Land-Use Authorizations (Right-of-Ways, Leases, Permits) 1166
4.3.6.6. Transportation and Utility Corridors 1192

4.4. Special Designations 1222
4.4.1. Areas of Critical Environmental Concern 1223
4.4.1.1. Summary 1223
4.4.1.2. Methods of Analysis 1223
4.4.1.3. Qualitative Intensity Scale 1223
4.4.1.4. Resources 1224
4.4.1.5. Resource Uses 1236
4.4.1.6. Special Designations 1249
4.4.1.7. Cumulative Impacts on ACECs 1252
4.4.2. Back Country Byways 1255
4.4.3. National Trails 1256
4.4.4. Wild & Scenic Rivers 1257
4.4.4.1. Summary 1257
4.4.4.2. Methods of Analysis 1257
4.4.4.3. Qualitative Intensity Scale 1257
4.4.4.4. Resources 1258
4.4.4.5. Resource Uses 1264
4.4.4.6. Special Designations 1271
4.4.4.7. Social and Economic 1273
4.4.4.8. Cumulative Impacts on Wild and Scenic Rivers 1273
4.4.5. Wilderness 1275
4.4.5.1. Summary 1275
4.4.5.2. Methods of Analysis 1275
4.4.5.3. Qualitative Intensity Scale 1276
4.4.5.4. Resources 1277
4.4.5.5. Resource Uses 1286
4.4.5.6. Special Designations 1292
4.4.5.7. Cumulative Impacts on Wilderness 1294
4.4.6. Wilderness Study Areas 1296
4.4.6.1. Summary 1296
4.4.6.2. Methods of Analysis 1296
4.4.6.3. Qualitative Intensity Scale 1297
4.4.6.4. Resources 1297
4.4.6.5. Resource Uses 1303
4.4.6.6. Special Designations 1309
4.4.6.7. Cumulative Impacts on Wilderness Study Areas 1310
4.5. Social and Economic Conditions 1312
4.5.1. Tribal Interests 1313
4.5.1.1. Impacts Common to All Alternatives 1313
4.5.1.2. Identification and Protection of Religiously/Spiritually Significant Sites 1313
4.5.2. Public Health and Safety 1315
4.5.2.1. Alternative 1 1315
4.5.2.2. Alternative 2 1315
4.5.2.3. Alternative 3 1315
4.5.2.4. Alternative 4 1315
4.5.3. Social and Economic Conditions 1316
4.5.3.1. Economic Impact Analysis Approach and Quantitative Results 1316
4.5.3.2. Economic Impacts 1317

4.5.3.3. Resources 1320
4.5.3.4. Resource Uses 1323
4.5.3.5. Special Designations 1330
4.5.3.6. Social and Economic 1331

5. Consultation and Coordination 1333

5.1. Specific Consultation and Coordination Activities 1335
5.1.1. Federal Agency and Intergovernmental 1335
5.1.2. Tribes 1336
5.1.3. Special Status Species Consultation 1336
5.1.4. List of Preparers 1336

Appendix A. Fire Management Plan 1339

A.1. Introduction 1345
A.1.1. Purpose 1345
A.1.2. Relationship to Environmental Compliance 1346
A.1.2.1. Land Use Plan Conformance 1346
A.1.2.2. FMP Implementation 1347
A.1.3. Collaborative Process Identification 1347
A.1.4. Authorities 1347
A.2. Relationship to Land Management Planning/Fire Policy 1348
A.2.1. Bureau of Land Management/Las Vegas Field Office Policy and Program Guidance 1348
A.2.1.1. BLM National Fire Policy 1349
A.2.1.2. National Fire Plan 1350
A.2.1.3. Special Status Species Policy and Guidance 1354
A.2.1.4. BLM Greater Sage grouse Species Policy and Guidance 1355
A.2.2. BLM Nevada/Regional Policy, Direction and Guidance 1356
A.2.2.1. Nevada BLM Sensitive Species Policy 1356
A.2.2.2. Desert Tortoise Recovery Plan, 1994 1356
A.2.2.3. Greater Sage grouse Conservation Plan for Nevada and Eastern California - June 2004 1356
A.2.2.4. Nevada Fire Safe Council Statewide Risk Assessment 1357
A.2.3. Las Vegas Field Office Fire Program Planning Guidance 1357
A.2.3.1. Resource Management Plans (RMP) and General Management Plans Guidance 1357
A.3. Fire Management Unit Descriptions, Objectives, and Strategies 1359
A.3.1. General Management Considerations 1359
A.3.2. Wildland Fire Management Goals 1360
A.3.3. Wildland Fire Management Options 1361
A.3.3.1. Greater Sage grouse Conservation Plan for Nevada and Eastern California - June, 2004 - Fire Management Strategies, Options and Guidelines 1362
A.3.4. Description of Wildland Fire Management Strategies by Fire Management Unit 1362
A.3.4.1. Summary 1362
A.3.4.2. Tortoise – Moderate Density 1370

A.3.4.3. Tortoise ACEC North 1386
A.3.4.4. Tortoise ACEC South 1400
A.3.4.5. Tortoise – Low Density 1412
A.3.4.6. Sloan NCA 1424
A.3.4.7. Red Rock NCA (LE) 1435
A.3.4.8. Red Rock NCA (HE) 1451
A.3.4.9. Las Vegas Valley-Apex 1465
A.3.4.10. Moapa-Overton BLM-FWS 1482
A.3.4.11. Mesquite – Bunkerville 1497
A.3.4.12. Virgin-Muddy-Meadow 1514
A.3.4.13. High Juniper 1528
A.3.4.14. Ash Meadows 1540
A.3.4.15. Mesquite – Acacia 1554
A.3.4.16. Pahrump 1569
A.3.4.17. Amargosa-Indian Springs 1582
A.3.4.18. Laughlin-Nelson 1594
A.3.4.19. Goodsprings-Primm 1608
A.3.4.20. Joshua Tree Forest 1622
A.3.4.21. Nellis-Sagegrouse 1633
A.3.4.22. Nellis Bighorn 1644
A.3.4.23. Nellis-High Juniper 1656
A.3.4.24. Nellis Low Elevation Shrub 1668
A.4. Fire Management Components 1679
A.4.1. Wildland Fire Suppression 1679
A.4.1.1. Las Vegas Field Office Large Fire History 1679
A.4.1.2. Las Vegas Field Office Suppression/Preparedness Actions 1680
A.4.1.3. LVFO Fire Prevention, Community Education, Community Risk Assessment, and Other Community Assistance Activities. 1684
A.4.1.4. LVFO Fire Training Activities 1684
A.4.1.5. LVFO Fire Detection Program 1685
A.4.1.6. Fire Weather and Fire Danger 1686
A.4.1.7. Aviation Management 1687
A.4.1.8. Initial Attack 1688
A.4.1.9. LVFO Extended Attack and Large Fire Suppression 1690
A.4.1.10. Other Fire Suppression Considerations in LVFO 1690
A.4.2. Wildland Fire Use 1691
A.4.3. Prescribed Fire 1691
A.4.4. Non-Fire Fuels Treatments 1692
A.4.5. Emergency Stabilization and Rehabilitation 1693
A.4.6. Community Protection/Community Assistance 1694
A.5. Organization and Budget 1695
A.5.1. Budget and Organization 1695
A.6. Monitoring and Evaluation 1697
A.6.1. Annual Program Assessment 1697
A.6.2. Project Monitoring 1697
A.6.3. Emergency Stabilization and Rehabilitation: 1698
A.6.4. Reporting 1698
A.6.5. Fire Research 1698

Appendix B. Design Features and Best Management Practices for VRM 1699

B.1. Utility Scale Solar Energy Project Design Features for Visual Resources 1699
B.1.1. General 1699
B.1.2. Site Characterization, Siting Design and Construction 1700
B.1.3. Operations and Maintenance 1705
B.1.4. Reclamation and Decommissioning 1705
B.2. Best Management Practices for Reducing Visual Impacts of Renewable Energy Facilities 1706

Appendix C. Fluid Leasable Mineral Management 1711

C.1. Summary 1711
C.2. Open to Fluid Mineral Leasing 1713
C.3. Open to Fluid Mineral Leasing Subject to Moderate Constraints 1713
C.4. Open to Fluid Mineral Leasing Subject to Major Constraints 1714
C.5. Closed to Fluid Mineral Leasing 1714
C.6. Geophysical Exploration 1715
C.7. Stipulation Maintenance 1715
C.8. Split Estate Minerals 1715
C.9. Hydraulic Fracturing 1715
C.9.1. Groundwater Protection Analysis and Documentation Process 1716
C.10. Fluid Mineral Lease Notice and Stipulations Specific to SNDO 1716
C.10.1. Desert Tortoise Notice 1717
C.10.2. Aquatic/Riparian Species Notice 1717
C.10.3. Stipulations 1717
C.10.4. ACEC's 1717
C.10.5. Desert Tortoise Critical Habitat in ACEC's 1718
C.10.6. Desert Tortoise Habitat 1718
C.10.7. Special Status Plants 1719
C.10.8. Threatened and Endangered and Special Status Species 1720
C.10.9. Valley of Fire State Park 1720
C.11. Nevada BLM Fluid Mineral Lease Notice and Stipulations 1721
C.11.1. Pronghorn Antelope Seasonal Habitat (NV-S-01-A-TL) 1722
C.11.2. Pronghorn Antelope Calving Habitat (NV-?-01-B-TL) 1722
C.11.3. Mule Deer Seasonal Habitat (NV-S-02-A-TL) 1723
C.11.4. Mule Deer Migration Corridors (NV-S-02-B-TL) 1723
C.11.5. Mule Deer Fawning Habitat (NV-S-02-C-TL) 1724
C.11.6. Elk Seasonal Habitat (NV-S-03-A-TL) 1724
C.11.7. Elk Calving Habitat 1725
C.11.8. Bighorn Sheep Year Round Habitat (NV-S-04-A-CSU) 1725
C.11.9. Bighorn Sheep Lambing/Crucial Winter Range Habitat (NV-S-04-B-TL) .. 1726
C.11.10. Bighorn Sheep Summer Range (NV-S-04-C-TL) 1726
C.11.11. Notice to Lessee - Wild Horse and Burro (NV-S-05-A-NTL) 1727
C.11.12. Notice to Lessee - T&E, Sensitive and Special Status Species (NV-S-06-A-NTL) 1727
C.11.13. Raptor Nest Sites (NV-S-06-B-TL) 1728
C.11.14. Notice to Lessee - Cultural Resources (NV-S-07-A-NTL) 1728
C.11.15. National Register of Historic Places (NV-S-07-B-NSO) 1729

C.11.16. Sites Eligible for National Register of Historic Places (NV-S-07-C-NSO) 1729
C.11.17. Trails (NV-S-07-D-NSO) 1730
C.11.18. Notice to Lessee - Fossils (PFYC-2) (NV-S-08-A-NTL) 1731
C.11.19. Notice to Lessee - Fossils (PFYC-3) (NV-S-08-B-NTL) 1731
C.11.20. Notice to Lessee - Fossils (PFYC-4) (NV-S-08-C-NTL) 1731
C.11.21. Fossils (PFYC-5) (NV-S-08-D-NSO) 1732
C.11.22. Recreation (NV-S-09-A-NSO) 1732
C.11.23. Riparian Habitat (NV-S-10-A-NSO) 1733
C.11.24. Riparian Habitat Buffer (NV-S-10-B-CSU) 1733
C.11.25. 100-year Flood Plains (NV-S-10-C-NSO) 1734
C.11.26. Playas (NV-S-10-D-NSO) 1734
C.11.27. Notice to Lessee — Municipal Wellhead Zones (NV-S-10-E-NTL) 1735
C.11.28. Soil Slopes > 30 and < 41 percent (NV-S-11-A-CSU) 1736
C.11.29. Soil Slopes >40 percent (NV-S-11-B-NSO) 1736
C.11.30. Soil Severe Erosion (NV-S-11-C-CSU) 1737
C.11.31. Notice to Lessee - NDOT Mineral Pits (NV-S-12-A-NTL) 1738
C.11.32. Notice to Lessee - Saleable Minerals: Community Pits (NV-S-12-B-NTL) 1738
C.11.33. Notice to Lessee — Mining Claims (NV-S-13-A-NTL) 1738
C.11.34. Notice to Lessee — Solid Mineral Leasing (NV-S-14-A-NTL) 1739

Appendix D. Lands with Wilderness Characteristics 1741

D.1. Arrow Canyon Addition Subunit B 1741
D.2. Billy Goat Peak 1741
D.3. Black Ridge 1742
D.4. Garrett Buttes 1743
D.5. Highland Range 1744
D.6. Ireteba Peaks Addition 1744
D.7. Lime Canyon Addition Subunit A 1745
D.8. Lime Canyon Addition Subunit B 1746
D.9. Lime Canyon Addition Subunit C 1747
D.10. McCullough Mountains 1747
D.11. Muddy Mountains Subunit A 1748
D.12. Muddy Mountains Subunit B 1749
D.13. Muddy Mountains Subunit C 1749
D.14. Muddy Mountains Subunit D 1750
D.15. Muddy Mountains Subunit E 1751
D.16. Muddy Mountains Subunit F 1751
D.17. Newberry Mountains 1752
D.18. Resting Springs Addition 1753
D.19. South McCullough Addition Subunit A 1753
D.20. Temple Mesa Subunit B 1754
D.21. Whitney Pockets West 1755

Appendix E. Noxious Weeds 1757

E.1. Executive Summary 1759
E.2. Background 1760
E.3. Current Situation 1760

E.4. NEPA noxious weed analysis 1761
E.5. Disposal areas 1761
E.6. Budget 1762
E.7. Goals, Management Opportunities and Recommended Strategies 1762
E.7.1. Goal 1: Implementation of an Integrated Weed Management (lWM) program 1762
E.7.1.1. Management Opportunities 1762
E.7.1.2. Recommended Strategies 1762
E.8. Goal 2: Inventory and subsequent re-inventory of weeds 1763
E.8.1. Management Opportunities 1763
E.8.2. Recommended Strategies 1764
E.9. Goal 3: Integration of a weed management component in all planning efforts with standard mitigation measures 1764
E.9.1. Management Opportunities 1764
E.9.2. Recommended Strategies 1764
E.10. Goal 4: Development of Prevention, Detection and Control efforts 1764
E.10.1. Management Opportunities 1765
E.10.2. Recommended Strategies 1765
E.11. Goal 5: Development of an Education and Awareness program for internal and external partners 1765
E.11.1. Management Opportunities 1765
E.11.2. Recommended Strategies 1765
E.12. Goal 6: Development of a means of coordination between agencies, industry and private landowners to control weeds 1766
E.12.1. Management Opportunities 1766
E.12.2. Recommended Strategies 1766
E.13. Goal 7: Development of monitoring and evaluation procedures for treated sites 1766
E.13.1. Management Opportunities 1766
E.13.2. Recommended Strategies 1766
E.14. Resource Needs 1767
E.15. Annual Operation Plan 1767
E.16. Appendix 1. State of Nevada Noxious Weed List. 1768
E.16.1. Category A 1768
E.16.2. Category B 1769
E.16.3. Category C 1770
E.17. Appendix 2. Laws, Regulations and Policies 1770
E.18. Appendix 3. Weed Survey Protocols 1771
E.19. Big Time Weed Plan 1773
E.19.1. Introduction 1774
E.19.2. 1.1 Plan Purpose 1774
E.19.3. 1.2 Goals and Objectives 1774
E.19.4. 1.3 Project Description 1775
E.19.5. 2.0 Noxious Weed Inventory 1775
E.19.5.1. Wyoming 1775
E.19.5.2. Utah 1776
E.19.5.3. Nevada 1776
E.19.5.4. California 1776
E.19.5.5. 2.1 Weed Management Areas 1776
E.19.6. 3.0 Noxious Weed Management 1776
E.19.6.1. 3.1 Identification of Problem Areas 1776

E.19.6.2. 3.2 Preventive Measures 1777
E.19.6.3. 3.3 Treatment Methods 1777
E.19.6.4. 3.4 Agency-Specific Requirements 1778
E.19.7. 4.0 Monitoring 1778
E.19.7.1. 4.1 Reclamation Monitoring 1779
E.19.7.2. 4.2 Ongoing Monitoring 1779
E.19.7.3. 4.3 Monitoring of Known Infestation Areas 1779
E.19.8. 5.0 Herbicide Application, Handling, Spills , and Cleanup 1780
E.19.8.1. 5.1 Herbicide Application and Handling 1780
E.19.8.2. 5.2 Herbicide Spills and Cleanup 1780
E.19.8.3. 5.3 Worker Safety and Spill Reporting 1781
E.19.9. 6. References 1781
E.20. Appendix 5. Rapid Start 1781
E.21. Appendix 6. LVFO Weed Coordinator Duties 1782
E.22. Appendix 7. Best Management Practices 1783
E.23. Appendix 8. Stipulations 1783
E.24. Appendix 9. Treatment Prioritization 1786
E.25. Appendix 10. LVFO Weed Prevention Schedule and Duties 1787
E.26. Appendix 11. Risk Assessment Instructions and Form 1788
E.26.1. Risk Factors 1789
E.27. Appendix 12. Pesticide Use Proposal Form and Example 1790
E.27.1. Blank Document Nevada BLM Pesticide Use Proposal 1790
E.27.2. Real Example Nevada BLM Pesticide Use Proposal 1792
E.28. Appendix 13. Pesticides and adjuvants approved for use on Public Lands 1795
E.29. Appendix 14. Plan of Operations, by year, for the LVFO Noxious Weed Coordinator 1803

Appendix F. Recreation Management Actions 1805

F.1. Las Vegas Field Office Recreation Management Areas 1805
F.1.1. Special Recreation Management Areas (SRMAs) 1805
F.1.1.1. Gold Butte Special Recreation Management Area (SRMA) 1805
F.1.1.2. Jean/Roach Special Recreation Management Area (SRMA) 1808
F.1.1.3. Las Vegas Valley Special Recreation Management Area (SRMA) 1817
F.1.1.4. Laughlin Special Recreation Management Area (SRMA) 1837
F.1.1.5. Logandale Special Recreation Management Area (SRMA) 1840
F.1.1.6. Nellis Dunes Special Recreation Management Area (SRMA) 1846
F.1.2. Extensive Recreation Management Areas (ERMAs) 1849
F.1.2.1. Clark County ERMAs 1849
F.1.2.2. Gold Butte Extensive Recreation Management Area (ERMA) 1853
F.1.2.3. Las Vegas Valley Extensive Recreation Management Area (ERMA) .. 1855
F.1.2.4. Muddy Mountains Extensive Recreation Management Area (ERMA) 1856
F.2. Pahrump Field Office Recreation Management Areas 1857
F.2.1. Special Recreation Management Areas (SRMAs) 1857
F.2.1.1. Big Dune Special Recreation Management Area (SRMA) 1857
F.2.1.2. Crater Flat Special Recreation Management Area (SRMA) 1860
F.2.2. Extensive Recreation Management Areas (ERMAs) 1863
F.2.2.1. Amargosa Extensive Recreation Management Area (ERMA) 1863
F.2.2.2. Pahrump Valley Extensive Recreation Management Area (ERMA) 1865

Appendix G. Consolidated Conservation Measures from Herbicide 1867

G.1. General 1867
G.2. Plants 1867
G.3. Aquatic Animals (Most of these are included in the NMFS Biological Opinion unless noted) 1875
G.4. Wildlife 1880
G.4.1. Conservation Measures for Butterflies and Moths 1881
G.4.2. Conservation Measures - Beetles 1882
G.4.3. Conservation Measures - Amphibians and Reptiles 1882
G.4.4. Conservation Measures - Bird Species 1884
G.4.5. Conservation Measures - Mammals 1892

Appendix H. SOPs for Applying Herbicides from PEIS 1905

Appendix I. Rock Collecting 1913

Appendix J. Wild and Scenic River Suitability Study 1915

J.1. Wild and Scenic River – Suitability Study 1915
J.1.1. Eligible River / Segment: Virgin River Segments 1-3 1915
J.1.2. Eligible River / Segment: Meadow Valley Wash 1917
J.1.3. Eligible River / Segment: Muddy River 1920
J.1.4. Eligible River / Segment: Hiko Spring 1922
J.1.5. Eligible River / Segment: Carson Slough 1925
J.2. BLM Management Recommendations for the preferred alternative: 1927

Appendix K. Wild and Scenic Rivers Review Eligibility Determination 1929

K.1. Wild and Scenic Rivers Review Eligibility Determination 1929
K.1.1. Introduction –Wild and Scenic Rivers Act (WSRA) 1932
K.1.2. Authorities and Guidelines 1932
K.1.3. History of Wild and Scenic River Process – Southern Nevada District Office, Las Vegas and Pahrump Field Offices 1932
K.1.4. Eligibility Review by Interdisciplinary Team 1933
K.1.5. Input from Local Governments, Agencies, Tribes, Organizations, and the Public 1936
K.1.6. Suitability Study 1936
K.1.7. Interface with Agencies with Contiguous Boundaries 1936
K.1.8. ID Team 1938
K.1.9. References 1939
K.1.10. Attachment A: Streams Having Less Than One Mile of Surface Flows 1939
K.1.11. Attachment B: Classification Criteria for Wild, Scenic, and Recreational River Areas 1939
K.1.12. Attachment C: River Lists Considered in Wild and Scenic Rivers Eligibility Review 1940

K.1.13. Attachment D: Major Streams Reviewed, Las Vegas and Pahrump Field Offices 1941
K.1.14. Attachment E: Outstandingly Remarkable Values of Eligible Rivers 1941
K.1.15. Map 1 Southern Nevada District Office Eligible Rivers 1944
K.2. Amendment To: Wild and Scenic Rivers Review Eligibility Determination 1944

Appendix L. Consolidated Conservation Measures from Herbicide PEIS 1949

L.1. General 1949
L.2. Plants 1949
L.3. Aquatic Animals (Most of these are included in the NMFS Biological Opinion unless noted) 1957
L.4. Wildlife 1962
L.4.1. Conservation Measures for Butterflies and Moths 1963
L.4.2. Conservation Measures - Beetles 1964
L.4.3. Conservation Measures - Amphibians and Reptiles 1964
L.4.4. Conservation Measures - Bird Species 1966
L.4.5. Conservation Measures - Mammals 1974

Appendix M. Best Management Practices for Communication Sites 1987

Appendix N. ACEC Evaluation Report 1989

N.1. Introduction 1989
N.1.1. Designating ACECs 1989
N.1.1.1. Relevance and Importance Criteria 1989
N.2. Evaluation Process 1991
N.2.1. Evaluate nominations 1991
N.2.1.1. Development of Alternatives to be Considered in the Draft RMP/EIS 1997
N.3. Evaluations of ACEC Nominations 1998
N.3.1. Existing ACECs 1998
N.3.1.1. Amargosa Mesquite ACEC 1998
N.3.1.2. Arden Historic Sites ACEC 1999
N.3.1.3. Arrow Canyon ACEC 2000
N.3.1.4. Ash Meadows 2002
N.3.1.5. Big Dune ACEC 2004
N.3.1.6. Coyote Springs ACEC 2006
N.3.1.7. Crescent Townsites ACEC 2008
N.3.1.8. Devils Throat ACEC 2009
N.3.1.9. Gold Butte, Part A 2010
N.3.1.10. Gold Butte, Part B 2012
N.3.1.11. Gold Butte, Part C (Virgin Mountains) 2015
N.3.1.12. Gold Butte Townsites ACEC 2017
N.3.1.13. Hidden Valley ACEC 2018
N.3.1.14. Keyhole Canyon ACEC 2020
N.3.1.15. Mormon Mesa ACEC 2021
N.3.1.16. Piute/Eldorado ACEC 2023
N.3.1.17. Rainbow Gardens ACEC 2025

N.3.1.18. Red Rock Spring ACEC 2028
N.3.1.19. River Mountains ACEC 2029
N.3.1.20. Stump Spring ACEC 2031
N.3.1.21. Virgin River ACEC 2032
N.3.1.22. Whitney Pocket ACEC 2034
N.3.2. Areas Nominated for ACEC Designation 2036
N.3.2.1. Bird Spring Valley Nominated ACEC 2036
N.3.2.2. Bitter Springs Nominated ACEC 2039
N.3.2.3. California Wash Nominated ACEC 2041
N.3.2.4. Gale Hills (formerly Lovell Wash) Nominated ACEC 2042
N.3.2.5. Grapevine Springs Nominated ACEC 2044
N.3.2.6. Highland Range Nominated ACEC 2046
N.3.2.7. Hiko Wash Nominated ACEC 2048
N.3.2.8. Ivanpah Valley 1 Nominated ACEC (BLM) 2051
N.3.2.9. Ivanpah Valley 2 Nominated ACEC (BLM and Basin and Range Watch) 2052
N.3.2.10. Jean Lake Nominated ACEC 2065
N.3.2.11. LaMadre (North and South) Nominated ACEC 2067
N.3.2.12. Lava Dune Nominated ACEC 2069
N.3.2.13. Logandale Nominated ACEC 2071
N.3.2.14. Lower Mormon Mesa Nominated ACEC 2073
N.3.2.15. Mesa Milkvetch Nominated ACEC 2074
N.3.2.16. Moapa Mesquite Nominated ACEC 2076
N.3.2.17. Mt. Schader Nominated ACEC 2078
N.3.2.18. Muddy Mountains Nominated ACEC 2079
N.3.2.19. Old Spanish Trail Nominated ACEC 2082
N.3.2.20. Opal Mountains Nominated ACEC 2084
N.3.2.21. Pahrump Valley to McCullough Mountains Nominated ACEC 2086
N.3.2.22. Pahrump Valley Nominated ACEC 2089
N.3.2.23. Perkins Ranch Nominated ACEC 2091
N.3.2.24. South Bare Mountains (Crater Flat) Nominated ACEC 2094
N.3.2.25. South Newbury Mountains Nominated ACEC 2095
N.3.2.26. Specter Hills Nominated ACEC 2098
N.3.2.27. Spirit Mountain Nominated ACEC 2100
N.3.2.28. Specter Range to Devil's Hole Hills Nominated ACEC 2101
N.3.2.29. Stewart Valley Nominated ACEC 2103
N.3.2.30. Stuart Ranch Nominated ACEC 2105
N.3.2.31. Stump Spring 2 Nominated ACEC 2108
N.3.2.32. Upper Las Vegas Wash and Corn Creek Nominated ACECs 2110
N.3.2.33. Valley of Fire Nominated ACEC 2114
N.4. Summary of ACEC Evaluations 2116

Appendix O. Supplemental Rules 2123

O.1. Introduction 2123
O.2. How to Read and Use This Document 2123
O.3. Summary 2123
O.4. Authority 2123
O.5. Process 2124

O.6. Rule Creation 2124
O.7. Public Process 2124
O.8. Public Comment Procedures 2125
O.9. Other Procedural Matters 2125
O.10. Proposed Supplementary Rules 2127
O.10.1. Definitions 2127
O.10.2. Alcohol and Drugs 2128
O.10.3. Camping 2128
O.10.4. Domesticated Animals 2128
O.10.5. Wild Horses and Burros 2129
O.10.6. Firearms 2129
O.10.7. Other Restrictions 2129
O.10.8. Prohibited Acts 2130
O.11. Penalties 2131

Appendix P. Laws, Regulations, and Policies 2133

P.1. Soil Management 2133
P.2. Water Resources 2134
P.3. Wild Horses and Burros 2134
P.4. Wildland Fire 2135
P.5. Leasable Minerals 2136
P.6. Saleable Minerals 2137
P.7. Locatable Minerals 2138
P.8. National Landscape Conservation System 2138

Appendix Q. Maps for the Las Vegas and Pahrump Field Offices RMP 2139

Appendix R. Best Management Practices for Formerly Used Defense Sites 2145

Glossary 2147

References 2187

Abbreviation/Acronyms 2199

List of Figures

Figure 1.1. Southern Nevada District Office Planning Area 5
Figure 2.1. How to Read the Alternatives Tables Example 23
Figure 3.1. Generalized Stratigraphic Column for La Madre Mountain in the Spring Mountains West of Las Vegas Valley, Modified from Axen (2000) 295
Figure 3.2. Monthly Averages of Crude Oil 434
Figure 3.3. Monthly Averages of Gasoline and Diesel Fuels 434
Figure 3.4. Saleable Resources Sold Since 2000 438
Figure 3.5. Historic Monthly High and Low Averages of Gold Over the Life of the 1998 RMP 444
Figure 3.6. Historic Monthly High and Low Averages of Silver Over the Life of the 1998 RMP 444
Figure 3.7. Historic Monthly High and Low Averages of Base Metals Over the Life of the 1998 RMP 445
Figure 3.8. Historic Prices for Rare Earth Elements Between 2004 and 2010 448
Figure 3.9. Prices for Rare Earth Elements Between 2012 and 2013 449
Figure N.1. Map — Existing ACECs 1993
Figure N.2. Areas Nominated for ACEC Designation 1997
Figure N.3. Map — Areas Meeting Relevance and Importance Criteria 2122

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List of Maps

Map 2.6.3.1 - 5. Areas of Ecological Importance, Alternative 2 2139
Map 2.6.1.9 - 1. Wildland Fire Management, Alternatives 2–4 2139
Map 2.6.1.12 - 1. Visual Resource Management, Alternative 1 2139
Map 2.6.1.12 - 2. Visual Resource Management, Alternative 2 2139
Map 2.6.1.12 - 3. Visual Resource Management, Alternative 3 2139
Map 2.6.1.12 - 4. Visual Resource Management, Alternative 4 2139
Map 2.6.1.13 - 1. Wilderness and Lands With Wilderness Characteristics, Alternative 1 2139
Map 2.6.1.13 - 2. Wilderness and Lands With Wilderness Characteristics, Alternative 2 2139
Map 2.6.1.13 - 3. Wilderness and Lands With Wilderness Characteristics, Alternative 3 2139
Map 2.6.1.13 - 4. Wilderness and Lands With Wilderness Characteristics, Alternative 4 2139
Map 2.6.2.2 - 1. Grazing Allotments, Alternative 1 2139
Map 2.6.2.2 - 3. Grazing Allotments, Alternative 3 2139
Map 2.6.2.2 - 4. Grazing Allotments, Alternative 4 2139
Map 2.6.2.3 - 1. Fluid Leasable Minerals, Alternative 1 2139
Map 2.6.2.3 - 2. Fluid Leasable Minerals, Alternative 2 2139
Map 2.6.2.3 - 3. Fluid Leasable Minerals, Alternative 3 2140
Map 2.6.2.3 - 4. Fluid Leasable Minerals, Alternative 4 2140
Map 2.6.2.3 - 13. Solid Leasable Minerals, Alternative 1 2140
Map 2.6.2.3 - 14. Solid Leasable Minerals, Alternative 2 2140
Map 2.6.2.3 - 15. Solid Leasable Minerals, Alternative 3 2140
Map 2.6.2.3 - 16. Solid Leasable Minerals, Alternative 4 2140
Map 2.6.2.3 - 5. Locatable Minerals, Alternative 1 2140
Map 2.6.2.3 - 6. Locatable Minerals, Alternative 2 2140
Map 2.6.2.3 - 7. Locatable Minerals, Alternative 3 2140
Map 2.6.2.3 - 8. Locatable Minerals, Alternative 4 2140
Map 2.6.2.3 - 9. Saleable Minerals, Alternative 1 2140
Map 2.6.2.3 - 10. Saleable Minerals, Alternative 2 2140
Map 2.6.2.3 - 11. Saleable Minerals, Alternative 3 2140
Map 2.6.2.3 - 12. Saleable Minerals, Alternative 4 2140
Map 2.6.2.4 - 9. Recreational Target Shooting Closures, Alternative 1 2140
Map 2.6.2.4 - 10. Recreational Target Shooting Closures, Alternative 2 2141
Map 2.6.2.4 - 11. Recreational Target Shooting Closures, Alternative 3 2141
Map 2.6.2.4 - 5. Recreation Management Areas, Alternative 1 2141
Map 2.6.2.4 - 6. Recreation Management Areas, Alternative 2 2141
Map 2.6.2.4 - 7. Recreation Management Areas, Alternative 3 2141
Map 2.6.2.4 - 8. Recreation Management Areas, Alternative 4 2141
Map 2.6.2.4 - 1. Off-Highway Vehicle Designations, Alternative 1 2141
Map 2.6.2.4 - 2. Off-Highway Vehicle Designations, Alternative 2 2141
Map 2.6.2.4 - 3. Off-Highway Vehicle Designations, Alternative 3 2141
Map 2.6.2.4 - 4. Off-Highway Vehicle Designations, Alternative 4 2141
Map 2.6.2.5 - 2. Travel Management Areas, Alternative 2 2141
Map 2.6.2.5 - 3. Travel Management Areas, Alternative 3 2141
Map 2.6.2.5 - 4. Travel Management Areas, Alternative 4 2141
Map 2.6.2.6 - 1. Disposal Boundaries, Alternative 1 2141
Map 2.6.2.6 - 2. Disposal Boundaries, Alternative 2 2141
Map 2.6.2.6 - 3. Disposal Boundaries, Alternative 3 2142
Map 2.6.2.6 - 4. Disposal Boundaries, Alternative 4 2142
Map 2.6.2.6 - 5. Solar Energy, Alternative 1 2142

Map 2.6.2.6 - 6. Solar Energy, Alternative 2 2142
Map 2.6.2.6 - 7. Solar Energy, Alternative 3 2142
Map 2.6.2.6 - 8. Solar Energy, Alternative 4 2142
Map 2.6.2.6 - 9. Wind Energy, Alternative 1 2142
Map 2.6.2.6 - 10. Wind Energy, Alternative 2 2142
Map 2.6.2.6 -11. Wind Energy, Alternative 3 2142
Map 2.6.2.6 -12. Wind Energy, Alternative 4 2142
Map 2.6.2.6 - 13. Utility Corridors, Alternative 1 2142
Map 2.6.2.6 - 14. Utility Corridors, Alternative 2 2142
Map 2.6.2.6 -15. Utility Corridors, Alternative 3 2142
Map 2.6.2.6 - 16. Utility Corridors, Alternative 4 2142
Map 2.6.3.1 - 1. Areas of Critical Environmental Concern, Alternative 1 2142
Map 2.6.3.1 - 2. Areas of Critical Environmental Concern, Alternative 2 2143
Map 2.6.3.1 - 3. Areas of Critical Environmental Concern, Alternative 3 2143
Map 2.6.3.1 - 4. Areas of Critical Environmental Concern, Alternative 4 2143
Map 2.6.3.3 - 1. Wild and Scenic Rivers, Alternative 1 2143
Map 2.6.3.3 - 2. Wild and Scenic Rivers, Alternative 2 2143
Map 2.6.3.3 - 3. Wild and Scenic Rivers, Alternative 3 2143
Map 3.2.2.3 - 1. Geology 2143
Map 3.2.4.4 - 1. Hydrologic Basins 2143
Map 3.2.4.4 - 2. NHD HUC 19 2143
Map 3.2.3.1 - 1. Soil (Water Erodibility Group) 2143
Map 3.2.3.1 - 2. Soil (Wind Erodibility Group) 2143
Map 3.2.5.11 - 1. Vegetation Community 2143
Map 3.2.5.13 - 1. Weed Inventory 2143
Map 3.2.6.1 - 1. Ash Meadows Critical Habitat 2143
Map 3.2.6.1 - 2. Bighorn Sheep Habitat 2143
Map 3.2.6.1 - 3. Desert Tortoise Critical Habitat 2144
Map 3.2.6.1 - 4. Desert Tortoise Habitat Model 2144
Map 3.2.6.1 - 5. Virgin/Muddy River Habitat 2144
Map 3.2.8.1 - 1. Herd Areas 2144
Map 3.2.8.1 - 2. Herd Management Areas 2144
Map 3.3.3.1 - 1. Geothermal Potential 2144
Map 3.3.3.1 - 2. Geothermal Well Location 2144
Map 3.3.3.3 - 3. Locatable Potential 2144
Map 3.3.3.1 - 3. Oil and Gas Lease Parcels 2144
Map 3.3.3.1 - 4. Oil and Gas Permits 2144
Map 3.3.3.1 - 5. Oil and Gas Potential 2144
Map 3.3.3.2 - 1. Sand and Gravel Potential 2144
Map 3.4.3.1 - 1. National Trails 2144
Map 3.4.2.1 - 1. Back Country Byways 2144
Map 3.5.2.3 - 1. Formerly Used Defense Sites 2144

List of Tables

Table 1.1. Surface Management Areas ... 3
Table 1.2. Nine Basic Planning Steps ... 13
Table 2.1. Air Quality Management Actions ... 26
Table 2.2. Soil Resources Management Actions ... 28
Table 2.3. Water Resources Management Actions ... 30
Table 2.4. Integrated Vegetation Management Actions ... 33
Table 2.5. Fish and Wildlife Management Actions ... 38
Table 2.6. Special Status Species Management Actions ... 42
Table 2.7. Management Actions for Nye County Areas of Ecological Importance ... 45
Table 2.8. Wild Horse and Burro Management Actions ... 49
Table 2.9. Cave and Karst Management Actions ... 53
Table 2.10. Wildland Fire Management Actions ... 55
Table 2.11. Cultural Resources Management Actions ... 61
Table 2.12. Cultural Resource Management Prescriptions (Based on Manual Series BLM 8130) 65
Table 2.13. Paleontological Resources Management Actions ... 68
Table 2.14. Visual Resource Management Actions ... 70
Table 2.15. Lands with Wilderness Characteristics Management Actions ... 77
Table 2.16. Forestry and Woodland Products Management Actions ... 82
Table 2.17. Livestock Grazing Management Actions ... 84
Table 2.18. Minerals Management Actions ... 88
Table 2.19. Fluid Leasable Mineral Management Actions (including geothermal) ... 90
Table 2.20. Land Designations that Impact Fluid Leasable Mineral Developments ... 93
Table 2.21. Solid Leasable Mineral Management Actions ... 95
Table 2.22. Land Designations that Impact Solid Leasable Minerals Developments ... 96
Table 2.23. Locatable Mineral Management Actions ... 98
Table 2.24. Land Designations that Impact Locatable Mineral Developments ... 99
Table 2.25. Saleable Mineral Management Actions ... 101
Table 2.26. Land Designations that Impact Saleable Minerals Development ... 103
Table 2.27. Recreation Management Actions ... 105
Table 2.28. Group 1: Speed-Based Recreation in McCullough Pass Critical Desert Tortoise Habitat ... 142
Table 2.29. Group 2: Speed-Based Recreation in McCullough Pass Critical Desert Tortoise Habitat ... 143
Table 2.30. Group 2: Speed-Based Recreation in Nelson Hills Critical Desert Tortoise Habitat 144
Table 2.31. Non-Speed SRPs for the Four Desert Tortoise Critical Habitat ACECs in the Desert Tortoise Inactive Season ... 145
Table 2.32. Non-Speed SRPs for the Desert Tortoise Critical Habitat ACECs in the Desert Tortoise Active Season ... 147
Table 2.33. OHV Area Allocations ... 150
Table 2.34. Travel Classification Summary ... 153
Table 2.35. Travel Management Areas ... 155
Table 2.36. Lands and Realty Management Actions ... 160
Table 2.37. ACEC Summary Table ... 181
Table 2.38. Management Actions Pertaining to all ACECs ... 187
Table 2.39. Management Actions Pertaining to Specific ACECs ... 189
Table 2.40. National Trails Management Actions ... 258
Table 2.41. Wild and Scenic Rivers Management Actions ... 260

Table 2.42. Management Actions on Rivers Studied for Inclusion in the Wild and Scenic Rivers System ... 264
Table 2.43. Wilderness Management Actions ... 269
Table 2.44. Wilderness Study Areas Management Actions ... 271
Table 2.45. Public Health and Safety Management Actions ... 275
Table 2.46. Comparative Summary of the Alternatives ... 277
Table 3.1. National Ambient Air Quality Standards ... 285
Table 3.2. Total Number of Exceedances of the PM_{10} 24-Hour Standard Between 2000 and 2010 – Pahrump Stations ... 286
Table 3.3. Annual CO Exceedances (Clark County) ... 288
Table 3.4. Las Vegas Monthly Temperature Averages ... 290
Table 3.5. Southern Nevada Geologic Summary ... 297
Table 3.6. 10th Level NHD Hydrolic Unit Codes Within the Planning Area ... 303
Table 3.7. State of Nevada Hydrographic Basins Within the Planning Area ... 304
Table 3.8. 303(d) Listed Waterbodies Within the Planning Area ... 309
Table 3.9. Summary of Stressors, Trends, and Effects to Native Plant Communities in the Planning Area ... 319
Table 3.10. Vegetation Categories and Southwest Regional Gap Analysis Project Ecological Systems in the Planning Area ... 321
Table 3.11. Category A Weeds ... 330
Table 3.12. Category B Weeds ... 331
Table 3.13. Category C Weeds ... 331
Table 3.14. Invasive Weeds ... 331
Table 3.15. Endangered, Threatened, and Candidate Wildlife Species in the Planning Area ... 343
Table 3.16. Desert Tortoise Critical Habitat Units ... 345
Table 3.17. Endangered, Threatened, and Candidate Plant Species in the Planning Area ... 352
Table 3.18. BLM Sensitive Wildlife Species in the Planning Area ... 361
Table 3.19. BLM Sensitive Plant Species in the Planning Area ... 374
Table 3.20. Wild Horse and Burro Herd Management Areas Within the Las Vegas and Pahrump Field Offices ... 385
Table 3.21. Wild Horse and Burro Herd Areas ... 386
Table 3.22. Fire Occurrence 1999 to 2012 ... 399
Table 3.23. Fire Regimes and Acres ... 399
Table 3.24. Fire Regime Condition Classes and Acres ... 400
Table 3.25. Lands with Wilderness Characteristics ... 418
Table 3.26. Summary of Grazing Allotments in the Planning Area ... 423
Table 3.27. Summary of Livestock-Range Studies ... 425
Table 3.28. Approximate Acres Available for Development of Each of the Mineral Programs Based on the 1998 RMP ... 427
Table 3.29. Geothermal areas in the planning area that may have developable uses ... 428
Table 3.30. Regional Locations of Historical Geothermal Drilling Activity ... 429
Table 3.31. Proposed Geothermal Lease Parcels and Their Resource Acreage for Southern Nevada Between 2004 and 2013 ... 430
Table 3.32. Proposed Fluid Mineral Lease Parcels and Their Resource Acreage for Southern Nevada Between 2004 and 2013 ... 432
Table 3.33. Brief Comparison of Notices and Plans ... 441
Table 3.34. Comparison of Number of Plans and Notices Submitted to the District ... 442
Table 3.35. Visitor Use Trends for Las Vegas Field Office ... 452
Table 3.36. Numbers of Public Served by Special Recreation Permits ... 454

Table 3.37. National Special Recreation Permit Fee Schedule 455
Table 3.38. Las Vegas Field Office (Clark County) 460
Table 3.39. Pahrump Field Office (Nye County) 460
Table 3.40. Current Disposal Areas Within the Las Vegas Field Office 462
Table 3.41. Current Disposal Areas Within the Pahrump Field Office 463
Table 3.42. SNPLMA R&PP Reservation Files 465
Table 3.43. Acquisition Transactions Under SNPLMA 467
Table 3.44. Non-Military and Military Withdrawals Actions 469
Table 3.45. Numbers and Acres of ROWs in the Planning Area 470
Table 3.46. Approved Renewable Energy Projects 471
Table 3.47. Communication Sites in the Planning Area 473
Table 3.48. LVFO and PFO Utility Corridors 476
Table 3.49. Existing Areas of Critical Environmental Concern 482
Table 3.50. Potential ACECs 490
Table 3.51. Potential Additions to Existing ACECs 491
Table 3.52. Wild and Scenic Rivers Eligibility Determination 495
Table 3.53. Las Vegas/Pahrump Wilderness Areas 497
Table 3.54. Wilderness Study Areas in the Planning Area 499
Table 3.55. Known Mine Hazards in the District 503
Table 3.56. Lake Mead Base Munitions Response Site Coordinates 507
Table 3.57. Population Area and Density for 2012 510
Table 3.58. Population of the Study Area, 1970 to 2020 512
Table 3.59. Absolute Population Increase in the Study Area by Decade, 1970 to 2020 512
Table 3.60. Study Area Population, 1990 to 2009 513
Table 3.61. Demographics Overview of SE Study Area Compared to State and Nation 514
Table 3.62. Population by Race in the SE Study Area 514
Table 3.63. Income Levels in the SE Study Area 515
Table 3.64. Housing in the SE Study Area 516
Table 4.1. Lands with Wilderness Characteristics Proposed for Designation by Alternative 941
Table 4.2. Summary of Impacts Associated with Recreational Designations 1021
Table 4.3. Impacts to Fluid Leasable Mineral Resources Related to ACEC Designations Under Alternative 1 1026
Table 4.4. Comparison of the ACECs Between Alternative 2 and Alternative 1 1027
Table 4.5. Impacts to Fluid Leasable Mineral Resources Related to ACEC Designations Under Alternative 2 1027
Table 4.6. Comparison of the ACECs Between Alternative 3 and Alternative 1 1028
Table 4.7. Impacts to Fluid Leasable Mineral Resources Related to ACEC Designations Under Alternative 3 1028
Table 4.8. Comparison of the ACECs Between Alternative 4 and Alternative 1 1029
Table 4.9. Impacts to Fluid Leasable Mineral Resources Related to ACEC Designations Under Alternative 4 1029
Table 4.10. Comparison of Acreages for All Alternatives 1032
Table 4.11. Comparison of the ACECs Between Alternative 2 and Alternative 1 1050
Table 4.12. Comparison of the ACECs Between Alternative 3 and Alternative 1 1050
Table 4.13. Comparison of the ACECs Between Alternative 4 and Alternative 1 1051
Table 4.14. Comparison of Acreages for All Alternatives 1054
Table 4.15. Summary of the Locatable Mineral Resource Findings within the Ludington (2006) Mineral Potential Report on the District's ACECs 1072
Table 4.16. Comparison of the ACECs Between Alternative 2 and Alternative 1 1073

Table 4.17. Comparison of the ACECs Between Alternative 3 and Alternative 1 1075
Table 4.18. Comparison of the ACECs Between Alternative 4 and Alternative 1 1076
Table 4.19. Comparison of Acreages for All Alternatives 1080
Table 4.20. Summary of the saleable mineral resource findings within the Ludington (2006) Mineral Potential Report on the District's ACECs 1096
Table 4.21. Comparison of the ACECs Between Alternative 2 and Alternative 1 1098
Table 4.22. Comparison of the ACECs Between Alternative 3 and Alternative 1 1099
Table 4.23. Comparison of the ACECs Between Alternative 4 and Alternative 1 1100
Table 4.24. Comparison of Acreages for All Alternatives 1103
Table 4.25. Disposal Acreage that Could be Impacted by Water Resources (Clark County) 1147
Table 4.26. Disposal Areas that Could be Impacted by Water Resources (Nye County) 1147
Table 4.27. Alternative 1 Overlapping Disposal Areas and SRMAs 1156
Table 4.28. Alternative 2 Overlapping Disposal Areas and SRMAs 1157
Table 4.29. Alternative 3 Overlapping Disposal Areas and SRMAs 1157
Table 4.30. Alternative 4 Overlapping Disposal Areas and SRMAs 1157
Table 4.31. Percentage of Land Classified under VRM Level That Would Impact Land-Use-Authorizations 1176
Table 4.32. Saleable Minerals Impacts to Land-Use Authorizations 1182
Table 5.1. Cooperating Agency List 1335
Table 5.2. Tribal Organization Contacted 1336
Table 5.3. List of Preparers 1336
Table A.1. Summary of Fire Management Units for the Las Vegas Field Office: 1362
Table A.2. Las Vegas Field Office Agency Ownership, by Fire Management Unit Type 1367
Table A.3. Las Vegas Field Office Ignition History Table, Total and Decadal, by Individual Fire Management Unit 1368
Table A.4. Las Vegas Field Office Ignition History Table, by Year 1369
Table A.5. Las Vegas Field Office Ignition History Table, by Fire Management Unit Type 1369
Table A.6. Las Vegas Field Office Ignition History and Multiple Fire Day History Table, by Fire Management Unit Type 1369
Table A.7. Bureau of Land Management Implemented Fire Resources - Attachment 1 1695
Table A.8. Currently Approved MEL 1696
Table B.1. Wind Energy 1706
Table B.2. Solar Energy 1707
Table B.3. Geothermal Energy 1708
Table C.1. Summary of Fluid Mineral Leasing Acreages 1713
Table C.2. SNDO Stipulations for Fluid Minerals 1716
Table C.3. Stipulation Numbering System (Ex: NV-B-02-A-TL) 1721
Table E.1. Initial 2006 Budget and Workload Targets for the Noxious Weeds Program 1767
Table E.2. All Vegetation and Soil Surface Disturbing Activities 1783
Table E.3. LVFO Weed Prevention Schedule and Duties 1787
Table E.4. Pesticide Application 1790
Table E.5. Maximum Rate of Application 1790
Table E.6. Pesticide Application 1792
Table E.7. Maximum Rate of Application 1793
Table E.8. Herbicides Approved for Use on BLM Lands 1 1795
Table E.9. Herbicides Approved for Use on BLM Lands 1 (updated December 2005) 1799
Table E.10. Adjuvants Approved for Use on BLM Lands 1801
Table E.11. 2006 Operating Plan 1803
Table E.12. 2007 Operating Plan 1804

Table G.1. Butler Distances to Minimize Risks to Threatened, Endangered, and Proposed Fish and Aquatic Invertebrates from Off-site Drift of BLM-Evaluated Herbicides from Broadcast and Aerial Treatments 1877
Table H.1. Standard Operating Procedures for Applying Herbicides 1905
Table I.1. Rock Collecting Guidelines 1913
Table J.1. Virgin River Segments 1-3 1915
Table J.2. Meadow Valley Wash 1917
Table J.3. Muddy River 1920
Table J.4. Hiko Spring 1922
Table J.5. Carson Slough 1925
Table K.1. BLM Las Vegas and Pahrump Field Offices – Wild and Scenic Rivers Eligibility Determination 1935
Table K.2. Southern Nevada District Office Interdisciplinary Team Members 1938
Table K.3. River Lists Considered in Wild and Scenic Rivers Eligibility Review 1941
Table K.4. Outstandingly Remarkable Values of Eligible Rivers 1941
Table K.5. Outstandingly Remarkable Values of Eligible Rivers 1946
Table L.1. Butler Distances to Minimize Risks to Threatened, Endangered, and Proposed Fish and Aquatic Invertebrates from Off-site Drift of BLM-Evaluated Herbicides from Broadcast and Aerial Treatments 1959
Table N.1. Existing ACECs 1992
Table N.2. Areas Nominated for Consideration as ACECs 1995
Table N.3. Proposed additions to existing ACECs 1996
Table N.4. Summary Evaluation of Existing ACECs and Areas Nominated for ACEC Designation 2116

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Mission Statement

The Bureau of Land Management is responsible for stewardship of our public lands. The BLM is committed to manage, protect, and improve these lands in a manner to serve the needs of the American people. Management is based upon the principles of multiple use and sustained yield of our nation's resources within the framework of environmental responsibility and scientific technology. These resources include recreation, rangelands, timber, minerals, watershed, fish and wildlife habitat, wilderness, air, and scenic quality, as well as scientific and cultural values.

*

*Cover designed by George Varhalmi. Images provided or taken by Nancy Christ, David Fanning, Katie Kleinick, Michele Leiber, and Marc Sanchez.

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Abstract

Lead Agency: U.S. Department of the Interior, Bureau of Land Management (BLM), Nevada

Proposed Action: Las Vegas and Pahrump Field Offices Draft Resource Management Plan/Environmental Impact Statement (Draft RMP/EIS)

Type of Action: Administrative draft

Abstract: The Southern Nevada District Office has prepared the Draft RMP/EIS to support the revision of the 1998 Las Vegas Resource Management Plan. The revised RMP will guide management actions on public lands and mineral estates that are administered by the BLM within the Las Vegas and Pahrump field offices. This plan describes and analyzes four alternatives. Alternative 1 is the "no action" alternative; Alternatives 2, 3, and 4 propose varying levels of resource use and conservation. Alternative 3 is the agency-preferred alternative. Issues analyzed include visual resource management, areas of critical environmental concern, lands and realty management, wild and scenic rivers, minerals and energy resources, travel management, lands with wilderness characteristics, wild horses and burros, fire and fuels management, livestock grazing, recreation, fish and wildlife, vegetation, air, soil, cultural, and water resources.

Comments: Comments on the Las Vegas and Pahrump Field Offices Draft RMP/EIS are due within 90 days of publication of the Notice of Availability in the Federal Register. The close of the comment period will be announced in news releases, newsletters, and on the project web site at: https://www.blm.gov/epl-front-office/eplanning/planAndProjectSite.do?methodName=renderDefaultPlanOrProjectSite&projectId=2900&dctmId=0b0003e88009debe. Comments may be submitted electronically at sndo_rmp_revision@blm.gov. Comments may also be submitted by mail to:

BLM Southern Nevada District Office
Las Vegas and Pahrump Field Offices Draft RMP/Draft EIS
4701 N. Torrey Pines Drive, Las Vegas, NV 89130

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Dear Reader Letter

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Nevada State Office
1340 Financial Boulevard
Reno, Nevada 89502-7147
http://www.blm.gov/nv

In Reply Refer To:
1610 (NVS0000)

Dear Reader:

Attached for your review and comment is the Draft Resource Management Plan/Draft Environmental Impact Statement (Draft RMP/EIS) for the Nevada Bureau of Land Management (BLM), Las Vegas and Pahrump Field Offices. BLM prepared this document in consultation with cooperating agencies, and in accordance with the National Environmental Policy Act of 1969, as amended, the Federal Land Policy and Management Act of 1976, as amended, implementing regulations, the BLM's Land Use Planning Handbook (H-1601-1), and other applicable law and policy.

The planning area consists of about 5.3 million acres of land which includes about 3.1 million acres of public lands managed by the Las Vegas and Pahrump Field Offices. The planning area is located in southern Nevada and includes all public lands managed by the Las Vegas Field Office within Clark County and all public lands managed by the Pahrump Field Office within southern Nye County. When approved, this RMP will replace the *1998 Las Vegas Resource Management Plan* and will guide the management of public lands administered by the Las Vegas and Pahrump Field Offices into the future. *The Las Vegas and Pahrump Field Offices Draft Resource Management Plan/Environmental Impact Statement* and supporting information is available on the project web site at: https://www.blm.gov/epl-front-office/eplanning/planAndProjectSite.do?methodName=renderDefaultPlanOrProjectSite&projectId=2900&dctmId=0b0003e88009debe

The BLM encourages the public to provide information and comments pertaining to the analysis presented in the Draft RMP/EIS. We are particularly interested in feedback concerning the adequacy and accuracy of the proposed alternatives, the analysis of their respective management decisions, and any new information that would help the BLM as it develops the plan. In developing the Proposed RMP/Final EIS, which is the next phase of the planning process, the decision maker may select various management decisions from each of the alternatives analyzed in the Draft RMP/EIS for the purpose of creating a management strategy that best meets the needs of the resources and values in this area under the BLM multiple use and sustained yield mandate. As a member of the public, your timely comments on the *Las Vegas and Pahrump Field Offices Draft Resource Management Plan/Environmental Impact Statement* will help formulate the Proposed RMP/Final EIS. Comments will be accepted for ninety (90) calendar days following the Environmental Protection Agency's (EPA) publication of its Notice of Availability in the Federal Register. The BLM can best utilize your comments and resource information submissions if received within the review period.

Comments may be submitted electronically at: sndo_rmp_revision@blm.gov. Comments may also be submitted by mail to: BLM Southern Nevada District Office, Las Vegas/Pahrump Field Offices Draft RMP/Draft EIS, 4701 N. Torrey Pines Drive, Las Vegas, NV 89130. To facilitate analysis of comments and information submitted, we strongly encourage you to submit comments in an electronic format.

Your review and comments on the content of this document are critical to the success of this planning effort. If you wish to submit comments on the Draft RMP/EIS, we request that you make your comments as specific as possible. Comments will be more helpful if they include suggested changes, sources, or methodologies, and reference to a section or page number. Comments containing only opinion or preferences will be considered and included as part of the decision making process, although they will not receive a formal response from the BLM.

Before including your address, phone number, email address, or other personal identifying information in your comment, be advised that your entire comment - including your personal identifying information - may be made publicly available at any time. While you can ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee that we will be able to do so.

Public meetings to provide an overview of the document, respond to questions, and take public comments will be announced by local media, website, and/or public mailings at least 15 days in advance. Public meetings are currently scheduled for Las Vegas, Henderson, Pahrump, Laughlin, and Amargosa Valley.

Copies of the Draft RMP/EIS have been sent to affected Federal, state and local government agencies and tribal governments. Copies of the Draft RMP/EIS are available for public inspection at https://www.blm.gov/epl-front-office/eplanning/planAndProjectSite.do?methodName=renderDefaultPlanOrProjectSite&projectId =2900&dctmId=0b0003e88009debe. Copies are also available for public inspection at the following BLM location:

BLM Southern Nevada District Office, 4701 N. Torrey Pines Drive, Las Vegas, NV 89130

Thank you for your continued interest in the *Las Vegas and Pahrump Field Offices Draft Resource Management Plan/Environmental Impact Statement*. We appreciate the information and suggestions you contribute to the planning process. For additional information or clarification regarding this document or the planning process, please contact Lee Kirk, RMP Team Lead, telephone: 702-515-5026; address: 4701 N. Torrey Pines Drive, Las Vegas, NV 89130; email: sndo_rmp_revision@blm.gov.

Sincerely,

Amy L. Lueders
State Director

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Executive Summary

Introduction

The U.S. Department of the Interior, Bureau of Land Management (BLM), has prepared this Draft Resource Management Plan (RMP) and associated Environmental Impact Statement (EIS) to support the revision of the 1998 Las Vegas Resource Management Plan. The revised RMP will guide management actions on public lands and mineral estates that are administered by the BLM within the Las Vegas and Pahrump field offices.

The BLM will document broad-scale land-use plan decisions in the RMP for each program area that guides subsequent site-specific implementation. As the broadest, least-specific level in the BLM planning process, the RMP will prescribe the allocation of and general future management direction for the resources and land uses of BLM-administered public lands in the planning area. In turn, the RMP also will guide more specific tiers of the planning process (i.e., activity plans and projects or site-specific plans). The land-use planning process is the key tool that the BLM uses to define resource management and to designate public land uses in coordination with federal, tribal, state, and local governments; land users; and interested members of the public. An RMP revision does not generally result in a complete change of management direction; rather, an RMP revision addresses new guidance or changes in land uses. Accordingly, this RMP incorporates new information and regulatory guidance that have come about since the 1998 Las Vegas Resource Management Plan and its amendments. The focus of the RMP is to provide management direction by establishing goals and objectives for resource management and the measures to achieve these goals and objectives. These measures are defined as management actions and allowable uses. The RMP will also address land-use issues, opportunities, and/or conflicts. Current management direction from the 1998 RMP that has proven effective and requires no change will be carried forward into this RMP, as well as through the analysis process.

The Federal Land Policy and Management Act (FLPMA) of 1976, as amended, requires the BLM to manage public lands and their various resources so that they are used in the combination that will best meet the present and future needs of the American people. Land-use plan decisions are made according to the procedures in the BLM's planning regulations (43 Code of Federal Regulations [CFR] §1600) and in accordance with FLPMA. Additionally, the revision of the RMP constitutes a major federal action and is subject to the National Environmental Policy Act of 1969 (NEPA). NEPA requires federal agencies to consider environmental consequences in their decision-making process. This EIS is being prepared to analyze the impacts from the actions proposed in the RMP alternatives and to fulfill the requirements for implementing NEPA found in 40 CFR 1500–1508. The EIS informs decision-makers and the public of a range of reasonable alternatives, associated environmental impacts, and any mitigation measures required for selection of an alternative.

Purpose and Need

The purpose for the RMP is to provide guidance for managing the use of BLM-administered lands and to provide a framework for future land management actions within the planning area. FLPMA requires the BLM to "develop, maintain, and when appropriate, revise land use plans" (43 United States Code [USC] 1712(a)). Following the evaluation of the existing RMP, the Las Vegas and Pahrump field offices determined that it was necessary to revise the RMP based on

some decisions that were not clear and/or inconsistent with other decisions, increased levels of conflict around existing issues, and new (unforeseen) public land uses and concerns that have arisen over the years and were not included or were inadequately addressed in the existing RMP.

Decisions to be Made

Land-use plan decisions cover a broad scale and guide subsequent site-specific implementation decisions. The RMP will make the following types of decisions to establish direction in the planning area:

- Establish resource goals, objectives, and desired future conditions.
- Describe actions to achieve goals, objectives, and desired future conditions.
- Make land-use allocations and designations.
- Make land-use adjustments.

Management under any of the alternatives would comply with state and federal regulations, laws, standards, and policies. Each alternative considered in the Las Vegas and Pahrump Field Offices Draft RMP/EIS allows for some level of support of all resources present in the planning area. The alternatives are designed to provide general management guidance in most cases. Specific projects for any given area or resource would be detailed in future implementation plans or site-specific proposals, and additional NEPA analysis and documentation would be conducted as needed.

After the comments on the Draft RMP/EIS are reviewed and analyzed, the responsible officials can decide to:

- Select one of the alternatives analyzed for implementation or
- Modify an alternative (e.g., combine parts of different alternatives) as long as the environmental consequences are analyzed in the Proposed RMP/Final EIS.

Issues

A planning issue is an area of controversy or concern regarding management of resources or uses on BLM-managed lands within the planning area. Issues for the RMP were identified through public scoping, coordination with cooperating agencies, and resource management concerns of the BLM. These issues drive the formulation of the plan alternatives, and addressing them has resulted in the range of management options presented in the Draft RMP/EIS alternatives. Additional discussions regarding the issues are in the Scoping and Issues section in Chapter 1.

Issues of primary concern in the development of this Draft RMP/EIS include the following:

1. **Visual Resource Management (VRM):** Adjust VRM classes based on the recently completed inventory.
2. **Areas of Critical Environmental Concern (ACEC):** Analyze nominations, drop or adjust existing designations, and clarify management including establishment of thresholds for disturbance and incorporation of acquired lands.
3. **Areas of Ecological Importance:** Analyze nominations and clarify management, including establishment of thresholds for disturbance.
4. **Lands and Realty:**
   - Add, remove, or adjust areas identified for disposal.
   - Identify and adjust utility corridors.
   - Identify areas that can be developed, avoided, or excluded for solar and wind energy.

5. **Recreation:** Adjust, remove, or designate new recreation management areas.
6. **Wild and Scenic Rivers:** Analyze the suitability of eligible rivers for designation as components of the National Wild and Scenic River System.
7. **Travel Management:** Re-evaluate and adjust off-highway vehicle designations as necessary.
8. **Minerals:** Refine fluid leasable minerals to clarify surface management restrictions and direction for management of split estate.
9. **Lands With Wilderness Characteristics:** Determine what areas should be managed to maintain their wilderness characteristics based on the BLM inventory conducted to identify areas meeting wilderness characteristics.

Alternatives

In developing alternatives, the basic goal was to prepare different combinations of management actions to address issues and resolve conflicts among uses. Alternatives must meet the purpose and need; be reasonable; provide a mix of resource protection, use, and development; be responsive to the issues; and meet the established planning criteria. Each alternative constitutes a complete RMP that provides a framework for multiple-use management of the full spectrum of resources, resource uses, and programs present in the planning area. Under all alternatives the BLM would manage their lands in accordance with all applicable laws, regulations, and BLM policies and guidance.

This plan describes and analyzes four alternatives. Alternative 1 is the "no action" alternative; Alternatives 2, 3, and 4 propose varying levels of resource use and conservation.

Alternative 1 is defined as a continuation of the current management direction contained in the 1998 Las Vegas Resource Management Plan and its amendments and changes since incorporation. This alternative describes the current goals and actions for management of resources and land uses in the planning area. The management direction could also be modified by current laws, regulations, and policies.

Alternative 2 emphasizes the protection of the planning area's resource values while allowing commodity uses as consistent with current laws, regulations, and policies. Management actions would emphasize resource values such as habitats for wildlife and plant species (including special status species), protection of riparian areas and water quality, preservation of ecologically important areas, maintenance of wilderness characteristics, and protection of scientifically important cultural and paleontological sites. Access to and development of resources within the planning area could occur with intensive management and mitigation of surface-disturbing and disruptive activities.

Alternative 3 provides opportunities to use and develop resources within the planning area while ensuring resource protection. Alternative 3 would provide continued access to and development of resources with stipulations and mitigation to protect natural and cultural resources. Alternative 3 represents the mix and variety of actions that the BLM believes best resolves the issues and management concerns in consideration of all values and programs, and is thus considered BLM's preferred alternative.

Alternative 4 emphasizes opportunities to use and develop resources within the planning area. It would provide for motorized access and commodity production with minimal restrictions while providing protection of natural and cultural resources to the extent required by law, regulation,

and policy. This alternative would largely rely on existing laws, regulations, and policies, rather than special management or special designations, to protect sensitive resources.

Environmental Consequences

Selection of Alternative 1, the no action alternative, would maintain the current rate of progress in protecting resource values and in resource development. Alternative 2 would have the least potential to impact physical and biological resources from BLM actions. Alternative 3 would allow for increased use levels while providing for site-specific protection of resources. There would be a higher potential for resource impacts than under Alternatives 1 and 2, but less than under Alternative 4. Alternative 4 would allow for the most resource development with the fewest constraints and would result in greater impacts on the physical and biological environment than would implementation of Alternatives 2 or 3.

Chapter 1. Introduction

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1.1. How to Read This Chapter

This chapter describes the purpose and need for the Las Vegas/Pahrump Resource Management Plan (RMP) and provides a general description of the planning area. It describes how the RMP addresses the issues raised during scoping. Additionally, it outlines the planning criteria and the relationship between the RMP and other BLM plans.

1.2. Background

In January 2010, the Bureau of Land Management (BLM) Southern Nevada District Office, Las Vegas and Pahrump Field Offices, published a Notice of Intent in the Federal Register initiating a planning process to revise the 1998 Las Vegas Resource Management Plan (RMP). The land-use planning process is the key tool the BLM uses to manage resources and to designate uses on public lands. This revised RMP incorporates new information and regulatory guidance that have come about since the 1998 Las Vegas Resource Management Plan and its amendments. The focus of the RMP is to provide management direction by establishing goals and objectives for resource management and the measures to achieve these goals and objectives (management actions and allowable uses). The RMP will also focus on areas to resolve land-use issues or conflicts. Current management direction that has proven effective and requires no change will be carried forward into this RMP, as well as through the analysis process. It is estimated that the RMP would be in effect for about 20 years.

The RMP was prepared using BLM's planning regulations and guidance issued under the authority of the Federal Land Policy and Management Act (FLPMA) of 1976 (43 USC 1701 et seq.) and BLM's Land Use Planning Handbook, H-1601-1 (BLM 2005a). An EIS is incorporated into this document to meet the requirements of the National Environmental Policy Act of 1969 (NEPA), Council on Environmental Quality (CEQ) regulations for implementing NEPA (40 CFR 1500-1508) (CEQ 1978), the U.S. Department of the Interior NEPA regulations (43 CFR 46), and requirements of BLM's NEPA Handbook, H-1790-1 (BLM 2008g).

1.3. Purpose And Need For The Plan

1.3.1. Purpose

The purpose of the Las Vegas/Pahrump RMP Revision is to provide guidance for managing the use of BLM-administered lands and to provide a framework for future land management actions within the planning area. The RMP incorporates new information and data, addresses land-use issues and conflicts, and specifies where and under what circumstances particular activities and uses will be allowed on BLM-administered public lands. Public lands addressed in the RMP will be managed on the basis of multiple use and sustained yield while preventing unnecessary or undue degradation of the lands, including the protection of natural and cultural resources, in accordance with FLPMA. The RMP generally does not include a description of how particular programs or projects would be implemented or prioritized; those decisions are deferred to implementation-level planning.

While comprehensive in nature, this RMP revision focuses on revising RMP actions in response to issues that the plan evaluation and public scoping have identified as needing to be updated. A summary of the planning issues that drove this process is detailed in the Scoping Report and

summarized in Section 1.5 (p. 6) below. Actions from the 1998 RMP that were determined to still be responsive to the issues were carried forward in the RMP revision.

1.3.2. Need

FLPMA requires the BLM to "develop, maintain, and when appropriate, revise land use plans" (43 United States Code [USC] 1712(a)). Following the evaluation of the 1998 RMP, the Las Vegas and Pahrump field offices determined that it was necessary to revise the RMP based on some decisions that were not clear and/or inconsistent with other decisions, increased levels of conflict around existing issues, and new (unforeseen) public land uses and concerns that have arisen over the years that were not included or were inadequately addressed in the 1998 RMP. Among other issues identified in the Scoping Report and summarized below, the RMP revision is needed to:

- Respond to new policies and changing resource demands including, but not limited to, increased demand for renewable energy development, conflicting uses of limited resources, appropriate protection of sensitive resources, etc.
- Ensure that public lands are being managed according to the principles of multiple use and sustained yield.
- Resolve multiple use conflicts or issues between resource values and resource uses.
- Update management decisions to reflect updated land ownership patterns (e.g., revisions to disposal areas).

In addition to responding to current issues, the RMP must make the required decisions as outlined in the BLM's Land Use Planning Handbook (H-1601-1).

1.4. Planning Area Description

BLM's Land Use Planning Handbook (H-1601-1) differentiates between geographic areas associated with planning. They include the planning area, decision area, and analysis area:

- **Planning area**: For this effort, the planning area includes the Southern Nevada District Office, with the exclusion of BLM-administered lands and mineral estates within the Red Rock Canyon National Conservation Area (NCA), Sloan Canyon NCA, the Department of Defense (DOD) lands, the U.S. Fish and Wildlife Service (USFWS) Desert National Wildlife Refuge, and the Department of Energy (DOE) Nevada National Security Site, and the DOE Yucca Mountain Repository. Figure 1.1, "Southern Nevada District Office Planning Area" (p. 5) displays the planning area boundary.
- **Decision area:** This includes the lands within the planning area for which BLM has authority to make land-use and management decisions. This is primarily composed of areas where the BLM administers the surface resources of public lands. It also includes the mineral estate on split estate lands where a private or other non-federal party (e.g., state, county) owns the surface while the federal government owns the subsurface minerals. The revised Las Vegas/Pahrump RMP does not include any planning and management decisions for areas where the land surface and minerals are both privately owned or owned by the state of Nevada or local governments. For the purposes of this document, the decision area refers to all BLM-administered surface and subsurface estates.
- **Analysis area:** This includes any lands, regardless of jurisdiction, for which BLM synthesizes, analyzes, and interprets data and information that relates to planning for BLM-administered lands. Analyses that extend beyond the planning area allow management decisions to be made within the context of overall resource conditions and trends within the surrounding area. Use of

the term "analysis area" in this document may vary according to resource or discussion and is always defined in its initial use. Sometimes, the term "study area" is used interchangeably with the term "analysis area." For example, the Socioeconomic Study Area of this Draft EIS refers to an analysis area composed of all of Clark County and Nye County.

The planning area is situated in southern Nevada and includes all of Clark County and portions of Nye County. The southern end of the planning area forms a large "V" shape. The east leg of the V is composed of the Nevada/Arizona state boundary with Lake Mead National Recreation Area (NRA); Grand Canyon-Parashant National Monument; Mojave County, Ariz.; and lands managed by the BLM's Arizona Strip and Kingman field offices adjacent to BLM-administered lands within the planning area. The west leg of the V is composed of the Nevada/California state boundary, with Death Valley National Park, the Mojave National Preserve, San Bernardino County, Calif., and public lands managed by the BLM's Barstow and Needles field offices. The northern boundary of the planning area is predominantly bounded by the USFWS Desert National Wildlife Range, the Department of Defense Nevada Test and Training Range, and the Department of Energy Nevada National Security Site. Also to the north of the planning area lies the Pahranagat National Wildlife Refuge, Lincoln and Esmerelda counties in Nevada, and lands managed by the BLM's Caliente and Tonopah field offices. Major drainages within the planning area include the Amargosa, Muddy, and Virgin rivers and the Meadow Valley Wash.

The decision area surrounds, but does not include, the U.S. Forest Service Spring Mountains NRA, Red Rock Canyon NCA, Sloan Canyon NCA, Moapa Valley National Wildlife Refuge, and Ash Meadows National Wildlife Refuge. The decision area does include federal mineral estates underlying Valley of Fire State Park and other lands where the surface is in non-federal ownership but the mineral estate is retained by the federal government.

Southern Nevada is characterized by diverse geographical features. Landforms range from rugged mountain ranges to sloping bajadas and broad valleys. The Colorado River and several of its tributaries flow through the eastern portions of the planning area. The Las Vegas Valley portion of the planning area is a major topographic feature, trending north-south through the middle of the planning area. This valley has an expanding metropolitan area consisting of the cities of Las Vegas, North Las Vegas and Henderson. Much of the planning area, however, remains remote and rural, with the population clustered in small communities, usually associated with the availability of water. The public lands in the planning area have important scenic, recreational, mineral, archaeological, wilderness, wildlife, and vegetative values. Public uses of these resources often have an important role in the growth and development of local and other communities.

Of the approximately 5,322,160 acres of land within the planning area, this RMP will make decisions only for the BLM surface estate and the federal mineral estate managed by the LVFO and PFO. Table 1.1, "Surface Management Areas" (p. 3) displays management responsibilities/ownership for lands within the planning area. A complete map of the mineral estate for the planning area does not exist, therefore the table only identifies surface management ownership and does not include mineral ownership.

Table 1.1. Surface Management Areas

	LVFO (Clark County)	Percent of LVFO	PFO (Nye County)	Percent of PFO
BLM	2,414,061	50.7 percent	702,094	14.4 percent
Private	546,105	11.5 percent	116,608	2.4 percent
State of Nevada	50,717	1.1 percent	80	0 percent

	LVFO (Clark County)	Percent of LVFO	PFO (Nye County)	Percent of PFO
Bureau of Indian Affairs	80,686	1.7 percent	0	0 percent
Department of Defense[a]	26,704	0.6 percent	2,978,516	61 percent
Department of Energy[b]	4,313	0.1 percent	877,169	18 percent
U.S. Forest Service	280,142	5.9 percent	37,356	0.8 percent
U.S. Fish and Wildlife Service[c]	751,322	15.8 percent	58,125	1.2 percent
National Park Service	563,349	11.8 percent	110,210	2.3 percent
Bureau of Reclamation	43,212	0.9 percent	0	0 percent
Total	**4,760,6110**		**4,880,128**	

[a]Acreage within the planning area does not include approximately 2,964,740 acres of the Nevada Test and Training Range within the Southern Nevada District Office.

[b]Acreage within the planning area does not include approximately 868,650 acres of the Department of Energy Nevada National Security Site, or the DOE Yucca Mountain Repository within the Southern Nevada District Office.

[c]Acreage within the planning area does not include approximately 751,350 acres of the Desert National Wildlife Refuge within the Southern Nevada District Office.

In areas where the land surface is privately owned or owned by the state of Nevada or local governments and the minerals are federally owned, the RMP will include planning and management decisions only for the BLM-administered federal mineral estate. The land and resource uses and values on the non-federal surface will be taken into account in the impact analysis and will affect development of the federal minerals. However, the RMP decisions will not pertain to non-mineral state and private actions on non-federal surface. Surface and minerals management actions and development activities of non-federal surfaces and mineral estate will be taken into account for purposes of cumulative impact analysis in the Las Vegas/Pahrump RMP/EIS.

In areas where the federal land surface is administered by the U.S. Forest Service, the National Park Service, or other federal agencies and the federal mineral estate is administered by the BLM, the land-surface planning and management decisions are the responsibility of those other federal surface management agencies. BLM administrative responsibilities within these areas are handled on a case-by-case basis and are guided by the other surface management agencies' policies, procedures, and plans when applying stipulations or restrictions. Surface and minerals management actions and development activities anticipated in these areas will be taken into account for purposes of cumulative impact analysis in the Las Vegas/Pahrump RMP/EIS.

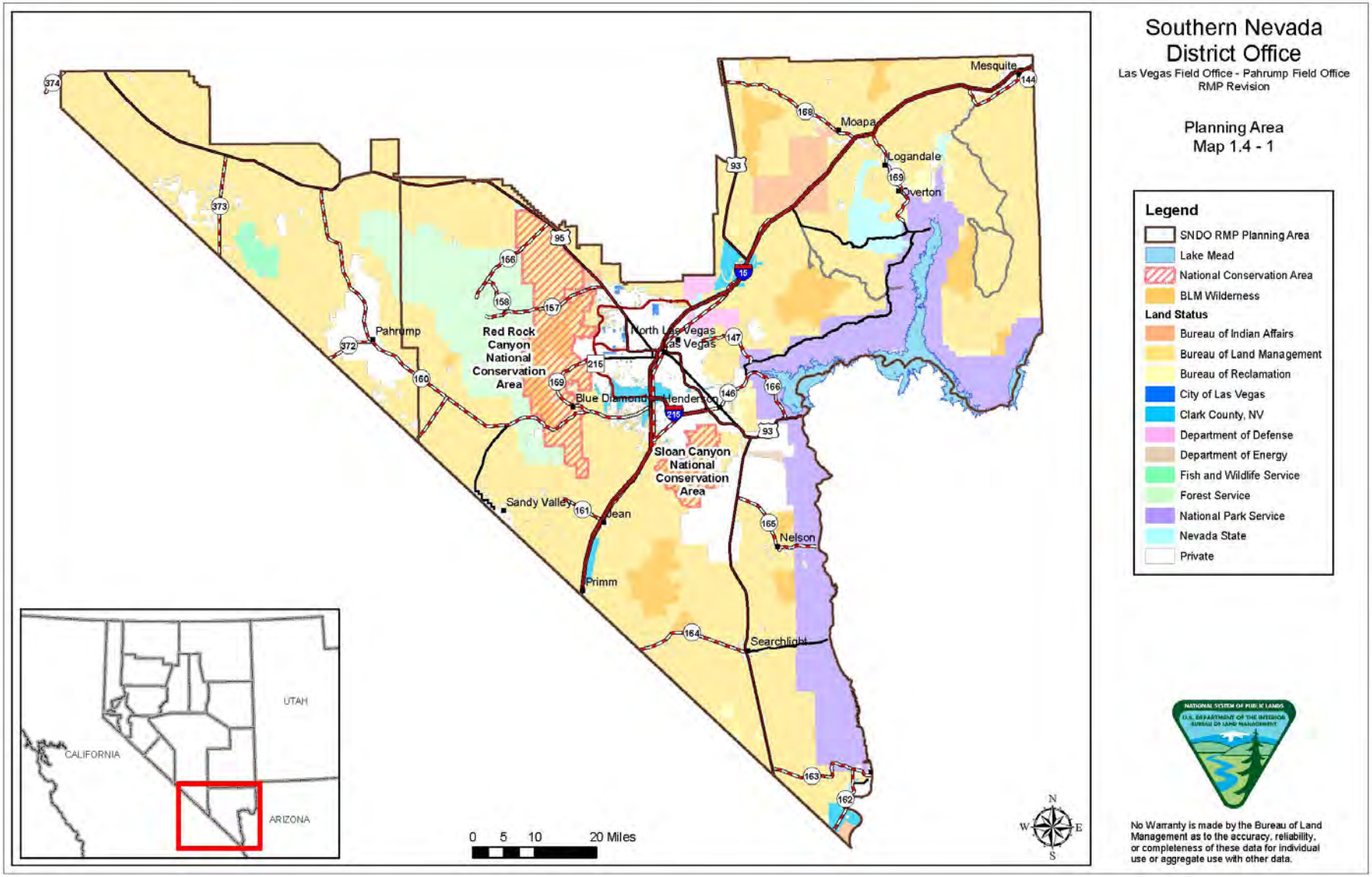

Figure 1.1. Southern Nevada District Office Planning Area

1.5. Scoping/Issues

1.5.1. The Scoping Process

Public input was generated through a formal public scoping period that began with the publication of the Notice of Intent (NOI) in the Federal Register on January 5, 2010. The scoping period included seven public scoping meetings. The formal scoping period ended on February 28, 2010. The majority of comments emphasized off-highway vehicle (OHV) management, recreation, and renewable energy development. Other issues of high interest included access to public lands and lands and realty management. Comments were used to focus the planning process, develop the significant issues, and to formulate alternatives.

1.5.2. Identification of Issues

Planning issues are disputes or controversies about existing and potential land and resource allocations, levels of resource use, production, and related management practices. Planning issues contribute to the need for this proposed RMP revision, and the RMP process provides an opportunity to address these conflicts or questions. Issues are position-neutral statements or questions that set the groundwork for development of alternative solutions to be analyzed in the EIS. Issues may be of local, state, or national concern, or they may reflect conditions specific to the decision area. Identified issues are subject to change throughout the planning process as new conditions or concerns are identified.

1.5.3. Issues Addressed

To identify issues, comments were solicited from the public; organizations; tribal governments; and federal, state, and local agencies. Additionally, concerns were identified through BLM resource specialists. Although not a comprehensive list, the following issues were identified during the agency and public scoping process. More information on these and other issues is available in Chapter 3 of the Scoping Report. Issues are organized by resources, resource uses, special designations, and social and economic features category.

1.5.3.1. Issues Used to Develop Alternatives

1. **Visual Resource Management (VRM):** Adjust VRM classes based on the recently completed inventory.
2. **Areas of Critical Environmental Concern (ACEC):** Analyze nominations, drop or adjust existing designations, and clarify management including establishment of thresholds for disturbance and incorporation of acquired lands.
3. **Areas of Ecological Importance:** Analyze nominations and clarify management, including establishment of thresholds for disturbance.
4. **Lands and Realty:**
   - Add, remove, or adjust areas identified for disposal.
   - Identify and adjust utility corridors.
   - Identify areas that can be developed, avoided, or excluded for solar and wind energy.

5. **Recreation:** Adjust, remove, or designate new recreation management areas.

6. **Wild and Scenic Rivers:** Analyze the suitability of eligible rivers for designation as components of the National Wild and Scenic River System.
7. **Travel Management:** Re-evaluate and adjust off-highway vehicle designations as necessary.
8. **Minerals:** Refine fluid leasable minerals to clarify surface management restrictions and direction for management of split estate.
9. **Lands With Wilderness Characteristics:** Determine what areas should be managed to maintain their wilderness characteristics based on the BLM inventory conducted to identify areas meeting wilderness characteristics.
10. **Reserve Units:** Clark and Nye counties requested that BLM consider "reserve units" on public land that would be managed for desert tortoise and other identified species through a habitat conservation plan and Section 10(a)(1)(B) incidental take permit, pursuant to the Endangered Species Act. Desert tortoise reserve units can be used to offset impacts from urban development on listed species and have a higher level of resource protection. To accommodate these requests, the BLM has integrated the counties' reserve unit configurations and management prescriptions into Alternative 2. Clark and Nye counties' reserve unit requests are provided on the project website.

1.5.4. Issues Considered but Not Further Analyzed

Some issues raised during scoping are beyond the RMP's purpose and will not be considered in the EIS. The following section describes the types of issues that were not analyzed in this EIS. For more information on the issues raised during scoping but not addressed in the EIS alternatives, see Chapter 4 of the Scoping Report. There are three justifications for removing these issues from consideration:

- The BLM does not have authority to resolve the issue raised.
- The issue is addressed through implementation/site-specific planning actions.
- The issue raised is resolved through law, regulation, BLM policy, or administrative action.

Issues are organized by resources, resource uses, special designations, and social and economic, with issues listed as brief, numbered list items.

Justification 1

The BLM does not have the authority to make RMP-level decisions to address issues that it does not have the authority to resolve, such as wilderness, funding allocation, and wild and scenic river designation. The BLM is granted certain authorities through federal law that are implemented by the Code of Federal Regulations (CFR). Issues that fall under this justification are usually resolved through congressional or judicial action.

Justification 2

Another variety of issues commonly raised during scoping are those addressed through implementation and site-specific planning actions and therefore best resolved at the implementation level of planning. RMP decisions provide guidance for "future land management actions and subsequent site-specific implementation decisions. These land-use plan decisions establish goals and objectives for resource management (desired outcomes) and the measures needed to achieve these goals and objectives, expressed as actions and allowable uses (lands that are open or available for certain uses, including any applicable restrictions, and lands that are closed to certain uses)" (BLM-M-1601 Section II A). As such, some site-specific issues, such as establishing appropriate management levels for specific wild horse and burro herd

management areas, are not appropriate for the RMP level. For these issues, knowledge of site-specific, on-the-ground resource conditions is needed to make an informed decision. Similar issues concerning site-specific resource concerns and conflicts are best answered by site-specific decisions and associated NEPA analysis. Appendix C of the BLM's planning handbook (BLM-H-1601-1) includes descriptions of implementation-level decisions for each resource, resource use, and special designation. This includes the route designation process associated with comprehensive transportation and travel management. The following list identifies issues that should be addressed during implementation of the RMP:

- How will individual cultural resource sites be preserved?
- What speed limits should be applied to the various designated roads and trails?
- How should OHV-user education be implemented to reduce impacts or conflicts?
- How should water developments be designed to avoid conflicts with bighorn sheep?

Justification 3

Another type of issue is those non-discretionary actions that are required through law, regulation, BLM policy, or administrative action. This includes actions that are implemented by the BLM as a standard operating procedure because laws or regulations require them or because they are BLM policy. For example, issues raised encouraging the BLM to analyze impacts in a certain manner are beyond the scope of the decisions to be made in the RMP. This is because the NEPA regulations (40 CFR 1500) and BLM NEPA handbook (BLM-H-1790) contain clear directions on how to conduct impact analysis and at what level of detail. Other examples include instances where rulings in court cases have provided legal direction on the correct interpretation of various laws. Including these types of issues in the RMP revision would lead the reader to believe that the BLM Las Vegas and Pahrump field offices have the authority to change laws, regulations, or BLM-wide policies when that is not the case. It is important to clarify that just because an issue is in this category does not mean it will not be addressed in the planning process associated with development of the EIS. Rather, the issue raised does not need to be incorporated into the alternatives development process and range of alternatives because the issue is addressed through conformance to existing policies. The following are examples of issues raised during the scoping process:

- Where are inventories necessary to support the current decision-making processes and ensure accurate impact analysis?
- How are viewsheds considered/classified, from either highways or roads/trails?
- How could livestock grazing trespass, particularly in the Gold Butte area, be addressed and eliminated?
- What level of NEPA documentation would be required for site-specific (Type I) and project area (Type II) grants for wind testing and monitoring projects proposed outside desert tortoise ACECs (e.g., categorical exclusions, environmental assessments, EISs)?
- How should wilderness areas be managed?
- How could the RMP revision simplify the process and reduce the time it takes to secure a permit for OHV events (of various sizes, commercial/non-commercial, types of events, etc.)?
- How will the BLM coordinate with adjacent land-managing agencies (adjacent BLM field offices, Lake Mead National Recreation Area, Death Valley National Park, national forests, etc.) and their management plans?
- How will coordination of future interstate transmission projects be accomplished among varied landowners and political jurisdictions?

1.5.4.1. Issues Addressed Through Administrative or Policy Action

1.5.4.1.1. Issue

BLM received a nomination request to add approximately 4,317 acres as a new disposal area in North Las Vegas.

BLM Response: These nominated lands are generally located in T. 19 S., R. 62 E., sec. 13 and portions of sections 14, 24 and 25; and T. 19 S., R. 63 E., sections 17, 18, 19 and portions of sections 20 and 30. BLM was able to partially address the City of North Las Vegas's request for disposal by creating new disposal areas under Alternatives 3 and 4. However, those lands requested by the city for disposal that have conflict areas such as military withdrawn lands in T. 19 S., R. 62 E., sec. 25, NE; and public lands specially designated as the Nellis Dunes Special Recreation Management Area (SRMA) in T. 19 S., R. 63 E., in portions of sections 17, 19, 20 and 30, do not meet the disposal criteria under Sec. 203 of FLPMA, therefore such lands are not being proposed for disposal. The Nellis Dunes SRMA is protected for its unique sand dune setting and adjacent features that provide thrill and speed associated with motorized recreation opportunities on sand washes and dunes. This is an open area for intensive off-road vehicle use and other recreation opportunities, including organized off-road vehicle events, casual off-road vehicle free play, photography, and commercial and competitive OHV-permitted activities. This area provides world-class motorized, cross-country sand dune OHV recreation for local and national public interests. Under Alternative 3, BLM is proposing approximately 1,590 acres for disposal, and approximately 2,861 acres are proposed for disposal under Alternative 4. These proposed disposal areas provide a range of alternatives for consideration under this RMP revision.

1.6. Planning Criteria/Legislative Constraints

Planning criteria are the constraints or ground rules that guide and direct the development of the RMP and determine how the planning team approaches development of alternatives and ultimately selects the preferred alternative. Planning criteria streamline and simplify the resource management planning actions. Planning criteria ensure that plans are tailored to the identified issues and that unnecessary data collection and analyses are avoided. They focus on the decisions to be made in the RMP and achieve the following:

- Provide an early, tentative basis for inventory and data collection needs.
- Enable the managers and staff to develop a preliminary planning base map delineating geographic analysis units.

The preliminary planning issues were included in the Notice of Intent, published in the Federal Register on January 5, 2010. That list was revised based on public and internal input. It is important to note that planning criteria are similar to scoping issues in that planning criteria can be adjusted throughout the planning process as information and/or conditions change. The planning criteria are:

- The planning area is defined as the area covered by the existing Las Vegas and Pahrump RMPs. The RMP revision will make planning determinations for public lands within the defined planning area boundary.
- The RMP revision effort will rely on available inventories of the lands and resources, as well as data gathered during the planning process, which will include an updated wilderness

characteristics inventory, to reach sound management decisions. Any decisions requiring additional inventories will be deferred until the inventories can be conducted.

- Use and protection of water, water resources, riparian zones, and other related values will be given a high priority.
- Geographic information systems and corporate geospatial data will be used to the extent practicable.
- The RMP revision will be consistent to the maximum extent possible with the plans and management programs of local governments, consistent with state and federal laws and regulations, and coordinated with other federal agencies where appropriate.
- The principles of multiple use and sustained yield will be followed.
- The planning process will involve consultation with Native American tribal governments.
- The RMP revision will acknowledge valid existing rights established under the current Las Vegas and Pahrump RMPs.
- Federal Geographic Data Committee standards and other applicable BLM data standards will be followed.
- Opportunities for public involvement will be encouraged throughout the RMP process.
- Findings of waterways as suitable for inclusion in the National Wild and Scenic River System will follow the criteria contained in BLM Manual 6400.
- The impacts of various proposed land uses on lands with wilderness characteristics will be analyzed as part of the RMP process.
- Environmental protection and energy production are desirable and necessary objectives and will not be considered mutually exclusive priorities.
- The RMP will be completed in compliance with the Federal Land Policy and Management Act, the National Environmental Policy Act, and all other relevant federal laws, executive orders, and management policies of the BLM.
- Where existing planning decisions are still valid, those decisions may remain unchanged and be incorporated into the revised RMP.
- The RMP Revision EIS will be developed through the BLM's ePlanning system to the extent consistent with the current functionality of the system and scheduling considerations.
- Several laws have provided direction for the management of public lands within the Las Vegas and Pahrump field offices. These legislative constraints include the following:
  - The Southern Nevada Public Land Management Act (SNPLMA) became law in October 1998. It set the boundaries for the Las Vegas Valley disposal area, legislatively amending the RMP with the new boundaries. The revenue derived from land sales is split between the State of Nevada General Education Fund (5 percent), the Southern Nevada Water Authority (10 percent), and a special account available to the Secretary of the Interior for uses such as parks, trails, natural areas, capital improvements, conservation initiatives, environmentally sensitive land acquisitions, and Multi-Species Habitat Conservation Plans (MSHCP).
  - The Ivanpah Valley Airport Public Lands Transfer Act of 2000 transferred lands from BLM administration to Clark County for the purpose of developing an airport facility and related infrastructure in the Ivanpah area adjacent to Interstate 15 and the California state line. The Federal Aviation Authority, in cooperation with BLM as joint lead agencies, pursuant to the Ivanpah Valley Airport Public Lands Transfer Act of 2000, were in the process of preparing an EIS for the Ivanpah Valley Airport. The airport is a 5,858-acre proposed airport, just south of Jean, Nev. Currently, the EIS is suspended; the Clark County Department of Aviation has reduced the level of effort on planning the airport.
  - The Clark County Conservation of Public Land and Natural Resources Act of 2002 designated Sloan Canyon NCA (removing it from the RMP decision area), designated several wilderness areas within the Las Vegas Field Office, and amended SNPLMA to expand the

disposal boundary area to address the continuing growth in the Las Vegas region. The Clark County Conservation of Public Land and Natural Resources Act of 2002 also includes a section that established a land transfer for an overlay district (approximately 17,000 acres) associated with the Ivanpah Valley Airport.
  - The Lincoln County Conservation and Development Act of 2004 changed the location of a utility corridor that was noted in the 1998 RMP. P.L. 108-424.

Beyond these legislative constraints, multiple programmatic planning documents have addressed broad management direction for a variety of public land uses. The direction from these previous planning efforts has been incorporated into this planning process as applicable. Applicable programmatic planning processes include the following:

- Implementation of a Wind Energy Development Program and Associated Land Use Plan Amendments (December 2005), which amended the RMP to adopt the programmatic wind policies and best management practices.
- Implementation of the Programmatic Solar EIS.
- Geothermal Leasing in the Western United States (December 2008), which amended the RMP in relation to geothermal leasing, best management practices, etc., for the Las Vegas and Pahrump field offices.
- Approved RMP Amendments/ROD for Designation of Energy Corridors on BLM Administered Lands in 11 Western States (January 2009), which amended the RMP in relation to designation of ROW corridors, best management practices, etc. for the Southern Nevada District Office.

1.7. Planning Process

FLPMA is the primary authority for the BLM's management of public lands. As defined by the act, public lands are those federally owned lands and any interest in lands (e.g., federally owned mineral estate) that are administered by the BLM. NEPA provides the basic national charter for environmental responsibility and requires the consideration and public availability of information regarding the environmental impacts of major federal actions significantly affecting the quality of the human environment. RMPs are considered a major federal action and require developing an accompanying EIS. In concert, these two laws provide the overarching guidance for administration of all BLM activities. The approved RMP will meet the BLM statutory requirement for a master land-use plan as mandated by FLPMA Section 202, which specifies the need for a comprehensive land-use plan consistent with multiple use and sustained-yield objectives.

In addition to the RMP providing management direction, the associated EIS can provide NEPA analysis to assist subsequent planning efforts. The "tiering" of NEPA documents is used to prepare new, more specific environmental documents without having to duplicate relevant parts of other previously prepared more general documents such as RMPs/EISs (BLM-H-1790). When this occurs, environmental documents associated with the more specific activity incorporate by reference the general discussions and analysis from the broader document (RMP/EIS), enabling the NEPA document for the specific activity to concentrate on the issues and impacts of the project that are not specifically covered in the broader document (BLM-H-1790). BLM decision-making relevant to land-use planning includes the following:

- **Resource Management Plans:** The BLM's broadest, least-specific level of decision-making specific to land and resource use is in the RMP. The BLM uses RMPs to make land-use allocations, provide general future management direction for managing specific areas of land, and provide the framework for management of all natural resources under BLM authority. Plan

decisions are based on a public NEPA disclosure process, usually including the development of an EIS.

- **Activity Plans:** These plans include more detailed management decisions than RMPs. Mid-level decisions are provided in activity plans, also known as implementation plans. Activity planning addresses management of specific programs and usually selects and applies best management practices to meet the RMP. Decisions covering major (often geographically widespread) proposals lead to coordinated activity plans that cover all programs in an integrated manner. A program-oriented activity plan such as a habitat management plan is another example of an activity plan. Activity plans also must undergo a NEPA analysis.
- **Project-Level Decisions:** The BLM analyzes individual projects proposed in a specific location for localized or site-specific effects. For example, constructing a fence to control livestock is designed based on site-specific surveys and BLM standards. A documented project decision allows the fence to be completed with site-specific mitigation, as needed. The designation of individual roads, primitive roads and trails, whether completed during the RMP revision process or designated through a future planning effort, are implementation level decisions. Changes to a designated route network may be accomplished through activity-level planning with the appropriate site specific NEPA analysis.

As the broadest, least-specific level in the BLM planning process, the Las Vegas/Pahrump RMP will prescribe the allocation of and general future management direction for the resources and land uses of BLM-administered public lands in the planning area. In turn, the Las Vegas/Pahrump RMP will also guide more specific tiers of the planning process (i.e., activity plans and projects or site-specific plans).

Land-use plan decisions that are implemented upon approval of the RMP do not require any further environmental analysis or documentation until modified through a RMP amendment or revision. Whenever implementation-level plans are prepared, additional environmental analysis and documentation would be required. Individual management actions or projects requiring additional site-specific project planning, as funding becomes available, would require further environmental analysis.

Site-specific environmental analyses and documentation (including the use of categorical exclusions and determinations of NEPA adequacy where appropriate) may be prepared for one or more individual projects in accordance with management objectives and decisions established in the approved land-use plan. In addition, BLM will ensure that the environmental review process includes evaluation of all critical elements, including cultural resources and threatened and endangered species, and completes required U.S. Fish and Wildlife Service Section 7 consultations and coordination with the State Historic Preservation Office (SHPO).

Interdisciplinary impact analysis will be based on this RMP/EIS and other applicable EISs. If the analysis prepared for site-specific projects finds potential for significant impacts not already described in an existing EIS, another EIS or a supplement to an existing EIS may be warranted.

Upon providing public notice of a decision, supporting environmental documentation will be sent to all affected interests and made available to other publics on request. Decisions to approve implementation-level plans or to implement site-specific projects are subject to administrative review at the time such decisions are made.

The RMP would be implemented using an adaptive management process. Under adaptive management, decisions, plans and proposed activities are treated as working hypotheses rather than final solutions to management of resources and uses. For the purposes of this plan, adaptive

management would represent a process that tests, evaluates and adjusts the assumptions, objectives, actions, and subsequent on-the-ground results from the implementation of RMP decisions. Used effectively, adaptive management would provide resource managers with the flexibility to respond quickly and effectively to changing resource and user conditions. Changes in management actions would be based on site-specific resource monitoring and evaluation.

The RMP would also be implemented using regional mitigation strategies per BLM IM 2013-142, Interim Policy, Draft Regional Mitigation Manual Section 1794.

The BLM RMP process consists of nine basic steps and requires the use of an interdisciplinary team for the completion of each step. The planning steps described in the regulations (43 CFR 1610.4) and used in preparing this plan are shown in Table 1.2, "Nine Basic Planning Steps" (p. 13).

Table 1.2. Nine Basic Planning Steps

Step 1: Identification of Issues	This planning step is designed to identify major problems, concerns, or opportunities associated with the management of public lands in the planning area. Issues are identified by the public, the BLM, and other governmental entities. The planning process is then focused on resolving the planning issues.
Step 2: Development of Planning Criteria	Planning criteria are identified to guide development of the RMP and prevent the collection of unnecessary information and data.
Step 3: Inventory Data and Information Collection	This planning step involves the collation and collection of various kinds of environmental, social, economic, resource, and institutional data. In most cases, this process is limited to information needed to address the issues. The data required for land-use planning decisions is usually at a broader scale than data required in implementation-level planning and analyses.
Step 4: Analysis of the Management Situation	This step calls for the deliberate assessment of the current situation. It identifies the way lands and activities are currently managed in the planning area, describes conditions and trends across the planning area, identifies problems and concerns resulting from the current management, and identifies opportunities to manage these lands differently. It also forms the basis for the "no action" alternative.
Step 5: Formulate Alternatives	During this step, BLM formulates a reasonable range of alternatives for managing resources in the planning area. Alternatives include a continuation of current management (no action) alternative and other alternatives that strive to resolve the major planning issues while emphasizing different management scenarios. Alternatives usually vary by the amounts of resource production or protection that would be allowed, or in the emphasis of one program area over another.
Step 6: Estimation of Effects of Alternatives	During this step, the BLM will estimate and display the physical, biological, economic, and social effects of implementing each alternative considered in detail. The estimation of effects shall be guided by the planning criteria and procedures implementing the National Environmental Policy Act. The estimate may be stated in terms of probable ranges where effects cannot be precisely determined.
Step 7: Selection of Preferred Alternative	Based on the information resulting from the estimation of effects, the BLM identifies a preferred alternative. The Draft RMP/EIS is then prepared for printing and distributed for a 90-day public review.

Step 8: Selection of RMP	This step involves the BLM evaluating the comments received and responding to substantive comments on the Draft RMP/EIS. The proposed RMP and final EIS in then forwarded to the state director for review and publication.
Step 9: Monitoring And Evaluation	This step involves the collection and analysis of resource condition and trend data to determine the effectiveness of the plan in resolving the identified issues and achieving desired results. Implementation of decisions requiring subsequent action is also monitored. Monitoring continues from the time the RMP is adopted until changing conditions require revision of the whole plan or any portion of it.

Five documents must be completed during preparation of the RMP to record the planning process: the Preplanning Analysis, the Analysis of the Management Situation (AMS), the Draft RMP/EIS, the Proposed RMP and Final EIS, and the ROD and Final RMP. A given document serves as a foundation for the subsequent one. The RMP/EIS is the foundation for an implementation/project-specific decision.

The Proposed RMP/Final EIS indicates a proposed RMP. Persons who participated in the planning process and have an interest that is or may be adversely affected by approval of the RMP may protest the approval. Protests may raise only issues that were submitted for the record during the planning process. Protests shall be filed within 30 days after the Proposed RMP/Final EIS is filed with the EPA.

The BLM monitors and evaluates the Final RMP, with formal review taking place at a minimum of every five years. Public reaction to the BLM's land management can lead to revision of the RMP through these periodic reviews. Public concerns voiced through changes in law or agency policy also serve as a basis for planning decisions.

1.7.1. Relationship to BLM Policies, Plans, and Programs

The National Environmental Policy Act of 1969, as amended, mandates that federal agencies prepare EISs for major federal actions. This RMP conforms to the Council on Environmental Quality regulations for implementing NEPA requirements (40 CFR 1500-1508).

NEPA, FLPMA, and the planning guidance contained in 43 CFR 1600 guide the BLM planning process. Management plans ensure that the BLM manages public lands in accordance with the intent of Congress as stated in FLPMA, under the principles of multiple use and sustained yield. As required by FLPMA, public lands must be managed in a manner that protects the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water, and cultural resources and values; that, where appropriate, preserves and protects certain public lands in their natural condition and provides food and habitats for fish and wildlife and domestic animals; and that provides for outdoor recreation and human occupancy and use by encouraging collaboration and public participation through the planning process. In addition, public lands must be managed in a manner that recognizes the nation's need for domestic sources for minerals, food, timber, and fiber from public lands.

In addition to the federal mandates and guidelines mentioned above, the planning team considered a number of existing management plans, programmatic documents, and standards and guidelines in the preparation of this RMP including:

- Land-use plans and amendments
- Activity (implementation) level plans
- Programmatic NEPA documents

- Policy and rules

These documents have been examined not only to assure appropriate integration and compliance, but also to identify information that is still appropriate for inclusion in the management plans and/or decisions that are still valid and can be carried forward into the documents being prepared. Activity plans that have been tiered off these plans have also been considered in this planning effort, but they may require revision to be consistent with the new management plans.

1.7.2. Collaboration

A variety of federal, state, county, local, and tribal groups played a vital role in this planning process by attending meetings, providing databases and general information, conducting peer reviews, and assisting with the development of the management alternatives presented in this Proposed Plan/FEIS. A brief discussion of collaborating groups is presented below. A more detailed list of these groups, along with other special interest groups and stakeholders involved in the planning process, are presented in Chapter 5.

CEQ requirements contained in 40 CFR 1501.6 and 1508.5 implement the NEPA mandate that federal agencies responsible for preparing NEPA analysis and documentation do so "in cooperation with state and local governments" and other agencies with jurisdiction by law or special expertise (42 USC 4331(a), 4332(2)). In support of this mandate, the BLM invited 46 federal, state, and local governments, agencies, or organizations, to become cooperating agencies for the RMP revision. Eighteen agencies accepted the invitation to become formal cooperating agencies.

Cooperating agency status offers the opportunity for interested agencies to assume additional roles and responsibilities beyond the collaborative planning processes of attending public meetings and reviewing and commenting on plan documents.

See Chapter 5 for a list of cooperating agencies and tribes.

1.8. Related Plans

Title II, Section 202 of FLPMA provides guidance for the BLM's planning process to coordinate planning efforts with American Indian tribes, other federal agencies, and state and local governments. To accomplish this directive, the BLM has kept abreast of other federal, state, and local plans; ensured that consideration is given to such plans; and worked with these other entities to avoid inconsistencies among their various plans. FLPMA Subsection 202(c)(9) states that "land use plans of the Secretary under this section shall be consistent with state and local plans to the maximum extent he [sic] finds consistent with federal law and the purposes of this Act."

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Chapter 2. Alternatives

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2.1. How to Read This Chapter

This chapter describes and compares four alternatives (including the "no action" alternative) that propose different approaches to managing public land resources and uses in the Las Vegas and Pahrump field offices. This chapter also contains an explanation of the alternative development process. Each alternative is a complete and reasonable resource management plan based on the following:

- A common set of desired future conditions and goals.
- Resource objectives.
- Management actions to meet resource goals and objectives, where appropriate.
- The allocations of land, resources, and uses to facilitate multiple resource management.

The components of each alternative are integral in guiding future management of the public land resources and uses in the planning area. Current management actions that have been deemed to be appropriate and effective would be carried forward through all alternatives.

Chapter 2 begins with introductory materials regarding the development of the alternatives for the Las Vegas and Pahrump Field Offices RMP/EIS, followed by a general narrative description of the alternatives. The chapter continues with a discussion of the alternatives considered but eliminated from detailed analysis. The heart of this chapter is the presentation of the four alternative management plans beginning with Air Quality Management Actions. The tables are organized by resource programs and provide an in-depth description of the management objectives and actions for each alternative. The actions are numbered to allow cross-checking and comparison among the alternatives. The term "no similar action" is used as a placeholder where an alternative does not include the same action as others. The use of this placeholder allows the numbering of the actions to remain consistent across the alternatives (see Section 2.5.1, "How to Read the Alternatives Tables" (p. 22)).

Acreages and other numbers used in the alternatives are approximate and serve for comparison and analytic purposes only. Data from geographic information systems (GIS) have been used in developing acreage calculations and may not reflect exact measurements or precise calculations.

Analysis of impacts that would be associated with the alternatives is required by BLM planning regulations and Council on Environmental Quality (CEQ) regulations in 40 CFR 1500. Based on this comparative analysis, BLM managers may choose a single alternative or a combination of the alternatives analyzed in the draft RMP/EIS.

2.2. General Description of Alternatives

This section provides a brief description of the four alternatives. Specific management decisions that are common to all alternatives are in Section 2.4, "Management Common to All Alternatives" (p. 21). The BLM's preferred alternative will be based on an examination of the following factors:

- Balance of use and protection of resources.
- Extent of the environmental impacts.
- Incorporation of formal recommendations from cooperating agencies and the public.
- National priorities.

The alternative will be chosen because it resolves major planning issues while providing common ground among conflicting opinions and multiple uses of public lands in a sustainable fashion.

It could be a combination of pieces from alternatives and should provide the best balance of resource protection and use within legal constraints.

2.2.1. Alternative 1 (No Action Alternative)

Alternative 1 is defined as a continuation of the current management direction contained in the 1998 RMP and amendments and changes since incorporation. This alternative describes the current goals and actions for management of resources and land uses in the planning area. The management direction could also be modified by current laws, regulations, and policies. Alternative 1 represents the baseline to which the other management alternatives are compared. Rather than transcribe the previous planning document into the no action alternative of this document, the management actions were modified for readability to align with recommended actions in the other alternatives.

2.2.2. Alternative 2

Alternative 2 emphasizes the protection of the planning area's resource values while allowing commodity uses as consistent with current laws, regulations, and policies. Management actions would emphasize resource values such as habitats for wildlife and plant species (including special status species), protection of riparian areas and water quality, preservation of ecologically important areas, maintenance of wilderness characteristics, and protection of scientifically important cultural and paleontological sites. Access to and development of resources within the planning area could occur with intensive management and mitigation of surface-disturbing and disruptive activities.

2.2.3. Alternative 3 (Preferred)

Alternative 3 provides opportunities to use and develop resources within the planning area while ensuring resource protection as consistent with current laws, regulations, and policies. Alternative 3 would provide continued access to and development of resources with stipulations and mitigation to protect natural and cultural resources. Alternative 3 represents the mix and variety of actions that the BLM believes best resolves the issues and management concerns in consideration of all values and programs and is thus considered the BLM's preferred alternative.

2.2.4. Alternative 4

Alternative 4 emphasizes opportunities to use and develop resources within the planning area. It would provide for motorized access and commodity production with minimal restrictions while providing protection of natural and cultural resources to the extent required by law, regulation, and policy. This alternative would largely rely on existing laws, regulations, and policies, rather than special management or special designations, to protect sensitive resources.

2.3. Alternatives Considered but Not Analyzed in Detail

No other alternatives were considered for detailed analysis since it was determined by BLM management that the four alternatives were sufficient to analyze impacts in the planning area.

2.4. Management Common to All Alternatives

Certain allowable uses and management actions from the 1998 RMP remain valid and do not require revision. All of the proposed alternatives carry these forward, while other decisions are common only to the action alternatives (Alternatives 2, 3, and 4).

Although each alternative is distinct in the resources and resource uses it emphasizes, all four alternatives do the following:

- Manage public lands for multiple uses of public resources within the framework of applicable laws, regulations, and agency policies.
- Preserve valid existing rights, which include any leases, claims, or other use authorizations established before a new or modified authorization, change in land designation, or new or modified regulation is approved.
- Seek to enhance collaborative opportunities, partnerships, and communications with other agencies and interested parties to implement the RMP, including education and outreach and project-specific activities.
- Protect and enhance cultural and natural resources and values using the diversity of tools available to the BLM.

In addition to the shared elements above, the alternative tables in Section 2.6 indicate goals, objectives, and management actions common to all four alternatives by using a single cell across the table row.

2.5. Alternatives Tables

2.5.1. How to Read the Alternatives Tables

This revised RMP incorporates new information and regulatory guidance that have come about since the 1998 RMP and its amendments. The focus of the RMP is to establish resource management direction for goals and objectives and the measures to achieve these goals and objectives (management actions). Current management direction that has been deemed effective and requires no change will continue as management actions in this RMP revision.

The alternative tables are organized by resource programs and provide goals, objectives, and management actions for the alternatives (see Section 2.2, "General Description of Alternatives" (p. 19)). Goals and objectives direct BLM's actions in most effectively meeting the legal mandates, numerous regulatory responsibilities, and national policy. Goals are broad statements of desired outcomes that are not quantifiable. Objectives identify specific desired outcomes for resources and are usually quantifiable and measurable and may have established timeframes for achievement. Management actions are land-use planning decisions to achieve the desired outcomes for the goals and objectives.

The management actions in the alternatives tables are coded by resource program type and number, as resource program indicators, to allow for cross-checking and comparison among the alternatives. Management actions that would continue to be carried forward from the current resource management plan (i.e., Alternative 1 – No Action alternative) are displayed in all alternatives by using a single horizontal cell across the table row. In some cases, the current management language only needs to be clarified. In these instances, the current management action is provided in Alternative 1, and the revised language is presented in Alternatives 2-4.

The alternatives tables also include proposed management actions that are new since the 1998 RMP. The term "no similar action" is used when there is no existing or proposed management action for that particular alternative. For example, when new management actions are being added for Alternatives 2-4, no similar action is placed in Alternative 1 (see Figure 2.1, "How to Read the Alternatives Tables Example " (p. 23)).

Table 2.4. Integrated Vegetation Management Actions

	Alternative 1 (Current Management – No Action Alternative)	Alternative 2	Alternative 3 (Preferred Alternative)	Alternative 4
Goal 1: Maintain land health and ecosystem services provided by native plant communities on public lands.				
Objective 1.1: Manage the impact of BLM-authorized actions on native plant communities to ensure sustainability and resilience.				
VEG-01	Rehabilitate, reclaim, or revegetate areas subjected to surface-disturbing activities, where feasible. When rehabilitating disturbed areas, manage for optimum species diversity by seeding native species, except where non-native species are appropriate.	For BLM-authorized actions, require restoration, revegetation, reclamation, or rehabilitation of temporary impacts associated with construction, operations, and maintenance. Guidance for restoration and standardized mitigation will be developed at a future date with significant public involvement.		
RIP-02	Retain wetlands, riparian woodlands, and mesquite and acacia woodlands in federal ownership, unless their disposal is in the public interest.			
RIP-03	No similar action.	Provide for no net unmitigated loss of wetlands, riparian communities, and mesquite and acacia woodlands within the planning area.		No similar action.

Management Action: The current management action (Alternative 1) is being revised (Alternatives 2-4). *Note: In this example, the revised action would be the same for each of the proposed alternatives.*

Management Action: The current management action is carried through all alternatives.

Management Action: No current management action exists ("no similar action"). New management actions are being proposed in Alternatives 2 and 3, but not in Alternative 4 ("no similar action").

Resource program indicator.

Figure 2.1. How to Read the Alternatives Tables Example

2.5.2. Resources

2.5.2.1. Air Quality

Table 2.1. Air Quality Management Actions

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Goal 1: Meet or exceed federal and state air quality within National Ambient Air Quality Standards.				
Objective 1.1: Ensure regulatory compliance with all proposed actions occurring on BLM-administered lands by maintaining or improving air quality; by achieving state implementation plan goals for non-attainment areas; and by reducing fugitive emissions from all point/nonpoint emission sources.				
AIR-01	Ensure that the planning process addresses air quality considerations by incorporating objectives and actions into resource activity plans, such as allotment management plans and watershed management plans. Where applicable, include "conformity" demonstration in site-specific plans and/or National Environmental Policy Act documentation.	Activities authorized on BLM-administered lands shall incorporate best management practices to reduce their impact on air quality.		
AIR-02	Permit only those activities on BLM-administered lands that are consistent with federal, state, and local air quality standards and regulations. Require that all appropriate air quality permits are obtained before BLM approval is granted. Where applicable, demonstrate how proposed management actions comply with local, state, tribal, and federal air quality laws, regulations and standards (Conformity; per 40 CFR 93.100 et seq.).	Require that air quality permits, when applicable, be obtained prior to the release of fugitive dust emissions and other emissions from all point and nonpoint sources on BLM-administered lands.		
AIR-03	No similar action.	Where criteria pollutant(s) trigger a regulatory non-attainment boundary, demonstrate compliance with state implementation plans for all activities (Conformity; per 40 CFR 93.100 et seq.).		

2.5.2.2. Soil Resources

Table 2.2. Soil Resources Management Actions

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Goal 1: Ensure watersheds are functioning appropriately and are consistent with land health standards. Characteristics of a properly functioning watershed include channels that are stable and in balance with the landscape; erosion and sediment deposition appropriate for the ecological site; infiltration of surface water in soil sufficient to support desired future conditions and minimize erosion from runoff; and flood frequencies, duration, and magnitudes appropriate for the landscape.				
Objective 1.1: Disturbance of sensitive soil surfaces, including those classified as highly susceptible to wind and water erosion and those with protective desert pavement or well-developed cryptogamic crust, will be avoided. If disturbance occurs, damage will be mitigated.				
SOIL-01	No similar action.	Developments and ground-disturbing activities will avoid areas of significant desert pavement, cryptogamic crust, and other sensitive or fragile soils that are vulnerable to disruption or have high wind or water erosion potential, unless project goals cannot be met in another location. Where facilities or projects cannot be relocated, mitigation measures will be taken, including but not limited to application of ground cover to address accelerated erosion potential.		
SOIL-02	No similar action.	The density of roads and trails within areas known to have sensitive soils (i.e. high erodibility as classified by Natural Resources and Conservation Service. Map 3.2.3.1 - 1 (p. 2143) and Map 3.2.3.1 - 2 (p. 2143)) will be evaluated and considered during route designation in the travel management plan. Closed roads will be rehabilitated. Roads left open will be treated to mitigate wind and water erosion. Also see the Travel Management section (p. 149).		
Objective 1.2: Maintain or restore upland, channel, and riparian components of watersheds that help stabilize or improve watershed conditions. Major indicators of watershed health include maintaining total cover (vegetation and litter) consistent with desired future conditions, riparian areas in proper functioning condition, and erosion and sedimentation rates appropriate to the ecological site.				
SOIL-03	On watersheds that exhibit good potential for recovery, implement protective measures including, but not limited to, fencing and removal of tamarisk.	Priorities for restoration will be established for disturbed areas that exhibit potential for recovery. Priorities will be based on the potential for soil erosion and loss, damage and loss to cultural or ecologically sensitive sites, and effects on water quality and quantity. Soil erosion or degradation at these sites will be minimized and mitigated.		
SOIL-04	Improve watersheds that have critical to moderate erosion susceptibility conditions. Give priority to those watersheds within the Colorado River drainage system.	Degraded sites will be stabilized and restored to slow or stop accelerated soil erosion and sedimentation and limit erosion to the natural rate for the ecological site.		
SOIL-05	Maintain watersheds that have a stable and slight erosion condition with a low, moderate, or high susceptibility; and maintain watersheds that have a moderate erosion condition with low or moderate erosion susceptibility.	No similar action. See SOIL-03 and SOIL-04.		

2.5.2.3. Water Resources

Table 2.3. Water Resources Management Actions

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Goal 1: All surface water in the planning area will meet appropriate state water quality standards or will have state-approved plans for water quality improvement.				
Objective 1.1: Impaired water quality in the Colorado River and Amargosa River watersheds will be improved or corrected; the BLM will commit to the state schedule for water quality improvement.				
WTR-01	Maintain the quality of waters presently in compliance with state and/or federal water quality standards. Improve the quality of waters found to be in noncompliance.	No similar action. See WTR-03.		
WTR-02	Maintain or reduce salt yields originating from public lands to meet state-adopted and Environmental Protection Agency-approved water quality standards for the Colorado River.	No similar action. See WTR-03.		
WTR-03	Using best management practices as identified by the state of Nevada, minimize contributions from both point and nonpoint sources of pollution (including salts) resulting from public land management actions.	The BLM will implement best management practices (BLM or BLM-approved) to protect surface waters from point and nonpoint source pollution.		
Goal 2: Maintain natural hydrologic function within watersheds.				
WTR-04	No similar action.	New or redeveloped facilities not related to water management will maintain natural hydrologic function by avoiding riparian areas; by avoiding the l00-year floodplain of washes or waterways as established by FEMA; avoiding changes to natural water flow or watershed dynamics; and by being consistent with other resource and public safety goals. Where water management facilities are necessary, the BLM will pursue options that minimize changes to natural water flow and watershed dynamics. Any activities in the 100-year floodplain will be planned for compliance with any county or federal floodplain regulations. Facilities could be relocated or modified if they are significantly affecting hydrologic, watershed, or floodplain function.		
Goal 3: Ensure physical and legal availability of water in sufficient quantity and quality to meet management needs.				
Objective 3.1: New water source development must not adversely affect existing sources and uses. This will be determined prior to any new water resource development activity, including issuance of a landowner's permission to drill (Notice to Proceed), as required by the Nevada Division of Water Resources.				

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
WTR-05	Ensure availability of adequate water to meet management objectives including the recovery and/or re-establishment of special status species.	All proposed new water uses and developments will be assessed to determine whether they will adversely affect springs, streams, tenajas, seeps, or threatened and endangered species; decrease water availability at existing wells; or conflict with other resource management goals. Protest water right applications as needed to protect water resources and ensure availability of adequate water to meet management objectives. Seek mitigation to minimize negative effects on surface waters and groundwater dependent resources.		
WTR-06	Determine instream flow requirements and apply for necessary water rights on the Virgin River and Meadow Valley Wash.	No similar action.		
WTR-07	Determine water needs to meet management objectives. File for appropriated water rights on public and acquired lands in accordance with state of Nevada water laws for water sources that are not federally reserved.	Determine water needs to meet management objectives. File for appropriated water rights on public and acquired lands in accordance with state of Nevada water laws for water sources that are not federally reserved. Retain lands in federal ownership where (1) the BLM or other federal agencies hold appropriated water rights or a federally reserved claim, or where (2) reasonable and foreseeable future development would negatively impact a federally reserved claim, unless their disposal is in the public interest.		
WTR-08	No similar action.	Cooperate with other federal agencies to coordinate and communicate efforts to conserve and manage water resources and water-dependent resources within existing and emerging areas of concern. This will be done in accordance with BLM Manual 7250.		

2.5.2.4. Integrated Vegetation

Table 2.4. Integrated Vegetation Management Actions

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Goal 1: Maintain land health and ecosystem services provided by native plant communities on public lands.				
Objective 1.1: Manage the impact of BLM-authorized actions on native plant communities to ensure sustainability and resilience.				
VEG-01	Rehabilitate, reclaim, or revegetate areas subjected to surface-disturbing activities, where feasible. When rehabilitating disturbed areas, manage for optimum species diversity by seeding native species, except where non-native species are appropriate.	For BLM-authorized actions, require restoration, revegetation, reclamation, or rehabilitation of temporary impacts associated with construction, operations, and maintenance. Guidance for restoration and standardized mitigation will be developed at a future date with significant public involvement.		
RIP-01	Do not allow competitive off-road vehicle events within one quarter mile of natural water sources and associated riparian areas.	No similar action. See F&W-03 (p. 38).		
GRA-13	Maintain static trend or achieve upward trend in plant vigor and reproductive capacity of key forage species through livestock management.	Maintain static trend or achieve upward trend in plant vigor and reproductive capacity of key forage species.		
RIP-02	Retain wetlands, riparian woodlands, and mesquite and acacia woodlands in federal ownership, unless their disposal is in the public interest.			
RIP-03	No similar action.	Provide for no net unmitigated loss of wetlands, riparian communities, and mesquite and acacia woodlands within the planning area.		Address the loss of wetlands, riparian communities, and mesquite and acacia woodlands in the planning area on a case-by-case basis.
VEG-02	No similar action.	Minimize the loss of native plant communities and the ecosystem services they provide. Mitigate for the impacts so there is no net loss of value in the planning area.		Address the loss of native plant communities and the ecosystem services they provide on a case-by-case basis. Where possible, reduce the unmitigated loss of value in the planning area.
VEG-03	Manage mesquite and acacia woodlands for their value as wildlife habitat in the following areas: Amargosa Valley, Meadow Valley Wash, Moapa Valley, Pahrump Valley, Stewart Valley, Hiko Wash, Piute Wash, Crystal, Stump Springs, or any other areas identified as being of significant wildlife value.			
Objective 1.2: Maintain or improve the condition of vegetation on public lands to a desired plant community or to a potential natural community.				
VEG-04	Manage to achieve a desired plant community or potential natural community.			

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
RIP-04	Complete assessments on all riparian areas, including development of actions necessary to achieve proper functioning condition, on all areas that are functioning at risk.			
RIP-05	Improve riparian areas, giving priority to areas functioning at risk with a downward trend. Implement measures to protect riparian areas, such as fencing and/or alternate water sources away from the riparian area.	Achieve and maintain proper functioning condition at all riparian areas by realizing and advancing ecological succession, except where resource management objectives require an earlier successional stage.		
RIP-06	Ensure that the minimum requirement of proper functioning condition on all riparian areas is maintained or achieved.	No similar action. See RIP-03.		
Objective 1.3: Manage threats to Mojave Desert native plant communities.				
VEG-05	No similar action.	Maintain connectivity of native plant communities by decommissioning and restoring closed roads and other linear features that interrupt species dispersal and migration and landscape processes.		
VEG-06	No similar action.	Maintain the resilience of native plant communities to climate change by reintroducing native species that have been lost or introduce other native species where necessary.		
VEG-07	No similar action.	Use native plant species to maintain the resilience of native plant communities when implementing vegetation management activities and actions. Consider the use of non-native species only in special circumstances where a suitable native species is unavailable and the non-native species has been proven to be non-invasive.		
VEG-08	No similar action.	Protect the genetic integrity of native communities by using source-identified seed and other materials during vegetation management activities and actions.		
WEED-01	Use integrated weed management techniques to control and eradicate tamarisk, such as burning or chemical, biological or mechanical treatments, where potential for treatment is good. Rehabilitate the area with native species to help reduce the potential for tamarisk re-establishment and improve ecosystem health.	Prevent the spread of invasive/noxious weeds by using integrated weed management techniques such as chemical, biological, cultural, and mechanical methods throughout the planning area. ● Require the implementation of best management practices on BLM-authorized projects within the planning area as described in the applicable weed management plan (see Appendix E (p. 1757), Appendix H (p. 1905), and Appendix L (p. 1949)). ● Allow the use of BLM-approved herbicides as a tool in the planning area to manage and protect native plant communities as long as it is determined through NEPA to be compatible with other resource management objectives and authorized through a pesticide use proposal (PUP). Herbicide use will be in conformance with the "Vegetation Treatments Using Herbicide on Bureau of Land Management Lands in 17 Western States Programmatic Environmental Impact Statement" (2007) and any future updates to the environmental impact statement. ● Maintain and periodically update a district weed management plan. ● Restore and revegatate treatment areas where practicable to help reduce the potential for re-infestation. ● Prevent the introduction of weeds by using weed-free seed and materials for vegetation management. ● Engage in education, mitigation, and outreach to inform the public about noxious and invasive species issues and what they can do to prevent the spread of weeds and other invasive species.		

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
WEED-02	No similar action.	Locate and treat noxious/invasive weeds quickly and efficiently to prevent further spread of newly introduced weeds using the early detection rapid response method. ● Periodically survey portions of the planning area to locate new weed infestations. ● When new or small infestations are found, treat them as quickly as possible to avoid spread and exacerbation of the problem. ● Streamline processes to allow for timely and efficient treatment of weed populations.		
WEED-03	No similar action.	Require a BLM-approved project-specific weed management plan for all federal actions involving a disturbance footprint greater than one acre, unless otherwise determined by the BLM weeds specialist.	Require a BLM-approved project-specific weed management plan for all federal actions involving a disturbance footprint greater than five acres, unless otherwise determined by the BLM weeds specialist.	Require a BLM-approved project-specific weed management plan for all federal actions involving a disturbance footprint greater than 10 acres, unless otherwise determined by the BLM weeds specialist.
WEED-04	No similar action.	Require certified weed-free feed on BLM land to prevent the transmission of invasive species through livestock feces.		Where practicable, require certified weed-free feed on BLM land to prevent the transmission of invasive species through livestock feces.
WEED-05	No similar action.	Require certified weed-free gravel on BLM-authorized projects to prevent the transmission of invasive species.		Where practicable, require certified weed-free gravel on BLM land to prevent the transmission of invasive species.
WEED-06	No similar action.	Coordinate weed management activities by developing and maintaining partnerships with federal and nonfederal partners, such as cooperative weed management areas.		
WEED-07	No similar action.	Use integrated pest management techniques, such as chemical, biological, cultural, and mechanical methods and early detection rapid response to control invasive animal species (such as insects, rodents, invasive fish, quagga mussels, etc.) throughout the planning area to benefit native species and protect human health and safety. Allow the use of pesticides as a tool to manage invasive animal species if determined through NEPA to be compatible with other resources and authorized through a pesticide-use proposal.		
Objective 1.4: Manage native plant communities in a coordinated and adaptive manner across the Mojave ecoregion.				
VEG-09	No similar action.	Participate in cooperative research efforts that advance vegetation management in the Mojave ecoregion.		
VEG-10	No similar action.	Monitor vegetation change and regularly contribute to regional data collection and monitoring efforts (such as rapid ecoregional assessments and assessed inventory monitoring).		
VEG-11	No similar action.	Practice adaptive management by periodically reviewing vegetation monitoring results and current scientific literature and update best management practices and standard operating procedures to reflect advancements in vegetation management.		

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
VEG-12	No similar action.	Develop consistency between vegetation best management practices and standard operating procedures with other BLM field offices in the Mojave ecoregion that pertain to vegetation management, riparian management, weeds management, fuels management, livestock grazing, and forestry and woodland products programs.		
	See the Wildland Fire (p. 54), Forestry and Woodland Products (p. 81), and Livestock Grazing sections (p. 83) for related management directions.			

2.5.2.5. Fish and Wildlife

The following management directions apply to all wildlife, including special status species. Additional management directions that apply specifically to special status wildlife species can be found in the Special Status Species (p. 41) section.

Table 2.5. Fish and Wildlife Management Actions

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Goal 1: Manage public lands to support viable and diverse native wildlife populations and the ecosystems that support them in a manner consistent with the principles of multi-use management.				
Objective 1.1: Provide habitats for wildlife (i.e., forage, water, cover, and space) and fisheries that are of sufficient quality and quantity to support productive and diverse wildlife and fish populations.				
F&W-01	Protect important resting/nesting habitat, such as riparian areas and mesquite/acacia woodlands. Do not allow projects that may adversely impact the water table supporting these plant communities.	Manage wildlife habitats to provide sufficient forage and cover to support healthy and diverse populations by implementing management directions in the Integrated Vegetation section (p. 32) and by applying standard operating procedures, best management practices, use and timing restrictions, or mitigation measures to BLM-authorized actions.		
F&W-02	Manage habitat to support elk that move onto BLM-managed lands from U.S. Forest Service lands in the Spring Mountains. Determine needed adjustments to population levels through monitoring in cooperation with the U.S. Forest Service and Nevada Division of Wildlife.	Manage wildlife habitats to limit fragmentation and to protect or enhance landscape connectivity between continuous functioning habitats by implementing management directions in the Integrated Vegetation section (p. 32) and by applying standard operating procedures, best management practices, use and timing restrictions, or mitigation measures to BLM-authorized actions.		
F&W-03	Protect artificial and natural waters that provide benefit to wildlife by providing a minimum buffer of one quarter mile for permitted activities (such as off-road vehicle events).	Avoid BLM-authorized activities within one half mile of natural waters and associated riparian areas. Avoid BLM-authorized activities within one half mile of artificial water sources.	Avoid BLM-authorized activities within one quarter mile of natural waters and associated riparian areas. Minimize impacts to artificial water sources due to BLM-authorized activities within one quarter mile of the water source on a case-by-case basis.	Avoid BLM-authorized activities within one quarter mile of natural waters and associated riparian areas.
F&W-04	Allow construction and maintenance of additional upland game guzzlers, as needed, consistent with BLM policy, including placement in wilderness study areas.	Allow construction and maintenance of additional guzzlers, as needed, consistent with BLM policy.		

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
F&W-05	Design new waters for livestock and wild horses and burros to reduce potential conflicts with bighorn sheep and other wildlife, consistent with BLM policy for management of wilderness study areas.	Modify existing and design new water developments to incorporate wildlife escape structures and to reduce competition and conflicts between wildlife and other BLM managed resources such as wild horses and burros.		
F&W-06	Improve disturbed non-game bird habitat, including the water table supporting these habitats, by emphasizing maintenance and enhancement of natural biodiversity.	No similar action (action covered by F&W-01 and the Water Resources section (p. 29)).		
F&W-07	Maintain and improve bighorn sheep habitat by maintaining existing water developments, constructing additional water developments, and protecting/improving springs, seeps and riparian habitat, consistent with BLM policy for management of wilderness study areas, in the following areas: ● Arrow Canyon/Elbow Range ● South Spring/Bird Spring Range ● Gold Butte/Virgin Mountains ● Muddy Mountains ● Spring Range ● Eldorado/Newberry Range ● Specter Range/Last Chance Range/Bare Mountains ● McCullough Range/Highland Range/Crescent Peak Limit competition between bighorn, livestock, and wild horses and burros around spring sources by providing separate water sources for each type of user. When possible, provide water at	No similar action (action covered by F&W-04 and F&W-05).		

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
	the source for wildlife. If new data indicate that improvements are needed in other areas, do not limit activities to the areas listed above.			
Objective 1.2: Maintain and/or improve wildlife population viability and reduce mortality of wildlife from human-related activities.				
F&W-08	No similar action.	Manage projects to minimize wildlife mortality and impacts to reproductive success by applying best management practices, standard operating procedures, buffers, use and timing restrictions, or mitigation measures to BLM-authorized actions.		
F&W-09	Protect key nesting areas, migration routes, important prey base areas, and concentration areas for birds of prey on public lands by mitigating during National Environmental Policy Act compliance.	Protect birds and their nests through development of and adherence to best management practices (BMPs) including, but not limited to, raptor BMPs, general bird nest management plans, and power line BMPs from the Avian Power Line Interaction Committee.		
F&W-10	Cooperate with state and federal wildlife agencies in implementing introductions, reintroductions, and augmentation releases of native and/or naturalized species (such as desert bighorn sheep and chukar).	Cooperate with state and federal wildlife agencies in implementing introductions, reintroductions, and augmentation releases of native and/or naturalized species. All areas outside of disposal areas and solar energy zones could be considered suitable for introductions, reintroductions, and augmentation releases pending site-specific analysis. All introductions, reintroductions, and augmentation releases will be done in accordance with BLM Manual 1745.		
F&W-11	Animal damage control activities may be allowed on a temporary basis if necessary for successful re-establishment of native species or to allow for recovery of decimated populations.	Manage non-native, nuisance, or overpopulated wildlife species on a case-by-case basis through integrated pest management or other approved methods to meet resource management objectives. Management will be coordinated with other federal and state agencies.		
Objective 1.3: Manage native wildlife habitats in a coordinated and adaptive manner across the Mojave ecoregion.				
F&W-12	No similar action.	Assess, inventory, and monitor wildlife populations and their habitats to help inform management decisions. Contribute inventory and monitoring data regularly to regional data collection efforts.		
F&W-13	No similar action.	Participate in cooperative research efforts that advance wildlife management in the Mojave ecoregion.		
F&W-14	No similar action.	Periodically review wildlife monitoring results and current scientific literature and consult with experts for updating BMPs and standard operating procedures to reflect advances in wildlife management practices.		
F&W-15	No similar action.	When appropriate for addressing similar management challenges, develop consistency in BMPs and standard operating procedures with other BLM districts and field offices, particularly those in the Mojave ecoregion. Retain flexibilty for tailoring BMPs and standard operating procedures to fit specific situations within the planning area to benefit fish and wildlife objectives.		
F&W-16	No similar action.	Assist the Nevada Department of Wildlife in implementing goals and objectives of the Nevada Wildlife Action Plan consistent with BLM policy.		

2.5.2.6. Special Status Species (Threatened, Endangered, and Sensitive)

The following management directions apply to BLM special status fish, wildlife, and plant species. These management directions are in addition to those found in the Integrated Vegetation (p. 32) and Fish and Wildlife (p. 37) sections, which also apply to special status species.

Table 2.6. Special Status Species Management Actions

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Goal 1: Manage public lands to conserve, maintain, and restore special status species populations and their habitats; support the recovery of federally listed threatened and endangered species; and preclude the need to list additional species.				
Objective 1.1: Manage habitats to sustain and recover the populations of federally listed species.				
SSS-01	Improve approximately 400 acres of aquatic and riparian habitat on the Virgin River, Muddy River, and Meadow Valley Wash from its existing poor-to-fair condition to good-or-better condition by replacing tamarisk with native species.	Manage, protect, restore, and/or improve riparian habitats to provide diverse native vegetation, including multiple age classes of cottonwood/willow, to meet recovery criteria for federally listed riparian birds and to promote diversity and ecosystem health.		
SSS-02	No similar action.	Manage, protect, restore, and/or improve aquatic habitats, including the installation of fish barriers or modifications to channel morphology, to meet recovery criteria for federally listed fish species and promote diversity and ecosystem health.		
SSS-03	Maintain or improve approximately 37,152 acres of spring, wet meadow, and desert habitats in the Ash Meadows ACEC to potential natural community or desired plant community.	Manage, protect, restore, and/or improve spring, wet meadow, and desert habitats within and around the Ash Meadows ACEC to potential natural community or desired plant community to meet recovery criteria for federally listed invertebrate, fish, and plant species and to promote diversity and ecosystem health.		
SSS-04	No similar action.	Manage, protect, restore, and/or improve desert tortoise habitat to meet recovery criteria for the federally listed desert tortoise and to promote diversity and ecosystem health.		
SSS-05	No similar action.	Manage, protect, restore, and/or improve habitats within important genetic and demographic corridors that have been identified through coordination with federal, state, and local agencies based on the best available information and site-specific analysis to support the population growth of federally listed species and to link continuous functioning habitats. Do not authorize actions that could sever connectivity through an identified corridor.		
SSS-06	Manage public lands adjacent to the Ash Meadows ACEC and the Moapa National Wildlife Refuge to complement spring and aquatic habitat for special status species, including projects that may affect groundwater levels or spring flows.	No similar action (See SSS-01, SSS-02, SSS-03, and the Water Resources section (p. 29).)		

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
SSS-07	No similar action.	Identify and manage the following areas as areas of ecological importance at the request of Nye County: ● North Amargosa Desert ● Specter Range, North ● Specter Range, South ● Pahrump Valley, East For management prescriptions, see Table 2.7, "Management Actions for Nye County Areas of Ecological Importance" (p. 45). *Alternative 2 map (p. 2139)*	No similar action.	
Objective 1.2: Manage habitats for BLM sensitive species to support viable populations so that future listings would not be necessary.				
SSS-08	No similar action.	Manage and improve BLM sensitive species habitats utilizing habitat improvement techniques.		
SSS-09	Evaluate discretionary activities proposed in bighorn sheep habitats on a case-by-case basis. Grant authorization if the proposed actions are consistent with goals and objectives of the Rangewide Plan for Managing Desert Bighorn Sheep Habitat on Public Lands (U.S. Dept. of Interior, BLM 1988) and other applicable policies.	Evaluate discretionary activities proposed in bighorn sheep habitats on a case-by-case basis. Grant authorization if the proposed actions are consistent with goals and objectives of the Rangewide Plan for Managing Desert Bighorn Sheep Habitat on Public Lands (BLM 1988), the Mountain Sheep Ecosystem Management Strategy in the 11 Western States and Alaska (BLM 1995), and other applicable policies. Assist NDOW with implementing its bighorn sheep management plan when consistent with BLM policy and resource objectives.		
SSS-10	No similar action.	Attain no net unmitigated loss of BLM sensitive species habitats due to BLM-authorized activities.		Minimize impacts to BLM sensitive species habitats due to BLM-authorized activities on a case-by-case basis.
SSS-11	No similar action.	Manage, protect, restore, and/or improve habitats within important genetic and demographic corridors that have been identified through coordination with federal, state, and local agencies based on the best available information and site-specific analysis to support population growth for BLM sensitive species and to link continuous functioning habitats.		
Objective 1.3: Manage special status species in a coordinated and adaptive manner across the Mojave ecoregion.				

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
SSS-12	Enter into conservation agreements with the U.S. Fish and Wildlife Service and the state of Nevada that, if implemented, could reduce the necessity of future listings of the species in question. Conservation agreements may include, but not be limited to, the following: Blue Diamond cholla, Las Vegas bearpoppy, white-margined penstemon, and phainopepla.	Enter into conservation agreements with the U.S. Fish and Wildlife Service, state of Nevada, and other parties. If implemented, the agreements could reduce the necessity of future listings of the species in question.		
SSS-13	Manage the Desert Tortoise Conservation Center Management Area (11,014 acres) to support desert tortoise research and other research associated with the Mojave Desert Ecosystem. When feasible, expand the function of the center to include an environmental education/awareness program in close coordination with other federal agencies and state and local governments.	Include the Desert Tortoise Conservation Center Management Area as part of the Bird Springs ACEC. The property will be managed for the conservation of the relevant and important values of the ACEC as a whole.	Manage the Desert Tortoise Conservation Center Management Area (11,014 acres) to support desert tortoise research and other research associated with the Mojave Desert ecosystem.	
SSS-14	If and when funding is available, expand the existing facilities at the Desert Tortoise Conservation Center Management Area as necessary to accommodate future research and educational needs.	No similar action.		

Table 2.7. Management Actions for Nye County Areas of Ecological Importance

Management Actions for Nye County Areas of Ecological Importance				
Areas of ecological importance	**Alternative 1**	**Alternative 2**	**Alternative 3**	**Alternative 4**
• North Amargosa Desert (6,841 acres) • Specter Range, North (7,981 acres) • Specter Range, South (6,404 acres) • Pahrump Valley, East (5,812 acres) *Areas of Ecological Importance Map (p. 2139)*	No similar action.	**Lands and Realty:** • Exclude new renewable energy developments. • Linear ROWs: Avoid except in designated corridors or bury infrastructure in linear ROWs outside of tortoise habitat. Revegetate with plants that serve as desert tortoise forage and shelter. Allow on a case-by-case basis access roads or ROWs for national security purposes. • Material site ROWs: Allow within one half mile of the edge of federal-aid highway ROWs. • Site-type land-use authorizations (LUA): Exclude site-type LUAs less than 5 acres except within one half mile of the edge of federal-aid highway ROWs and those that meet ACEC-07 (p. 187). Exclude site-type LUAs greater than 5 acres. • FHWA and NDOT mineral material site ROWs: Allow within one half mile of federal-aid highways. • Exclude new landfills. • Exclude ground-disturbing military maneuvers. • Commercial activities may be permitted on a	No similar action.	

Management Actions for Nye County Areas of Ecological Importance				
Areas of ecological importance	**Alternative 1**	**Alternative 2**	**Alternative 3**	**Alternative 4**
		case-by-case basis if not in conflict with recovery of the desert tortoise. **Minerals:** ● Fluid leasable: Vehicle access and exploration limited to designated routes. ● Solid leasable: Open on a case-by-case basis; allow if it will not impact desert tortoise. ● Locatable: Pursue withdrawal. ● Saleable: Open on a case-by-case basis; allow if it will not impact desert tortoise. **Recreation:** ● Commercial activities: Allowed ● Camping: Allowed ● Speed events: Excluded ● Non-speed events: Allowed **Travel Management:** ● Limited to designated routes **Fire:** ● Minimize impacts to tortoise habitat during response to wildfire. Give priority to keeping the wildfire to an absolute minimum. ● Allow prescribed fire use to meet resource objectives and habitat enhancement purposes in appropriate areas to support habitat recovery objectives. **Vegetation:**		

Management Actions for Nye County Areas of Ecological Importance				
Areas of ecological importance	**Alternative 1**	**Alternative 2**	**Alternative 3**	**Alternative 4**
		• Support development of native seed bank that provides desert tortoise forage and/or shelter seed while providing seed for local wildfire and other vegetation restoration projects. • Allow the use of approved herbicides following ground-disturbing activities to implement invasive species control and support habitat restoration and recovery. • Activities resulting in loss or degradation of tortoise habitat would require reclamation to a level that enhances desert tortoise forage and/or shelter where feasible. Reclamation may include, but would not be limited to, re-contouring the area, scarification of compacted soil, soil amendments, and seeding with plant species utilized by desert tortoises. Subsequent seeding efforts may be required if monitoring indicates that the original effort was not successful.		

2.5.2.7. Wild Horses and Burros

Table 2.8. Wild Horse and Burro Management Actions

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Goal 1: Protect, maintain and manage healthy wild horse and burro populations within established herd management areas (HMAs) at appropriate management levels in a manner designed to achieve and maintain a thriving natural ecological balance and multiple-use relationship on public lands (Map 3.2.8.1 - 1 (p. 2144) and Map 3.2.8.1 - 2 (p. 2144)).				
Objective 1.1: Wild horse and burro management would occur in HMAs where key habitat components (forage, water, cover, and space) are adequate and could meet land health standards to support healthy, genetically diverse populations and where a thriving natural ecological balance and multiple-use relationship can be achieved and maintained. Maintain the wild, free-roaming character of the wild horses and burros on public lands. Protect wild horses and burros from harm, harassment, disease, and illegal capture.				
WHB-01	Establish appropriate management levels within HMAs.	Manage herd sizes to preserve and maintain a thriving natural ecological balance and multiple-use relationships for that area. Regularly evaluate and adjust appropriate management levels as needed when monitoring determines the animal population, animal condition, forage, water, riparian, and other ecosystem management objectives are not being met (See Chapter 3).		
WHB-02	Limit utilization on current year's production by all herbivores on key perennial forage species within herd management areas to 50 percent grasses and 45 percent for shrubs and forbs.	Limit utilization of current year's production by all herbivores on key perennial forage species to 50 percent for grasses and 45 percent for shrubs and forbs averaged across the entire HMA. An exception may be granted in the event of a wildfire.		
WHB-03	Develop and maintain dependable water sources, consistent with BLM policy for wilderness management, to allow more even distribution of wild horses and burros throughout the HMAs.	Repair and/or maintain dependable water sources to allow more even distribution of wild horses and burros throughout the HMA. All water developments will have wildlife escape structures.		
WHB-04	Use by wild horses and burros will not be allowed in that portion of the Gold Butte HMA that overlaps with the desert tortoise Gold Butte ACEC (Gold Butte Part A).	Manage wild burros for an appropriate management level of zero in Gold Butte Part A.		No similar action.
WHB-05	No similar action.	Exclude site-type ROWs of more than 5 acres from HMAs.	Avoid site-type ROWs of more than 5 acres from key habitat components (forage, water, cover, and space) within HMAs.	Site-type ROWs of more than 5 acres would be addressed on a case-by-case basis within HMAs.

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
WHB-06	No similar action.	Exclude new surface-disturbing or disruptive activities that would adversely impact the key habitat components (forage, water, cover, and space) necessary for maintaining wild horse and burro populations within HMAs.	Avoid surface-disturbing activities that may adversely impact the key habitat components (forage, water, cover, and space) necessary for maintaining wild horse and burro populations within HMAs.	Avoid surface-disturbing activities that may adversely impact the key habitat components (forage, water, cover, and space) during the primary foaling season (March 1 to May 31) within HMAs.
WHB-07	Wild horses and burros will be removed when animals are residing on lands outside the HMA or when the appropriate management level is exceeded within the HMA.			
WHB-08	Wild horses and burros that become problem animals or traffic hazards on Nevada State Routes 159 and 160 or in urban areas will be removed as soon as possible.	Wild horses and burros that become problem animals or traffic hazards will be removed as soon as possible.		
WHB-09	Wild horses and burros will be scheduled for removal as expeditiously as possible from fenced private lands within the planning area after a request is made by the private landowner and reasonable efforts to restrict the animals from private property have failed.	Wild horses and burros will be scheduled for removal as soon as possible from fenced private lands within the planning area after a request is made by the private landowner and reasonable efforts to restrict the animals from private property have failed.		
WHB-10	Develop/maintain memorandums of understanding for coordinated herd management with the National Park Service and U.S. Forest Service where HMAs extend across administrative boundaries.	Develop/maintain memoranda of understanding and/or agreements for coordinated herd management with the National Park Service and U.S. Forest Service where animal populations extend across administrative boundaries.		
WHB-11	No similar action.	When constructing or maintaining fences in HMAs, wild horse and burro safety and access will be considered a priority.		

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
WHB-12	Construct underpasses or other structures within highway rights-of-way to allow safe passage of wild horses and burros. Appropriate locations will be determined by BLM and the Nevada Department of Transportation in coordination with affected interests.	Allow and analyze underpasses or other structures within new or amended highway rights-of-way to allow safe passage of wild horses and burros and wildlife within HMAs. Appropriate locations will be determined by BLM and the Nevada Department of Transportation in coordination with affected interests.		
WHB-13	No new wild horse or burro ranges will be recommended for approval by the director.	New wild horse or burro ranges could be considered and recommended on a case-by-case basis.		
Goal 2: Reduce (slow) population growth rates and extend the gather cycle.				
Objective 2.1: Use population growth suppression techniques including, but not limited to, fertility control vaccines, sterilization (chemical and mechanical) for both males and females, and sex ratio adjustment to reduce (slow) population growth rates to extend the gather cycle, to maintain appropriate management levels, and achieve a thriving, natural ecological balance.				
WHB-14	Portions of the wild horse and burro populations in the district's HMAs may be managed as a nonreproducing herd.			

2.5.2.8. Cave and Karst Management

Table 2.9. Cave and Karst Management Actions

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Goal 1: Secure, protect, and preserve cave and karst resources.				
Objective 1.1: Protect and maintain important cave and karst resources including their biologic, geologic, mineralogic, paleontological, hydrologic, cultural, educational, scientific, and recreational values. Manage each cave for its primary unique resource opportunity. **Objective 1.2:** Manage cave and karst resources to provide for public health and safety while recognizing that part of the recreational experience inherently involves risk-taking.				
CK-01	Determine the primary values of each cave and set long-term management goals and objectives.			
CK-02	No similar action.	Identify significant caves within the planning area and manage them in accordance with the Federal Cave Resource Protection Act of 1988 to preserve their values.		
CK-03	Enlist local and national caving organizations to assist in assessment and management of cave resources. Restrict access to cave location data to bona fide scientific studies and experienced cavers.			
CK-04	Manage all cave resources as wild systems, free from commercial or show-cave type developments. Special recreation permits for commercially guided trips by qualified cave experts may be considered if environmental studies show that cave resources will not be impacted.	Manage all cave resources as wild systems, free from commercial or show-cave type developments. Special recreation permits for commercial and organized groups may be considered if environmental studies show cave resources will not be impacted.		
CK-05	Establish a registration system for cave entry, where needed.			
CK-06	Designate all significant cave resources and newly discovered cave resources as right-of-way (ROW) avoidance areas.	Designate ROW avoidance areas within one half mile of significant caves, exclusive of any designated corridors.	Designate ROW avoidance areas within one quarter mile of significant caves, exclusive of any designated corridors.	Allow ROWs near cave sites except when it prohibits access or compromises sensitive resource values.
CK-07	If necessary, implement closures to protect breeding, hibernating, or migratory bats from unnecessary disturbances.	If necessary, implement closures to protect breeding, hibernating, or migratory bats from unnecessary disturbances and introduction of diseases, and to protect unique cave and karst resources.		
CK-08	If necessary, gate cave entrances to protect unique and fragile cave resources from damage or overuse.	If necessary, gate or fence cave entrances and karsts to protect unique and fragile cave resources from damage or overuse, or to provide for public health and safety.		
CK-09	No similar action.	Restore altered or vandalized cave and karst systems to a more natural function and appearance, where feasible.		

2.5.2.9. Wildland Fire Management

Table 2.10. Wildland Fire Management Actions

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Goal 1: Manage wildland fire to ensure that firefighter and public safety are the first priority in all fire management activities. Utilize the full range of fire management activities and economical strategies to protect wildland urban interface (WUI) and help achieve sustainable ecosystems across the landscape. Ecosystem sustainability includes managing fire where it is an essential natural ecological process and minimizing loss where fire is not an essential natural ecological process.				
Objective 1.1: Establish public and firefighter safety as the first priority in every fire management activity.				
FIRE-01	No similar action.	Develop and direct processes, procedures, and objectives that ensure firefighter and public safety.		
Objective 1.2: Suppress all fires that threaten WUI or resources by using the full range of fire management response within designated fire management units (FMU) and in coordination with local, state, and federal partners (see Map 2.6.1.9-1 (p. 2139)).				
FIRE-02	Provide fire suppression efforts commensurate with resource and adjacent property values at risk.	Fire management direction: ● Provide a fire response for all wildfires occurring within the planning area as established in the fire management plan and FMUs. ● Wildland fire can be used to protect, maintain, and enhance resources and be allowed to function in its natural ecological role where resource management objectives are being met. ● Use of fire will be based on approved fire management plans. ● Ensure that fire management programs and activities are economically viable and based upon the values to be protected, costs, and land and resource management objectives.		
FIRE-03	Provide maximum fire protection through a comprehensive fire detection system using a multi-agency approach.			
FIRE-04	Provide maximum fire protection through use-approved fire suppression techniques in areas of critical environmental concern where there are concerns for habitat, cultural resources, threatened and endangered species, wilderness study areas, designated natural areas, and urban/rural/wildland interface zones through a comprehensive fire detection system using a multi-agency approach.	Fire suppression direction: ● Provide fire suppression efforts commensurate with resource and adjacent property values at risk. ● Suppress wildfires at the lowest cost with the fewest negative consequences while ensuring firefighter and public safety. ● Actively suppress wildfires in areas of concern including desert tortoise ACECs and other identified high-priority areas. ● Aggressively defend wetlands including springs, seeps, and riparian areas from wildfire (see the Integrated Vegetation section (p. 32) for more information). ● Utilize resource advisors to guide wildland fire response decisions in areas of concern such as desert tortoise habitat, cultural resource districts, or wilderness. Resource advisors can assist with pre-planning and post-fire activities. ● Evaluate burned areas within established time frames for emergency stabilization and rehabilitation needs. ● Use approved fire suppression techniques where there are concerns for WUI, habitat, cultural resources, threatened and endangered species, herd management areas, wilderness or wilderness study areas, designated natural areas, or wild and scenic rivers.		
FIRE-05	For fire suppression, follow specific guidance in the Fire Management Action Plan.	A fire management plan will carry forward management direction by specifically outlining management strategies including fire response, as well as further defining implementation actions that meet objectives for all areas with burnable vegetation within the planning area.		

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
FIRE-06	Fire suppression areas/zones. The planning area is subject to suppression for wildland fires in three suppression zones based on site-specific resource management needs (such as critical desert tortoise habitat, wilderness study areas and areas of critical environmental concern).	Update the fire management plan and FMUs/fire suppression: ● Update specific strategies, management requirements, tactics, and initial attack schemes in subsequent activity plans for each FMU in the planning area. ● Update, modify, consolidate, or simplify FMU boundaries as needed to create efficiency in fire response and management. ● FMUs in the planning area are subject to wildland fire response decisions based on WUI and site-specific resource management needs such as desert tortoise habitat, riparian habitat, wilderness study areas, herd management areas, wild and scenic rivers, and ACECs. ● Wildland fire will be managed in the planning area to protect, enhance, restore, and sustain ecosystem services as they relate to WUI and other high-priority areas.		
FIRE-07	Fire use areas — Prescribed burning for resource enhancement may occur in the Gold Butte Allotment (where important values are wildlife, watershed, wild horses and burros), South McCullough Range (for wildlife), Virgin River Floodplains (where important values are riparian, wildlife, water quality, and recreation), and the Ash Meadows/Armargosa Flat Area.	See FIRE-06.		
Objective 1.3: Reduce the risks and threats from wildfire to communities or resources through community assistance, fire prevention, enforcement, mitigation, education, and outreach in collaboration with local, state, and federal partners.				
FIRE-08	Prevent human-caused fires through an aggressive education, investigation, and public outreach effort.	Improve fire prevention and reduce human-caused fires: ● Utilize community assistance and integrated vegetation management techniques to reduce hazardous fuels and protect WUI, infrastructure, and communities. ● Engage in active mitigation and education, fire trespass investigation, and public outreach efforts to reduce human-caused fires. ● Implement fire restrictions or related restrictions such as area closures when and where necessary to prevent human-caused fires. ● Use education, mitigation, outreach, and risk assessments to inform the public about wildland fire safety issues through programs such as Living with Fire or Firewise. ● Update prevention plans, protection plans, or risk assessments as needed.		
Objective 1.4: Base fire management activities on planning and decision analysis processes that utilize the best available science to address current and anticipated situational conditions at the landscape level.				
FIRE-09	No similar action.	Utilize a decision support process for wildfire decisions: ● Use a decision support process to guide and document wildfire management decisions. ● Encourage strategies through the decision support process to manage fire to restore and maintain the natural fire regime where safe and possible.		

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
FIRE-10	No similar action.	Increase scientific knowledge of biological, physical, and sociological factors: ● Coordinate with agency partners such as the National Weather Service and Geographic Area Coordination Centers to support and improve fire management planning and decision analysis. ● As practicable, implement new approaches for fuels management activities and new science for fuels and suppression management on a case-by-case basis.		
FIRE-11	No similar action.	Evaluate ecological conditions: ● Utilize fire regime condition class (FRCC) or a similar concept to identify existing ecological conditions as they relate to the quality of ecological services. ● Enhance knowledge and understanding of the effects of climate change on fire regimes and condition class. ● Utilize implementation monitoring to assess fire management actions. ● Utilize effectiveness monitoring as a strategy to assess whether desired outcomes are being achieved. ● Evaluate strategies to achieve or maintain the desired future condition of Fire Regime Condition Class 1 in priority areas of concern or where there are concerns for habitat, cultural resources, threatened and endangered species, herd management areas, wilderness or wilderness study areas, designated natural areas, wild and scenic rivers, and WUI areas. ● Identify areas of altered condition class and develop strategies to improve the fire regime condition class.		
Objective 1.5: Utilize integrated vegetation management techniques and adaptive management strategies in a multidisciplinary approach for resource enhancement purposes that meet resource objectives in any given FMU.				
FIRE-12	No similar action.	Emergency stabilization, rehabilitation, and restoration: ● Pursue emergency stabilization and rehabilitation (ESR) actions post-fire to stabilize and rehabilitate burned areas in conformance with integrated vegetation management and ESR guidelines. ● ESR or restoration efforts will be undertaken in the planning area to protect and sustain ecosystems, address public health and safety, stabilize soils and water, rehabilitate habitats, protect cultural resources, prevent weed infestations, and repair infrastructure as needed. ● Ensure ESR activities are commensurate with resource damage and management objectives. ● Develop and maintain a programmatic ESR plan.		
FIRE-13	No similar action.	Issue a two-year area closure to all activities on lands impacted by wildfire within the planning area. Closures would be evaluated on a two-year basis to determine whether the closure continues to meet management objectives (see 43 CFR 8364).	Implement area closures to activities on lands impacted by wildfire on a case-by-case basis. Closures would be evaluated on a regular basis to determine whether the closure continues to meet management objectives (see 43 CFR 8364).	
Objective 1.6: Provide hazardous fuel reduction, noxious weed control, and vegetation management for resource enhancement and protection of communities and resources in the planning area.				

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
FIRE-14	Determine specific prescribed burn priorities annually, including any noxious or invasive species infestations, and implement where possible.	Hazardous fuels priorities: ● Determine specific hazardous fuel and vegetation management priorities annually, including any noxious or invasive species infestations, and implement treatments where possible and according to the existing budget. ● Use integrated weed management techniques to control and eradicate invasive and noxious plant species that are hazardous fuels or contribute to hazardous fuel problems in the planning area. ● Meet management goals and objectives through the use of a full range of tools such as prescribed fire, mechanical, chemical, or biological treatments in the planning area. ● Develop hazardous fuels plans as needed.		
FIRE-15	Allow prescribed fire for resource enhancement purposes on identified areas.	Allow the construction of fuel breaks and use prescribed fire as a tool to increase suppression and initial attack success and to manage and protect native plant communities as long as it is compatible with the respective resource management objectives (see the Integrated Vegetation section (p. 32)).		
FIRE-16	No similar action.	Reduce the risk of fire to human life and property: ● Assess fire risk to communities and rural developments in terms of direct wildland fire impact and economic values, and implement effective programs to mitigate that risk through collaborative planning, projects, and education. ● Highest priority for fuel treatments would be those communities surrounded by hazardous fuels. ● Reduce the risk and cost of wildfire suppression in areas of hazardous fuels buildup. ● Achieve resource objectives utilizing integrated vegetation management techniques.		
FIRE-17	No similar action.	Improve ecological conditions: ● Implement strategies to achieve or maintain the desired future condition of Fire Regime Condition Class 1 in ACECs or where there are concerns for habitats, cultural resources, threatened and endangered species, herd management areas, wilderness or wilderness study areas, designated natural areas, wild and scenic rivers, and WUI areas. ● Improve condition class from Class 3 to Class 2 in ACECs or where there are concerns for habitats, cultural resources, threatened and endangered species, herd management areas, wilderness or wilderness study areas, designated natural areas, wild and scenic rivers, and WUI areas.		
FIRE-18	No similar action.	Allow the use of herbicides as a tool for fuels reduction and to manage invasive and noxious plant species to protect native plant communities. The use of herbicides should be compatible with other resource management objectives and as authorized in the environmental impact statement, “Final Vegetation Treatments Using Herbicides on BLM Lands in 17 Western States Programmatic EIS of 2007,” and subsequent federal herbicide approvals.		

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
FIRE-19	Fire Fuels Management Areas — The fuel hazard reduction for resource/property protection will occur in the Virgin Peak White Fir Stands (ladder fuel reduction), South McCullough Range Pinion-Juniper Woodlands (shaded fuel break), and the Spring Mountain Woodlands (ladder fuel reduction).	Update the fire management plan and FMUs/fuel management: ● Update specific strategies, management requirements, methods, for hazardous fuel and vegetation treatments in subsequent activity plans for each FMU in the planning area. ● FMUs in the planning area are subject to vegetation treatment decisions based on WUI and site-specific resource management needs such as desert tortoise habitat, riparian habitat, wilderness study areas, herd management areas, wild and scenic rivers, and ACECs. ● Utilize hazardous fuel reduction in the planning area for property and resource protection, focusing on WUI and site-specific resource management needs such as desert tortoise habitat, riparian habitat, herd management areas, and ACECs. ● Utilize integrated vegetation management techniques including chemical, mechanical, biological, and prescribed fire for the purpose of resource protection and enhancement throughout the planning area based on site-specific resource management needs. ● Hazardous fuel reduction and vegetation treatments will be managed to achieve ecosystem sustainability where possible and in accordance to resource objectives in the planning area. ● Hazardous fuels and vegetation treatments will consider strategies to reduce wildfire impacts to desert tortoise habitat or other areas of concern.		
Goal 2: Utilize and apply, to the extent possible, standard policies and strategies to fire management and related activities to facilitate coordination, cooperation, and collaboration with federal, state, tribal, local, interagency, and international partners.				
Objective 2.1: Provide fire suppression assistance to other state and federal entities where formal agreements are in place.				
FIRE-20	Provide, maintain, and/or upgrade fire management cooperative agreements, memoranda of understanding, and reciprocal agreements to provide maximum protection to resources and/or adjacent property values.			
FIRE-21	No similar action.	Wildland fire management coordination and collaboration: ● Coordinate with those agencies and/or other cooperators to develop actions and response for wildfires on or threatening BLM lands. ● Ensure emphasis on minimizing the loss of life and damage to private property, minimizing environmental damage due to suppression efforts, primary consideration of firefighter and public safety, and consideration of resource values and high-value habitats. ● Establish new and/or continue existing partnerships with all interagency cooperators to facilitate coordinated fire management activities including an interagency communication center. ● Work in collaboration with the communities at risk from wildfire within identified WUI areas or areas of concern. ● Work in collaboration with federal, state, and local partners to develop cross-boundary management strategies and prioritize interagency/cross-boundary fire management actions. ● Encourage close coordination and collaboration among stakeholders with federal, interested organizations, private landowners, state, and local partners.		
Objective 2.2: Develop a common process for determining budget needs and cost sharing for all aspects of fire management operations.				
FIRE-22	No similar action.	Collaborate and coordinate with agency partners within the Southern Nevada Fire Planning Unit (GB-06) during the Fire Program Analysis or similar budgeting processes.		
See the Integrated Vegetation section (p. 32) for additional direction.				

2.5.2.10. Cultural Resources

Table 2.11. Cultural Resources Management Actions

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Goal 1: Identify, protect, and preserve cultural resources to ensure they are available for appropriate use by present and future generations.				
Objective 1.1: Reduce imminent threats from natural or human-caused deterioration and resolve potential conflicts with other resource uses. **Objective 1.2:** Provide opportunities for scientific and educational use of cultural resource sites.				
CUL-01	Release cultural resource sites designed for "management for conservation" only after development of a memorandum of agreement between BLM and the State Historic Preservation Office (SHPO), and invite the Advisory Council on Historic Preservation to consult. This document would detail efforts to conduct intensive documentation or retrieve the physical remains of the property.	Release cultural resource sites designed for "management for conservation" only after development of a memorandum of agreement between the BLM, State Historic Preservation Office, and the Advisory Council on Historic Preservation. This memorandum would detail efforts to conduct intensive documentation or retrieve the physical remains of the property.		
CUL-02	The following management directions are based on a variety of attributes. The attributes include the potential to contain important scientific data; existing site conditions or integrity; ease of access to a property, and; an assessed potential for impacts from recreational activities. Each site type possesses one or more prescribed management uses. See Table 2.12, "Cultural Resource Management Prescriptions (Based on Manual Series BLM 8130)" (p. 65).			
CUL-03	Manage the following site types for scientific use and conservation: rockshelters, roasting pits, campsites/open-air lithic scatters, artifact scatters, rock features, and historic sites. These kinds of sites should be subject to the following directions: ● Mitigate, through BLM-approved research designs, adverse effects to cultural resources from surface-disturbing activities. Mitigation will include either avoidance, minimization of harm, data recovery, or compensation (off-site mitigation such as for rock art sites). ● Meet responsibilities under the NHPA as addressed in the State Protocol Agreement between the BLM, the state of Nevada, the Nevada SHPO, and as addressed in the National Programmatic Agreement, including Native American coordination. ● Study known cultural sites not expected to incur impacts from federal actions as a result of using proactive research designs (as per NHPA Section 110). The research designs may be initiated by the BLM or independent researchers subject to the concurrence of the BLM and the SHPO. ● Representative samples of each site type will be preserved for conservation purposes. ● Manage cultural resources on 1,500 acres of public lands within the Virgin River Anasazi prehistoric "district" for the potential to yield scientific or historic information.			

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
CUL-04	Manage the following for conservation potential: rockshelters, rock art locales, prehistoric and historic remains, mining sites, and historic road/trail site types, which are located in areas that do not receive intensive recreational uses. These kinds of sites should be subjected to the following direction: ● Manage cultural resources on 11,759 acres of public lands at Red Rock Spring and Stump Springs, the Hidden Valley district, the Arden historic sites, the Crescent and Gold Butte mining town sites, and the South Virgin Peak Ridge District for conservation of their overriding scientific and/or historic importance.	Manage the following for conservation potential: rockshelter, rock art, prehistoric and historic structural remains, mining sites, and historic road/trail site types, which are located in areas that do not receive intensive recreational uses. These kinds of sites should exclude surface disturbance and disruptive activities within 500 feet of any cultural or historic resource within cultural ACECs.	These kinds of sites should exclude surface disturbance and disruptive activities within 100 feet of any cultural or historic resource within cultural ACECs.	
CUL-05	Manage the following for public uses: rockshelter, rock art locale, prehistoric and historic structural remains, mining sites, and historic road/trail site types located in areas that have sustained, or are projected to receive, intensive recreational uses.	Manage the following for public uses: rockshelter, rock art, prehistoric and historic structural remains, mining sites, and historic road/trail site types located in areas that have sustained, or are projected to receive, intensive recreational uses.		
CUL-06	Manage cultural resources on 3,660 acres of public lands within the Arrow Canyon Rock Art District, Keyhole Canyon, Frenchman Mine, and Gypsum Cave areas for public values that include sociocultural, educational, and recreational uses.	Manage cultural resources for public values that include sociocultural, education, and recreational uses within the Keyhole Canyon, Stuart Ranch, Gold Butte Townsite, Whitney Pocket, and along National Historic Trails.		

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
CUL-07	Develop programs that use surveillance to monitor resources with public value uses. Where analysis of monitoring results indicates a need for further protection, construct or install physical barriers as appropriate.	Develop programs that use surveillance to monitor resources with conservation uses. Where monitoring indicates a need for further protection, construct or install physical barriers as appropriate.		
CUL-08	Manage cultural resources on approximately 200,000 acres of traditional lifeway areas within the Las Vegas BLM District for their sociological values by providing for their protection and preservation. This direction would primarily be accomplished by inviting Native American traditional cultural groups to share information with the BLM concerning sensitivity of cultural values on federal lands in traditional lifeway areas. These lands are not available for disposal.	Manage cultural resources on approximately 200,000 acres of traditional areas (Gold Butte) and traditional cultural properties (Upper Las Vegas Wash, Gypsum Cave, and Spirit Mountain) within the Southern Nevada BLM District for their sociological values by providing for their protection and preservation. This direction would primarily be accomplished by inviting Native American traditional cultural groups to share information with the BLM concerning sensitivity of cultural values on federal lands in these traditional areas. These lands are not available for disposal (see L&R-10 (p. 164)). Ensure continued access to tribal sacred sites and traditional cultural properties when planning and implementing land uses. Prevent or mitigate physical damage or intrusions that might impede the traditional use of sacred sites and/or traditional cultural properties.		
CUL-09	Selected cultural resources should be designated as priorities for activity planning and determining best use potential. These include historic remains in Gold Butte, Crescent, Goodsprings, and Searchlight mining districts, as well as the Hidden Valley Archeological District in the Muddy Mountains. There are also special cultural resource considerations that may affect the location, timing, or method of development or use of other resources in the planning area. These resources include plants or animals essential to maintaining	Selected cultural resources should be designated as priorities for activity planning and determining best use potential. These include Gold Butte, the Hidden Valley Archaeological District in the Muddy Mountains, Logandale, the McCullough and Highland ranges, the Virgin River Anasazi prehistoric district, Amargosa Mesquite ACEC, and the Ash Meadows ACEC. There are also special cultural resource considerations that may affect the location, timing, or method of development or use of other resources in the planning area. These resources include plants or animals essential to maintaining cultural integrity of traditional areas.		

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
	cultural integrity of a traditional lifeway area.			
CUL-10	No similar action.	Allocations should be re-evaluated and revised by site or area when circumstances change or when new data becomes available. Consult with the SHPO and Native American tribes as appropriate.		

Table 2.12. Cultural Resource Management Prescriptions (Based on Manual Series BLM 8130)

Cultural Resource Management Prescriptions (Based on Manual Series BLM 8130)			
Site Type	**Location Description**	**Management Use**	**Prescriptions**
Prehistoric			
Rockshelter	Located in area proposed for severe disturbance or total destruction from federal actions.	Scientific	Data recovery
	Located in relatively isolated area, not projected for intense recreational uses or federal actions.	Conservation	Monitoring/protection
	Located in area projected for intense recreational uses.	Public uses	Interpretation
Roasting pit	Located in any area; representative samples for conservation previously selected.	Scientific, conservation, public uses	Monitoring/protection
Campsite	Located in any area; representative samples for conservation previously selected.	Scientific, conservation, public uses	Monitoring/protection
Artifact scatter	Located in any area; representative samples for conservation previously selected.	Scientific, conservation	Monitoring/protection
Rock feature/rock alignments	Located in any area; representative samples for conservation previously selected.	Scientific, conservation	Monitoring/protection
Structural remains	Located in area proposed for severe disturbance or total destruction from federal actions.	Scientific	Data recovery
	Located in relatively isolated area, not projected for intense recreational uses or federal actions.	Conservation	Monitoring/protection
	Located in area projected for intense recreational uses.	Public uses	Interpretation

Cultural Resource Management Prescriptions (Based on Manual Series BLM 8130)			
Site Type	**Location Description**	**Management Use**	**Prescriptions**
Rock art	Located in area proposed for severe disturbance or total destruction from federal actions.	Scientific	Research/documentation
	Located in relatively isolated area, not projected for intense recreational uses or federal actions. Representative samples for conservation previously selected.	Conservation	Monitoring/protection
	Located in area projected for intense recreational uses.	Public uses	Interpretation
Historic			
Structural remains	Located in area proposed for severe disturbance or total destruction from federal actions.	Scientific	Architectural documentation/data recovery
	Located in relatively isolated area, not projected for intense recreational uses or federal actions.	Conservation	Monitoring/protection
	Located in area projected for intense recreational uses.	Public uses	Interpretation
Artifact scatter (historic debris)	Located in any area; representative samples for conservation previously selected.	Scientific, conservation	Data gathering, monitoring/protection
NHT/road/trail	Located in area proposed for severe disturbance or total destruction from federal actions.	Scientific	Data recovery
	Located in relatively isolated area, not projected for intense recreational uses or federal actions.	Conservation	Monitoring/protection
	Located in area projected for intense recreational uses.	Public uses	Interpretation

2.5.2.11. Paleontological Resources

Table 2.13. Paleontological Resources Management Actions

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Goal 1: Identify and preserve paleontological resources.				
Objective 1.1: Provide opportunities for scientific, educational, and recreational uses of paleontological resources. **Objective 1.2:** Cooperate with other federal, state, and local agencies in paleontological resource management activities.				
PAL-01	Utilize data recovery efforts to attempt to mitigate adverse effects to paleontological localities from proposed federal actions.			
PAL-02	Study known paleontological sites not expected to incur impacts from federal actions as a result of using proactive research. The designs may be initiated by the BLM or independent researchers subject to the concurrence of the BLM.			
PAL-03	No similar action.	Allow collection of common invertebrate and botanical paleontological resources for personal (noncommercial) use without permits only in specifically designated fossil collecting areas.	Allow surface collection (as defined in BLM Manual 8270) of common invertebrate and botanical paleontological resources for personal (noncommercial) use without permits unless such resources are of scientific or educational/recreational value and need to be preserved, or where collection is incompatible with other resource preservation. See Appendix I (p. 1913).	
PAL-04	Release paleontological sites designated for "management for conservation" uses only after the development of a research design approved by BLM to remove the specimens, create casts of the objects, and provide interpretive exhibits.	Manage vertebrate paleontological localities, including trace fossils and track sites, for protection (in place or through data recovery) of their scientific information. Safeguard all these localities from unpermitted collection. Develop on-site or community-based interpretation for significant sites/specimens to foster an appreciation for the unique nature of the resource and to create opportunities for public access to such resources if appropriate.		
PAL-05	Manage paleontological resources on 40 acres of public lands within the Arrow Canyon Bird Track paleontological site for conservation of its overriding scientific importance.	Manage paleontological resources within Tertiary-aged trackways and the Upper Las Vegas Wash for conservation of their overriding scientific importance. Preclude activities that could destroy, damage, or reduce the data potential of the paleontological resources.	Manage paleontological resources within Tertiary-aged trackways and the Upper Las Vegas Wash for conservation of their overriding scientific importance. Develop on-site or community-based interpretation for important sites/specimens to foster an appreciation for the unique nature of the resource and to create opportunities for public access to such resources.	Manage paleontological resources within Tertiary-aged trackways and the Upper Las Vegas Wash for conservation of their overriding scientific importance. Activities that have the potential to impact paleontological resources could be permitted following paleontological inventories (field surveys) and data collection prior to any surface-disturbing activities.

2.5.2.12. Visual Resource Management

Maps:

- Visual Resource Management, Alternative 1 (p. 2139)
- Visual Resource Management, Alternative 2 (p. 2139)
- Visual Resource Management, Alternative 3 (p. 2139)
- Visual Resource Management, Alternative 4 (p. 2139)

Table 2.14. Visual Resource Management Actions

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Goal 1: Manage the diversity of landscapes in the planning area for a desired level of change consistent with visual resource management (VRM) class designations.				
Objective 1.1: Limit future impacts on the visual and aesthetic character of public lands. **Objective 1.2:** Identify and manage the visual landscape by assigning areas as VRM Class I (preservation), Class II (retention of landscape character), Class III (partial retention of the landscape character), or Class IV (modification of the landscape character).				
VRM-01	Designate the following acreages for the objectives defined for each VRM class: ● Class I: 47,562 acres ● Class II: 917,200 acres ● Class III: 1,622,226 acres ● Class IV: 523,297 acres *Alternative 1 map* (p. 2139)	Designate the following acreages for the objectives defined for each VRM class: ● Class I: 472,574 acres ● Class II: 948,521 acres ● Class III: 834,364 acres ● Class IV: 856,378 acres *Alternative 2 map* (p. 2139)	Designate the following acreages for the objectives defined for each VRM class: ● Class I: 230,372 acres ● Class II: 1,149,827 acres ● Class III: 848,909 acres ● Class IV: 882,617 acres *Alternative 3 map* (p. 2139)	Designate the following acreages for the objectives defined for each VRM class: ● Class I: 230,372 acres ● Class II: 897,796 acres ● Class III: 836,152 acres ● Class IV: 1,148,446 acres *Alternative 4 map (p. 2139)*
VRM Class I				
VRM-02	Designate 47,562 acres of public lands as VRM Class I, specifically the following areas: **Wilderness:**[a] ● Arrow Canyon Wilderness ● Eldorado Wilderness ● Ireteba Peaks Wilderness ● Jumbo Springs Wilderness ● Lime Canyon Wilderness ● Meadow Valley Range Wilderness ● Mormon Mountains Wilderness ● Mt. Charleston Wilderness ● Muddy Mountains Wilderness ● South McCullough Wilderness ● Spirit Mountain Wilderness ● Wee Thump Joshua Tree Wilderness **Wilderness Study Areas:**	Designate 472,574 acres of public lands as VRM Class I, specifically the following areas: **Wilderness:** ● Arrow Canyon Wilderness ● Eldorado Wilderness ● Ireteba Peaks Wilderness ● Jumbo Springs Wilderness ● Lime Canyon Wilderness ● Meadow Valley Range Wilderness ● Mormon Mountains Wilderness ● Mt. Charleston Wilderness ● Muddy Mountains Wilderness ● South McCullough Wilderness ● Spirit Mountain Wilderness ● Wee Thump Joshua Tree Wilderness **Wilderness Study Areas:**	Designate 230,372 acres of public lands as VRM Class I, specifically the following areas: **Wilderness:** ● Arrow Canyon Wilderness ● Eldorado Wilderness ● Ireteba Peaks Wilderness ● Jumbo Springs Wilderness ● Lime Canyon Wilderness ● Meadow Valley Range Wilderness ● Mormon Mountains Wilderness ● Mt. Charleston Wilderness ● Muddy Mountains Wilderness ● South McCullough Wilderness ● Spirit Mountain Wilderness ● Wee Thump Joshua Tree Wilderness **Wilderness Study Areas:** ● Million Hills Wilderness Study Area ● Mount Stirling Wilderness Study Area ● Resting Springs Wilderness Study Area (PFO)	

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
	● Million Hills Wilderness Study Area ● Mount Stirling Wilderness Study Area ● Resting Springs Wilderness Study Area (PFO) ● Virgin Mountain Instant Study Area	● Million Hills Wilderness Study Area ● Mount Stirling Wilderness Study Area ● Resting Springs Wilderness Study Area (PFO) ● Virgin Mountain Instant Study Area **Lands with Wilderness Characteristics:** ● Arrow Canyon Addition ○ Subunit B ● Billy Goat Peak ● Black Ridge ● Garrett Buttes ● Highland Range ● ● Ireteba Peaks Addition ● Lime Canyon Addition ○ Subunit A ○ Subunit B ○ Subunit C ● McCullough Mountains ● Muddy Mountains Addition ○ Subunit A ○ Subunit B ○ Subunit C ○ Subunit D ○ Subunit E ○ Subunit F ● Newberry Mountains ● Resting Springs Addition (PFO) ● South McCullough Addition ○ Subunit A ● Temple Mesa ○ Subunit B ● Whitney Pockets West **Wild and Scenic Rivers:**	● Virgin Mountain Instant Study Area	

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
		• WSRs found suitable and classified as wild (Hiko Spring and Carson Slough [PFO]; within one quarter mile of each side of the river from the ordinary high water mark)		
VRM-03	No similar action.	Congressionally designated wilderness areas are assigned VRM Class I.		
VRM-04	No similar action.	Wilderness study areas (WSAs), including instant study areas released by Congress for other purposes, would no longer be designated as VRM Class I. The area within the released WSA that meets the standard for Class II, III, or IV in the visual resource inventory would be designated as such for VRM, unless otherwise specifically designated below.		
VRM-05	No similar action.	Designated lands with wilderness characteristics that no longer meet the size criteria as a result of released WSAs would no longer be managed as VRM Class I. The areas within the formerly designated lands with wilderness characteristics that meet the standard for Class II, III, or IV in the visual resource inventory would be designated as such for VRM unless otherwise specifically designated below.	No similar action.	No similar action.
VRM Class II				
VRM-06	Designate 917,200 acres of public lands as VRM Class II.	Designate 948,521 acres of public lands as VRM Class II, specifically the following areas: **ACECs (LVFO):** • Arrow Canyon ACEC • Gold Butte ACEC, Part A • Gold Butte ACEC, Part B • Gold Butte ACEC, Part C • Hidden Valley ACEC • Highland Mountain Range (portion within Piute/Eldorado ACEC) • Keyhole Canyon ACEC • Rainbow Gardens ACEC	Designate 1,149,827 acres of public lands as VRM Class II, specifically the following areas: **ACECs (LVFO):** • Arrow Canyon ACEC • Gold Butte ACEC, Part A • Gold Butte ACEC, Part B • Gold Butte ACEC, Part C • Hidden Valley ACEC • Highland Mountain Range (portion within Piute/Eldorado ACEC) • Keyhole Canyon ACEC • Rainbow Gardens ACEC	Designate 897,796 acres of public lands as VRM Class II, specifically the following areas: **ACECs (LVFO):** • Arrow Canyon ACEC • Gold Butte ACEC, Part A • Gold Butte ACEC, Part B • Gold Butte ACEC, Part C • Hidden Valley ACEC • Highland Mountain Range (portion within Piute/Eldorado ACEC) • Keyhole Canyon ACEC • Rainbow Gardens ACEC

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
		● River Mountains ACEC ● Bitter Springs ACEC ● Gale Hills ACEC ● Hiko Wash ACEC ● Logandale ACEC ● Lower Mormon Mesa ACEC ● Old Spanish Trail ACEC (one mile buffer from the centerline on either side) **ACEC (PFO):** ● Amargosa Mesquite ACEC ● Ash Meadows ACEC ● Lava Dune ACEC **Minerals and Energy:** ● West side of the Bare Mountains **Recreation (LVFO):** ● Bitter Springs Backcountry Byway (a half-mile buffer from the center line of the road on either side) ● Gold Butte Backcountry Byway (a half-mile buffer from the center line of the road on either side) ● Mojave Road Scenic Area (within Laughlin SRMA; southernmost portion of SRMA [south of Hiko Springs]; bounded by California and Piute/Eldorado ACEC on the south and west, respectively) **Wild and Scenic Rivers (LVFO):** ● WSRs classified as scenic or recreational (Virgin River, Muddy River, and Meadow Valley Wash; within one quarter mile of each side of the river	● River Mountains ACEC ● Bitter Springs ACEC ● Gale Hills ACEC ● Hiko Wash ACEC ● Logandale ACEC ● Lower Mormon Mesa ACEC ● Old Spanish Trail ACEC (one mile buffer from the centerline on either side) **ACEC (PFO):** ● Amargosa Mesquite ACEC ● Ash Meadows ACEC Lava Dune ACEC **Lands with Wilderness Characteristics (LVFO):** ● Arrow Canyon Addition ○ Subunit B ● Garrett Buttes ● Ireteba Peaks Addition ● Lime Canyon Addition ○ Subunit A ○ Subunit B ○ Subunit C ● Muddy Mountains Addition ○ Subunit B ● Temple Mesa ○ Subunit B **Recreation (LVFO):** ● Bitter Springs Backcountry Byway (a half-mile buffer from the center line of the road on either side) ● Gold Butte Backcountry Byway (a half-mile buffer from the center line of the road on either side)	● River Mountains ACEC **Recreation (LVFO):** ● Bitter Springs Backcountry Byway (a half-mile buffer from the center line of the road on either side) ● Gold Butte Backcountry Byway (a half-mile buffer from the center line of the road on either side) **Lands with Wilderness Characteristics (LVFO):** ● Arrow Canyon Addition ○ Subunit B ● Ireteba Peaks Addition ● Lime Canyon Addition ○ Subunit A ○ Subunit B ○ Subunit C ● Temple Mesa ○ Subunit B All areas that meet the standard for Class II in the VRI that are not otherwise specifically designated as VRM Class I, above.

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
		from the ordinary high water mark) All areas that meet the standard for Class II in the VRI that are not otherwise specifically designated as VRM Class, I above.	● Mojave Road Scenic Area (within Laughlin SRMA; southernmost portion of SRMA [south of Hiko Springs]; bounded by California and Piute/Eldorado ACEC on the south and west, respectively) **Wild and Scenic Rivers (LVFO):** ● WSRs classified as recreational (Meadow Valley Wash; within one quarter mile of each side of the river from the ordinary high water mark) All areas that meet the standard for Class II in the VRI that are not otherwise specifically designated as VRM Class I, above.	
VRM Class III				
VRM-07	Designate 1,622,226 acres of public lands as VRM Class III.	Designate 834,364 acres of public lands as VRM Class III, specifically the following areas: **Lands and Realty:** ● ROW corridors **Minerals and Energy:** ● Community pits (authorized non-operational) ● Community pits (authorized operational) All areas that meet the standard for Class III in the VRI that are not otherwise specifically designated as VRM Class I or II, above.	Designate 848,909 acres of public lands as VRM Class III, specifically the following areas: **Lands and Realty:** ● ROW corridors **Minerals and Energy:** ● Community pits (authorized non-operational) ● Community pits (authorized operational, except for those designated as Class IV below) ● Material pits (Nevada Department of Transportation — active only) ● West side of Bare Mountains All areas that meet the standard for Class III in the VRI that are not	Designate 836,152 acres of public lands as VRM Class III, specifically the following areas: **Lands and Realty:** ● ROW corridors **Minerals and Energy:** ● Material pits (NDOT — active only) All areas that meet the standard for Class III in the VRI that are not otherwise specifically designated as VRM Class I or II, above.

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
			otherwise specifically designated as VRM Class I or II, above.	
VRM Class IV				
VRM-08	Designate 523,297 acres of public lands as VRM Class IV.	Designate 856,378 acres of public lands as VRM Class IV, specifically the following areas: **Lands and Realty:** ● Amargosa Solar Energy Zone ● Dry Lake Solar Energy Zone All areas that meet the standard for Class IV in the VRI that are not otherwise specifically designated as VRM Class I, II, or III, above.	Designate 882,617 acres of public lands as VRM Class IV, specifically the following areas: **Lands and Realty:** ● Those existing and proposed solar energy zones depicted on Solar Energy Alternative 3 map (p. 2142). **Minerals and Energy:** ● Community pits (Jean North, Jean South, Lone Mountain, Speedway, Mesquite, Pahrump) All areas that meet the standard for Class IV in the VRI that are not otherwise designated as VRM Class I, II, or III, above.	Designate 1,148,446 acres of public lands as VRM Class IV, specifically the following areas: **Lands and Realty:** ● Those existing and proposed solar energy zones as depicted on Solar Energy Alternative 3 map (p. 2142). **Minerals and Energy:** ● Community pits (authorized operational) ● Community pits (authorized non-operational) ● West side of Bare Mountains All areas that meet the standard for Class IV in the VRI that are not otherwise designated as VRM Class I, II, or III, above.
Objective 1.3: Manage existing facilities, ROWs, and mineral material free-use permits/contracts during repair, reconstruction, and maintenance actions consistent with VRM class designations.				
VRM-09	No similar action.	All authorized existing facilities, ROWs, mines, and mineral material free-use permits and contracts not otherwise specifically identified above will maintain the VRM objectives and mitigation measures stipulated in the authorization. Decrease the visual effect of existing facilities during reconstruction, replacement, or major maintenance, where practical.		
Goal 2: Manage the diversity of landscapes in acquired lands for a desired level of change consistent with visual resource management class designations.				
Objective 2.1: Limit future impacts on the visual and aesthetic character of acquired lands.				
VRM-10	No similar action.	Identify and manage acquired lands by assigning areas as VRM Class I (preservation), Class II (retention of landscape character), Class III (partial retention of the landscape character), or Class IV (modification of the landscape character).		

[a] There were no congressionally designated wilderness areas in existence at the time of the Decision Record for the 1998 RMP; however BLM policy is to manage these areas as VRM I.

2.5.2.13. Lands with Wilderness Characteristics

Maps:

- Wilderness and Lands With Wilderness Characteristics, Alternative 2 (p. 2139)
- Wilderness and Lands With Wilderness Characteristics, Alternative 3 (p. 2139)
- Wilderness and Lands With Wilderness Characteristics, Alternative 4 (p. 2139)

Table 2.15. Lands with Wilderness Characteristics Management Actions

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Goal 1: Protect, preserve, and maintain wilderness characteristics outside congressionally designated wilderness and wilderness study areas (WSAs) while considering other resource values, uses, and manageability.				
Objective 1.1: Manage these primitive and backcountry landscapes for their undeveloped character and provide opportunities for primitive recreational activities and experiences of solitude, as appropriate.				
LWC-01	No similar action.	Manage the following lands with wilderness characteristics specifically to protect, preserve, and maintain their wilderness characteristics (242,214 acres): ● Arrow Canyon Addition ○ Subunit B (5,773 acres) ● Billy Goat Peak (30,345 acres) ● Black Ridge (14,430 acres) ● Garrett Buttes (11,694 acres) ● Highland Range (34,606 acres) ● Ireteba Peaks Addition (5,374 acres) ● Lime Canyon Addition ○ Subunit A (9,839 acres) ○ Subunit B (2,081 acres) ○ Subunit C (233 acres) ● McCullough Mountains (53,396 acres) ● Muddy Mountains Addition ○ Subunit A (16,132 acres) ○ Subunit B (819 acres) ○ Subunit C (1,259 acres) ○ Subunit D (312 acres) ○ Subunit E (14,741 acres) ○ Subunit F (3,408 acres) ● Newberry Mountains (38 acres) ● Resting Springs Addition (9,317 acres) (Pahrump Field Office) ● South McCullough Addition ○ Subunit A (13,069 acres) ● Temple Mesa ○ Subunit B (220 acres)	Manage the following lands with wilderness characteristics specifically to protect, preserve, and maintain their wilderness characteristics (36,033 acres): ● Arrow Canyon Addition ○ Subunit B (5,773 acres) ● Garrett Buttes (11,694 acres) ● Ireteba Peaks Addition (5,374 acres) ● Lime Canyon Addition ○ Subunit A (9,839 acres) ○ Subunit B (2,081 acres) ○ Subunit C (233 acres) ● Muddy Mountains Addition ○ Subunit B (819 acres) ● Temple Mesa ○ Subunit B (220 acres) **Management Prescriptions:** ● Restrict construction of new structures and facilities that are unrelated to the preservation or enhancement of wilderness characteristics. Structures and facilities should be necessary for wilderness characteristics management. ● Remove existing structures and facilities unrelated to the preservation or enhancement of wilderness characteristics. Structures and facilities should	Manage the following lands with wilderness characteristics specifically to protect, preserve, and maintain their wilderness characteristics (29,840 acres): ● Arrow Canyon Addition ○ Subunit B (5,773 acres) ● Garrett Buttes (11,694 acres) ● Lime Canyon Addition ○ Subunit A (9,839 acres) ○ Subunit B (2,081 acres) ○ Subunit C (233 acres) ● Temple Mesa ○ Subunit B (220 acres) **Management Prescriptions:** ● Restrict construction of new structures and facilities that are unrelated to the preservation or enhancement of wilderness characteristics. Structures and facilities should be necessary for wilderness characteristics management. ● Remove existing structures and facilities unrelated to the preservation or enhancement of wilderness characteristics. Structures and facilities should be necessary for wilderness characteristics management. **Wildland Fire Management:**

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
		• Whitney Pockets West (15,128 acres) **Management Prescriptions:** • Restrict construction of new structures and facilities that are unrelated to the preservation or enhancement of wilderness characteristics. Structures and facilities should be necessary for wilderness characteristics management. • Remove existing structures and facilities unrelated to the preservation or enhancement of wilderness characteristics. Structures and facilities should be necessary for wilderness characteristics management. **Wildland Fire Management:** • Utilize minimum impact suppression techniques for fire suppression operations. • Allow fire management actions in conformity with the fire management plan so long as it is consistent with improving or maintaining the area's wilderness characteristics. **Integrated Vegetation:** • Closed to commercial sale of vegetative resources. **Recreation and Travel Management:** • Allow commercial services in support of primitive recreational activities.	be necessary for wilderness characteristics management. **Wildland Fire Management:** • Utilize minimum impact suppression techniques for fire suppression operations. • Allow fire management actions in conformity with the fire management plan so long as it is consistent with improving or maintaining the area's wilderness characteristics. **Integrated Vegetation:** • Open to commercial sale on a case-by-case basis. **Recreation and Travel Management:** • Develop and maintain recreation facilities only when compatible with maintaining wilderness characteristics. • Allow commercial services in support of primitive recreational activities. • Limited to designated routes for motor vehicles and mechanical transport. • Allow commercial services for OHV tours on designated routes. **Lands and Realty:** • Avoid new ROWs. • Retain in federal ownership. **Minerals:**	• Utilize minimum impact suppression techniques for fire suppression operations. • Allow fire management actions in conformity with the fire management plan so long as it is consistent with improving or maintaining the area's wilderness characteristics. **Integrated Vegetation:** • Open to commercial sale on a case-by-case basis. **Recreation and Travel Management:** • Develop and maintain recreation facilities only when compatible with maintaining wilderness characteristics. • Allow commercial services in support of primitive recreational activities. • Limited to designated routes for motor vehicles and mechanical transport. • Allow commercial services for OHV tours on designated routes. **Lands and Realty:** • Avoid new ROWs. • Retain in federal ownership. **Minerals:** • Open to fluid mineral leasing with major constraints (NSO). • Closed to solid mineral leasing. • Pursue withdrawal from locatable mineral entry.

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
		• Closed to motor vehicles and mechanical transport with the exception of designated routes and wildlife water developments routes within administered lands with wilderness characteristics. **Lands and Realty:** • Exclude new ROWs. • Retain in federal ownership. **Minerals:** • Closed to fluid mineral leasing. • Closed to solid mineral leasing. • Pursue withdrawal from locatable mineral entry. • Closed to saleable minerals. *Alternative 2 map (p. 2139)*	• Open to fluid mineral leasing with major constraints (NSO). • Closed to solid mineral leasing. • Pursue withdrawal from locatable mineral entry. • Closed to saleable minerals. *Alternative 3 map (p. 2139)*	• Closed to saleable minerals. *Alternative 4 map (p. 2139)*

2.5.3. Resource Uses

2.5.3.1. Forestry and Woodland Products

Table 2.16. Forestry and Woodland Products Management Actions

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Goal 1: Provide for the public and commercial use of vegetative resources.				
Objective 1.1: Provide for use while maintaining ecological health.				
FOR-01	Maintain woodland and conifer forest where possible for all aged stands with understory vegetation forage values at moderate or better.			
FOR-02	Firewood cutting and gathering is limited to approved areas subject to restrictions developed for protection of threatened and endangered and sensitive species and other sensitive resources.			
FOR-03	Allow harvest of dead and/or down wood or BLM-marked green mesquite "trees" for dwarf mistletoe control only in approved areas.	Prohibit commercial harvest and personal use of mesquite and acacia woodlands, including live, dead standing, or dead and down.	Prohibit commercial harvest of mesquite and acacia woodlands, including live, dead standing, or dead and down. Allow personal use of other dead-and-down mesquite and acacia for on-site recreational campfires, except in areas closed to firewood gathering and subject to seasonal fire restrictions.	
Objective 1.2: Conduct responsible sale and disposal of special forest products by permit.				
FOR-04	Limit collection or sale of desert vegetation and other vegetative resources at locations where surface-disturbing activities are authorized.	Commercial seed collections will be allowed within identified seed-collection areas. Commercial seed collections outside designated seed collection areas will be authorized on a case-by-case basis except where otherwise prohibited (such as a wilderness area). Local seed collections for project-specific restoration will be allowed within the project footprint and 1,000 feet adjacent to the project area.		
FOR-05	Assess the potential for salvage and/or harvest of desert vegetation at locations where surface-disturbing activities are authorized.	Assess the potential to salvage desert vegetation from all locations where surface-disturbing activities are proposed. Prioritize the disposal of cacti and yucca and other materials regulated under the forestry program as follows: first priority will be the use of the materials for revegetation of temporary use areas associated with the project; second priority will be the use of the materials for restoration of nearby BLM lands not associated with the project; and third priority will be given to disposal through a public or commercial sale.		
FOR-06	No similar action.	Allow the collection of reasonable amounts of renewable native plant products, including flowers, leaves, fruit, seeds, nuts, cones, berries, and dead-and-downed native vegetation for noncommercial, personal use, except within ACECs.		
	See the Integrated Vegetation section (p. 32) for additional forestry management directions.			

2.5.3.2. Livestock Grazing

Maps:

- Grazing Allotments, Alternative 1 (p. 2139)
- Grazing Allotments, Alternative 3 (p. 2139)
- Grazing Allotments, Alternative 4 (p. 2139)

Table 2.17. Livestock Grazing Management Actions

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Goal 1: Provide for livestock grazing on BLM lands within the planning unit.				
Objective 1.1: Provide for continued grazing of domestic livestock on public lands, consistent with law, regulations, established standards and guidelines, and policy on areas open to livestock grazing.				
GRA-01	Manage range resources consistent with the phenological and physiological requirements of key perennial species.			
GRA-02	Livestock grazing on all ephemeral allotments will be permitted if on-the-ground evaluations determine that forage is available and that use is consistent with the standards, guidelines, and allotment-specific objectives.			
GRA-03	Salt and mineral supplements will be placed a minimum of one mile from water.			
GRA-04	Manage grazing allotments outside the desert tortoise ACECs consistent with grazing Prescription 2 as identified in Biological Opinion File No.: 1-5-91-F-36 as amended: Livestock use may occur on open allotments in desert tortoise habitat outside ACECs/Desert Wildlife Management Areas from March 1 to October 14 as long as forage utilization does not exceed 40 percent on key perennial grasses, forbs, and shrubs. Between October 15 and February 28, forage utilization will not exceed 50 percent on key perennial grasses and 45 percent on key shrubs and perennial forbs. The BLM will initiate formal consultation on a case-by-case basis if any change is identified to Prescription 2 in an allotment grazing system.	Manage grazing allotments outside the desert tortoise ACECs consistent with Section 7 of the Endangered Species Act, allotment management plans, and agency ephemeral grazing prescriptions.		

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
GRA-05	Close all allotments to livestock grazing within the planning unit, with the following exceptions: Hidden Valley, Mount Stirling, Lower Mormon Mesa, Roach Lake, White Basin, Muddy River, Wheeler Wash, Mesa Cliff, Arrow Canyon in Battleship Wash, Flat Top Mesa, Jean Lake, and Arizona-administered allotments. That portion of the Jean Lake allotment within the desert tortoise area of critical environmental concern would be closed to grazing. Close all land disposal areas to livestock grazing. *Alternative 1 map (p. 2139)*	Close all allotments to livestock grazing within the planning area.	The following allotments would be unavailable to livestock grazing: ● Roach Lake (LVFO) ● White Basin (LVFO) ● Mesa Cliff (LVFO) ● Muddy River (LVFO) ● Wheeler Wash (PFO) ● Arrow Canyon (LVFO) ● Arrow Canyon in Battleship Wash (LVFO) ● Jean Lake (LVFO) The following allotments would be available for livestock grazing(43 CFR 4130.2[a]): ● Hidden Valley (LVFO) ● Lower Mormon Mesa (LVFO) ● Flat Top Mesa (LVFO) ● Arizona-administered allotments Close all land disposal areas to livestock grazing.[a] *Alternative 3 map (p. 2139)*	The following allotments would be unavailable to livestock grazing: ● Roach Lake ● White Basin ● Mesa Cliff ● Arrow Canyon in Battleship Wash ● Jean Lake The following allotments would be available for livestock grazing (43 CFR 4130.2[a]): ● Hidden Valley ● Lower Mormon Mesa ● Flat Top Mesa ● Muddy River ● Wheeler Wash ● Arizona-administered allotments Close all land disposal areas to livestock grazing.[a] *Alternative 4 map (p. 2139)*
GRA-06	Designate allotments that currently have an existing closure as permanently closed. Designate all unallotted areas within southern Nye County as permanently closed to livestock grazing.This includes Indian Springs, River Mountain, Las Vegas Valley, Lake Mead NRA, Action-Ferrier, Billy Goat Ridge, Black Butte, Bunkerville, Carson Slough, Christmas Tree Pass, County Line, Crescent Peak, Dry Lake, Glendale, Gold Butte, Grapevine-Rock Valley, Hen Springs, Indian Springs, Iretreba Peaks, Jackrabbit, Kyle Canyon, Lucky Strike, McCullough Mountain, Mount Stirling, Muddy Mountain, Newberry Mountains, Overton Arm, Pittman Well, Pulsipher Wash, Rox, South Point, Spring Mountain, Stump Springs, Sunrise Mountain, Table Mountain, Toquop Sheep, Upper Mormon Mesa, Ute, Virgin River Bottom, Wheeler Slope, and Younts Spring.			
GRA-07	Additional allotment closures could be approved based on voluntary relinquishments of grazing preferences, permits, or leases.			

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
GRA-08	The type of livestock that will be authorized on each allotment is identified in the Livestock Grazing Appendix of the 1998 RMP. Changes to the type of livestock may be made following site-specific environmental analysis.	The types of livestock grazing that will be authorized on each allotment includes horses and cattle in Flat Top Mesa and Lower Mormon Mesa; and cattle only in Hidden Valley. Changes to the type of livestock may be made following site-specific environmental analysis.		The types of livestock grazing that will be authorized on each allotment includes horses and cattle in Flat Top Mesa and Lower Mormon Mesa; and cattle only in Hidden Valley, Wheeler Wash, and Muddy River. Changes to the type of livestock may be made following site-specific environmental analysis.
Objective 1.2: Establish grazing management systems including rest rotation, deferred rest rotation, or other management approaches as needed to meet specific resource management objectives.				
GRA-09	Include water availability for all uses as part of any grazing system, considering riparian areas, livestock, wildlife, and wild horses and burros.			
GRA-10	Develop range improvements, as needed, to reach more uniform distribution of livestock consistent with management objectives.			
GRA-11	Incorporate standards and guidelines into all livestock use authorizations, grazing systems, and management plans to ensure rangeland health is improved or maintained.			
Objective 1.3: Manage allotments open to grazing using the selective management approach.				
GRA-12	Drop existing categories from allotments closed to livestock grazing. Other direction: ● Arrow Canyon and White Basin: remain "M" (maintain) ● Hidden Valley, Jean Lake, and Wheeler Wash: remain "I" (improve) ● Mesa Cliff, Muddy River, and Roach Lake: remain "C" (custodial) ● Lower Mormon Mesa: change from "C" to "I" ● Flat Top Mesa: change from "C" to "M" The category for the three allotments administered by Arizona will not be changed.	BLM will manage in accordance with these category determinations. Drop existing categories for allotments closed to livestock grazing. Other direction: ● Flat Top Mesa: remain "M" ● Lower Mormon Mesa, Hidden Valley, and Wheeler Wash: remain "I" ● Muddy River: change to "I" The category for the three allotments administered by Arizona (Mesquite Community, Lime Spring, and Tassi) will not be changed.		
	See the Integrated Vegetation section (p. 32) for additional livestock management objectives and directions.			

[a] In accordance with 43 CFR §4110.4-2(2)(b), grazing permittees/leasees will be given two year's notice prior to any BLM land sale that would result in cancelation or modification of their grazing permit, lease, or preference.

2.5.3.3. Minerals

The purpose of the minerals program is to manage public lands consistent with the applicable mining laws, as amended, and other authorities and regulations as appropriate. This includes authorizing the development of the vast mineral estate, both surface and subsurface, in a manner that would allow for development with a minimal impact to the environment and to accommodate the material needs of the public and the nation as a whole. Casual rock collecting for personal enjoyment is an important use of the administered lands within the planning area; a simple guide can be found under Appendix I (p. 1913).

Table 2.18. Minerals Management Actions

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Goal 1: Where lands remain open to mineral development, provide orderly exploration and development of valuable minerals on federally owned mineral estate whether or not the surface estate is in federal ownership.				
Objective 1.1: Authorize the development of mineral commodities found in the district through the use of appropriate regulatory guidance and environmental safeguards (e.g no surface occupancy) while minimizing impacts to other resources and their values.				
MIN-01	Manage those lands released by Congress to allow opportunities for mineral exploration and development in accordance with current laws and regulation and consistent with decisions for minerals management on adjacent lands.	Manage lands released from withdrawal or special designation to allow opportunities for mineral exploration and development in accordance with current laws and regulations and consistent with decisions for minerals management on adjacent lands. Lands released from withdrawals or special designations may include but are not limited to: ● Congressionally withdrawn lands such as wilderness study areas, instant study areas, Bureau of Reclamation lands, etc. ● Administratively withdrawn special designation lands such as ACECs, select disposal boundaries, etc.		

Fluid Leasable Mineral Management

Fluid minerals include oil, gas, and geothermal resources and are subject to four levels of management:

- **Open to fluid mineral leasing:** All leases are subject to standard terms and conditions.
- **Open to fluid mineral leasing subject to moderate constraints:** Timing limitations and controlled surface use (CSU).
- **Open to fluid mineral leasing subject to major constraints:** No surface occupancy (NSO).
- **Closed to leasing.**

A Lease Notice may be attached to the lease to inform potential lessees of important resource issues under existing laws and regulations that may result in delays associated with subsequent permitting and appropriate mitigation of those resource concerns.

Fluid leasable mineral development will need to comply with the list in Appendix C (p. 1711).

Maps:

- Fluid Leasable Minerals, Alternative 1 (p. 2139)
- Fluid Leasable Minerals, Alternative 2 (p. 2139)
- Fluid Leasable Minerals, Alternative 3 (p. 2140)
- Fluid Leasable Minerals, Alternative 4 (p. 2140)

Table 2.19. Fluid Leasable Mineral Management Actions (including geothermal)

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Goal 2: Provide opportunities for environmentally responsible geophysical exploration and production of fluid leasable minerals for energy resources on public lands. Evaluate fluid leasable mineral exploration on a case-by-case basis. Apply special management direction for leasing within desert tortoise habitat.				
Objective 2.1: Authorize lease sales and development on lands open to fluid mineral leasing, including those with moderate and major constraints, complying with environmental protocols through the use of best management practices.				
MIN-02	No similar action.	Manage fluid mineral leasing as follows and in Table 2.20, "Land Designations that Impact Fluid Leasable Mineral Developments" (p. 93): • Open: 311,521 acres • Moderate constraints (CSU): 78,750 acres • Major constraints (NSO): 0 acres • Closed: 2,721,963 acres *Alternative 2 map (p. 2139)*	Manage fluid mineral leasing as follows and in Table 2.20, "Land Designations that Impact Fluid Leasable Mineral Developments" (p. 93): • Open: 1,281,291 acres • Moderate constraints (CSU): 362,314 acres • Major constraints (NSO): 294,301 acres • Closed: 1,173,464 acres *Alternative 3 map (p. 2140)*	Manage fluid mineral leasing as follows and in Table 2.20, "Land Designations that Impact Fluid Leasable Mineral Developments" (p. 93): • Open: 1,818,010 acres • Moderate constraints (CSU): 130,494 acres • Major constraints (NSO): 202,315 acres • Closed: 962,314 acres *Alternative 4 map (p. 2140)*
MIN-03	Allow fluid mineral leasing subject to standard terms and conditions on 1,909,351 acres, which are outside identified disposal and administrative areas and outside ACECs.	See MIN-02 for open fluid leasable mineral development within the district.		
MIN-04	Allow fluid mineral leasing, subject to NSO stipulations within areas having important cultural, geological, and riparian resources; special status species plant and animal habitat; ACECs; administrative sites; and special recreation management areas (SRMAs). The ACECs subject to this NSO provision total approximately 866,000 acres.	See MIN-02 for fluid leasable with major constraints for mineral development within the district.		

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
MIN-05	Allow fluid mineral leasing on lands released from wilderness review, subject to management direction. The total acreage released will not be known until determined by a Congressional act.	See MIN-01		
MIN-06	Close the Ash Meadows ACEC, including BLM lands inside the Ash Meadows National Wildlife Refuge, to geothermal prospecting and leasing.	Closed to fluid leasable mineral prospecting, exploration, and leasing in the Ash Meadows ACEC, including BLM lands inside the Ash Meadows National Wildlife Refuge.		
MIN-07	No similar action.		Upon designation, manage solar energy zones and wind development areas as NSO for fluid mineral leasing.	
MIN-08	No similar action.	On split-estate lands where the BLM owns the minerals, mineral estate would be closed to fluid mineral leasing.	On split-estate lands where the BLM owns the minerals, the mineral estate would be subject to NSO stipulations for fluid mineral leasing unless the lessee has the surface owner's written consent to the occupancy.	On split-estate lands where the BLM owns the minerals, the mineral estate would be open to fluid mineral leasing.
MIN-09	No similar action.	On split-estate lands at Valley of Fire State Park, where the BLM owns the minerals, mineral estate would be closed to fluid mineral leasing.	On split-estate lands at Valley of Fire State Park, where the BLM owns the minerals, the mineral estate would be closed to fluid mineral leasing with a one half mile buffer outside the park subject to NSO stipulations for visual resource management.	On split-estate lands, at Valley of Fire State Park, where the BLM owns the minerals, the mineral estate would be subject to NSO with no surrounding buffer to fluid mineral leasing.

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
MIN-10	No similar action.	Large ACECs will be closed with the exception of having a 1-mile buffer designated as open with major constraints (NSO) to allow for mineral extraction. These lands will remain open to fluid mineral leasing. ● These buffers will be along portions of the ACEC boundary where adjacent lands are either open or open with moderate constraints (CSU). ● Any segment of the boundary where adjacent lands are closed to fluid leasable mineral exploration and development would also be closed to fluid leasable minerals. The buffer would allow for fluid mineral exploration and development to occur under the NSO lands using current drilling and recovery technology while facilitating feasible, near future, technological advances to expand their range.		
		None — all ACECs are closed under this alternative.	The ACECs that are affected by these buffers are Gold Butte Part A (tortoise — designated critical), Mormon Mesa (tortoise — designated critical), Coyote Springs (tortoise — designated critical), Piute/Eldorado (tortoise — designated critical), and Rainbow Gardens (rare plants).	The ACECs that are affected by these buffers are Gold Butte Part A (tortoise — designated critical), Mormon Mesa (tortoise — designated critical), Coyote Springs (tortoise — designated critical), Piute/Eldorado (tortoise — designated critical), Rainbow Gardens (rare plants), and Jean Lake (rare plants).

Table 2.20. Land Designations that Impact Fluid Leasable Mineral Developments

Land Designations that Impact Fluid Leasable Mineral Developments				
	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Note: "No similar action" indicates that the special management area or land disposal does not exist in that alternative(s). Also see the Lands With Wilderness Characteristics (p. 76), Recreation (p. 104), ACEC (p. 180), and Wild and Scenic Rivers (p. 259) sections for more management prescriptions.				
Las Vegas Field Office Disposal Areas				
Sloan Hills	No similar action	Closed		
Solar Energy Zones (SEZs)				
Amargosa Valley	NSO			
Ash Meadows (PFO)	No similar action		Open	No similar action
Dry Lake (LVFO)	NSO			
Lathrop Wells (PFO)	No similar action		Open	
Mercury Tech Park (PFO)	No similar action		Open	
NE Clark County (LVFO)	No similar action			Open
Off-The-Grid (formerly Pahrump / Sandy Valley) (PFO and LVFO)	No similar action			Open
South Beatty (PFO)	No similar action		Open	No similar action

Solid Leasable Minerals

Solid leasable minerals are a discretionary mineral that consists of energy and non-energy minerals that are developed through leases. These resources include, but are not limited to, coal, potash, potassium, and sodium-based salts. Each commodity has specific royalties and regulations for their development.

Land-use planning lists which lands are open and which are closed.

Maps:

- Solid Leasable Minerals, Alternative 1 (p. 2140)
- Solid Leasable Minerals, Alternative 2 (p. 2140)
- Solid Leasable Minerals, Alternative 3 (p. 2140)
- Solid Leasable Minerals, Alternative 4 (p. 2140)

Table 2.21. Solid Leasable Mineral Management Actions

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Goal 3: Manage lands open to solid mineral leasing under the mineral leasing laws in accordance with the guidelines set forth under 43 CFR 3500.				
Objective 3.1: Authorize lease sales and development on lands open to solid mineral leasing, complying with environmental protocols through the use of best management practices.				
MIN-11	On split-estate lands, private surface that is developed for non-mineral use will not be managed for solid mineral development.			
MIN-12	Allow solid mineral leasing on 1,916,135 acres that are on lands outside identified disposal and administrative areas, outside riparian and natural spring areas, and outside ACECs, subject to standard lease terms and conditions.	Solid mineral leasing is closed in the following: ● All disposal and administrative areas within the Las Vegas and Pahrump field offices. ● Riparian and natural spring areas.		
		Manage solid mineral leasing as follows: ● Open: 1,373,556 acres ● Closed: 1,737,791 acres *Alternative 2 map (p. 2140)*	Manage solid mineral leasing as follows: ● Open: 1,702,600 acres ● Closed: 1,408,747 acres *Alternative 3 map (p. 2140)*	Manage solid mineral leasing as follows: ● Open: 1,791,582 acres ● Closed: 1,319,765 acres *Alternative 4 map (p. 2140)*
MIN-13	Solid mineral leasing will be allowed on lands released from wilderness review that are not within ACECs.	See MIN-01.		

Table 2.22. Land Designations that Impact Solid Leasable Minerals Developments

Land Designations that Impact Solid Leasable Minerals Developments				
	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Note: "No similar action" indicates that the special management area or land disposal does not exist in that alternative(s). Also see the Lands With Wilderness Characteristics (p. 76), Recreation (p. 104), ACEC (p. 180), and Wild and Scenic Rivers (p. 259) sections for more management prescriptions.				
Solar Energy Zones (SEZs)				
Amargosa Valley	Open			
Ash Meadows (PFO)	No similar action		Open	No similar action
Dry Lake (LVFO)	Open			
Lathrop Wells (PFO)	No similar action		Open	
Mercury Tech Park (PFO)	No similar action		Open	
NE Clark County (LVFO)	No similar action			Open
Off-The-Grid (formerly Pahrump / Sandy Valley) (PFO and LVFO)	No similar action			Open
South Beatty (PFO)	No similar action		Open	No similar action

Locatable Minerals

Locatable minerals are non-discretionary minerals that consist of all other minerals not addressed before and consist of two primary categories: metallic and non-metallic minerals. Strategic minerals, important to national stability and growth, are found among both categories. These are developed under the General Mining Law of 1872, as amended, with the location of mining claims that are valid existing rights. Through the land-use plan, lands currently open to mineral entry can be proposed for withdrawal. If management selects an alternative in the land-use plan that proposed withdrawal, a mineral potential report must be completed before withdrawal can be pursued. Once lands are withdrawn from mineral entry, no new mining claims may be staked on those lands.

Maps:

- Locatable Minerals, Alternative 1 (p. 2140)
- Locatable Minerals, Alternative 2 (p. 2140)
- Locatable Minerals, Alternative 3 (p. 2140)
- Locatable Minerals, Alternative 4 (p. 2140)

Table 2.23. Locatable Mineral Management Actions

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Goal 4: Manage lands open under the General Mining Law of 1872, as amended, in accordance with guidelines within 43 CFR 3809.				
Objective 4.1: Authorize mining operations and exploration activities on public lands open to mineral entry while preventing undue and unnecessary degradation of public lands.				
MIN-14	An estimated 1,956,677 acres would remain open to the operation of mining laws after existing withdrawals for military uses, industrial sites, and power sites.	An estimated 1,356,970 acres would remain open for mining, subject to mining laws, after withdrawals for military uses, industrial sites, ACECs, wilderness (including wilderness study areas [WSAs]), special recreation management areas (SRMAs), and power sites.	An estimated 1,809,403 acres would remain open for mining, subject to mining laws, after withdrawals for military uses, industrial sites, ACECs, wilderness (including WSAs), SRMAs, and power sites.	An estimated 1,573,533 acres would remain open for mining, subject to mining laws, after withdrawals for military uses, industrial sites, ACECs, wilderness (including WSAs), SRMAs, and power sites.
MIN-15	Withdraw the following urban disposal areas: BLM-administrative areas, special plant and animal management areas, sensitive cultural resource sites, and special geologic areas from the operation of the mining laws, subject to valid existing rights. Within desert tortoise areas of critical environmental concern, conduct validity determinations of mining claims prior to approval of a mine plan on pre-existing mining claims.	Withdraw BLM administrative areas. Special management actions apply to specific lands designated in Table 2.24, "Land Designations that Impact Locatable Mineral Developments" (p. 99) as open to development, withdrawn, or proposed for withdrawal from the operation of the mining laws, subject to valid existing rights. Within desert tortoise ACECs, conduct validity determinations of mining claims prior to approval of a mine plan on pre-existing mining claims.		
		Manage locatable minerals as shown: ● Withdrawn: 1,145,407 acres ● Proposed for withdrawal: 608,942 acres *Alternative 2 map (p. 2140)*	Manage locatable minerals as shown: ● Withdrawn: 1,135,676 acres ● Proposed for withdrawal: 166,883 acres *Alternative 3 map (p. 2140)*	Manage locatable minerals as shown: ● Withdrawn: 1,146,560 acres Proposed for withdrawal: 395,272 acres *Alternative 4 map (p. 2140)*

Table 2.24. Land Designations that Impact Locatable Mineral Developments

Land Designations that Impact Locatable Minerals Developments				
	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Withdrawal is withholding an area of federal land from settlement, sale, location, or entry under some or all of the general land laws for the purpose of limiting activities under those laws to maintain other public values in the area or reserving the area for a particular public purpose or program; or transferring jurisdiction over an area of federal land other than property governed by the Federal Property and Administrative Services Act, from one department, bureau, or agency to another department, bureau, or agency.				
Note: "No similar action" indicates that the special management area or land disposal does not exist in that alternative(s). Also see the Lands With Wilderness Characteristics (p. 76), Recreation (p. 104), ACEC (p. 180), and Wild and Scenic Rivers (p. 259) sections for more management prescriptions.				
Las Vegas Field Office Disposal Areas				
Sloan Hills	No similar action		Pursue withdrawal	
SNPLMA	Withdrawn			
Solar Energy Zones (SEZs)				
Amargosa Valley	Withdrawn			
Ash Meadows (Nye)	No similar action		Pursue withdrawal	No similar action
Dry Lake (Clark)	Withdrawn			
Lathrop Wells (Nye)	No similar action		Pursue withdrawal	
Mercury Tech Park (Nye)	No similar action		Pursue withdrawal	
NE Clark County (Clark)	No similar action			Pursue withdrawal
Off-The-Grid (Pahrump / Sandy Valley) (Nye & Clark)	No similar action			Pursue withdrawal
South Beatty (Nye)	No similar action		Pursue withdrawal	No similar action

Saleable Minerals

Saleable minerals are a discretionary mineral that are composed of common varieties of sand, stone, gravel, cinders, clay, pumice, and pumicite. They are predominantly used in the construction industries for urban uses, but they also include decorative landscaping uses. Saleable minerals are administered under the mineral materials regulations (43 CFR 3600) and managed through sales contracts.

Land-use planning lists which lands are open and which are closed.

Maps:

- Saleable Minerals, Alternative 1 (p. 2140)
- Saleable Minerals, Alternative 2 (p. 2140)
- Saleable Minerals, Alternative 3 (p. 2140)
- Saleable Minerals, Alternative 4 (p. 2140)

Table 2.25. Saleable Mineral Management Actions

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Goal 5: Manage lands open under the Materials Act of 1947, as amended, in accordance with 43 CFR 3601 through 3604.				
Objective 5.1: Authorize mining operations on public lands that are open to mineral material disposal for resource uses of common varieties of sand, stone, gravel, clay, etc.				
MIN-16	Allow saleable mineral disposal outside the Desert Tortoise Conservation Center, Nellis Dunes SRMA, riparian zones, and ACECs. Two exceptions are described below, one for highway maintenance use in desert tortoise management ACECs, and another for existing Clark County free use and the Government Wash Community Pit on the east edge of the Rainbow Gardens ACEC. 1. Gold Butte A, Coyote Springs, Mormon Mesa and Piute/Eldorado desert tortoise ACECs remain open to issuance of free-use permits only within one half mile to either side of the state highways and county roads. These authorizations would only be issued to governmental entities. Grant permits only for a limited time. For expansions of existing pits exceeding a cumulative total of 1,000 acres of new disturbance, the applicant would be responsible for U.S. Fish and Wildlife consultation addressing possible impacts to desert tortoise. 2. Allow existing free-use and community pit authorizations	• Allow saleable mineral disposal in areas shown as open on the Saleable Minerals Alternative 2 map (1,604,225 acres) and described in Table 2.26, "Land Designations that Impact Saleable Minerals Development" (p. 103). • Issue free-use permits (FUPs) within one quarter mile of the centerline of federal and state highways and specified county roads in ACECs to governmental entities only. *Alternative 2 map (p. 2140)*	• Allow saleable mineral disposal in areas shown as open on the Saleable Minerals Alternative 3 map (1,858,359 acres) and described in Table 2.26, "Land Designations that Impact Saleable Minerals Development" (p. 103). • Issue FUPs within one half mile of the centerline of federal and state highways and specified county roads in ACECs to governmental entities only. *Alternative 3 map (p. 2140)*	• Allow saleable mineral disposal in areas shown as open on the Saleable Minerals Alternative 4 map (2,032,485 acres) and described in Table 2.26, "Land Designations that Impact Saleable Minerals Development" (p. 103). • Issue FUPs within one half mile of the centerline of federal and state highways and specified county roads in ACECs to governmental entities only. *Alternative 4 map (p. 2140)*

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
	in Township 20 South, Range 64 East, within the Rainbow Gardens ACEC, to be re-authorized or renewed, but do not allow expansion of the sites.			
MIN-17	Mineral material disposal determined to be detrimental to desert tortoises would not be authorized.			
MIN-18	Consult town boards or advisory councils before approval of saleable minerals disposal that could impact an unincorporated town or community.			

Table 2.26. Land Designations that Impact Saleable Minerals Development

Land Designations that Impact Saleable Minerals Developments				
	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Note: "No similar action" indicates that the special management area or land disposal does not exist in that alternative(s). Also see the Lands With Wilderness Characteristics (p. 76), Recreation (p. 104), ACEC (p. 180), and Wild and Scenic Rivers (p. 259) sections for more management prescriptions.				
Las Vegas Field Office Disposal Areas				
Sloan Hills	No similar action		Closed	
Solar Energy Zones (SEZs)				
Amargosa Valley	Open			
Ash Meadows (Nye)	No similar action		Open	No similar action
Dry Lake (Clark)	Open			
Lathrop Wells (Nye)	No similar action		Open	
Mercury Tech Park (Nye)	No similar action		Open	
NE Clark County (Clark)	No similar action			Open
Off-The-Grid (Pahrump / Sandy Valley) (Nye & Clark)	No similar action			Open
South Beatty (Nye)	No similar action		Open	No similar action

2.5.3.4. Recreation

Maps:

- Recreational Target Shooting Closures, Alternative 1 (p. 2140)
- Recreational Target Shooting Closures, Alternative 2 (p. 2141)
- Recreational Target Shooting Closures, Alternative 3 (p. 2141)
- Recreation Management Areas, Alternative 1 (p. 2141)
- Recreation Management Areas, Alternative 2 (p. 2141)
- Recreation Management Areas, Alternative 3 (p. 2141)
- Recreation Management Areas, Alternative 4 (p. 2141)

Table 2.27. Recreation Management Actions

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Goal: 1 Ensure that a wide range of recreation opportunities are available on public lands for recreation visitors while protecting the natural resources that attract users.				
Objective 1.1: Provide recreational activities in a variety of physical, social, and administrative settings, from primitive to near-urban, that allow visitors to have desired recreational experiences and enjoy the resulting benefits. **Objective 1.2:** Enhance recreational experiences and promote public health and safety through interpretation, facility development, and visitor management. **Objective 1.3:** Manage recreational use to protect resources. **Objective 1.4:** Retain important recreational values and sites in federal ownership to ensure a continued diversity of recreation activities, experiences, and benefits. Appendix F (p. 1805) contains a list of activities, experiences, benefits, and recreation-setting characteristics being managed for in recreation management areas (RMA).				
General Recreation				
REC-01	No similar action.	Use the minimum necessary signage for public safety and information or to control unauthorized use. Design facilities to be compatible with local landscapes and recreation experiences.		
REC-02	No similar action.	Management responses to unacceptable resource and/or social conditions would range from least-restrictive methods (e.g., information and education) to most-restrictive (e.g., visitor limits, supplemental rules, or restrictions). Where feasible, the least-restrictive methods would be implemented first. (Recognize that various levels of regulations and limits are necessary.)		
REC-03	No similar action.	Pursue withdrawal from locatable mineral entry for developed recreation sites and close to all other mineral development.		
REC-04	No similar action.	Provide information to visitors regarding recreation opportunities, interpretation of natural and human history, and specific rules and regulations about public lands. Provide education and outreach programs such as Tread Lightly or Leave No Trace. Provide information on the area's cultural and natural resources through outreach programs (e.g., organizations, schools, and partnerships) to build emotional, intellectual, and recreational ties with the area.		
REC-05	No similar action.	In most areas for retrieving game, hunters may use non-motorized mechanized methods for cross-country travel in observation that: ● Motorized vehicles must stay on designated roads, primitive roads, and trails. ● In areas where motorized travel is restricted, hunters may utilize non-motorized mechanized game carts for cross-country travel. ● In wilderness and wilderness study areas, no motorized or mechanized methods of game retrieval are allowed.		

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
REC-06	No similar action.	If camping restrictions are in effect in an area, camping will be allowed only at designated sites. In areas where designations have not been made, or will not be made, camping must be within previously disturbed areas. Camping on undeveloped public lands or designated sites or areas for more than 14 days within a 28-consecutive day interval is prohibited. A 28-day interval begins when an occupant initially occupies a specific site on BLM land. After 14 days, the persons and personal property must relocate to a site outside of a 25-mile radius from the occupied site or to non-BLM administered land for 14 days.		
REC-07	The act of hunting is allowed in accordance with regulations set by the state of Nevada.			
REC-08	No similar action.	When the authorized officer determines that a site or area on BLM-managed lands that is used on a regular basis for recreational target shooting is creating public disturbance; is creating risk to other persons on public lands; is contributing to the defacement, removal, or destruction of natural features, native plants, cultural resources, historic structures, or government and/or private property; is facilitating or creating a condition of littering, refuse accumulation, and abandoned personal property is violating existing use restrictions, closure and restriction orders, or supplementary rules notices, and reasonable attempts to reduce or eliminate the violations by the BLM have been unsuccessful, the authorized officer will close the affected area to recreational target shooting.		
REC-09	All existing BLM, Clark County, and Nye County recreational target shooting closures will be retained.	Recreational target shooting: ● Existing BLM, Clark County, and Nye County closures would be retained. ● Closed within a quarter mile of the sand dune within the Big Dune SRMA. ● The Logandale North RMZ would be closed. ● The Mesquite Community gravel pit would be closed. ● Extend the existing closure boundary down to the south edge of Red Rock Canyon National Conservation Area. This includes T. 232 R. 59E, Sec. 1-4, 9-16, 21-27, and 34-36; T. 232, R. 60E, Sec. 2-11, 14-23, and 26-36; T. 245, R. 59E, Sec. 1-3; and T. 245, R. 60E, Sec. NW ¼, Sec. 1, 2-6.	Recreational target shooting: ● Existing shooting closures for BLM in Clark County would be retained. ● The Logandale North RMZ would be closed. ● The Mesquite Community gravel pit would be closed.	Recreational target shooting: ● Shooting is permitted throughout the planning area provided it is in accordance with existing BLM regulations and policies.

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
SPECIAL RECREATION PERMITS (SRPs)				
General				
REC-10	No similar action.	All SRPs issued for motorized, mechanized, and equestrian use will be limited to designated roads, primitive roads, and trails. Prior to route designations being completed, use will be limited to existing roads, trails, and washes.		
Speed-Based Permitted Recreation				
REC-11	**Within tortoise areas of critical environmental concern:** Prohibit off-road vehicle speed events, bicycle races, horse endurance rides, 4-wheel drive hill climbs, mini-events, publicity rides, high-speed testing, and similar speed-based events. **Within other areas of critical environmental concern:** Prohibit off-road vehicle speed events, 4-wheel drive hill climbs, mini-events, publicity rides and high-speed testing. Mountain bike events and horse endurance rides may be allowed on a case-by-case basis and limited to existing roads and trails. **Within non-ACEC critical habitats:** Nine speed-based events can be allowed yearly in the Nelson Hills/Eldorado Valley on existing roads and trails with racing allowed between November 1 and February 28, and the number of laps limited to a maximum of five. Additional specifics may be included in the U.S. Fish and Wildlife Service biological opinion. If the U.S. Fish and Wildlife Service changes critical habitat following the designation of tortoise areas of critical environmental concern, the off-highway vehicle designations	**Within desert tortoise critical habitat ACECs:** Prohibit motorized and mechanized speed-based events. **Within desert tortoise critical habitat not contained within an ACEC:** See Table 2.28, "Group 1: Speed-Based Recreation in McCullough Pass Critical Desert Tortoise Habitat" (p. 142), Table 2.29, "Group 2: Speed-Based Recreation in McCullough Pass Critical Desert Tortoise Habitat" (p. 143), and Table 2.30, "Group 2: Speed-Based Recreation in Nelson Hills Critical Desert Tortoise Habitat" (p. 144). **Within other ACECs:** See specific guidance in the ACEC section. **Nellis Dunes, Big Dune, and dry lake beds (open OHV areas):** Allow OHV and other events subject to environmental protection and public safety stipulations. **Other areas:** Permit events on a case-by-case basis. Restrictions and/or stipulations could include, but are not limited to, seasonal restrictions, group size limits, and limits on the type or number of specific activities allowed.		

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
	and off-road vehicle restrictions will be reviewed and modified if appropriate. **Nellis Dunes and dry lakes:** Allow off-road vehicle and other speed events subject to environmental protection and public safety stipulations. **Other areas:** Permit events on a case-by-case basis. No seasonal restrictions. No new courses in critical desert tortoise habitat. No new off-road vehicle events in crucial bighorn sheep habitat.			
REC-12	Desert tortoise active season is March 1 through October 31.	Seasonal restrictions for high-speed events will be implemented in accordance with the applicable biological opinion for threatened and endangered species and their critical habitats. The tortoise active season is currently defined as: ● Desert tortoise active season: March 15 through May, plus September through October. ● Desert tortoise less-active season: All times of year not listed in active season.		

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Non-Speed Based Permitted Recreation				
REC-13	**Within desert tortoise ACECs:** Allow non-speed events subject to the following limitations: 1. Issue special recreation permits for events with more than 25 vehicles. 2. Events involving more than 100 vehicles must be held during the tortoise inactive season from November 1 to February 28/29. To maintain consistency with California vehicle limit restrictions, there will be a cap of no more than 300 motorcycles or 300 four-wheeled vehicles (including all-terrain vehicles) on all events. 3. No OHV non-speed events will be permitted between April 1 and June 1 and between August 15 and October 15 (Dates will vary slightly annually due to calendar shifts to provide a full Saturday and Sunday weekend if April 1 falls during the weekend and to provide three full weekends prior to, or including November 1) . 4. A maximum of 10 permitted non-speed events, with a limit of 100 vehicles, will be allowed annually during the tortoise active season (March 1 to October 31, except for dates allowed in #3 above). There will be no more than three events per ACEC, with the exception	**Within desert tortoise ACECs:** See Table 2.31, "Non-Speed SRPs for the Four Desert Tortoise Critical Habitat ACECs in the Desert Tortoise Inactive Season" (p. 145), and Table 2.32, "Non-Speed SRPs for the Desert Tortoise Critical Habitat ACECs in the Desert Tortoise Active Season" (p. 147). **Within desert tortoise critical habitat not contained within an ACEC:** Non-speed uses such as non-speed off-road vehicle events (road rallies, dual sport rides, and non-speed transfer sections of speed events), guided commercial scenic tours, and bicycle tours are allowed on designated roads, primitive roads, and trails. **Within other ACECs:** See specific guidance in ACEC section. **Nellis Dunes, Big Dune, and dry lake beds (open OHV areas):** Allow OHV and other events subject to environmental protection and public safety stipulations. **Other areas:** Permit events on a case-by-case basis.			

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Non-Speed Based Permitted Recreation				
	that an event based on historic use patterns will be allowed from Mesquite through the Mormon Mesa ACEC. This event, which may have 200 entrants, counts as two of the 3 events held annually and is limited to a one-way route (north-south or south-north). 5. A maximum of 12 permitted non-speed events will be allowed annually during the tortoise inactive season (November 1 to February 28/29) with no more than 4 events per ACEC. 6. Vehicles shall not exceed the legal speed limit (posted or unposted) of the roads used during the event. Clark County speed limit for unposted roads is 25 miles per hour. These events include, but are not limited to, motorcycle or buggy rallies and mountain bike rides. 7. Authorized non-speed events that cross the Lincoln/Clark County borders will only be allowed in accordance with corridors identified within the approved Caliente MFP Amendment. **Within other ACECs:** Non-speed uses such as non-speed off-road vehicle events (road rallies, dual sport rides, and non-speed transfer sections of speed events), mountain bike events, and horse trail rides are allowed on existing roads, trails, and dry washes.			

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Non-Speed Based Permitted Recreation				
	Within non-ACEC critical habitat: Non-speed uses such as non-speed off-road vehicle events (road rallies, dual sport rides, and non-speed transfer sections of speed events), guided commercial scenic tours, and mountain bike tours are allowed on existing routes. If the U.S. Fish and Wildlife Service changes critical habitat following the designation of tortoise ACEC, OHV designations will be reviewed and modified if appropriate. **Nellis Dunes and dry lake beds (open OHV areas):** Allow OHV and other events subject to environmental protection and public safety stipulations. **Other areas:** Permit events on a case-by-case basis. No seasonal restrictions. No new courses in critical desert tortoise habitat.			

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Recreation Management Areas				
REC-14	Retain the recreation opportunity spectrum (ROS) inventory classifications and opportunity settings as a long-term management goal for all actions. ROS designations include the following: ● Semi-primitive nonmotorized: 276,570 acres ● Semi-primitive motorized: 651,414 acres ● Roaded natural: 1,928,640 acres ● Rural: 350,626 acres ● Urban: 124,645 acres	Manage recreation-setting characteristics (RSCs) within SRMAs to provide diverse settings for meeting desired experiences of recreational activities.	Manage RSCs to provide diverse settings for meeting desired experiences of recreational activities.	
REC-15	Designate the following SRMAs as areas where BLM will concentrate the majority of its recreation management program effort: ● Big Dune (p. 117) (11,473 acres) ● Jean/Roach Dry Lakes (p. 122) (210,856 acres) ● Las Vegas Valley (p. 128) (99,048 acres) ● Laughlin (p. 135) (21,250 acres) ● Muddy Mountains (p. 138)(12,8291 acres) ● Nellis Dunes (p. 139) (10,865 acres) ● Nelson Hills/Eldorado (p. 140) (72,703 acres) ● Sunrise Mountain (p. 134) (38,702 acres)	Designate the following areas as SRMAs and manage them to recognize and protect recreation and visitor services: ● Big Dune (p. 117) (98,031 acres) ● Gold Butte (p. 121) (356,912 acres) ● Jean/Roach (p. 122) (93,112 acres) ○ Dry Lakes RMZ (p. 125) (5,040 acres) ● Logandale (p. 137) (21,172 acres) ○ Logandale North RMZ (p. 137) (17,829 acres) ● Laughlin (p. 135) (21,270 acres) ● Nellis Dunes (p. 139) (10,865 acres) ● Las Vegas Valley (p. 128) (153,314 acres)	Designate the following areas as SRMAs and manage them to recognize and protect recreation and visitor services: ● Big Dune (p. 117) (98,031 acres) ● Gold Butte (p. 121) (356,912 acres) ● Jean/Roach (p. 122) (217,757 acres) ○ Dry Lakes RMZ (p. 125) (5,040 acres) ○ Jean/Roach West RMZ (p. 126) (93,803 acres) ● Las Vegas Valley (p. 128) (153,314 acres) ○ Fossil Beds RMZ (p. 132) (10,494 acres) ● Nellis Dunes (p. 139) (10,865 acres)	Designate the following areas as SRMAs and manage them to recognize and protect recreation and visitor services: ● Logandale (p. 137) (21,172 acres) ○ Logandale North RMZ (p. 137) (17,799 acres) ● Nellis Dunes (p. 139) (10,865 acres) *Alternative 4 map (p. 2141)*

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Recreation Management Areas				
	Alternative 1 map (p. 2141)	○ Arden RMZ (p. 132) (553,050 acres) ○ Eldorado RMZ (p. 132) (11,047 acres) ○ Fossil Beds RMZ (p. 132) (10,494 acres) ○ NCA Gateway RMZ (p. 133) (10,520 acres) ○ River Mountains RMZ (p. 133) (7,251 acres) ○ Sunrise Mountain RMZ (p. 134) (38,191 acres) *Alternative 2 map (p. 2141)*	● Logandale (p. 137) (21,172 acres) ○ Logandale North RMZ (p. 137) (17,829 acres) ● Laughlin (p. 135) (21,270 acres) *Alternative 3 map (p. 2141)*	
REC-16	Manage public lands not included within SRMAs as the Southern Nevada Extensive Recreation Management Area (ERMA), emphasizing dispersed and diverse recreation opportunities (2,517,984 acres). Manage permitted recreation and commercial events (outside SRMAs) as follows: **ACECs:** ● Prohibit the following activities: off-road vehicle speed events, 4-wheel drive hill climbs, and high speed testing. ● Limit non-speed and non-off-road vehicle events	Designate the following areas as ERMAs and manage them to support and sustain the principle recreation activities, qualities, and settings, commensurate with the management of other resources and resource uses: ● Amargosa (p. 116) (346,681 acres) ● Clark County North (p. 119) (359,881 acres) ● Clark County South (p. 120) (553,867 acres) ● Clark County West (p. 120) (469,854 acres)	Designate the following areas as ERMAs and manage them to support and sustain the principle recreation activities, qualities, and settings, commensurate with the management of other resources and resource uses: ● Amargosa (p. 116) (346,681 acres) ● Clark County North (p. 119) (359,881 acres) ● Clark County South (p. 120) (523,025 acres) ● Clark County West (p. 120) (376,049 acres)	Designate the following areas as ERMAs and manage them to support and sustain the principle recreation activities, qualities, and settings, commensurate with the management of other resources and resource uses: ● Gold Butte (p. 121) (356,912 acres) ● Jean/Roach Dry Lakes (p. 122) (123,962 acres) ● Las Vegas Valley (p. 128) (156,390 acres) ● Muddy Mountains (p. 138) (274,933 acres)

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Recreation Management Areas				
	to designated roads, primitive roads, and trails in tortoise ACECs; and to existing routes in ACECs designated for other purposes. ● Allow other recreation and/or commercial events on a case-by-case basis. Seasonal restrictions may be imposed, based on tortoise activity. **Other areas:** ● Permit events on a case-by-case basis. Restrictions and stipulations necessary for protection of the desert tortoise may be imposed within desert tortoise habitat. Close land disposal areas to overnight camping. Allow recreation concession leases that enhance resource management objectives. As resource conditions and/or use levels warrant, inventory, designate, and manage mountain bicycle and equestrian trails throughout the ERMA to meet increasing public demand for these activities. *Alternative 1 map (p. 2141)*	● Las Vegas Valley (p. 128) (28,394 acres) ● Muddy Mountains (p. 138) (338,778 acres) ● Pahrump Valley (p. 141) (256,577 acres) *Alternative 2 map (p. 2141)*	● Las Vegas Valley (p. 128) (34,531 acres) ● Muddy Mountains (p. 138) (338,778 acres) ● Pahrump Valley (p. 141)(256,540 acres) *Alternative 3 map (p. 2141)*	*Alternative 4 map (p. 2141)*

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Recreation Management Areas				
REC-17	No similar action.			Manage all areas not listed in REC-15 and REC-16 to meet basic recreation and visitor services and resource stewardship needs and as areas where recreation is not emphasized but may occur. *Alternative 4 map (p. 2141)*
REC-18	No similar action.	All SRMAs and ERMAs will have the following management prescriptions: ● Coordinate with other federal, state, county, and local agencies to identify and develop recreational trails and trailheads as needed. ● Encourage cooperative ventures to enhance recreation opportunities. ● Concentrate recreation use to reduce the impacts to sensitive cultural, biological, scenic, and other resource values. ● Consider the development of trails for separate user groups (e.g., hiking, biking, equestrian) to avoid trail expansion and pioneering and to reduce conflicts as needed. ● Monitor recreation use and update management prescriptions as needed through implementation-level documents. ● Consider the development of recreation support facilities to improve the recreation experience and to address human health and safety and resource protection issues. ● Install visitor interpretation/education signs at trailheads and in areas of potential user conflict or resource impact as needed. ● All new developments would be required to maintain access through or around development areas on designated roads, primitive roads, and trails. ● During environmental planning for projects impacting recreation, BLM and the proponent will consider off-site mitigation related to loss of recreation opportunities and outcomes by providing recreational facilities (e.g., developing trailheads) for displaced recreation users.			

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Amargosa ERMA (Pahrump Field Office)				
Objective 1.5: Facilitate visitor access to a range of outdoor recreation activities associated with a wide-open landscape with limited developments. Maintain the natural settings for multiple recreation opportunities in ACECs, wilderness study areas (WSAs), and lands with wilderness characteristics.				
REC-19	The Amargosa area would be managed as part the Southern Nevada ERMA (p. 114).	Designate the Amargosa area as an ERMA (346,681 acres) with the following management: **Travel Management:** ● Interim designation: Travel would be limited to existing roads, trails, and dry washes until completion of a travel management plan. When completed, all travel would be restricted to designated roads, primitive roads, and trails. **Lands and Realty:** ● All renewable energy developments and other large site-type ROWs would be required to maintain recreation access through development areas on designated roads, primitive roads, and trails. During project-specific environmental planning for renewable energy developments, the BLM and proponent will consider off-site mitigation related to loss of recreation opportunities and outcomes by providing recreational developments (e.g., developing trailheads, recreation facilities) for displaced recreation users.		Manage as public lands not designated as recreation management areas.

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Big Dune SRMA (PFO)				
Objective 1.6: Protect the unique sand dune setting and adjacent features that provide thrill and speed associated with motorized recreation opportunities on sand washes and dunes.				
REC-20	Manage the Big Dune area as a SRMA (11,473 acres) for moderate, casual off-road vehicle use, camping, and other casual recreation opportunities. Prohibit all OHV use within the 200-acre beetle habitat in the Big Dune ACEC (except on the designated route through the area) to ensure continued survival of the native beetle population. Prohibit speed-based competitive off-road vehicle events within the 1,920-acre Big Dune ACEC. Allow commercial activities and other permitted events on a case-by-case basis. Establish long-term management goals and objectives including consideration of group camping areas. Long-term recreation management within the dunes would be based on the beetles' minimum habitat requirements.	Designate the Big Dune area as a SRMA (98,031 acres) with the following management: **Special recreation permits:** ● Permits issued on a case-by-case basis June 1 through March 31 with restrictions and/or stipulations to minimize impacts to beetle habitat. Restrictions and/or stipulations could include, but are not limited to, seasonal restrictions, group size limits, and limits on the type or number of specific activities allowed. ● No permits would be issued during April or May. **Big Dune ACEC:** ● Allow commercial and non-speed activities outside of the closed beetle habitat. ● Camping closed. ● Prohibit all speed events and commercial vending. **Lava Dune ACEC:** ● Camping closed. ● Prohibit motorized and mechanized events. ● Prohibit commercial vending. ● Allow commercial filming on a case-by-case basis. **Travel Management:**	Designate the Big Dune area as a SRMA (98,031 acres) with the following management: **Special recreation permits:** ● Permits issued on a case-by-case basis June 1 through March 31 with restrictions and/or stipulations to minimize impacts to beetle habitat. Restrictions and/or stipulations could include, but are not limited to, seasonal restrictions, group size limits, and limits on the type or number of specific activities allowed. ● No permits would be issued during April or May. **Big Dune ACEC:** ● Allow commercial, competitive, and organized events outside closed beetle habitat. ● Camping allowed. ● Allow OHV, motorcycle, and UTV events outside of closed beetle habitat. ● Prohibit truck and buggy events and commercial vending. **Lava Dune ACEC:** ● Camping closed. ● Prohibit all motorized and mechanized events. ● Prohibit commercial vending.	Manage as public lands not designated as recreation management areas.

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Big Dune SRMA (PFO)				
		• Open: Sand dune area only. Driving on vegetation prohibited. • Interim designation: Travel would be limited to existing roads, trails, and dry washes until a travel management plan is completed. When completed, travel would be restricted to designated roads, primitive roads, and trails. • Approximately 100 acres would be closed to motorized and mechanized use in the Giuliani's dune scarab habitat at Big Dune and approximately 435 acres at Lava Dune. **Lands and Realty:** • Exclude site-type ROWs greater than five acres unless they are ancillary to public health and safety and/or enhance recreational values. Avoid linear ROWs except in designated corridors.	• Allow commercial filming on a case-by-case basis. **Travel Management:** • Open: Sand dune area only. Driving on vegetation prohibited. • Interim designation: Travel would be limited to existing roads, trails, and dry washes until a travel management plan is completed. When completed, travel would be restricted to designated roads, primitive roads, and trails. • Approximately 100 acres would be closed to motorized and mechanized use in the Giuliani's dune scarab habitat at Big Dune and approximately 435 acres at Lava Dune. **Lands and Realty:** • Exclude site-type ROWs greater than five acres unless they are ancillary to public health and safety and/or enhance recreational values. Avoid linear ROWs except in designated corridors.	

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Clark County North ERMA (Las Vegas Field Office)				
Objective 1.7: Facilitate visitor access to a range of outdoor recreation activities associated with a wide-open landscape with limited developments. Maintain the natural settings for multiple recreation opportunities in wilderness areas, WSAs, lands with wilderness characteristics, ACECs, and Mormon Mesa. Minimize impacts from increased recreation use by providing facilities, interpretation, education, and information. Recreation use occurs on myriad routes, trails, and roads and connects to trail systems such as the Silver State Trail.				
REC-21	This area is not within any SRMAs and will be included within the Southern Nevada ERMA (p. 114).	Designate the Clark County North area as an ERMA (359,881 acres) with the following management: **Special recreation permits:** ● Allow permitted recreation activities, subject to site-specific restrictions and stipulations, to meet objectives for other resources and uses. Restrictions and stipulations could include, but are not limited to, seasonal restrictions, group size limits, and limits on the type or number of specific activities. **Travel Management:** ● With the exception of routes that have been previously designated (such as in ACECs), travel would be limited to existing roads, trails, and dry washes until completion of a travel management plan (TMP). When the TMP is completed, travel would be restricted to designated roads, primitive roads, and trails.		Manage as public lands not designated as recreation management areas.

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Clark County South ERMA (LVFO)				
Objective 1.8: Facilitate visitor access to a range of outdoor recreation activities associated with a wide-open landscape with limited developments. Maintain the natural settings for multiple recreation opportunities in ACECs, wilderness areas, WSAs, lands with wilderness characteristics, the Mojave Road, and Christmas Tree Pass. Minimize impacts from increased recreation use by providing facilities, interpretation, education, and information.				
REC-22	Portions are within the Nelson Hills and Laughlin SRMAs (those respective sections for management). The remainder are not within any SRMAs and will be included within the Southern Nevada ERMA (p. 114).	Designate the Clark County South area as an ERMA (553,867 acres for Alternative 2 and 523,025 acres for Alternative 3) with the following management: **Special recreation permits:** ● Allow permitted recreation activities, subject to site-specific restrictions and stipulations, to meet objectives for other resources and uses. Restrictions and stipulations could include, but are not limited to, seasonal restrictions, group size limits, and limits on the type or number of specific activities. **Travel Management:** ● With the exception of routes that have been previously designated (such as in ACECs), travel would be limited to existing roads, trails, and dry washes until completion of a travel management plan (TMP). When the TMP is completed, travel would be restricted to designated roads, primitive roads, and trails.		Manage as public lands not designated as recreation management areas.
Clark County West ERMA (LVFO)				
Objective 1.9: Facilitate visitor access to a range of outdoor recreation activities associated with a wide-open landscape with limited developments. Maintain the natural settings for multiple recreation opportunities in ACECs, wilderness areas, WSAs, and lands with wilderness characteristics. Minimize impacts from increased recreation use by providing facilities, interpretation, education, and information.				
REC-23	Portions of this area are within the Jean/Roach Dry Lakes SRMA; the rest is not within any SRMAs and will be included within the Southern Nevada ERMA (p. 114).	Designate the Clark County West area as an ERMA (469,854 acres in Alternative 2 and 376,049 acres in Alternative 3) with the following management: **Special recreation permits:** ● Allow permitted recreation activities, subject to site-specific restrictions and stipulations, to meet objectives for other resources and uses. Restrictions and stipulations could include, but are not limited to, seasonal restrictions, group size limits, and limits on the type or number of specific activities. **Travel Management:** ● Travel would be limited to existing roads, trails, and dry washes until completion of a travel management plan. When completed, travel would be restricted to designated roads, primitive roads, and trails.		Manage as public lands not designated as recreation management areas.

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Gold Butte SRMA/ERMA (LVFO)				
Objective 1.10: Facilitate visitor access to a range of outdoor recreation activities associated with a wide-open landscape with limited developments. Maintain the natural settings for multiple recreation opportunities in ACECs, wilderness, WSAs, and lands with wilderness characteristics.				
REC-24	The Gold Butte area would be managed as part the Southern Nevada ERMA (p. 114).	Designate the Gold Butte area (356,912 acres) as a SRMA with the following management: **Special recreation permits:** ● Prohibit all speed-based OHV activities, including but not limited to hill climbs and high-speed testing. ● Allow non-speed permitted activities on a case-by-case basis. ● Encourage equestrians to utilize designated roads, primitive roads, and trails. **Travel Management:** ● Closed to both motorized and mechanized travel within lands with wilderness characteristics; limited to designated roads, primitive roads, and trails everywhere else. ● With the exception of routes that have been previously designated (such as in ACECs), travel would be limited to existing roads, trails, and dry washes until completion of a travel management plan. When the plan is completed, travel would be restricted to designated roads, primitive roads, and trails.	Designate the Gold Butte area (356,912 acres) as a SRMA with the following management: **Special recreation permits:** ● Prohibit all speed-based OHV activities, including but not limited to hill climbs and high-speed testing. ● Allow non-speed permitted activities on a case-by-case basis. ● Encourage equestrians to utilize designated roads, primitive roads, and trails. If equestrian use is causing undue or unnecessary adverse effects upon managed resources and uses, they may be required to use only designated roads, primitive roads, and trails. **Travel Management:** ● With the exception of routes that have been previously designated (such as in ACECs), travel would be limited to existing roads, trails, and dry washes until completion of a travel management plan. When the plan is completed, travel would be restricted to designated roads, primitive roads, and trails.	Designate the Gold Butte area (356,912 acres) as an ERMA with the following management: **Special recreation permits:** ● Prohibit speed-based OHV activities. ● Allow non-speed permitted activities on a case-by-case basis. **Travel Management:** ● With the exception of routes that have been previously designated (such as in ACECs), travel would be limited to existing roads, trails, and dry washes until completion of a travel management plan. When the plan is completed, travel would be restricted to designated roads, primitive roads, and trails.

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Jean/Roach SRMA (LVFO)				
Objective 1.11: Provide settings for larger high-speed motorized events (longer than a 10-mile course, such as 60- to 100-mile loops), with an emphasis on truck/buggy race events. Additionally, this area would be managed to provide opportunities for high-speed OHV use, motorized OHV touring, and other dispersed motorized events.				
REC-25	Manage the Jean/Roach Dry Lakes area as a SRMA (210,856 acres) for intensive recreation opportunities, including competitive off-road vehicle (in accordance with the U.S. Fish and Wildlife Service biological opinion) and other recreational events, as well as dispersed recreational use and commercial activities. Minimize impacts to white-margined penstemon populations in accordance with policies regarding BLM sensitive species. Permit high-speed, competitive off-road vehicle events, casual off-road vehicle uses, and other recreational and commercial activities. Permitted events will be allowed only on previously disturbed areas in tortoise habitat, existing roads, trails, and dry washes. Nonvegetated parts of the dry lake beds will be managed as open to unrestricted OHV use.	Designate the Jean/Roach area as a SRMA (93,112 acres) with one RMZ: • Dry Lakes RMZ (p. 125) Manage the remaining parts of the SRMA as follows: **Special recreation permits:** • Allow permitted recreation activities, subject to site-specific restrictions and stipulations, to meet objectives for other resources and uses. Restrictions and stipulations could include, but are not limited to, seasonal restrictions, group size limits, and limits on the type or number of specific activities. • During implementation-level planning such as the recreation area management plan (RAMP)/comprehensive transportation and travel management plan (CTTMP), identify a route or routes for high-speed event courses. Relocate access routes to maintain accessibility and race routes for areas where routes could be impacted as part of renewable energy or minerals developments. • During implementation-level planning such as the RAMP/CTTMP, areas for high-speed testing of OHV	Designate the Jean/Roach area as a SRMA (217,757 acres) with two RMZs: • Dry Lakes RMZ (p. 125) • Jean/Roach West RMZ (p. 126) Manage the remaining parts of the SRMA as follows: **Special recreation permits:** • Allow permitted recreation activities, subject to site-specific restrictions and stipulations, to meet objectives for other resources and uses. Restrictions and stipulations could include, but are not limited to, seasonal restrictions, group size limits, and limits on the type or number of specific activities. • During implementation-level planning such as the RAMP/CTTMP, identify a route or routes for high-speed event courses. Relocate access routes to maintain accessibility and race routes for areas where routes could be impacted as part of renewable energy or minerals developments. • During implementation-level planning such as the RAMP/CTTMP, areas for high-speed testing of OHV racing platforms (such as trucks, buggies, UTVs, ATVs, and	Designate the Jean/Roach area as an ERMA (123,962 acres) with the following management: **Special recreation permits:** • During implementation-level planning such as the RAMP/CTTMP, designate a route or routes for identifying high-speed event courses. Relocate access routes to maintain accessibility and race routes for areas where routes could be impacted as part of renewable energy or minerals developments. • During implementation-level planning such as the RAMP/CTTMP, areas for high-speed testing of OHV racing platforms (such as trucks, buggies, UTVs, ATVs, and motorcycles) will be analyzed for this type of need and use. • During implementation-level planning such as the RAMP/CTTMP, areas for high-speed commercial touring (including trucks, buggies, UTVs, ATVs, and motorcycles) will be analyzed for this type of need and use. • Allow non-speed activities (such as all-terrain bicycle events, motorcycle trail rides, noncompetitive OHV events, and commercial permitted

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Jean/Roach SRMA (LVFO)				
		racing platforms (such as trucks, buggies, UTVs, ATVs, and motorcycles) may be analyzed for this type of need and use. ● During implementation-level planning such as the RAMP/CTTMP, areas for high-speed commercial touring (including trucks, buggies, UTVs, ATVs, and motorcycles) may be analyzed for this type of need and use. ● Allow non-speed activities (such as all-terrain bicycle events, motorcycle trail rides, noncompetitive OHV events, and commercial permitted events and activities) on a case-by-case basis. **Special Status Species:** ● Minimize impacts to white-margined penstemon populations in accordance with policies regarding BLM sensitive species. **Lands and Realty:** ● Lands that overlap disposal boundaries will be managed as part of the SRMA until the lands are disposed of. ● Exclude site-type ROWs and other land-use authorizations larger than 20 acres, except for those that enhance recreational values, public health and safety and in support of or ancillary to utility corridors and the Ivanpah Valley Airport.	motorcycles) may be analyzed for this type of need and use. ● During implementation-level planning such as the RAMP/CTTMP, areas for high-speed commercial touring (including trucks, buggies, UTVs, ATVs, and motorcycles) may be analyzed for this type of need and use. ● Allow non-speed activities (such as all-terrain bicycle events, motorcycle trail rides, noncompetitive OHV events, and commercial permitted events and activities) on a case-by-case basis. **Special Status Species:** ● Minimize impacts to white-margined penstemon populations in accordance with policies regarding BLM sensitive species. **Lands and Realty:** ● Lands that overlap disposal boundaries will be managed as part of the SRMA until the lands are disposed of. ● Exclude site-type ROWs and other land-use authorizations larger than 20 acres, except for those that enhance recreational values, public health and safety and in support of or ancillary to utility corridors and the Ivanpah Valley Airport. ● Avoid linear ROWs in the area. Concentrate major utility line	events and activities) on a case-by-case basis. ● Lands that overlap disposal boundaries will be managed as part of the ERMA until the lands are disposed of. **Travel Management:** ● With the exception of the dry lake beds travel would be limited to existing roads, trails, and dry washes until completion of a travel management plan (TMP). When the TMP is completed, travel would be restricted to designated roads, primitive roads, and trails. The dry lake beds will be managed as open.

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Jean/Roach SRMA (LVFO)				
		● Avoid linear ROWs in the area. Concentrate major utility line ROWs within the confines of designated utility corridors. **Travel Management:** ● With the exception of the dry lake beds, travel would be limited to existing roads, trails, and dry washes until completion of a travel management plan. When the plan is completed, travel would be restricted to designated roads, primitive roads, and trails. The dry lake beds will be managed as open.	ROWs within the confines of designated utility corridors. **Travel Management:** ● With the exception of the dry lake beds, travel would be limited to existing roads, trails, and dry washes until completion of a travel management plan. When the plan is completed, travel would be restricted to designated roads, primitive roads, and trails. The dry lake beds will be managed as open.	

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Jean/Roach SRMA Dry Lakes RMZ (LVFO)				
Objective 1.12: Provide settings for dispersed recreation opportunities, including non-motorized and motorized recreation. Provide access and setting for the staging of motorized speed events (that would mostly occur in the Jean/Roach SRMA adjacent to the Dry Lakes RMZ). Provide opportunities for casual OHV use, including dispersed high-speed and cross-country OHV use.				
REC-26	The Dry Lakes area would be managed as part of the Jean/Roach Dry Lakes SRMA (p. 122); management is identified in the Jean/Roach Dry Lakes SRMA actions above.	Designate the Dry Lakes area as an RMZ within the Jean/Roach Dry Lakes SRMA (5,040 acres) with the following management: **Special recreation permits:** ● Allow open, unrestricted use only when the lake bed is dry. Close dry lake beds to OHV use when there is standing water to protect the lake bed surface. ● Allow speed-based OHV events (e.g. motorcycle, truck, and buggy races) on a case-by-case basis. ● Allow non-speed activities on a case-by-case basis. **Lands and Realty:** ● Lands that overlap disposal boundaries will be managed as part of the RMZ until the lands are disposed of. ● Exclude land-use-authorizations except those that enhance recreational values, public health and safety and in support of or ancillary to utility corridors and the Ivanpah Valley Airport. **Travel Management:** ● The area is open to unrestricted travel unless there is standing water.		This area would be managed as part of the Jean/Roach ERMA (p. 122).

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Jean/Roach SRMA Jean/Roach West RMZ (LVFO)				
Objective 1.13: Provide settings for dispersed recreation opportunities, including non-motorized and motorized recreation. Provide access and setting for the staging of motorized events, excluding competitive truck/buggy events. Provide opportunities for casual OHV use, rally car racing, rock crawling, and commercial touring. Provide opportunities for nonmotorized trails (hiking, biking) around the town of Goodsprings.				
REC-27	This area is part of the Jean/Roach SRMA (p. 122)as described above.	This area would be part of the Clark County West ERMA (p. 120).	Designate the Jean/Roach West area as an RMZ within the Jean/Roach SRMA (93,803 acres) with the following management: **Special recreation permits:** ● Allow permitted recreation activities, subject to site-specific restrictions and stipulations, to meet objectives for other resources and uses. Restrictions and stipulations could include, but are not limited to, seasonal restrictions, group size limits, and limits on the type or number of specific activities. ● During implementation-level planning such as the RAMP/CTTMP, analyze a route or routes for high-speed motorcycle, ATV, and rally car event courses. Relocate access routes to maintain accessibility and race routes for areas where routes could be closed during travel management. ● Prohibit high-speed truck/buggy events. ● Prohibit extreme touring.	Manage as public lands not designated as recreation management areas.

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Jean/Roach SRMA Jean/Roach West RMZ (LVFO)				
			● Allow non-speed activities (such as all-terrain bicycle events, motorcycle trail rides, noncompetitive OHV events, rock crawling, and commercial permitted events and activities) on a case-by-case basis. **Lands and Realty:** ● Lands that overlap disposal boundaries will be managed as part of the RMZ until the lands are disposed of.	

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Las Vegas Valley SRMA/ERMA (LVFO)				
Objective 1.14: Work with local municipalities to provide a natural, undeveloped setting adjacent to an urban population with mostly non-motorized recreation opportunities.				
REC-28	Coordinate with county and city governments to manage 99,048 acres in the Las Vegas Valley as a SRMA to facilitate the provision of open space areas, recreational trails, and parks necessary for valley residents. • Identify land for reserve recreational trails, open space, parks, etc. as needed prior to land disposals. Reservations should be done through recreation and public purposes (R&PP) applications by local governmental agencies. • Identify public lands on the perimeter and within the SRMA that are appropriate for recreational uses in support of local government land-use plans. • Prohibit camping on public lands in the SRMA, except where specifically authorized and designated. • Close the SRMA to individual, organized, and competitive off-road use and vehicle events, including off-road casual use. An exception to this closure is the Nellis Dunes off-road vehicle area and the Nevada 400 course route to the north. Nevada 400 course limited to one event per year.	Lands within the Las Vegas Valley that are outside the lands identified for disposal, as well as the fossil beds, will be designated as a SRMA. Coordinate with county and city governments to manage lands in the Las Vegas Valley to facilitate the provision of open space areas, recreational trails, and parks necessary for valley residents (153,314 acres), divided into six RMZs: • Arden RMZ (p. 132) (53,050 acres) • Eldorado RMZ (p. 132) (11,047 acres) • Fossil Beds RMZ (p. 132) (10,494 acres) • NCA Gateway RMZ (p. 133) (10,520 acres) • River Mountains RMZ (p. 133) (7,251 acres) • Sunrise Mountain RMZ (p. 134)(38,191 acres) **Management Prescriptions:** • Identify land for reserve recreational trails, open space, parks, etc. as needed prior to land disposals. Reservations should be done through R&PP applications by local governmental agencies. • Identify public lands on the perimeter and within the SRMA that are appropriate for	Lands within the Las Vegas Valley that are outside the Lands identified for disposal, as well as the fossil beds, will be designated as a SRMA. Coordinate with county and city governments to manage lands in the Las Vegas Valley to facilitate the provision of open space areas, recreational trails, and parks necessary for valley residents (153,314 acres). The Fossil Beds (p. 132) (10,494 acres) would be designated as an RMZ. Manage the remaining parts of the SRMA as follows: • Identify land for reserve recreational trails, open space, parks, etc., as needed prior to land disposals. Reservations should be done through R&PP applications by local governmental agencies. • Identify public lands on the perimeter and within the SRMA that are appropriate for recreational uses in support of local government land-use plans. • Prohibit speed-based OHV events (e.g. motorcycle, truck, and buggy races). • Allow non-speed events (such as all-terrain bicycle events, motorcycle trail rides,	Designate lands within the Las Vegas Valley area, but outside the SNPLMA disposal boundary, as an ERMA (156,390 acres). Include the Fossil Beds area within the ERMA with the following management: • Prohibit camping except where specifically authorized and designated. **Travel Management:** • With the exception of the routes identified TRV-03 (p. 152) in and routes that have been previously designated, such as Rainbow Gardens, Lava Butte, and Kodachrome, (OHV area allocation: limited), travel in the Las Vegas Valley SRMA would be closed until route designations are completed. Then travel would be restricted to designated roads, primitive roads, and trails. • Limit mechanized use to designated roads, primitive roads, and trails. • Limit equestrian use to designated roads, primitive roads, and trails.

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Las Vegas Valley SRMA/ERMA (LVFO)				
		recreational uses in support of local government land-use plans. • Prohibit speed-based OHV events (e.g. motorcycle, truck, and buggy races). • Allow non-speed events (such as all-terrain bicycle events, motorcycle trail rides, noncompetitive OHV events, and commercial permitted events and activities) on a case-by-case basis. • Prohibit camping except where specifically authorized and designated. • Provide trailheads, parking areas, and/or staging areas for trailheads as needed on a case-by-case basis. **Travel Management:** • With the exception of the routes identified in TRV-03 (p. 152) and routes that have been previously designated, such as Rainbow Gardens, Lava Butte, and Kodachrome, (OHV area allocation: limited), travel in the Las Vegas Valley SRMA would be closed until route designations are completed. Then travel would be restricted to designated roads, primitive roads, and trails. • Limit mechanized use to designated roads, primitive roads, and trails.	noncompetitive OHV events, and commercial permitted events and activities) on a case-by-case basis. • Prohibit camping except where specifically authorized and designated. • Provide trailheads, parking areas, and/or staging areas for trailheads as needed on a case-by-case basis. **Travel Management:** • With the exception of the routes identified in TRV-03 (p. 152) and routes that have been previously designated, such as Rainbow Gardens, Lava Butte, and Kodachrome, (OHV area allocation: limited), travel in the Las Vegas Valley SRMA would be closed until route designations are completed. Then travel would be restricted to designated roads, primitive roads, and trails. • Limit mechanized use to designated roads, primitive roads, and trails. • Limit equestrian use to designated roads, primitive roads, and trails. **Lands and Realty:** • Exclude site-type ROWs and other land-use authorizations larger than 20 acres, except for those that enhance recreational values, public health and safety	

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Las Vegas Valley SRMA/ERMA (LVFO)				
		• Limit equestrian use to designated roads, primitive roads, and trails. **Lands and Realty:** • Exclude site-type ROWs and other land-use authorizations larger than 20 acres, except for those that enhance recreational values, public health and safety (such as R&PP leases) and in support of or ancillary to utility corridors.	(such as R&PP leases) and in support of or ancillary to utility corridors.	
Objective 1.15: Manage dispersed recreation, which takes place on many of the small public land parcels in the Las Vegas Valley, to protect natural, biological, and cultural resources and access to adjacent recreation opportunities and trail systems. Parcels in this ERMA are slated for disposal and/or do not contain significant amounts of recreation opportunities. Larger parts of the ERMA north of the Fossil Beds do not offer many recreation opportunities, but provide some access points to other areas, such as the Las Vegas Paiute Tribal lands, the Desert National Wildlife Refuge, and the Fossil Beds RMZ.				
REC-29	The areas within a disposal boundary (SNPLMA, Valley West, or Apex) would be managed as part the Las Vegas Valley SRMA.	The lands identified for disposal within the Las Vegas Valley, excluding the fossil beds, will be designated as an ERMA (28,394 acres) with the following management: • Prohibit camping except where specifically authorized and designated. **Travel Management:** • With the exception of the routes identified in TRV-03 (p. 152) and routes that have been previously designated (OHV area allocation: limited), travel in the Las Vegas Valley ERMA would be closed until route designations are completed. Then travel would be restricted	The lands identified for disposal within the Las Vegas Valley, excluding the fossil beds, will be designated as an ERMA (34,531 acres) with the following management: • Prohibit camping except where specifically authorized and designated. **Travel Management:** • With the exception of the routes identified in TRV-03 (p. 152) and routes that have been previously designated (OHV area allocation: limited), travel in the Las Vegas Valley ERMA would be closed until route designations are completed. Then travel would be restricted to designated	The areas within the SNPLMA disposal boundary excluding the Fossil Beds area would be managed as public lands not designated as recreation management areas.

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Las Vegas Valley SRMA/ERMA (LVFO)				
		to designated roads, primitive roads, and trails. ● Limit equestrian use to designated roads, primitive roads, and trails.	roads, primitive roads, and trails. ● Limit equestrian use to designated roads, primitive roads, and trails.	

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Las Vegas Valley SRMA Arden RMZ (LVFO)				
Objective 1.16: Increasing demands for recreational use would be managed in a manner to protect desert tortoise habitat while providing opportunities for non-motorized, trails-based recreation activities. Manage recreation opportunities in concert with relevant and important values of the Bird Springs Valley/Desert Tortoise Conservation Center ACEC.				
REC-30	The Arden area would be managed as part of the Las Vegas Valley SRMA. See the Las Vegas Valley SRMA section (p. 128) for management.	Designate the Arden area as an RMZ within the Las Vegas Valley SRMA (53,050 acres).	The Arden area would be managed as part of the Las Vegas Valley SRMA. See the Las Vegas Valley SRMA section (p. 128) for management.	The Arden area would be managed as part of the Las Vegas Valley ERMA. See the Las Vegas Valley ERMA section (p. 128) for management.
Las Vegas Valley SRMA Eldorado RMZ (LVFO)				
Objective 1.17: Provide a natural setting adjacent to an urban population with mostly non-motorized opportunities and a few motorized routes. Protect scenic and backcountry values on the part of the RMZ that is adjacent to the Sloan Canyon National Conservation Area.				
REC-31	The Eldorado area would be managed as part of the Nelson Hills/Eldorado SRMA. See the Nelson Hills/Eldorado SRMA section (p. 140) for management.	Designate the Eldorado area as an RMZ within the Las Vegas Valley SRMA (11,047 acres).	The Eldorado area would be managed as part of the Las Vegas Valley SRMA. See the Las Vegas Valley SRMA section (p. 128) for management.	The Eldorado area would be managed as part of the Las Vegas Valley ERMA. See the Las Vegas Valley ERMA section (p. 128) for management.
Las Vegas Valley SRMA Fossil Beds RMZ (LVFO)				
Objective 1.18: Manage in a manner to protect fossil beds while providing opportunities for non-motorized, trails-based recreation activities and educational/scientific benefits. Manage recreation opportunities in concert with relevant and important values of the Upper Las Vegas Wash ACEC.				
REC-32	The Fossil Beds area would be managed by the Southern Nevada ERMA (p. 114) and the Las Vegas Valley SRMA (p. 128).	Designate the Fossil Beds area as an RMZ within the Las Vegas Valley SRMA (10,494 acres) with the following management: ● Limit motorized use to designated roads, primitive roads, and trails for licensed street-legal vehicles. ● Limit mechanized travel to designated roads, primitive roads, and trails.		The Fossil Beds area would be managed as part of the Las Vegas Valley ERMA. See the Las Vegas Valley ERMA section (p. 128) for management.

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Las Vegas Valley SRMA NCA Gateway RMZ (LVFO)				
Objective 1.19: Protect scenic and backcountry values adjacent to the Red Rock and Sloan Canyon national conservation areas. Manage access points and gateways into the NCAs for recreation types that are consistent with the recreation use inside the NCAs.				
REC-33	The part of the SRMA near Red Rock and Sloan Canyon NCAs would be managed as part of the Las Vegas Valley SRMA. See the Las Vegas Valley SRMA section (p. 128) for management.	Designate the part of the SRMA near the NCAs as an RMZ within the Las Vegas Valley SRMA (10,520 acres) with the following management: • Limit motorized use to designated roads, primitive roads, and trails for licensed street-legal vehicles. • Limit mechanized travel to designated roads, primitive roads, and trails.	The part of the SRMA near the NCAs would be managed as part of the Las Vegas Valley SRMA. See the Las Vegas Valley SRMA section (p. 128) for management.	The part of the SRMA near the NCAs would be managed as part of the Las Vegas Valley ERMA. See the Las Vegas Valley ERMA section (p. 128) for management.
Las Vegas Valley SRMA River Mountains RMZ (LVFO)				
Objective 1.20: Provide a natural setting for non-motorized opportunities adjacent to an urban population. Manage recreation opportunities in concert with the relevant and important values of the River Mountains ACEC.				
REC-34	The River Mountains area would be managed as part of the Las Vegas Valley SRMA. See the Las Vegas Valley SRMA section (p. 128) for management.	Designate the River Mountains area as an RMZ within the Las Vegas Valley SRMA (7,251 acres).	The River Mountains area would be managed as part of the Las Vegas Valley SRMA. See the Las Vegas Valley SRMA section (p. 128) for management.	The River Mountains area would be managed as part of the Las Vegas Valley ERMA. See the Las Vegas Valley ERMA section (p. 128) for management.

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Las Vegas Valley SRMA Sunrise Mountain RMZ (LVFO)				
Objective 1.21: Provide a natural setting for non-motorized opportunities and a few motorized routes adjacent to an urban population. Manage recreation opportunities in concert with the relevant and important values of the Rainbow Gardens ACEC and the instant study area (ISA).				
REC-35	Manage the Sunrise/Frenchman Mountain/Rainbow Gardens area as a SRMA (38,702 acres) for recreation opportunities in concert with sensitive plant, scenic, cultural, and geologic values of the concurrent ACEC. Prohibit speed based motorcycle/truck/buggy off-road vehicle events. Limit bicycle events to designated roads, primitive roads, and trails until completion of long-term planning in the recreation area management plan (RAMP). Allow non-speed events (such as all-terrain bicycle events, motorcycle trail rides, noncompetitive off-road vehicle events, and commercial permitted events and activities) on designated roads, primitive roads, and trails on a case-by-case basis until completion of long-term planning in the RAMP. Encourage cooperative ventures, such as concession leases, to enhance recreation opportunities. Concentrate major power line transmission rights-of-way within the confines of the designated utility corridor to reduce conflicts with recreation and to reduce impacts to scenic resources, such as Rainbow Gardens and Lava Butte.	Designate the Sunrise/Frenchman Mountain/Rainbow Gardens area as the Sunrise Mountain RMZ within the Las Vegas Valley SRMA (38,191 acres) with the following management: ● Limit motorized use to designated roads, primitive roads, and trails for licensed street-legal vehicles. ● Limit mechanized travel to designated roads, primitive roads, and trails. ● Minimize impacts to Las Vegas bearpoppy populations in accordance with policies regarding BLM sensitive species.	The Sunrise/Frenchman Mountain/Rainbow Gardens area would be managed as part of the Las Vegas Valley SRMA. See the Las Vegas Valley SRMA section (p. 128) for management.	The Sunrise/Frenchman Mountain/Rainbow Gardens area would be managed as part of the Las Vegas Valley ERMA. See the Las Vegas Valley ERMA section (p. 128) for management.

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Laughlin SRMA (LVFO)				
Objective 1.22: Provide a destination for motorized recreation experiences in a natural setting with a variety of recreation opportunities with integrated management of wildlife habitats, cultural resources, and other recreational uses.				
REC-36	Manage the Laughlin area as a SRMA (21,250 acres). Provide a higher level of management emphasis through increased use monitoring, ranger patrols, increased BLM presence at permitted events, and increased coordination with local government and businesses for recreational uses. Work closely with the Nevada Department of Wildlife to protect habitat areas and riparian resources of concern. Until completion of the Recreation Area Management Plan, allow up to two off-road vehicle events with the following terms: ● Limit to 200 participants. ● Closed from May 1 to the Saturday following opening of upland game bird season (usually the second Saturday in October). The seasonal restrictions and the number of events and participants may be modified as a result of the RAMP process.	Manage the Laughlin area as a SRMA (21,270 acres). ● Consider developing limits to the number of SRPs during implementation-level planning to maintain the recreation setting for a wide variety of potential uses. ● Manage the Mojave Road and surrounding area for the scenic recreation experience. This area is a transition zone between the Mojave and Sonoran deserts and provides unique experiences not found elsewhere in the planning area. This area receives heavy visitation from recreationists who wish to view native flora and avian species as they migrate through the area. ● Allow high-speed permitted events year-round in conformance with the applicable biological opinion. ● Prohibit high-speed permitted events where the SRMA overlaps the Hiko Springs ACEC. **Lands and Realty:** ● Exclude site-type ROWs larger than 20 acres except for those that enhance recreational values, public health and safety, and in support of or ancillary to utility corridors and transmission lines. ● Avoid linear ROWs except within designated corridors.	Manage the Laughlin area as a SRMA (21,270 acres). ● Consider developing limits to the number of SRPs during implementation-level planning to maintain the recreation setting for a wide variety of potential uses. ● Manage the Mojave Road and surrounding area for the scenic recreation experience. This area is a transition zone between the Mojave and Sonoran deserts and provides unique experiences not found elsewhere in the planning area. This area receives heavy visitation from recreationists who wish to view native flora and avian species as they migrate through the area. ● Allow high-speed permitted events year-round in conformance with the applicable biological opinion. ● Prohibit high-speed permitted events where the SRMA overlaps the Hiko Springs ACEC. **Lands and Realty:** ● Avoid site-type ROWs larger than 20 acres in the area except for those that enhance recreational values, public health and safety, and in support of or ancillary to utility corridors. ● Allow recreation and public purposes (R&PP) leases to governmental entities.	Manage as public lands not designated as recreation management areas.

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Laughlin SRMA (LVFO)				
		Travel Management: ● Travel would be limited to existing roads, trails, and dry washes until completion of a travel management plan. When completed, travel would be restricted to designated roads, primitive roads, and trails. ● Limit mechanized use to designated roads, primitive roads, and trails.	● Avoid linear ROWs except within designated corridors. Lands that overlap disposal boundaries will be managed as part of the SRMA until the lands are disposed of. **Travel Management:** ● Travel would be limited to existing roads, trails, and dry washes until completion of a travel management plan. When completed, travel would be restricted to designated roads, primitive roads, and trails. ● Limit mechanized use to designated roads, primitive roads, and trails.	

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Logandale SRMA (LVFO)				
Objective 1.23: Provide a destination for recreation experiences in a natural setting with a variety of recreation opportunities with integrated management of wildlife habitats, cultural resources, and other recreational uses.				
REC-37	The Logandale area would be managed as part the Southern Nevada ERMA (p. 114).	Designate the Logandale area as a SRMA (21,172 acres) with one RMZ: ● Logandale North RMZ (p. 137) (17,829 acres), located north of Overton Wash. Manage the remaining parts of the SRMA as follows: ● Coordinate recreation management to accommodate the existing Logandale Management Plan. ● Prohibit speed-based OHV activities. ● Allow non-speed permitted activities on a case-by-case basis. **Minerals:** ● Fluid leasable: Open ● Solid leaseble: Open ● Locatable: Open ● Saleable: Open **Travel Management:** ● Travel would be limited to existing roads, trails, and dry washes until completion of a travel management plan. When completed, travel would be restricted to designated roads, primitive roads, and trails. ● Limit bicycle use to designated roads, primitive roads, and trails.		
Logandale SRMA Logandale North RMZ (LVFO)				
REC-38	No similar action.	Designate the Logandale North area as an RMZ within the Logandale SRMA (17,829 acres). In addition to the management prescriptions for the SRMA, the following prescriptions apply to the RMZ: ● Minimize impacts to threecorner milkvetch populations in accordance with policies regarding BLM sensitive species. **Minerals:** ● Fluid leasable: Closed ● Solid leasable: Closed ● Locatable: Pursue withdrawal ● Saleable: Closed except for the disposal of excess materials associated with other permitted actions, trespass resolution, and free-use permits to the BLM. **Lands and Realty:** ● Exclude site-type ROWs except for those requested by the BLM. BLM facilities and ROWs that provide resource protection, enhancement of recreational values, and/or address human health and safety would be allowed on a case-by-case basis. ● Exclude linear ROWs except for those requested by the BLM.		

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Muddy Mountains SRMA/ERMA (LVFO)				
Objective 1.24: Maintain a variety of dispersed recreation opportunities that facilitate visitor access to a range of outdoor recreation activities associated with a wide-open landscape with limited developments. Maintain the natural settings for multiple recreation opportunities in ACECs, wilderness, the Bitter Springs Backcountry Byway, Lower Mormon Mesa, and lands with wilderness characteristics. Minimize impacts from increased recreation use by providing facilities, interpretation, education, and information.				
REC-39	Manage the Muddy Mountains area as a SRMA (128,291 acres). Manage area to provide semi-primitive recreation opportunities and integrated management of wildlife habitat, cultural resources, and other recreational uses. Manage the majority of the area (78,480 acres) for semi-primitive non-motorized recreation opportunities. Manage the remaining area (44,897 acres) for semi-primitive motorized recreation opportunities.	Designate the Muddy Mountains area as an ERMA (338,778 acres) with the following management: ● Manage the Bitter Springs Backcountry Byway with a visual buffer to protect viewsheds. **Travel Management:** ● With the exception of routes that have been previously designated (such as in ACECs), travel would be limited to existing roads, trails, and dry washes until completion of a travel management plan. When the plan is completed, travel would be restricted to designated roads, primitive roads, and trails.		Designate the Muddy Mountains area as an ERMA (274,933 acres) with the following management: ● Manage the Bitter Springs Backcountry Byway with a visual buffer to protect viewsheds. **Travel Management:** ● With the exception of routes that have been previously designated (such as in ACECs), travel would be limited to existing roads, trails, and dry washes until completion of a travel management plan. When the plan is completed, travel would be restricted to designated roads, primitive roads, and trails.

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Nellis Dunes SRMA (LVFO)				
Objective 1.25: Protect the unique sand dune setting and adjacent features that provide thrill and speed associated with motorized recreation opportunities on sand washes and dunes.				
REC-40	Manage the Nellis Dunes area as a SRMA (10,865 acres). Manage the area as an open area for intensive off-road vehicle and other recreation opportunities, including organized off-road vehicle events, casual off-road vehicle free-play, picnicking, and other non-off-road vehicle commercial and competitive permitted activities.			
REC-41	• Permit off-road vehicle free-play and high-speed competitive off-highway vehicle events of all types within the SRMA. • Prohibit recreational and target shooting in the SRMA to coincide with Clark County's shooting ordinance. • Consider cooperative ventures such as concession leases to enhance recreation opportunities.	**Management Prescriptions:** • Prohibit camping except where specifically authorized and designated. • Provide trailheads, parking areas, and/or staging areas for trailheads as needed on a case-by-case basis. • During implementation-level planning such as the RAMP/CTTMP, areas for high-speed testing of OHV racing platforms (including trucks, buggies, UTVs, ATVs, and motorcycles) may be analyzed for this type of need and use. • During implementation-level planning such as the RAMP/CTTMP, areas for high-speed commercial touring (including trucks, buggies, UTVs, ATVs, and motorcycles) may be analyzed for this type of need and use. **Travel Management:** • Open **Minerals:** • Fluid leasable: Closed • Solid leasable: Closed • Locatable: Pursue withdrawal • Saleable: Closed except for the disposal of excess materials associated with other permitted actions, trespass resolution, and free-use permits to the BLM. **Lands and Realty:** • Exclude site-type ROWs except for those requested by the BLM. BLM facilities and ROWs that provide resource protection, enhancement of recreational values, and/or address human health and safety would be allowed on a case-by-case basis. • Avoid linear ROWs except for designated corridors.		

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Nelson Hills/Eldorado SRMA (LVFO)				
REC-42	Manage 72,703 acres for competitive off-road vehicle events on BLM-administered lands in the Nelson Hills Eldorado Valley SRMA in accordance with the applicable biological opinion(s) to protect desert tortoise habitat. ● Authorize a maximum of nine speed-based events yearly, including five motorcycle/all-terrain vehicle and four buggy events. ● All permitted events must take place on existing previously used course. ● Permitted speed-based off-road vehicle events are allowed only between November 1 and February 28 within the parts of the special recreation management area that are critical tortoise habitat.	Nelson Hills will be managed as part of the Clark County South ERMA (p. 120). Designate the Eldorado area as an RMZ (p. 132) within the Las Vegas Valley SRMA.	Nelson Hills will be managed as part of the Clark County South ERMA (p. 120). The Eldorado area would be managed as part of the Las Vegas Valley SRMA. See the Las Vegas Valley SRMA (p. 128) section for management.	Nelson Hills will be managed as part of the Clark County South ERMA (p. 120). The Eldorado area would be managed as part of the Las Vegas Valley ERMA. See the Las Vegas Valley ERMA (p. 128) section for management.

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Pahrump Valley ERMA (PFO)				
Objective 1.26: Facilitate visitor access to a range of outdoor recreation activities associated with a wide-open landscape with limited developments adjacent to the town of Pahrump.				
REC-43	The Pahrump Valley would be managed as part the Southern Nevada ERMA (p. 114).	Designate the Pahrump Valley as an ERMA (256,577 acres in Alternative 2, and 256,540 acres in Alternative 3) with the following management: **Travel Management:** ● Interim designation: Travel would be limited to existing roads, trails, and dry washes until completion of a travel management plan. When completed, travel would be restricted to designated roads, primitive roads, and trails. **Lands and Realty:** ● Avoid linear ROWs except within designated corridors. ● Avoid site-type ROWs. ● All renewable energy developments and other large site-type ROWs would be required to maintain recreation access through developed areas on designated roads, primitive roads, and trails. During project-specific environmental planning for renewable energy developments, the BLM and proponent will consider off-site mitigation related to loss of recreation opportunities and outcomes by providing recreational developments (e.g., developing trailheads, recreation facilities) for displaced recreation users.		Manage as public lands not designated as recreation management areas.

Table 2.28. Group 1: Speed-Based Recreation in McCullough Pass Critical Desert Tortoise Habitat

Group 1: Car, Truck and Buggy/UTV/ATV/Motorcycle				
	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Maximum number of permits issued annually	Existing management direction is listed in REC-11 (p. 108).	0	1	1
Maximum number of vehicles per permit		0	300	300
Maximum number of laps per permit		0	4	4
Seasonal constraints		N/A	Allowed only from December through February.	No speed-based recreation activities during the tortoise active season.
Publicity run allowed		None		

Table 2.29. Group 2: Speed-Based Recreation in McCullough Pass Critical Desert Tortoise Habitat

Group 2: Motorcycle and ATV				
	Alternative 1	**Alternative 2**	**Alternative 3**	**Alternative 4**
Maximum number of permits issued annually	Existing management direction is listed in REC-11 (p. 108).	0	2	2
Maximum number of vehicles per permit		0	300	300
Maximum number of laps per permit		0	5	5
Seasonal constraints		N/A	Allowed only from December through February.	No speed-based recreation activities during the tortoise active season.
Publicity run allowed		None		

Table 2.30. Group 2: Speed-Based Recreation in Nelson Hills Critical Desert Tortoise Habitat

Group 2: Motorcycle and ATV				
	Alternative 1	**Alternative 2**	**Alternative 3**	**Alternative 4**
Maximum number of permits issued annually	Existing management direction is listed in REC-11 (p. 108).	0	2	2
Maximum number of vehicles per permit		0	180	180
Maximum number of laps per permit		0	5	5
Seasonal constraints		N/A	Allowed only from December through February.	No speed-based recreation activities during the tortoise active season.
Starting interval		N/A	1 to 2 every 30 seconds	1 to 2 every 30 seconds
Publicity run allowed		None		

Table 2.31. Non-Speed SRPs for the Four Desert Tortoise Critical Habitat ACECs in the Desert Tortoise Inactive Season

Non-Speed SRPs for the Four Desert Tortoise Critical Habitat ACECs in the Desert Tortoise Inactive Season				
Type of SRP	**Alternative 1**	**Alternative 2**	**Alternative 3**	**Alternative 4**
One-time competitive/ commercial events (each event up to four days in length)	Existing management direction is listed in REC-13 (p. 110).	Four per ACEC (16 total) per year. Event could be motorized, mechanized, or equestrian. Does not include foot-based events that could be permitted on a case-by-case basis.		
Ongoing commercial tours — motorized		Three per day in Gold Butte A.* No motorized commercial tours allowed in Mormon Mesa, Coyote Springs, or Piute/Eldorado** ACECs. Tours will be limited to use of Gold Butte Backcountry Byway, Fisherman's Cove Road, Nay Ranch Road, Grand Wash Road, and approved short spurs off these roads. Approved short-spur roads will be determined during implementation-level planning. Does not include tours outside the ACECs that need to pass through the ACEC to access their tour location.		Five per day in Gold Butte A.* No motorized commercial tours allowed in Mormon Mesa, Coyote Springs, or Piute/Eldorado** ACECs. Tours will be limited to use of Gold Butte Backcountry Byway, Fisherman's Cove Road, Nay Ranch Road, Grand Wash Road, and approved short spurs off these roads. Approved short-spur roads will be determined during implementation-level planning. Does not include tours outside of the ACECs that need to pass through the ACEC to access their tour location.
Ongoing commercial tours — mechanized (bicycles)		Three per day in each ACEC on designated roads, primitive roads, and trails that have been designated for bicycle use. Designated roads, primitive roads, and trails will be determined through implementation-level planning. No permits will be issued prior to completion of implementation-level planning. Does not include tours outside the ACECs that need to pass through the ACEC to access their tour location.		Five per day in each ACEC on designated roads, primitive roads, and trails that have been designated for bicycle use. Designated roads, primitive roads, and trails will be determined through implementation-level planning. No permits will be issued prior to completion of implementation-level planning. Does not include tours outside of ACECs that need to pass through the

Non-Speed SRPs for the Four Desert Tortoise Critical Habitat ACECs in the Desert Tortoise Inactive Season				
Type of SRP	**Alternative 1**	**Alternative 2**	**Alternative 3**	**Alternative 4**
				ACEC to access their tour location.
Ongoing commercial tours — non-mechanized (guided hikes, rock climbs, equestrian, etc.)		Three per day in each ACEC on designated roads, primitive roads, and trails. Designated roads, primitive roads, and trails will be determined through implementation-level planning. No permits will be issued prior to completion of implementation-level planning. Does not include tours outside the ACECs that need to pass through the ACEC to access their tour location.		
Organized groups (non-commercial, non-competive) — motorized		Case-by-case		
Organized groups — non-motorized		Case-by-case		

* Occurrences in Gold Butte B or C that need to pass through Gold Butte A do not count toward any of the limits on numbers or seasons.

** Occurrences on the Mojave Road in Piute/Eldorado do not count toward any of the limits on numbers or seasons.

Table 2.32. Non-Speed SRPs for the Desert Tortoise Critical Habitat ACECs in the Desert Tortoise Active Season

Non-Speed SRPs for the Desert Tortoise Critical Habitat ACECs in the Desert Tortoise Active Season				
Type of SRP	**Alternative 1**	**Alternative 2**	**Alternative 3**	**Alternative 4**
One-time competitive/ commercial events (each event up to four days in length).	Existing management direction is listed in REC-13 (p. 110).	Three per ACEC (12 total) per year. Event could be mechanized, equestrian, or foot-based. No motorized events allowed. Does not include tours outside the ACEC that need to pass through the ACEC to access their tour location.	Three per ACEC (12 total) per year. Event could be mechanized or equestrian. Does not include foot-based events that could be permitted on a case-by-case basis. No motorized events allowed.	
Ongoing commercial tours — motorized		One per day in Gold Butte A.* No motorized commercial tours allowed in Mormon Mesa, Coyote Springs, or Piute/Eldorado** ACECs. Tours will be limited to use of Gold Butte Backcountry Byway, Fisherman's Cove Road, Nay Ranch Road, Grand Wash Road, and approved short spurs off these roads. Does not include tours outside the ACECs that need to pass through the ACEC to access their tour location.	Three per day in Gold Butte A.* No motorized commercial tours allowed in Mormon Mesa, Coyote Springs, or Piute/Eldorado** ACECs. Tours will be limited to use of Gold Butte Backcountry Byway, Fisherman's Cove Road, Nay Ranch Road, Grand Wash Road, and approved short spurs off these roads. Does not include tours outside the ACECs that need to pass through the ACEC to access their tour location.	Five per day in Gold Butte A.* No motorized commercial tours allowed in Mormon Mesa, Coyote Springs, or Piute/Eldorado** ACECs. Tours will be limited to use of Gold Butte Backcountry Byway, Fisherman's Cove Road, Nay Ranch Road, Grand Wash Road, and approved short spurs off these roads. Does not include tours outside the ACECs that need to pass through the ACEC to access their tour location.
Ongoing commercial tours — mechanized (bicycles)		One per day in each ACEC on designated roads, primitive roads, and trails that have been designated for bicycle use. Designated roads, primitive roads, and trails will be determined during implementation-level planning. No permits will be issued prior to completion of implementation-level planning. Does not include tours outside the ACEC that need to pass through the	Three per day in each ACEC on designated roads, primitive roads, and trails that have been designated for bicycle use. Designated roads, primitive roads, and trails will be determined during implementation-level planning. No permits will be issued prior to completion of implementation-level planning. Does not include tours outside the ACEC that need to pass through the	Five per day in each ACEC on designated roads, primitive roads, and trails that have been designated for bicycle use. Designated roads, primitive roads, and trails will be determined during implementation-level planning. No permits will be issued prior to completion of implementation-level planning. Does not include tours outside the ACEC that need to pass through the

Non-Speed SRPs for the Desert Tortoise Critical Habitat ACECs in the Desert Tortoise Active Season				
Type of SRP	**Alternative 1**	**Alternative 2**	**Alternative 3**	**Alternative 4**
		ACEC to access their tour location.	ACEC to access their tour location.	ACEC to access their tour location.
Ongoing commercial tours — non-mechanized (guided hikes, rock climbs, equestrian, etc.)		One per day in each ACEC on designated roads, primitive roads, and trails. Designated roads, primitive roads, and trails will be determined during implementation-level planning. No permits will be issued prior to completion of implementation-level planning. Does not include tours outside the ACEC that need to pass through the ACEC to access their tour location.	Three per day in each ACEC on designated roads, primitive roads, and trails. Designated roads, primitive roads, and trails will be determined during implementation-level planning. No permits will be issued prior to completion of implementation-level planning. Does not include tours outside the ACEC that need to pass through the ACEC to access their tour location.	Five per day in each ACEC on designated roads, primitive roads, and trails. Designated roads, primitive roads, and trails will be determined during implementation-level planning. No permits will be issued prior to completion of implementation-level planning. Does not include tours outside the ACEC that need to pass through the ACEC to access their tour location.
Organized groups (non-commercial, non-competive) —motorized		One per month per ACEC	Two per month per ACEC	
Organized groups — non-motorized		Case-by-case		

* Events occurring in Gold Butte B or C that need to pass through Gold Butte A do not count toward the any of the limits on numbers or seasons.

** Events occurring on the Mojave Road in Piute/Eldorado do not count toward the any of the limits on numbers or seasons.

2.5.3.5. Travel and Transportation

Comprehensive travel management strives to provide manageable access to public lands while balancing resource protection. The allocation of areas as open, closed, or limited to OHV (also described as off-road vehicles in 43 CFR 8340–8342), directs the management approach for vehicular travel on public lands. A comprehensive travel management plan also addresses travel routes for non-motorized forms of travel, and supplementary rules will need to be developed for restrictions on non-motorized travel. Implementation-level actions such as designating routes as part of a planned network help create balance between human use and resource protection. Administrative uses of vehicles such as police, fire, or military actions are expressly defined as not being an off-road vehicle and are exempt from vehicle regulations (43 CFR 8342). In areas allocated as closed, the BLM may issue permits or other land-use authorization access.

The designation of individual roads, primitive roads and trails, whether completed during the RMP revision process or designated through a future planning effort, are implementation-level decisions. Changes to a designated route network may be accomplished through activity-level planning with the appropriate site-specific NEPA analysis. During the travel management planning process, the BLM will consider the minimization criteria found at 43 CFR 8342.1, along with NHPA Section 106.

A travel management plan is not intended to provide evidence bearing on or addressing the validity of any R.S. 2477 assertions. R.S. 2477 assertions are a grant of a right-of-way for the construction of highways across unreserved public lands. In 1938, as part of the recodification of statutes, R.S. 2477 became 43 U.S.C. 932 until its repeal in 1976 by the Federal Land Policy and Management Act.

R.S. 2477 rights are determined through a process that is entirely independent of the BLM's planning process. Consequently, travel management planning should not take into consideration R.S. 2477 assertions or evidence. Travel management planning should be founded on an independently determined purpose and need that is based on resource uses and associated access to public lands and waters. At such time as a decision is made on R.S. 2477 assertions, the BLM will adjust its travel routes accordingly (Transportation and Travel Management BLM Manual 1626).

Maps:

- Off-Highway Vehicle Designations, Alternative 1 (p. 2141)
- Off-Highway Vehicle Designations, Alternative 2 (p. 2141)
- Off-Highway Vehicle Designations, Alternative 3 (p. 2141)
- Off-Highway Vehicle Designations, Alternative 4 (p. 2141)

Table 2.33. OHV Area Allocations

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Area Allocation: Open				
Goal 1: Provide manageable access to public lands while balancing resource protection and public safety.				
Objective 1.1: Designate all public land as open, closed, or limited. **Objective 1.2:** Support the attainment of recreation goals and objectives related to unstructured travel through designated OHV open areas while minimizing the impacts to other resources.				
TRV-01	Maintain the following areas as open to all motorized and mechanized vehicles (approx. 26,563 acres): • Big Dune SRMA (on unvegetated dunes outside the ACEC and outside the beetle habitat) • Nellis Dunes SRMA (10,865 acres) • Non-vegetated portions of dry lake beds *Alternative 1 map (p. 2141)*	Designate the following areas as open to all motorized vehicles (15,881 acres): • Big Dune SRMA (Approximately 985 acres outside the identified beetle habitat in the Big Dune ACEC.) • Nellis Dunes SRMA • Dry Lakes RMZ in the Jean/Roach SRMA • Apex Dry Lake Bed Close dry lake beds to OHV use when there is standing water to protect the lake bed surface. *Alternative 2 map (p. 2141)*	Designate the following areas as open to all motorized vehicles (15,880 acres): • Big Dune SRMA (Approximately 1,092 acres outside the identified beetle habitat in the Big Dune ACEC.) • Nellis Dunes SRMA • Dry Lakes RMZ in the Jean/Roach SRMA • Apex Dry Lake Bed Close dry lake beds to OHV use when there is standing water to protect the lake bed surface. *Alternative 3 map (p. 2141)*	Designate the following areas as open to all motorized vehicles (15,881 acres): • Nellis Dunes SRMA • Dry lake beds in the Jean/Roach ERMA • Apex Dry Lake Bed • Big Dune SRMA (Approximately 1,125 acres outside the identified beetle habitat in the Big Dune ACEC.) Close dry lake beds to OHV use when there is standing water to protect the lake bed surface. *Alternative 4 map (p. 2141)*
Area Allocation: Closed				
Objective 1.3: Manage areas for resource protection, conservation, restoration, and public safety using the OHV area allocation closed.				
TRV-02	Maintain the following areas as closed to all motorized and mechanized vehicles (319,408 acres): • Wilderness areas (183,248 acres) • Beetle habitat in the Big Dune SRMA (approx. 200 acres) • Las Vegas Valley SRMA (99,048 acres) • Hidden Valley ACEC (3,357 acres)	Designate the following areas as closed to all motorized vehicles (424,840 acres): • Las Vegas Valley ERMA (28,394 acres) • Big Dune ACEC (233 acres) • Hidden Valley ACEC (3,357 acres) • Lava Dune ACEC (435 acres) • Mt. Schrader ACEC (283 acres) • Peace Camp at Mercury	Designate the following areas as closed to all motorized vehicles (181,617 acres): • Big Dune ACEC (119 acres) • Hidden Valley ACEC (3,357 acres) • Lava Dune ACEC (435 acres) • Mt. Schrader ACEC (283 acres) • Wilderness areas (183,248 acres)	Designate the following areas as closed to all motorized vehicles (181,616 acres): • Hidden Valley ACEC (3,357 acres) • Wilderness areas (183,248 acres) • Big Dune ACEC (86 acres) • Lava Dune ACEC (435 acres) *Alternative 4 map (p. 2141)*

	Except for the Hidden Valley area, lands in wilderness study areas (WSAs) are not included in this designation. This designation would apply to any areas designated by Congress as wilderness in the future. *Alternative 1 map (p. 2141)*	• Suitable wild and scenic river segments with a tentative classification of wild. • Lands with wilderness characteristics (242,214 acres) • Wilderness areas (183,248 acres) *Alternative 2 map (p. 2141)*	*Alternative 3 map (p. 2141)*	
Area Allocation: Limited				
Objective 1.4: Manage areas by structuring travel for visitor use, resource protection, conservation, restoration, and public safety using the OHV area allocation limited.				
TRV-03	Designate the following areas (1,136,598 acres) as limited to designated for all motorized and mechanized vehicles: • Approximately 743,209 acres of desert tortoise ACEC including the Piute/Eldorado, Mormon Mesa, Coyote Springs, and Gold Butte. • Approximately 327,000 acres adjacent to the Red Rock National Conservation Area and the U.S. Forest Service Spring Mountain National Recreation Area (between State Highway 160 and U.S. Highway 95). • Rainbow Gardens ACEC (38,764 acres) • BLM inholdings totaling approximately 9,423 acres in Ash Meadows National Wildlife Refuge. • All land disposal areas. Designate approximately 1,628,460 acres as shown on Map 2.6.2.4 - 1 as limited to	Designate all areas not closed or open above as limited to designated routes for all motorized vehicles (2,669,582 acres). *Alternative 2 map (p. 2141)*	Designate all areas not closed or open above as limited to designated routes for all motorized vehicles (2,912,805 acres). Designate portions of the Las Vegas Valley SRMA as limited to licensed, street-legal vehicles to enable access to legal travel routes on adjacent public lands. Areas to designate include, but are not limited to: • Dutchman's Pass on the gas line corridor • Rainbow power line to Goodsprings • Power line from Magnolia substation to Sloan Canyon National Conservation Area. *Alternative 3 map (p. 2141)*	Designate all areas not closed or open above as limited to designated routes for all motorized vehicles (2,913,100 acres). Designate portions of the Las Vegas Valley SRMA as limited to licensed, street-legal vehicles to enable access to legal travel routes on adjacent public lands. Areas to designate include, but are not limited to: • Dutchman's Pass on the gas line corridor • Rainbow power line to Goodsprings • Power line from Magnolia substation to Sloan Canyon National Conservation Area. *Alternative 4 map (p. 2141)*

	existing roads, trails, and dry washes for all motorized and mechanized vehicles. This designation includes: ● All ACECs designated for purposes other than tortoise habitat protection and all lands not otherwise designated. ● All WSAs (or portions). WSAs are limited to existing trails and ways. This distinction is made because WSAs are by definition (and inventory) "roadless." However, some WSAs have 4-wheel drive Jeep trails known as trails or ways that remain open to limited use. OHV designations in WSAs are interim, contingent on Congress making a final decision as to their designation as wilderness. *Alternative 1 map (p. 2141)*			

Table 2.34. Travel Classification Summary

Travel Classification	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Open	26,563 acres	15,881 acres	15,880 acres	15,881 acres
Closed	319,408 acres	424,840 acres	181,617 acres	181,616 acres
Limited to existing roads, trails, and dry washes	1,628,460 acres	0	0	0
Limited to designated roads and trails	1,136,598 acres	2,669,582 acres	2,912,805 acres	2,913,100 acres
Limited to existing trails and ways	4,607 acres	0	0	0
Total	**3,115,636 acres**	**3,110,303 acres**	**3,110,302 acres**	**3,110,597 acres**

Travel Management Areas

Travel management areas are a planning and management tool that may be used to address area-specific travel issues. Travel management areas may be used to identify unique travel management circumstances that may require a particular focus, specific management prescriptions, or additional analysis. Travel management areas may also be used to separate specific areas from the larger planning area for a variety of reasons, such as the areas's complexity or level of controversy, the need for higher-level public involvement, consideration of special resource characteristics, or manageability of the area.

Maps:

- Travel Management Areas, Alternatives 2–4 (p. 2141)

Table 2.35. Travel Management Areas

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Goal 2: Develop a travel management plan and implement a travel management system to meet public use, resource management, and regulatory needs.				
Objective 2.1: Manage areas where community interests or manageable geographic boundaries exist and address landscape issues in a programmatic manner.				
TRV-04	No similar action.	Create the following areas as travel management areas: ● Amargosa (346,623 acres) ● Big Dune (13,994 acres) ● Clark County North (359,832 acres) ● Clark County South (522,956 acres) ● Clark County West (376,048 acres) ● Crater Flat (84,042 acres) ● Gold Butte (354,879 acres) ● Jean/Roach (217,827 acres) ● Las Vegas Valley (193,760 acres) ● Laughlin (21,270 acres) ● Logandale (21,132 acres) ● Muddy Mountains (338,500 acres) ● Pahrump East (44,196 acres) ● Pahrump South (38,946 acres) ● Pahrump West (38,895 acres) ● Specter (134,533 acres) In general, travel management area boundaries will correspond to the boundaries set forth in this plan. *Alternatives 2–4 maps (p. 2141)*		
Objective 2.2: Develop travel management plans for specific travel management areas that connect communities, adjacent lands, and areas of interest.				
TRV-05	No similar action.	Criteria to guide route designations would be established based on the criteria found in 43 CFR 8342.1 and management actions for recreation, wildlife, vegetation, cultural resources, lands/realty, mining, and other resources or resource uses as appropriate.		
Goal 3: Protect resources from human impacts associated with motorized and non-motorized travel.				
Objective 3.1: Close areas to motorized vehicle activities to protect resources and meet associated conservation, restoration, and public safety goals over the life of the plan.				
TRV-06	No similar action.	Where off-road vehicles are causing or will cause considerable adverse effects upon soil, vegetation, wildlife, wildlife habitats, cultural resources, historical resources, threatened or endangered species, wilderness suitability, other authorized uses, or other resources, the affected areas shall be immediately closed to the type(s) of vehicle causing the adverse effect until the adverse effects are eliminated and measures are implemented to prevent recurrence (43 CFR 8341.2(a)).		

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
TRV-07	The Mojave Road in Laughlin, Nevada, is closed to competitive events along or within the road alignment; however, a race course may cross the road alignment.	See the Recreation section (p. 104) for management of the Mojave Road.		
Objective 3.2: Limit motorized vehicle use to minimize impacts to resources and to reduce or eliminate resource, visitor, and behavior-based conflicts during the life of the plan.				
TRV-08	No similar action.	Interim designation in areas designated as limited: Travel would be limited to existing roads and trails until such time as route designations are completed. When this is completed, travel would be restricted to designated roads, primitive roads and trails. Existing roads and trails are those routes on the ground that clearly show prior use to the extent that a clear path is visible with no vegetation on it, or is some cases little vegetation in the center between wheel ruts. A single set of vehicle tracks does not make an existing route.	Existing roads and trails are those routes on the ground that clearly show prior use to the extent that a clear path is visible with no vegetation on it, or is some cases little vegetation in the center between wheel ruts. A single set of vehicle tracks does not make an existing route. A timeline to complete travel planning in travel management areas will be identified, prioritized and updated annually to accelerate the accomplishment of: data collection, route evaluation and selection, and on the ground implementation efforts including signing, monitoring and rehabilitation.	Existing roads and trails are those routes on the ground that clearly show prior use to the extent that a clear path is visible with no vegetation on it, or is some cases little vegetation in the center between wheel ruts. A single set of vehicle tracks does not make an existing route. A timeline to complete travel planning in travel management areas will be identified, prioritized and updated annually to accelerate the accomplishment of: data collection, route evaluation and selection, and on the ground implementation efforts including signing, monitoring and rehabilitation. Due to the lack of verifiable data, the BLM will defer publication of route inventory data until subsequent implementation level travel management planning. During subsequent implementation level travel management planning, travel management areas will be inventoried and any additional route data will be requested from the public during the public planning process. All routes would undergo a route evaluation to determine its purpose and need and the potential resource and/or user conflicts from motorized travel using criteria described in TRV-05.
TRV-09	No similar action.	The Las Vegas Valley SRMA and ERMA would remain closed to motorized travel until the travel management plan is complete with the exception of routes already designated in the Rainbow Gardens ACEC and routes identified in TRV-03 (p. 152) (Dutchman's Pass, Rainbow to Goodsprings power line, and the power line from Magnolia substation to Sloan Canyon National Conservation Area).		
TRV-10	Route designations will remain in effect in the following ACECs: Coyote Springs, Gold Butte (A,B,C), Mormon Mesa, Piute/Eldorado, and Rainbow Gardens.			
Goal 4: Provide a comprehensive travel management system that supports protection of resources and provides sustainable public use and enjoyment.				

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Objective 4.1: All travel modes and uses on the travel system must be consistent with the travel management plan and resource objectives while maintaining desired recreation experiences, protecting resources, and meeting associated conservation, restoration, and public safety goals.				
TRV-11	No similar action.	Seek legal or permissive access to designated roads, primitive roads, and trails through non-BLM-administered lands as needed. These access points would be identified in a travel management plan. The need to acquire easements across private land will be determined through subsequent travel planning.		
TRV-12	No similar action.	● In areas where motorized use is limited, hunters must utilize non-motorized methods for cross-country travel to retrieve game. Otherwise, hunters must stay on designated roads, primitive roads, and trails. ● In areas where mechanized travel is restricted, hunters may utilize non-motorized mechanized game carts for cross-country travel. ● In wilderness and WSAs, no motorized or mechanized methods of game retrieval are allowed.		
TRV-13	No similar action.	Develop an adaptive management process to adjust the closed beetle habitat boundaries identified in TRV-02 (p. 151), Big Dune ACEC, in response to the shifting of occupied beetle habitat and the slip face resulting from the dynamic movement of the sand dune.		
Goal 5: Provide manageable, non-motorized access to public lands while balancing resource protection and public safety.				
Objective 5.1: Manage areas by structuring non-motorized travel for visitor use, resource protection, conservation, restoration, and public safety.				
TRV-14	No similar action.	In the Las Vegas Valley SRMA, limit equestrian use to designated routes.		
TRV-15	No similar action.	In the Las Vegas Valley SRMA, limit mechanized use to designated routes.		
TRV-16	No similar action.	In the Logandale SRMA, limit bicycle use to designated routes.		

2.5.3.6. Lands and Realty

The lands and realty program's goals are to manage public lands consistent with the Federal Land Policy Management Act of 1976 (FLPMA). FLPMA provides for retention of public lands in federal ownership and management by BLM for multiple-use and sustained yield of the lands and resources, with environmental integrity. The primary responsibilities of the lands and realty program include land tenure adjustments (disposals and acquisitions) and withdrawal actions; land-use authorizations (i.e., rights-of-way, permits, leases, and easements) to include managing renewable energy development; and the designation of transportation and utility corridors. This chapter outlines lands and realty management prescriptions in Table 2.36 consistent with its goals and objectives.

Public lands may be transferred from BLM to other federal agencies for management. Disposal by sale, exchange, or recreation and public purpose (R&PP) patent remains an option, if such an action will serve an important objective and have a public benefit. A land disposal is a transaction that leads to the transfer of title of public lands from the federal government. Prior to any disposal, a site-specific analysis must determine that the lands considered for disposal contain no significant wildlife, recreation, or other resource values, the loss of which cannot be mitigated; have no overriding public values; and represent no substantial public investments. Disposal must serve the public interest. Lands to be considered for disposal, at a minimum, must meet disposal criteria outlined in Section 203 of FLPMA, such as: 1) they are difficult and uneconomical to manage, and are not suitable for management by another federal agency; or 2) disposal would serve important public objectives, including but not limited to community expansion or economic development that could not be achieved prudently or feasibly on land other than public lands and which outweigh other public objectives or values; or 3) such a tract was acquired for a specific purpose, and the tract is no longer required for that purpose or any other federal purpose.

Within the planning area, the respective BLM field office (Las Vegas or Pahrump) manages lands identified as suitable for disposal through land-use planning or plan amendment. BLM also manages legislative disposal areas as identified below, which are public lands congressionally mandated for disposal for a specific purpose and need:

- **Apex disposal area**: Congressionally mandated pursuant to Public Law 101-67 (1989).
- **SNPLMA disposal area:** Congressionally mandated pursuant to Public Law 105-263 (1998), as amended. This disposal boundary overlays the disposal boundary established by the Santini-Burton Act of 1980 (P.L. 96-586), and the McCarran Airport Cooperative Management Area.
- **Ivanpah Airport Environs Overlay District disposal area:** Congressionally mandated pursuant to Public Law 106-362 (2000).

BLM's disposal areas (both lands identified as suitable for disposal or legislative disposal areas) are depicted in Table 2.36, "Lands and Realty Management Actions" (p. 160) under L&R-01.

Maps:

- Disposal Areas, Alternative 1 (p. 2141)
- Disposal Areas, Alternative 2 (p. 2141)
- Disposal Areas, Alternative 3 (p. 2142)
- Disposal Areas, Alternative 4 (p. 2142)
- Solar Energy, Alternative 1 (p. 2142)
- Solar Energy, Alternative 2 (p. 2142)

- Solar Energy, Alternative 3 (p. 2142)
- Solar Energy, Alternative 4 (p. 2142)
- Wind Energy, Alternative 1 (p. 2142)
- Wind Energy, Alternative 2 (p. 2142)
- Wind Energy, Alternative 3 (p. 2142)
- Wind Energy, Alternative 4 (p. 2142)
- Utility Corridors, Alternative 1 (p. 2142)
- Utility Corridors, Alternative 2 (p. 2142)
- Utility Corridors, Alternative 3 (p. 2142)
- Utility Corridors, Alternative 4 (p. 2142)

Table 2.36. Lands and Realty Management Actions

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
LAND TENURE				
Goal 1: Land tenure focuses on disposing and acquiring lands or interests in lands. BLM's land tenure goals are: ● To dispose of lands or interests in lands that are difficult or uneconomical to manage, or are no longer needed for federal purposes. ● To retain public lands or interests in lands that enhance multiple-use management. ● To acquire lands or interests in lands (i.e. water rights, mineral rights, conservation easements, etc.) that complement resource values and further management objectives.				
Land Disposals				
Goal 2: Make public lands available through disposal for community growth and recreation and public purposes, as well as other infrastructure needs to provide for the orderly expansion and development of lands within the jurisdiction of the Southern Nevada District Office.				
Objective 2.1: ● Dispose of public lands, as appropriate, by legislative action or as provided under land-use planning such as sale, exchange, and recreation and other public purposes consistent with federal regulations and policies and procedures. ● Public lands other than those identified for disposal in this land-use plan may be considered for disposal when specific criteria are met to consolidate public land-use patterns for improved management. This will be done on a case-by-case basis in accordance with management direction through a land-use plan amendment. ● Public lands may be disposed of or transferred out of federal ownership once land-use planning has determined that the lands are difficult or uneconomical to manage; were acquired for a specific purpose and are no longer required for that or any other federal purpose; or may serve important public objectives.				
L&R-01	Manage existing disposal areas totaling approximately 163,918 acres as identified on the Disposal Areas Alternative 1 map. **Denotes legislative disposal areas. All other disposal areas are lands identified as suitable for disposal.* *Alternative 1 map (p. 2141)*	Manage the following disposal areas totaling approximately 61,400 acres as identified on the Disposal Areas Alternative 2 map; boundaries are revised for ACEC and habitat considerations. **Denotes legislative disposal areas. All other disposal areas are lands identified as suitable for disposal.* *Alternative 2 map (p. 2141)*	Manage the following disposal areas totaling 155,279 acres as identified on the Disposal Areas Alternative 3 map; boundaries are revised for ACEC and habitat considerations. **Denotes legislative disposal areas. All other disposal areas are lands identified as suitable for disposal.* *Alternative 3 map (p. 2142)*	Manage the following disposal areas totaling 194,738 acres as identified on the Disposal Areas Alternative 4 map; boundaries are revised for ACEC and habitat considerations. **Denotes legislative disposal areas. All other disposal areas are lands identified as suitable for disposal.* *Alternative 4 map (p. 2142)*
	LVFO (Clark County) Disposal Areas – 14 total (121,874 acres):	**LVFO (Clark County) Disposal Areas – 14 total (72,296 acres):**	**LVFO (Clark County) Disposal Areas – 21 total (112,766 acres):**	**LVFO (Clark County) Disposal Areas – 22 total (116,437 acres):**
	Apex (4,795 acres)*	Apex (4,795 acres)*	Apex (4,795 acres)*	Apex (4,795 acres)*
	No similar action.	No similar action.	No similar action.	Army National Guard (3,012 acres)
	No similar action.	No similar action.	City of Las Vegas (2,525 acres)	City of Las Vegas (2,525 acres)
	No similar action.	No similar action.	Crescent Peak (213 acres)	Crescent Peak (213 acres)
	Goodsprings (960 acres)	Goodsprings (960 acres)	Goodsprings (960 acres)	Goodsprings (960 acres)

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
LAND TENURE				
	Indian Springs (384 acres)	Indian Springs (384 acres)	Indian Springs (384 acres)	Indian Springs (384 acres)
	Indian Springs Prison (formerly Indian Springs North and Indian Springs South) (1,301 acres)	Indian Springs Prison (1,301 acres)	Indian Springs Prison (1,301 acres)	Indian Springs Prison (1,301 acres)
	*Ivanpah Airport Environs Overlay District (formerly Southern Nevada Airport Cooperative Management) (14,454 acres)	*Ivanpah Airport Environs Overlay District (14,454 acres)	*Ivanpah Airport Environs Overlay District (14,454 acres)	*Ivanpah Airport Environs Overlay District (14,454 acres)
	Laughlin (4,944 acres)	No similar action.	Laughlin (3,504 acres)	Laughlin (3,504 acres)
	No similar action.	No similar action.	Lone Mountain (4,178 acres)	Lone Mountain (4,178 acres)
	Mesquite-Bunkerville (5,979 acres)	Mesquite-Bunkerville (1,047 acres)	Mesquite-Bunkerville (15,287 acres)	Mesquite-Bunkerville (15,244 acres)
	Moapa-Glendale (28,631 acres)	Moapa-Glendale (726 acres)	Moapa-Glendale (12,278 acres)	Moapa-Glendale (12,278 acres)
	Nelson (799 acres)	Nelson (507 acres)	Nelson (707 acres)	Nelson (999 acres)
	No similar action.	No similar action.	North Las Vegas (2,451 acres)	North Las Vegas (2,861 acres)
	No similar action.	No similar action.	Republic Services (640 acres)	Republic Services (640 acres)
	Sandy Valley (3,996 acres)	Sandy Valley (3,977 acres)	Sandy Valley (3,977 acres)	Sandy Valley (3,977 acres)
	Searchlight (2,071 acres)	Searchlight (2,067 acres)	Searchlight (2,067 acres)	Searchlight (2,067 acres)
	No similar action.	Sloan Hills (796 acres)	Sloan Hills (796 acres)	Sloan Hills (796 acres)
	*SNPLMA (39,925 acres)	*SNPLMA (39,925 acres)	*SNPLMA (39,925 acres)	*SNPLMA (39,925 acres)
	Sunrise Landfill (803 acres)	Sunrise Landfill (803 acres)	Sunrise Landfill (803 acres)	Sunrise Landfill (803 acres)
	No similar action.	Three Kids Mine (554 acres)	Three Kids Mine (554 acres)	Three Kids Mine (554 acres)
	Valley West (967 acres)	No similar action.	Valley West (967 acres)	Valley West (967 acres)
	PFO (Nye County) Disposal Areas – 3 total (42,044 acres):	**PFO (Nye County) Disposal Areas – 6 total (6,203 acres):**	**PFO (Nye County) Disposal Areas – 16 total (42,513 acres):**	**PFO (Nye County) Disposal Areas – 17 total (78,301 acres):**
	Amargosa Valley (27,639 acres)	No similar action.	Amargosa Valley (25,863 acres)	Amargosa Valley (27,220 acres)
	No similar action.	Last Chance Range (80 acres)	Last Chance Range (191 acres)	Last Chance Range (433 acres)
	Lathrop Wells (5,628 acres)	Lathrop Wells (2,572 acres)	Lathrop Wells (5,628 acres)	Lathrop Wells (7,550 acres)
	Pahrump (8,777 acres)	Pahrump (2,705 acres)	Pahrump (3,515 acres)	Pahrump (6,677 acres)
	No similar action.	Belle Vista (355 acres)	Belle Vista (355 acres)	Belle Vista (355 acres)
	No similar action.	No similar action.	No similar action.	Pahrump Stateline (2,902 acres)
	No similar action.	Nye County 1 (92 acres)	Nye County 1 (92 acres)	Nye County 1 (210 acres)
	No similar action.	No similar action.	Von Schmidt Disposal (122 acres)	Von Schmidt Disposal (122 acres)
	No similar action.	No similar action.	Highway 95/160 Intersection (204 acres)	Highway 95/160 Intersection (652 acres)
	No similar action.	No similar action.	Stateline (13 acres)	Stateline (13 acres)
	No similar action.	Nye County 2 (399 acres)	Nye County 2 (399 acres)	Nye County 2 (399 acres)

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
LAND TENURE				
	No similar action.	No similar action.	Last Chance Basin (640 acres within 3,921-acre boundary)	Last Chance Basin (4,486 acres)
	No similar action.	No similar action.	Mercury (313 acres)	Mercury (2,658 acres)
	No similar action.	No similar action.	Pahrump East (418 acres)	Pahrump East (7,446 acres)
	No similar action.	No similar action.	Southern Pahrump Connection (299 acres)	Southern Pahrump Connection (2,696 acres)
	No similar action.	No similar action.	Southern Pahrump/Off the Grid (689 acres)	Southern Pahrump/Off the Grid (11,144 acres)
	No similar action.	No similar action.	South Beatty (491 acres)	South Beatty (2,838 acres)
L&R-02	No similar action.		The Lone Mountain disposal area includes an area managed as the Lone Mountain Community Pit (N-43006). The community pit encompasses the following described lands: T. 19 S., R. 59 E., Section 35, NE¼, SE¼SW¼, NW¼SW¼, N½NE¼SW¼, SW¼SE¼, SE¼SE¼, S½NE¼SE¼; Section 26, W½SE¼SW¼, E½SW¼SW¼; and Section 34, E½SW¼NE¼, SE¼NE¼, NE¼NE¼; and T. 20 S., R. 59 E., Section 2, N½NW¼, N½S½NW¼, N½NE¼, N½SW¼NE¼, SE¼NE¼, E½NE¼SE¼. Once all mining operations have ceased, the above described lands would be available for disposal.	
L&R-03	No similar action.			The North Las Vegas disposal area includes the Las Vegas Speedway Community Pit (N-48710). The community pit encompasses the following described lands: T. 19 S., R. 62 E., section 13, all that is south of Interstate 15; T. 19 S., R. 62 E., section 24, all that is south of Interstate 15 and north of Las Vegas Boulevard; T. 19 S., R. 62 E., section 25, all that is north of Las Vegas Boulevard; T. 19 S., R. 63 E., section 08, all that is south of Interstate 15; T. 19 S., R. 63 E., section 16, all that is north of Las Vegas Boulevard; T. 19 S., R. 63 E., section 17, all that is south of Interstate 15 and north of Las Vegas Boulevard; T. 19 S., R. 63 E., section 18, all that is south of Interstate 15; T. 19 S., R. 63

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
LAND TENURE				
				E., section 19, all that is north of Las Vegas Boulevard; and T. 19 S., R. 63 E., section 20, all that is north of Las Vegas Boulevard. Once all mining operations have ceased, the above lands would be available for disposal.
L&R-04	No similar action.	No similar action.	Within the Amargosa Valley disposal area, up to 552 acres will be evaluated for disposal under the RMP biological opinion. All further disposals in this area will require a project-specific biological opinion on a case-by-case basis.	No similar action.
L&R-05	No similar action.	Sloan Hills disposal area is withdrawn to locatable minerals consistent with the validity exam and closed to discretionary minerals.		
L&R-06	BLM-administered lands within the congressionally mandated Ivanpah Airport Environs Overlay District disposal area are to be transferred to Clark County consistent with the 2002 Clark County Act, FLPMA, and federal regulation and policy. Subject to valid existing rights, this legislative disposal area is withdrawn from location and entry under the mining laws, and from operation under the mineral leasing and geothermal leasing laws, until the Secretary terminates the withdrawal or the land, respectively, is patented.			
L&R-07	BLM-administered lands within the Sunrise Landfill disposal area are to be transferred to Clark County consistent with the 2008 Consent Decree and Settlement Agreement (Civil Action No. 2:08–cv–01024), FLPMA, and federal regulation and policy.			
L&R-08	Dispose up to 2,654 acres for future private development within the Upper Las Vegas Wash Study Area consistent with SNPLMA, as amended, and the Records of Decision for the 2011 Upper Las Vegas Wash Conservation Transfer Area Final SEIS and the 2004 Las Vegas Valley Disposal Boundary Final EIS.			
L&R-09	On a case-by-basis, unauthorized use of public lands outside established disposal areas may be resolved through a direct sale. A land-use amendment would be required to proceed with the disposal action. A direct sale can happen if it is proven that the unauthorized use was not willful or was due to an erroneous survey, or if remediation of existing hazardous substances on the property would be too costly.	No similar action.		

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
LAND TENURE				
L&R-10	Public lands located outside established disposal areas would be considered for repositioning to consolidate BLM parcels into a more contiguous land pattern and to improve public services and BLM land management. Repositioning would occur on a case-by-case basis, by exchange only, provided that: ● The lands would serve the purpose of: a) community expansion and economic development, b) local government needs, or c) to facilitate federal land management and minimize BLM administrative costs. ● The lands are not adjacent to congressionally mandated disposal boundaries. ● Lands to be disposed are located outside any ACEC, culturally sensitive area, special recreation management area, right-of-way corridor, wilderness study area, active communication site, riparian site, or cultural sites eligible for inclusion on the National Register of Historic Places.	Public lands located outside established disposal areas would be considered for conveyance to consolidate BLM parcels into a more contiguous land pattern and to improve public services and land management. Conveyance would occur on a case-by-case basis taking into consideration that: 1. The lands would serve the purpose of: A) community expansion and economic development, B) local government needs, or C) to facilitate federal land management and minimize BLM administrative costs. 2. Lands to be disposed are located outside any ACEC, culturally sensitive area, special recreation management area, right-of-way corridor, wilderness study area, active communication site, riparian site, or cultural site eligible for inclusion on the National Register of Historic Places. 3. The public lands are not encumbered by an existing permit or lease that would preclude the disposal action. 4. Other public uses of the parcel are of less value. 5. The parcel is for a specific purpose and is no longer required for any other federal purpose. 6. Local communities support the exchange and there is close coordination with the U.S. Fish and Wildlife Service, the Nevada Division of Wildlife, Clark County, and/or Nye County. 7. Public access would be improved. 8. Any other specific values or concerns not identified above would be analyzed at the time of the proposal to determine if the disposal would be in the public's best interest.		

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
LAND TENURE				
	● The public lands are not encumbered by an existing permit or lease that would preclude the disposal action. ● The lands do not include habitat of threatened, endangered, and special status species, or other crucial wildlife habitat. ● Other public uses of the parcel are of less value. ● The parcel of land is for a specific purpose and is no longer required for any other federal purpose. ● Local communities support the exchange and there is close coordination with the U.S. Fish and Wildlife Service, the Nevada Division of Wildlife, and Clark County. ● Public access would be improved. ● Any other specific values or concerns not identified above would be analyzed at the time of the proposal to determine if the disposal would be in the public's best interest.			
L&R-11	Public lands within the planning area are not suitable for entry under Indian Allotment, Desert Land Entry, or the Carey Act, and would not be disposed of through those authorities.	Public lands within the planning area are deemed classified as unsuitable for disposal subject to the Indian Allotment, Desert Land Entry, or the Carey Act and would not be disposed of through those authorities.		

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
LAND TENURE				
L&R-12	Recreation and public purpose leases identified for sale prior to approval of this plan, which were located inside a disposal area under the current management plan and are outside the proposed disposal areas, would remain available for sale to the current lessee or assignee.	Recreation and public purpose leases identified for sale prior to approval of this plan revision that were located inside a disposal area under the 1998 RMP but are located outside a disposal area as a result of the approved revised RMP would remain available for sale to the current lessee or assignee.		
L&R-13	No similar action.	Transportation and utility corridors will be excepted and reserved in patents or deeds when public lands are conveyed out of federal ownership.		
L&R-14	No similar action.	Consistent with Sec. 208 of FLPMA, title transfers of BLM-administered lands may include terms, covenants, conditions, and reservations as deemed necessary to ensure proper land use and protection of the public interest.		
Land Exchanges				
L&R-15	No similar action.	Consider land exchanges that serve the national interest and are beneficial to BLM Nevada State Office programs or support programs of other agencies.		
Acquisition of Lands and Interests in Land				
Objective 2.2: Acquire lands and/or interests in lands, such as water rights, mineral rights, etc., to complement existing resource values and uses, to facilitate and enhance administration of adjacent BLM-administered public lands, and to provide legal access.				
L&R-16	Land acquisition needs will generally be processed through the land exchange program; however, if the opportunity arises lands may be acquired by donations, congressionally appropriated funds, or compensation funds. The following land acquisition priorities are based on finding willing sellers: ● Private lands required to meet management objectives within designated ACECs, WSAs, recommended wilderness areas, congressionally designated areas, threatened and endangered species habitats, and areas containing special status species.	Acquisition methods include, but are not limited to, negotiated purchase, donation, and exchange to adequately manage public lands and resources; consolidating ownership patterns to ensure effective administration and improve resource management of adjacent land; retaining and acquiring land containing important resource values to provide for long-term protection and management of those values; or acquiring legal public and administrative access to ensure continued effective administration and public access. Lands acquired under legislation shall be managed consistent to the legislation and the RMP. Furthermore, lands located within and/or contiguous to specially designated areas will be incorporated and managed consistent with the specially designated areas, as appropriate. The following land acquisition priorities are based on finding willing sellers: 1. Private land required to meet management objectives within, and/or contiguous to, designated ACECs, WSAs, congressionally designated areas, threatened and endangered species habitats, and areas containing special status species. 2. Private lands contiguous to areas that contain significant resource values, such as the Virgin River. 3. Private lands known as Anniversary Mine south of the Muddy Mountains Wilderness Area. 4. Lands not specifically identified for acquisition could be acquired on a case-by-case basis for the following reasons: ● Protect threatened and endangered species and special status species. ● Provide resource protection.		

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
LAND TENURE				
	● Lands located within the district and conveyed into private ownership to the Coyote Springs planned development project through P.L. 100-275. The lands involved are located in Coyote Spring Valley and will be retained in federal ownership as part of Coyote Springs ACEC. ● Private lands along the Virgin River. Lands not specifically identified for acquisition could be acquired on a case-by-case basis for the following reasons: ○ Protect threatened and endangered species and special status species. ○ Provide resource protection. ○ Facilitate implementation of the RMP. ○ Provide a more manageable land ownership pattern. ○ Maintain or enhance public uses and values.	● Facilitate implementation of the RMP. ● Provide a more manageable land ownership pattern. ● Maintain or enhance public uses and values. ● Secure legal public and administrative access to otherwise inaccessible public lands. ● Provide life and property protection.		
L&R-17	BLM will not acquire contaminated property.			
L&R-18	No similar action.	BLM may consider acquiring less than fee title (i.e. conservation easement) to property if management goals can be achieved by doing so.		
L&R-19	No similar action.	Acquired lands will be closed to locatable, leasable, and saleable mineral development unless it is determined through an activity-level management plan and associated NEPA document that the acquired land is open for such development.		
Withdrawals and Segregations				
Goal 3: Ensure timely processing of new withdrawal and segregation actions, or extensions of previously authorized withdrawals, to adequately protect specific areas and/or sites for a specific purpose.				
Objective 3.1: Process withdrawal and segregation actions with the least-restrictive measures and minimum size necessary to accomplish the desired purpose.				

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
LAND TENURE				
L&R-20	In consultation with the appropriate federal agency or applicant, review existing and pending classifications, segregations, and withdrawals to determine if there is a continued need for them. Consideration will be given to withdrawal of approximately 1,500 acres of public land adjacent to Nellis Air Force Base in support of the Department of Defense's Ammunition and Explosives Safety Program.	In consultation with the appropriate federal agency, review existing and pending classifications, segregations, and withdrawals to determine whether there is a continued need.		
L&R-21	Approximately 11,014 acres of the DTCC Management Area are available for withdrawal by other federal agencies when such transfer would further objective SSS-04 (p. 42).	Approximately 40 acres of the DTCC Management Area are available for withdrawal by other federal agencies when such transfer would further recovery objectives for the federally listed desert tortoise and promote diversity and ecosystem health (See SSS-04 (p. 42)).	Approximately 689 acres of the DTCC Management Area are available for withdrawal by other federal agencies when such transfer would further recovery objectives for the federally listed desert tortoise and promote diversity and ecosystem health (See SSS-04 (p. 42)).	Approximately 11,081 acres of the DTCC Management Area are available for withdrawal by other federal agencies when such transfer would further recovery objectives for the federally listed desert tortoise and promote diversity and ecosystem health (See SSS-04 (p. 42)).

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
LAND-USE AUTHORIZATIONS				
Goal 4: Provide land-use authorizations to support national and local needs while minimizing adverse impacts to other resource values and the proliferation of separate and in-common use authorizations.				
Rights-of-Way / Permits / Leases / Easements				
Objective 4.1: Meet public demand and reduce impacts to sensitive resources by providing an orderly system of development through land-use authorizations (i.e. rights-of-way, permits, leases, easements) and co-locating, as appropriate, for transportation, transmission, and related facilities including flood control, communication facilities, and legal access.				
L&R-22	All public lands within the planning area, unless otherwise classified, segregated or withdrawn, are available at the discretion of the agency for land-use leases and permits under Sec. 302 of the Federal Land Policy and Management Act and for airport leases under the authority of the Act of May 24, 1928, as amended, and R&PP leases. ACECs and wilderness areas are exceptions.	All public lands within the planning area, unless otherwise classified, segregated or withdrawn, are available at the discretion of the agency for land-use authorizations. Designated ACECs and wilderness areas are exceptions.		
L&R-23	Land-use lease or permit applications and airport lease applications will be addressed on a case-by-case basis, where consistent with other resource management objectives and local land uses. Special terms and conditions regarding use of the public lands involved will be developed as applicable.	Land-use lease or permit applications and airport lease applications will be addressed on a case-by-case basis, where consistent with other resource management objectives and local land uses. Special terms and conditions regarding use of the public lands involved will be developed as applicable. 1. Directional signs that are intended to inform the general public will be considered on a case-by-case basis and must be in conformance with BLM plans, policy, and programs, and local zoning ordinances. 2. Political signs are not permitted on public lands. 3. No signs of advertising devices shall be placed on public lands except those posted by or at the direction of the authorized officer. 4. Informational signs will be authorized where needed to prevent resource damage or known safety concerns. 5. Needs will be determined based upon historic locations, public surveys, and other monitoring. 6. Vendor services or commercial vending on public lands will not be authorized unless directly related to recreational permits.		
L&R-24	When feasible, and where compatible, major pipeline rights-of-way (ROWs) will be placed within power line corridors.	When practicable, and where compatible, major linear ROWs (i.e. pipelines) will be placed within designated utility corridors. Where a corridor is available, applicants will propose one of its project alternatives within an available corridor in any environmental analysis document to evaluate the potential effect of the project.		
L&R-25	No similar action.	Site-type ROWs may be placed within designated corridors when practicable and where compatible with the purpose of the corridor.		

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
LAND-USE AUTHORIZATIONS				
L&R-26	No similar action.	Land-use authorizations within congressionally designated or specially designated areas will be analyzed and managed during project-level implementation consistent with the respective legislation and/or special designation of the area. For example, Moapa Utility Corridor (P.L. 96-491) or the Ivanpah Airport Environs Overlay District area (P.L. 106-362).		
L&R-27	Provide right-of-way access for local flood control agencies to develop or maintain flood control developments, consistent with right-of-way avoidance and exclusion areas.	Provide ROW access for local flood-control agencies to develop or maintain flood-control developments, consistent with ROW avoidance and exclusion areas and consistent with resource protection.		
L&R-28	Except as stated in the 1998 RMP, all ACECs and all lands within one quarter mile of significant caves, exclusive of any designated corridors, are designated as ROW avoidance areas.	Designate ROW avoidance areas within one half mile of significant caves, exclusive of any designated corridors.	Designate ROW avoidance areas within one quarter mile of significant caves, exclusive of any designated corridors.	Allow ROWs near cave sites except when it prohibits access or compromises sensitive resource values.
L&R-29	Linear ROW exclusion areas are limited to the Hidden Valley District, Sloan Rock Art, and Big Dune ACECs.	**Exclusion areas** are areas with sensitive resource values where linear land-use authorizations (such as ROWs, permits, leases, and easements) would not be authorized. These areas have been determined to be unsuitable for a land-use authorization because of (1) unique, highly valued, complex, or legally protected resources; (2) potentially significant environmental impacts resulting from conflicts with current land uses; or (3) areas posing substantial hazard to construction and/or operation of a linear facility (e.g., electric transmission lines, pipelines, telephone lines, fiber optic lines). In these areas, land-use authorizations would be granted only in cases where there is a legal requirement to provide such access or an immediate public safety concern. **Avoidance areas** are areas with sensitive resource values where linear land-use authorizations would be strongly discouraged and therefore "avoided." Authorizations to be considered within avoidance areas must be compatible with the purpose for which the area was designated and not be otherwise feasible on lands outside the avoidance area. Authorizations approved within these areas would be required to meet additional mitigation measures set forth by individual program areas that manage the "avoided" designated allocation. ● See the following sections for the respective land-use and special designations for avoidance and exclusion areas: ○ ACECs (p. 180) ○ Recreation (p. 104) management areas (e.g., SRMA/ERMA) ○ Wilderness (p. 268), wilderness study areas (p. 270), and lands with wilderness characteristics (p. 76) ○ Herd management areas (p. 48)			

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
LAND-USE AUTHORIZATIONS				
L&R-30	Site-type ROW exclusion areas are limited to all areas of critical environmental concern, except within one half mile on either side of federal-aid highways.	**Exclusion areas** are areas with sensitive resource values where site-type or non-linear land-use authorizations (such as ROWs, permits, leases, and easements) would not be authorized. These areas have been determined to be unsuitable for a land-use authorization because of (1) unique, highly valued, complex, or legally protected resources; (2) potentially significant environmental impacts resulting from conflicts with current land uses; or (3) areas posing substantial hazard to construction and/or operation of a linear facility (e.g., electric transmission lines, pipelines, telephone lines, fiber optic lines). In these areas, land-use authorizations would be granted only in cases where there is a legal requirement to provide such access or an immediate public safety concern. **Avoidance areas** are areas with sensitive resource values where site-type or non-linear land-use authorizations would be strongly discouraged and therefore "avoided." Authorizations to be considered within avoidance areas must be compatible with the purpose for which the area was designated and not be otherwise feasible on lands outside the avoidance area. Authorizations approved within these areas would be required to meet additional mitigation measures set forth by individual program areas that manage the "avoided" designated allocation. On a case-by-case basis, consider site-type ROWs larger than 5 acres in ACECs when the ROW serves as an important link to increase power capacity and reliability to an electric transmission facility, such as a substation. When feasible, such ROWs would be located within designated transportation and utility corridors. ● See the following sections for the respective land-use and special designations for avoidance and exclusion areas: ○ ACECs (p. 180) ○ Recreation (p. 104) management areas (e.g., SRMA/ERMA) ○ Wilderness (p. 268), wilderness study areas (p. 270), and lands with wilderness characteristics (p. 76) ○ Herd management areas (p. 48)		
L&R-31	No similar action.	Valid existing rights within specially designated areas prior to its designation are grandfathered rights, and therefore, restrictions would not apply to such valid existing rights. Renewal options would be considered on a case-by-case basis consistent with 43 Code of Federal Regulations 2800 and 2900 and the respective specially designated area.		
L&R-32	Consistent with the 2011 Record of Decision for the 2011 Upper Las Vegas Wash Conservation Transfer Area (CTA), land-use authorizations within the CTA will be consistent with the protection of fossil beds, sensitive species, and the hydrologic function of the Upper Las Vegas Wash. Allowable uses could include rights-of-way for access, recreational trails, flood control, educational interpretation, and other similar types of uses that are compatible with protecting the sensitive resources. Such uses will be consolidated into a conservation strategy plan.			

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
LAND-USE AUTHORIZATIONS				
L&R-33	All public lands within the planning area, except as stated in the 1998 RMP, are available at the discretion of the agency for ROWs under the authority of the Federal Land Policy Management Act.	No similar action.		
L&R-34	Land-use lease or permit applications and airport lease applications will be addressed on a case-by-case basis where consistent with other resource management objectives and local land uses. Special terms and conditions regarding use of the public lands involved will be developed as applicable.	No similar action.		
Objective 4.2: Authorize access to federal-aid highway material sites.				
L&R-35	Provide legal access to material sites.			
Renewable Energy				
Goal 5: Promote environmentally responsible renewable energy production on public land under the jurisdiction of the BLM Southern Nevada District Office.				
Objective 5.1: ● Identify specific lands where renewable energy development would be allowed, excluded, and/or avoided. ● Adopt adaptive management strategies to ensure that potential environmental impacts are kept to a minimum.				
L&R-36	Manage solar energy development as a result of land-use planning consistent with the 2012 Solar PEIS ROD, specifically those areas identified as solar energy zones, avoidance (variance), or exclusion. *Alternative 1 map (p. 2142)*	Manage solar energy development as a result of land-use planning consistent with the 2012 Solar PEIS ROD, establishing areas as solar energy zones, avoidance (variance), or exclusion. *Alternative 2 map (p. 2142)*	Manage solar energy development as a result of land-use planning consistent with the 2012 Solar PEIS ROD, establishing areas as solar energy zones, avoidance (variance), or exclusion. *Alternative 3 map (p. 2142)*	Manage solar energy development as a result of land-use planning consistent with the 2012 Solar PEIS ROD, establishing areas as solar energy zones, avoidance (variance), or exclusion. *Alternative 4 map (p. 2142)*
	Solar exclusion areas: 2,129,838 acres	Solar exclusion areas: 2,838,097 acres	Solar exclusion areas: 2,654,966 acres	Solar exclusion areas: 2,402,600 acres
	Solar avoidance (variance) areas: 967,148 acres	Solar avoidance (variance) areas: 258,833 acres	Solar avoidance (variance) areas: 417,010 acres	Solar avoidance (variance) areas: 541,175 acres

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
LAND-USE AUTHORIZATIONS				
	Areas for solar development (solar energy zones): 14,128 acres	Areas for solar development (solar energy zones): 13,921 acres	Areas for solar development (solar energy zones): 39,113 acres	Areas for solar development (solar energy zones): 168,255 acres
L&R-37	Manage wind energy development as a result of land-use planning consistent with the 2005 Wind PEIS ROD, specifically those areas identified as open, avoidance, or exclusion. *Alternative 1 map (p. 2142)*	Manage wind energy development as a result of land-use planning consistent with the 2005 Wind PEIS ROD, establishing areas as open, avoidance, or exclusion. *Alternative 2 map (p. 2142)*	Manage wind energy development as a result of land-use planning consistent with the 2005 Wind PEIS ROD, establishing areas as open, avoidance, or exclusion. *Alternative 3 map (p. 2142)*	Manage wind energy development as a result of land-use planning consistent with the 2005 Wind PEIS ROD, establishing areas as open, avoidance, or exclusion. *Alternative 4 map (p. 2142)*
	Wind exclusion areas: 1,098,385 acres	Wind exclusion areas: 2,556,580 acres	Wind exclusion areas: 2,497,299 acres	Wind exclusion areas: 1,787,654 acres
	Areas open for wind development: 2,013,097 acres	Areas open for wind development: 172,537 acres	Areas open for wind development: 183,861 acres	Areas open for wind development: 485,067 acres
	No similar action.	Wind avoidance areas: 381,576 acres	Wind avoidance areas: 429,453 acres	Wind avoidance areas: 865,232 acres
L&R-38	To minimize impacts to groundwater dependent species, BLM will require applicants to implement conservation measures.			
L&R-39	Wind energy applications will adhere to the best management practices for wind energy development established in the Wind PEIS Record of Decision signed in December 2005 (incorporated by reference).			
Solar Energy Zones (SEZs)				
Objective 5.2: ● Facilitate utility-scale solar energy development on public lands. ● Minimize potential negative environmental impacts and social and economic impacts. ● Provide flexibility to the solar industry to consider a variety of solar energy projects (i.e., location, facility size, and technology).				
L&R-40	Consistent with the 2012 Solar PEIS and ROD, manage the following solar energy zones. *Alternative 1 map (p. 2142)*	Consistent with the 2012 Solar PEIS and ROD, manage the following solar energy zones. *Alternative 2 map (p. 2142)*	Consistent with the 2012 Solar PEIS and ROD, manage existing solar energy zones and establish solar energy zones as identified below. *Alternative 3 map (p. 2142)*	Consistent with the 2012 Solar PEIS and ROD, manage existing solar energy zones and establish solar energy zones as identified below. *Alternative 4 map (p. 2142)*
	Amargosa Valley (8,411 acres) *Note: Amargosa Valley acres are determined by the BLM Geographic Coordinate Data Base (GCDB), not the acres stated in*	Amargosa Valley (8,204 acres) *Note: Amargosa Valley acres are determined by the BLM Geographic Coordinate Data Base (GCDB), not the acres stated*	Amargosa Valley (8,204 acres) *Note: Amargosa Valley acres are determined by the BLM Geographic Coordinate Data Base (GCDB), not the acres stated in*	Amargosa Valley (8,204 acres) *Note: Amargosa Valley acres are determined by the BLM Geographic Coordinate Data Base (GCDB), not the acres stated*

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
LAND-USE AUTHORIZATIONS				
	the Solar PEIS ROD (8,479 acres), a difference of 68 acres.	*in the Solar PEIS ROD (8,479 acres), a difference of 275 acres.*	*the Solar PEIS ROD (8,479 acres), a difference of 275 acres.*	*in the Solar PEIS ROD (8,479 acres), a difference of 275 acres.*
	Dry Lake (5,717 acres)	Dry Lake (5,717 acres)	Dry Lake (5,717 acres)	Dry Lake (5,717 acres)
	No similar action.	No similar action.	Ash Meadows (3,797 acres)	No similar action.
	No similar action.	No similar action.	South Beatty (7,142 acres)	No similar action.
	No similar action.	No similar action.	Lathrop Wells (8,852 acres)	Lathrop Wells (20,054 acres)
	No similar action.	No similar action.	Mercury-Tech (179 acres)	Mercury-Tech (9,309, acres)
	No similar action.	No similar action.	No similar action.	Northeast Clark County (84,409 acres)
	No similar action.	No similar action.	Dry Lake Expansion (1,521 acres)	No similar action.
	No similar action.	No similar action.	Off-The-Grid (3,700 acres) (*formerly Pahrump-Sandy Valley*)	Off-The-Grid (40,563 acres) (*formerly Pahrump-Sandy Valley*)
L&R-41	Consistent with the 2012 Solar PEIS and ROD, variance areas are made up of BLM-administered lands that are outside of solar energy zones (SEZs) and not otherwise excluded by the Solar Energy Program. The BLM will consider ROW applications for utility-scale solar energy development in variance areas on a case-by-case basis based on environmental considerations; coordination with appropriate federal, state, and local agencies and tribes; and public outreach. This evaluation is referred to as the variance process.			
L&R-42	The BLM will process pending solar applications (grandfathered applications) consistent with land-use plan decisions in place prior to amendment by the Solar PEIS ROD and ROW regulations, policies, and procedures. In the 2012 Solar PEIS ROD, "pending" applications are defined as any applications (regardless of place in line) filed within proposed variance and/or exclusion areas before the publication of the Supplement to the Draft Solar PEIS (October 28, 2011), and any applications filed within proposed SEZs (Amargosa Valley and Dry Lake SEZ) before June 30, 2009. Pending/grandfathered applications, if revised, will still be processed consistent with this management prescription.			
L&R-43	Solar energy applications, except grandfathered applications received by Oct. 28, 2011, will adhere to the programmatic design features for solar energy development identified in Appendix A of the Final Solar PEIS (incorporated by reference) and adopted in the Solar PEIS-Record of Decision (incorporated by reference) and the mitigation measures identified in the programmatic biological opinion (Service File No. 84320–20 I 2–F-0200).			
L&R-44	No similar action.		Proposed solar energy zones (SEZs) will adhere to the design features identified in Appendix A of the Final Solar PEIS (incorporated by reference) and adopted in the Solar PEIS-Record of Decision (incorporated by reference) and the mitigation measures identified in the programmatic biological opinion (Service File No. 84320–20 I 2–F-0200).	
Communication Sites				
Objective 5.3: Maximize the use of existing communication sites and prevent the proliferation of single user sites.				

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
LAND-USE AUTHORIZATIONS				
L&R-45	Authorization of future communication site ROW would be handled as follows: **Communication sites with a site management plan:** Facilities authorized under new ROWs will be constructed in accordance with an approved site management plan. **Communication sites without a site management plan:** New ROWs will be authorized within and on existing rights-of-way and facilities. This direction also includes communication site facilities not ordinarily located on a mountain top, such as AM radio facilities, personal communications service facilities, and cellular telephone sites. Personal communications service facilities will most likely occur along transportation corridors such as interstate highways.	Authorization of future communication site ROWs would be handled as follows: **Communication sites with a site management plan:** Facilities authorized under new ROWs will be constructed in accordance with an approved site management plan. **Communication sites without a site management plan:** New ROWs will be authorized within and on existing rights-of-way and facilities. This includes communication site facilities not ordinarily located on a mountain top, such as AM radio facilities, personal communications service facilities, and cellular telephone sites. **Exclude communication and meteorological towers in Timpi Canyon area:** The Timpi Canyon area is approximately located in T. 15 S., R. 54 E., sec. 2, W½ NW¼, W½ SE¼; secs. 3-10; sec. 11, W½ NW¼, W½ SE¼; secs. 15-22; sec. 23 W½ NW¼, W½ SE¼; secs. 28-30. T. 15 S., R. 53 E., sec. 1, SE; sec. 12, E½; sec. 13, E½; sec. 24, E½; sec. 25, E½; sec. 36, E½ north of Highway 95.		
L&R-46	Requests for new communication sites will generally be processed as follows: 1. Competitive bidding procedures will be utilized. 2. Multi-user facilities will be constructed. 3. Site users will jointly form a committee and develop a site management plan.	Requests for new communication sites will generally be processed as multi-user facilities. Use of all facilities and improvements by more than one user will be required except where the facility owner is a government agency. The proponent/applicant with the first authorized ROW for a proposed site would take the lead in constructing facilities designed to accommodate multi-uses and multiple tenants and/or customers. This includes multiple uses of buildings, towers, backup generators, grounding systems, fuel containers, access roads, and parking areas. BLM will not authorize new ROWs or ROW modifications until it is determined that existing authorized space and facilities are being used to maximum allowable occupancy. Maximum allowable occupancy are buildings/facilities that have to be three-quarters (or 75 percent) full before allowing new buildings. Development or modification of a ROW solely to preclude potential competitors from locating nearby is unacceptable and will not be authorized by the BLM.		

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
TRANSPORTATION AND UTILITY CORRIDORS				
Goal 6: Designate and manage ROW corridors to minimize adverse environmental impacts and the proliferation of separate use authorizations while providing an orderly system for transportation and utility purposes.				
Objective 6.1: Meet public demand and reduce impacts to sensitive resources by providing an orderly system of development for transportation and major utility transmission lines and related facilities.				
L&R-47	Designate a corridor 1,400 feet wide from the north side of the Sunrise Instant Study Area south through Rainbow Gardens to the Lake Mead crossover. This corridor is described as west of the east boundary of the IPP-McCullough power lines. Activation and use of this corridor is contingent upon congressional action releasing the instant study area from further wilderness consideration and study. (Note: The width of this corridor within T.20S., R.63E., secs. 23 and 26 is legislatively narrowed to 500 feet wide pursuant to the 2002 Clark County Act and by land-use plan amendment per the 2009 WEC PEIS. Furthermore, in January 2014, Sec. 115(a) of the Consolidated Appropriations Act (H.R. 3547-309), released the Sunrise Mountain ISA from further wilderness consideration and study).	Designate a corridor 3,500 feet wide west of the east boundary of the IPP-McCullough power lines. The corridors starts at the north side of the Rainbow Gardens ACEC extending south through the ACEC from T.20S., R.63E. sec. 1 through T.21S, R.63E., sec. 21. This corridor overlaps the 500-foot-wide legislative corridor pursuant to the 2002 Clark County Act.		Designate a corridor 5,280 feet wide west of the east boundary of the IPP-McCullough power lines. The corridors starts at the north side of the Rainbow Gardens ACEC extending south through the ACEC from T.20S., R.63E. sec. 1 through T.21S, R.63E., sec. 21. This corridor overlaps the 500-foot-wide legislative corridor pursuant to the 2002 Clark County Act.

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
TRANSPORTATION AND UTILITY CORRIDORS				
L&R-48	An approximate total of 158,806 acres of proposed corridor designations is involved, including legislative designations and the proposed Sunrise Mountain designation. The corridors range in width from 1,400 feet to 3,000 feet, for a total length of approximately 538 miles. Corridor widths vary from 500 feet wide to 3,500 feet wide. *Alternative 1 map (p. 2142)*	See the Corridors Alternative 2 map for location of the proposed corridor designations in this alternative. Corridor widths vary from 2,000 feet wide to 3,500 feet wide. *Alternative 2 map (p. 2142)*	See the Corridors Alternative 3 map for location of the proposed corridor designations in this alternative. Corridor widths vary from 2,000 feet wide to 3,500 feet wide. *Alternative 3 map (p. 2142)*	See the Corridors Alternative 4 map for location of the proposed corridor designations in this alternative. Corridor widths vary from 2,000 feet wide to 5,280 feet wide. *Alternative 4 map (p. 2142)*
L&R-49	Manage the congressionally mandated Interstate Route 15 South Corridor (or Ivanpah Valley Corridor), consistent with the 2002 Clark County Act, to provide for high-quality development in Clark County. This corridor extends along Interstate 15 south of the Las Vegas Valley to Nevada and California state line. Pursuant to the 2002 Clark County Act, this corridor is legislatively restricted to a width of 2,640 feet between the Las Vegas valley and the proposed Ivanpah Airport for the placement, on a non-exclusive basis, of utilities and transportation. Subject to valid existing rights, the corridor is withdrawn from location and entry under the mining laws, and from operation under the mineral leasing and geothermal leasing laws until the Secretary terminates the withdrawal or the corridor or land, respectively, is patented.			
L&R-50	Manage the congressionally mandated Moapa Corridors consistent with P.L. 96–491 (December 2, 1980) and ROW regulation and policy. This corridor is legislatively restricted to a width of 3,000 feet. This corridor starts at the most northeastern part of the Moapa River Indian Reservation, in T. 15 S., R. 65 E., secs. 12 and 13, running southwest through the reservation, terminating just north of the Crystal substation in T. 16 S., R. 64 E., secs. 32, 33, and 34. Pursuant to P.L. 96-491, the Secretary of the Interior has the authority through FLPMA to grant and administer ROWs through this congressionally designated corridor.			
L&R-51	Manage those federally excepted and reserved transportation and utility corridors within those lands patented pursuant to the Eldorado Valley Transfer Act (P.L. 85-339, as amended), and ROW regulation and policy. The Eldorado Valley Corridors are located southeast of Las Vegas, south of the cities of Henderson and Boulder City, and east of the McCullough Mountains in Clark County.			
L&R-52	Manage the legislative Apex Corridor consistent with P.L. 101-67. The Apex Corridor starts in T. 17 S., R. 63 E., sec. 32 and continues south along the western boundary of the Apex site. There are multiple Apex Corridors that extend through the Apex site, with widths that vary up to 2,000 feet.			

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
TRANSPORTATION AND UTILITY CORRIDORS				
L&R-53	Manage those corridors designated as West-Wide Energy Corridors (WWEC) consistent with Sec. 368 of the Energy Policy Act of 2005 [P.L. 109-58], the 2008 Final Programmatic EIS (DOE/EIS-0386), the January 2009 BLM RMP Amendment/Record of Decision, and the July 2012 court-approved Settlement Agreement for the Wilderness Society v. United States Department of the Interior, No. 3:09-cv-03048-JW (D.N.D. Cal.) (referred as the "Settlement"). Per the Settlement, the BLM, U.S. Forest Service, and Department of Energy developed an interagency work group and entered into a Memorandum of Understanding (MOU) that was approved on July 8, 2013. The MOU and corresponding work plans provide the framework for future corridor studies and periodic regional reviews of corridors. Furthermore, the Settlement specified a number of corridors with a variety of environmental, cultural, and other concerns ("Corridor of Concern" or COC), as well as a process for the ongoing use and modification of corridors, including revisions to, deletions from, and additions of designated corridors taking into consideration certain principles such as: location of corridors in favorable landscapes; facilitation of renewable energy projects where feasible; avoidance of environmentally sensitive areas to the maximum extent practicable; minimize the proliferation of dispersed rights-of-way crossing the landscape; and improvement of the long-term benefits of reliable and safe energy transmission. These corridors are referred as WWEC or Sec. 368 corridors.			
L&R-54	The 2009 Record of Decision for the West-Wide Energy Corridor Programmatic EIS (WWEC PEIS) evaluated utility corridors within the planning area for inclusion in the nationwide designations authorized by Section 368 of the Energy Policy Act of 2005. Use of Sec. 368 corridors (or WWEC) that are considered to be corridors of concern will require an extensive review and analysis consistent with the July 2012 Settlement Agreement during project level implementation. Use of interagency operating procedures (IOPs) as defined in Appendix B of the WWEC PEIS for projects sited/proposed within Sec. 368 corridors is required. The IOPs provide uniform processing and performance criteria for energy transportation rights-of-way during project planning, construction, operation, and decommissioning.			

2.5.4. Special Designations

2.5.4.1. Areas of Critical Environmental Concern

2.5.4.1.1. Summary of Existing and Potential ACECs

The following table summarizes the existing and proposed areas of critical environmental concern to be considered in this RMP revision. It describes the range of ACECs and relevant and important values to be considered for designation, and the range of sizes being considered for each area.

There are 23 existing ACECs and 23 potential ACECs. Two ACECs designated in the 1998 RMP are not included in this analysis as they are located in the Red Rock Canyon National Conservation Area and Sloan Canyon National Conservation Area. Management of the areas previously designated as the Bird Spring ACEC (not to be confused with the proposed Bird Spring Valley ACEC) and Sloan Rock Art District ACEC is outlined within the RMPs for those national conservation areas and is, therefore, outside the scope of this RMP.

Maps:

- ACEC, Alternative 1 (p. 2142)
- ACEC, Alternative 2 (p. 2143)
- ACEC, Alternative 3 (p. 2143)
- ACEC, Alternative 4 (p. 2143)

Table 2.37. ACEC Summary Table

ACEC Summary Table				
ACEC	**Alternative 1**	**Alternative 2**	**Alternative 3**	**Alternative 4**
Goal 1: Provide increased protection for important historic, cultural, or scenic values; fish and wildlife resources; natural process or systems; and/or natural hazards while continuing to provide public access to enjoy these resources and compatible economic uses of public land.				
Objective 1.1: Establish ACECs to protect significant cultural, natural, or geologic values. **Objective 1.2:** Establish ACECs to manage habitat of listed and sensitive species to maintain or improve species resiliency and ensure persistence. **Objective 1.3:** Establish ACECs to protect the public from significant natural hazards.				
	Manage 23 existing ACECs (1,014,301 acres) to protect the relevant and important values below. Specific management prescriptions are found in Table 2.38, "Management Actions Pertaining to all ACECs" (p. 187). *Alternative 1 map (p. 2142)*	Manage 21 existing and designate and manage 23 new ACECs (44 total, 1,444,548 acres) to protect the relevant and important values below. Specific management prescriptions are found in Table 2.38, "Management Actions Pertaining to all ACECs" (p. 187). *Alternative 2 map (p. 2143)*	Manage 21 existing and designate and manage 20 new ACECs (41 total, 1,292,216 acres) to protect the relevant and important values below. Specific management prescriptions are found in Table 2.38, "Management Actions Pertaining to all ACECs" (p. 187). *Alternative 3 map (p. 2143)*	Manage 21 existing and designate and manage 4 new ACECs (25 total, 1,021,365 acres) to protect the relevant and important values below. Specific management prescriptions are found in Table 2.38, "Management Actions Pertaining to all ACECs" (p. 187). *Alternative 4 map (p. 2143)*
Amargosa Mesquite (Pahrump Field Office)	6,784 acres	9,642 acres		6,784 acres
Relevant and important values identified	Neotropical migratory bird habitat	Neotropical migratory bird habitat, relic plant community (mesquite), and cultural/historic values		Neotropical migratory bird habitat
Arden Historic Sites (Las Vegas Field Office)	1,443 acres	Release the area from ACEC designation.		
Relevant and important values identified	Historic railroad construction and mining sites	Release the area from ACEC designation.		
Arrow Canyon (LVFO)	2,070 acres			
Relevant and important values identified	Paleontological resources (Miocene bird tracks); geological (candidate for the mid-Carboniferous boundary stratotype section); and cultural resources (prehistoric rock art)	Paleontological resources (Miocene bird tracks); geological (candidate for the mid-Carboniferous boundary stratotype section); cultural resources (prehistoric rock art), and scenic values		
Ash Meadows (PFO)	37,280 acres	28,084 acres	28,005 acres	27,555 acres

ACEC Summary Table				
ACEC	**Alternative 1**	**Alternative 2**	**Alternative 3**	**Alternative 4**
Relevant and important values identified	Devil's Hole pupfish, Ash Meadows Amargosa pupfish, Warm Springs pupfish, Ash Meadows speckled dace, Ash Meadows naucorid, Amargosa niterwort, Ash Meadows milkvetch, spring-loving centaury plant, Ash Meadows sunray, Ash Meadows ivesia, and Ash Meadows blazing star			
Big Dune (PFO)	1,900 acres	2,455 acres	1,589 acres	428 acres
Relevant and important values identified	Giuliani's Big Dune scarab; Big Dune aphodius scarab; large aegialian scarab; and Rulien's miloderes weevil			
Bird Spring Valley (LVFO)	No similar action.	78,959 acres	26,987 acres	No similar action.
Relevant and important values identified	No similar action.	Desert tortoise, western burrowing owl, and yellow two-tone beardtongue		No similar action.
Bitter Springs (LVFO)	No similar action.	61,733 acres		No similar action.
Relevant and important values identified	No similar action.	Scenic values, Las Vegas bearpoppy, sticky ringstem, Las Vegas buckwheat, and desert bighorn sheep		No similar action.
California Wash (LVFO)	No similar action.	11,998 acres	No similar action.	
Relevant and important values identified	No similar action.	Cultural/historic values and threecorner milkvetch	No similar action.	
Coyote Springs (LVFO)	51,527 acres			
Relevant and important values identified	Desert tortoise			
Crescent Townsite (LVFO)	436 acres	Release the area from ACEC designation.		
Relevant and important values identified	Historic railroad construction and mining sites	Release the area from ACEC designation.		
Devil's Throat (LVFO)	639 acres			
Relevant and important values identified	Natural hazard area			
Gale Hills (LVFO)	No similar action.	3,865 acres		No similar action.
Relevant and important values identified	No similar action.	Cultural/historic values, scenic values, Las Vegas bearpoppy, and Las Vegas buckwheat		No similar action.
Gold Butte, Part A (LVFO)	186,566 acres	186,064 acres	183,441 acres	
Relevant and important values identified	Desert tortoise	Scenic values, cultural/historic values, desert tortoise, relict leopard frog		
Gold Butte, Part B (LVFO)	122,694 acres	116,734 acres		
Relevant and important values identified	Scenic values, cultural/historic values, desert tortoise, relict leopard frog, desert bighorn sheep, Las Vegas buckwheat, and Las Vegas bearpoppy			
Gold Butte, Part C (Virgin Mountains) (LVFO)	35,707 acres			
Relevant and important values identified	Scenic values, relict forest stands, and desert bighorn sheep	Scenic values, cultural/historic values, relict forest stands, and desert bighorn sheep		

ACEC Summary Table				
ACEC	**Alternative 1**	**Alternative 2**	**Alternative 3**	**Alternative 4**
Gold Butte Townsite (LVFO)	159 acres			
Relevant and important values identified	Historic mining sites	Cultural/historic values and historic mining sites		
Grapevine Spring (PFO)	No similar action.	87 acres		
Relevant and important values identified	No similar action.	Spring Mountains pyrg and Southeast Nevada pyrg		
Hidden Valley (LVFO)	3,357 acres			
Relevant and important values identified	Cultural/historic values	Cultural/historic values and scenic values		
Hiko Wash (LVFO)	No similar action.	709 acres		No similar action.
Relevant and important values identified	No similar action.	Cultural/historic values, scenic values, neotropical migratory bird habitat, and riparian habitat		No similar action.
Ivanpah Valley (LVFO)	31,857 acres			
Relevant and important values identified	Desert tortoise			
Jean Lake (LVFO)	No similar action.	11,606 acres		9,138 acres
Relevant and important values identified	No similar action.	White-margined penstemon		
Keyhole Canyon (LVFO)	240 acres	639 acres		240 acres
Relevant and important values identified	Cultural/historic values	Cultural/historic values, scenic values, and desert tortoise		
Lava Dune (PFO)	No similar action.	437 acres		No similar action.
Relevant and important values identified	No similar action.	Giuliani's Big Dune scarab, Big Dune aphodius scarab, large aegialian scarab, and Rulien's miloderes weevil		No similar action.
Logandale (LVFO)	No similar action.	6,073 acres	No similar action.	
Relevant and important values identified	No similar action.	Cultural/historic values, scenic values, and threecorner milkvetch	No similar action.	
Lower Mormon Mesa (LVFO)	No similar action.	64,559 acres	25,478 acres	No similar action.
Relevant and important values identified	No similar action.	Rare geologic feature		No similar action.
Mesa Milkvetch (LVFO)	No similar action.	9,144 acres	3,500 acres	No similar action.
Relevant and important values identified	No similar action.	Cultural/historic values and threecorner milkvetch		No similar action.
Moapa Mesquite (LVFO)	No similar action.	1,214 acres	1,304 acres	No similar action.
Relevant and important values identified	No similar action.	Cultural/historic values and riparian woodland		No similar action.

ACEC Summary Table				
ACEC	**Alternative 1**	**Alternative 2**	**Alternative 3**	**Alternative 4**
Mormon Mesa (LVFO)	150,489 acres	169,124 acres		161,176 acres
Relevant and important values identified	Desert tortoise			
Mt. Schrader (PFO)	No similar action.	283 acres		No similar action.
Relevant and important values identified	No similar action.	Cultural/historic values		No similar action.
Muddy Mountains (LVFO)	No similar action.	36,196 acres		No similar action.
Relevant and important values identified	No similar action.	Desert bighorn sheep		No similar action.
Old Spanish Trail (LVFO)	No similar action.	49,844 acres	33,848 acres	No similar action.
Relevant and important values identified	No similar action.	Cultural/historic values		No similar action.
Pahrump Valley (PFO)	No similar action.	36,826 acres	20,903 acres	No similar action.
Relevant and important values identified	No similar action.	Mesquite acacia woodlands, neotropical migratory bird habitat, and Pahrump Valley buckwheat	Mesquite acacia woodlands and neotropical migratory bird habitat	No similar action.
Perkins Ranch (LVFO)	No similar action.	408 acres		
Relevant and important values identified	No similar action.	Cultural/historic values, southwestern willow flycatcher, Moapa dace, Muddy River population of the Virgin River chub, neotropical migratory bird habitat, and riparian resources		
Piute/Eldorado (LVFO)	323,710 acres	347,633 acres		338,769 acres
Relevant and important values identified	Desert tortoise	Desert tortoise, desert bighorn sheep, and scenic.		Desert tortoise
Rainbow Gardens (LVFO)	38,764 acres	35,353 acres		
Relevant and important values identified	Cultural/historic values, scenic values, Las Vegas buckwheat, Las Vegas bearpoppy, paleontological resources (Pleistocene megafauna), and a geologic feature (Great Unconformity)			
Red Rock Spring (LVFO)	638 acres			
Relevant and important values identified	Cultural/historic values	Cultural/historic values and relict leopard frog		
River Mountains (LVFO)	11,029 acres	6,697 acres		
Relevant and important values identified	Scenic values and desert bighorn sheep			
Sandy Valley (LVFO)	No similar action.	210 acres	No similar action.	
Relevant and important values identified	No similar action.	Pahrump Valley buckwheat	No similar action.	
Specter Hills (PFO)	No similar action.	5,420 acres		No similar action.
Relevant and important values identified	No similar action.	White-margined penstemon		No similar action.

ACEC Summary Table				
ACEC	**Alternative 1**	**Alternative 2**	**Alternative 3**	**Alternative 4**
Spirit Mountain (LVFO)	No similar action.	9,488 acres		No similar action.
Relevant and important values identified	No similar action.	Cultural/historic values		No similar action.
Stewart Valley (PFO)	No similar action.	5,204 acres	3,249 acres	No similar action.
Relevant and important values identified	No similar action.	Cultural/historic values, mesquite woodlands, and Pahrump Valley buckwheat		No similar action.
Stuart Ranch (LVFO)	No similar action.	278 acres		
Relevant and important values identified	No similar action.	Cultural/historic values, relict leopard frog, southwestern willow flycatcher, Meadow Valley desert sucker, Meadow Valley Wash speckled dace, desert tortoise, and riparian habitat		
Stump Spring (LVFO)	647 acres			
Relevant and important values identified	Cultural/historic values			
Upper Las Vegas Wash (LVFO)	No similar action.	12,296 acres		No similar action.
Relevant and important values identified	No similar action.	Cultural/historic values, paleontological, Le Conte's thrasher		No similar action.
Virgin River (LVFO)	6,185 acres	8,500 acres		7,493 acres
Relevant and important values identified	Cultural/historic values, Virgin River chub, woundfin, southwestern willow flycatcher, and riparian habitat			
Whitney Pocket (LVFO)	160 acres			
Relevant and important values identified	Cultural/historic values			

2.5.4.1.2. ACEC Management Actions

Table 2.38. Management Actions Pertaining to all ACECs

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Lands and Realty				
ACEC-01	Retain all ACECs in federal ownership.			
ACEC-02	Incorporate ACECs on lands relinquished from withdrawal to other federal agencies into the ACEC. Also apply the management guidance, restrictions, and directions appropriate to ACEC to the relinquished lands.	Incorporate lands into ACECs that are relinquished from withdrawal by other federal agencies that are within or contiguous to an ACEC and contain significant relevant and important values. Apply the management guidance and directions appropriate to the ACEC to the relinquished lands.		
ACEC-03	No similar action.	All lands acquired within or adjacent to ACECs for the purpose of conservation of relevant and important values will be incorporated into the ACEC at the time of acquisition.		
ACEC-04	Require the reclamation of temporary roads within all ACECs.	No similar action.		
ACEC-05	All ACECs would authorize new roads in response to specific actions only.	Allow new road ROWs within ACECs on a case-by-case basis.		
ACEC-06	Ensure access to private property.	Ensure reasonable access to private property.		
ACEC-07	Limit recreation facility development within ACECs to those necessary for resource protection.	Unless otherwise restricted by law, BLM facilities, ROWs, and free-use permits (FUPs) that provide resource protection, enhance the relevant and important values, manage recreational use, and/or address human health and safety would be allowed on a case-by-case basis even if otherwise excluded below. Commercial uses that enhance resource protection or manage recreational use, and that enhance or conserve the relevant and important values (otherwise excluded below) would be allowed on a case-by-case basis.		
ACEC-08	No similar action.	All ACECs are subject to valid and existing rights. Unless otherwise restricted by law, allow renewal and transfer of existing land-use authorizations (LUAs) within ACECs if otherwise designated as avoidance or exclusion zones.		
ACEC-09	No similar action.	Attain no net unmitigated loss of relevant and important values within ACECs due to BLM-authorized activities.		Address the loss of relevant and important values within ACECs on a case-by-case basis.
ACEC-10	No similar action.	Do not authorize any actions that lead to the irreparable damage of relevant and important values within ACECs.		
Special Status Species and Wildlife				

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
ACEC-11	Establish ACECs specifically for management of desert tortoises within the Colorado Desert, Northeastern Mojave, and Eastern Mojave recovery units identified in the Tortoise Recovery Plan (USFWS 1994, 2011). Manage a sufficient quality and quantity of desert tortoise habitat, which in combination with tortoise habitat on other federal, state, and private lands, will meet recovery plan criteria. Maintain functional corridors of habitat between ACECs to increase the chance of long-term persistence of desert tortoise populations within the recovery unit.			
ACEC-12	No similar action.	Allow commercial, scientific, and casual collection of sensitive invertebrate species only with a BLM permit.		
Integrated Vegetation				
ACEC-13	Do not allow commercial collection of flora in the Coyote Springs, Gold Butte Part A, Mormon Mesa, and Piute/Eldorado ACECs.	Commercial seed collections would be allowed in all ACECs on a case-by-case basis, except where otherwise prohibited (such as a wilderness area) and as long as it is compatible with resource management objectives. Local seed collections for project-specific restoration will be allowed within the project footprint and within 1,000 feet adjacent to the project area.		
ACEC-14	Allow harvesting of green or dead-and-down mesquite by permit only and where consistent with sustaining plant communities in a healthy and vigorous state and also consistent with sustaining viable wildlife populations.	Prohibit woodcutting and firewood gathering for commercial and personal use.		
ACEC-15	No similar action.	Temporary disturbance in all ACECs would be restored in accordance with Southern Nevada District Office restoration standards.		
Wilderness Study Areas				
ACEC-16	Manage those portions of an ACEC within a WSA under the Interim Management Policy until Congress makes further determination on their status. For those areas released from wilderness consideration by Congress, manage under the appropriate ACEC guidance, restrictions, and directions.	Manage those portions of an ACEC within a WSA under BLM Manual 6330–Management of Wilderness Study Areas until Congress makes further determination on their status. For those areas released from wilderness consideration by Congress, manage under the appropriate ACEC guidance, restrictions, and directions.		

Table 2.39. Management Actions Pertaining to Specific ACECs

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Amargosa Mesquite ACEC (Pahrump Field Office)				
ACEC-17	Manage as a 6,784-acre ACEC to protect neotropical migratory bird habitat.	Manage as 9,642-acre ACEC to protect neotropical migratory bird habitat, mesquite groves, and cultural/historic values.		Manage as a 6,784-acre ACEC to protect neotropical migratory bird habitat.
	Management prescriptions: In addition to the management prescriptions listed above for all ACECs, the following prescriptions would apply:			
	Lands and Realty:			
	• Linear ROWs: Avoid			
	• Site-type LUAs: Avoid except within designated corridors.	• Site-type LUAs: Avoid site-type LUAs less than 5 acres. Exclude site-type LUAs greater than 5 acres.		
	• Material site ROWs: Closed			
	Minerals:			
	• Fluid leasable: CSU	• Fluid leasable: Closed	• Fluid leasable: NSO (vehicle access and exploration limited to designated roads, primitive roads, and trails). Closed except for the disposal of excess materials associated with other permitted actions, trespass resolution, and free-use permits to the BLM. There is a half-mile buffer along the lateral edges of the ACEC designated as NSO; all remaining areas within the interior of the ACEC beyond this buffer are designated as closed to fluid leasable mineral development.	• Fluid leasable: CSU
	• Solid leasable: Closed			
	• Locatable: Withdrawn (6,784 acres)	• Locatable: 9,642-acre pre-existing ACEC withdrawn. Pursue withdrawal on additional acres added to the ACEC.		• Locatable: Withdrawn
	• Saleable: Closed	• Saleable: Closed except for disposal of excess materials associated with other permitted actions and trespass resolution; FUPs to the BLM.		
	Wild Horse and Burros: Manage wild horses and burros for an AML of zero.	No similar action.		
	Recreation:			
	• Camping: Allowed			
	• Speed events: Excluded			

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Amargosa Mesquite ACEC (Pahrump Field Office)				
	• Non-speed events: Allowed			
	• Commercial activities: Allowed			
	Travel Management: Limited to existing	**Travel Management:** Limited to designated		
	No similar action.	**Water Rights:** Seek to obtain water rights to support the maintenance of the water table and surface flow.		**Water Rights:** Do not seek to obtain.

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Arden Historic ACEC (Las Vegas Field Office)				
ACEC-18	Manage as a 1,443-acre ACEC to protect historic railroad construction and mining sites.	Release the ACEC and associated locatable withdrawal. Open to saleable and leasable mineral development.		
	Management prescriptions: In addition to the management prescriptions listed above for all ACECs, the following prescriptions would apply:			
	Lands and Realty: ● Linear ROWs: Avoid except in designated corridors ● Site-type LUAs: Exclude ● Material site ROWs: Closed			
	Minerals: ● Fluid leasable: NSO ● Solid leasable: Closed ● Locatable: Withdrawn (1,443 acres) ● Saleable: Closed			
	Recreation: ● Camping: Closed ● Speed events: Excluded ● Non-speed events: Allowed ● Commercial activities: Allowed			
	Travel Management: Closed			

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Arrow Canyon ACEC (LVFO)				
ACEC-19	Manage as a 2,070-acre ACEC to protect paleontological resources (Miocene bird tracks); geological (candidate for the mid-Carboniferous boundary stratotype section); and cultural resources (prehistoric rock art).	Manage as a 2,070-acre ACEC to protect paleontological resources (Miocene bird tracks); geological (candidate for the mid-Carboniferous boundary stratotype section); cultural resources (prehistoric rock art), and scenic values.		
	Management prescriptions: In addition to the management prescriptions listed above for all ACECs, the following prescriptions would apply:			
	Lands and Realty:			
	• Linear ROWs: Avoid except in designated corridors	• Linear ROWs: Avoid. Exclude in wilderness.		
	• Site-type LUAs: Avoid except within designated corridors.	• Site-type LUAs: Avoid site-type LUAs less than 5 acres. Exclude site-type LUAs greater than 5 acres.		
	• Material site ROWs: Closed			
	Minerals:			
	• Fluid leasable: NSO	• Fluid leasable: Closed	• Fluid leasable: NSO (vehicle access and exploration limited to designated routes) except closed in wilderness. There is a half-mile buffer along the lateral edges of the ACEC designated as NSO; all remaining areas within the interior of the ACEC beyond this buffer are designated as closed to fluid leasable mineral development.	
	• Solid leasable: Closed			
	• Locatable: Withdrawn (2,070 acres)			
	• Saleable: Closed	• Saleable: Closed except for the disposal of excess materials associated with other permitted actions, trespass resolution, and free-use permits to the BLM.		
	Recreation: • Camping: Allowed • Speed events: Excluded • Non-speed events: Allowed • Commercial activities: Allowed			
	Travel Management: Limited to designated			
	Fish and Wildlife and Sensitive Species: • Support installation of tortoise-proof fencing and culverts to allow tortoises to cross under highways and other heavily traveled roads.			

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Ash Meadows ACEC (PFO)				
ACEC-20	Manage as a 37,280-acre ACEC to protect special status species habitats.	Manage as a 28,084-acre ACEC to protect special status species habitats.	Manage as a 28,005-acre ACEC to protect special status species habitats.	Manage as a 27,555-acre ACEC to protect special status species habitats.
	Management prescriptions: In addition to the management prescriptions listed above for all ACECs, the following prescriptions would apply:			
	Lands and Realty:			
	• Acquisitions: Acquire private land on a willing seller basis.			
	• Retain under BLM management	• Pursue withdrawal to USFWS refuge system	• Retain under BLM management	
	• Linear ROWs: Avoid except in designated corridors	• Linear ROWs: Avoid		
	• Site-type LUAs: Avoid except within designated corridors.	• Site-type LUAs: Avoid site-type LUAs less than 5 acres. Exclude site-type LUAs greater than 5 acres.	• Site-type LUAs: Avoid site-type LUAs less than 5 acres. Exclude site-type LUAs greater than 5 acres.	
	• Material site ROWs: Closed			
	Minerals:			
	• Fluid leasable: NSO, except closed to geothermal prospecting exploration and leasing, including BLM lands inside the Ash Meadows NWR.	• Fluid leasable: Closed		• Fluid leasable: NSO (vehicle access and exploration limited to designated routes), except closed to geothermal prospecting exploration and leasing, including BLM lands inside the Ash Meadows NWR.
	• Solid leasable: Closed			
	• Locatable: Withdrawn (37,280 acres)	• Locatable: Release the associated locatable withdrawal on 9,736 acres no longer managed as an ACEC.	• Locatable: Release the associated locatable withdrawal on 9,275 acres no longer managed as an ACEC.	• Locatable: Release the associated locatable withdrawal on 9,725 acres no longer managed as an ACEC.
	• Saleable: Closed	• Saleable: Closed except for the disposal of excess materials associated with other permitted actions, trespass resolution, and free-use permits to the BLM.		
	Livestock Grazing: Closed			
	Wild Horse and Burros: Manage wild horses and burros for an AML of zero.	No similar action (area is in a herd area but not a herd management area).		
	Recreation: • Camping: Allowed • Speed events: Excluded • Non-speed events: Allowed • Commercial activities: Allowed			

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Ash Meadows ACEC (PFO)				
	Travel Management: Limited to existing	**Travel Management:** Limited to designated		
	No similar action.	**Water Rights:** Seek to obtain water rights to support the maintenance of the water table and surface flow.		
	Fish and Wildlife and Sensitive Species: ● Maintain, restore, and/or improve springs, wet meadow, and desert habitats to potential natural community or desired plant community.			

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Big Dune ACEC (PFO)				
ACEC-21	Manage as a 1,900-acre ACEC to protect special status species habitat.	Manage as a 2,455-acre ACEC to protect special status species habitat.	Manage as a 1,589-acre ACEC to protect special status species habitat.	Manage as a 428-acre ACEC to protect special status species habitat.
	Management prescriptions: In addition to the management prescriptions listed above for all ACECs, the following prescriptions would apply:			
	Lands and Realty: ● Linear ROWs: Exclude except for those that meet ACEC-07 (p. 187). ● Site-type LUAs: Exclude except for those that meet ACEC-07 (p. 187). ● Material site ROWs: Closed			
	Minerals:			
	● Fluid leasable: NSO	● Fluid leasable: Closed	● Fluid leasable: NSO (vehicle access and exploration limited to designated routes). There is a half-mile buffer along the lateral edges of the ACEC designated as NSO; all remaining areas within the interior of the ACEC beyond this buffer are designated as closed to fluid leasable mineral development.	
	● Solid leasable: Closed			
	● Locatable: Withdrawn (1,900 acres)	● Locatable: 2,455-acre pre-existing ACEC is withdrawn. Pursue withdrawal on 539 acres added to the ACEC.	● Locatable: Release the associated locatable withdrawal on 311 acres no longer managed as an ACEC.	● Locatable: Release the associated locatable withdrawal on 1,472 acres no longer managed as an ACEC.
	● Saleable: Closed	● Saleable: Closed except for the disposal of excess materials associated with other permitted actions, trespass resolution, and free-use permits to the BLM.		
	Recreation:			
	● Camping: Allowed	● Camping: Closed	● Camping: Allowed	
	● Speed events: Excluded		● Speed events: Exclude truck and buggy events. ATV, motorcycle, and UTV are permitted outside beetle habitat closed area. Permits issued on a case-by-case basis June 1 through March 31 with restrictions to limit impacts to adjacent beetle habitat.	
	● Non-speed events: Allowed	● Non-speed events: Allow motorized and mechanized activities outside of the closed area. Use of designated routes is OK. Permits issued on a case-by-case basis June 1 through March 31 with restrictions to limit impacts to adjacent beetle habitat.		
	● Commercial activities: Allowed	● Commercial activities: Allow primitive recreation activities. Allow motorized and mechanized activities outside of the closed area. The use of designated routes is OK. Permits are issued on a case-by-case basis June 1 through March 31 with restrictions to limit impacts to adjacent beetle habitat.		
	Travel Management: 10 to 15 percent closed, 85 to 90 percent open	**Travel Management:** Open in dune area only. Driving on vegetation is prohibited. Closed to motorized and mechanized use in the beetle habitat area at Big Dune.		
	Fish and Wildlife and Sensitive Species:			
	● Maintain 1,900 acres of sand dune habitat in a natural condition to support all species dependent upon dune habitat, with emphasis on special status species.	● Maintain and restore sand dune habitat in a natural condition to support all species dependent upon dune habitat, with emphasis on special status species.	● Maintain sand dune habitat in a natural condition to support all species dependent upon dune habitat, with an emphasis on special status species.	

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Bird Spring Valley ACEC (LVFO)				
ACEC-22	No similar action.	Designate and manage as a 78,959-acre ACEC to protect desert tortoise habitat, burrowing owl habitat, and vegetation communities.	Designate and manage as a 26,987-acre ACEC to protect desert tortoise habitat, burrowing owl habitat, and vegetation communities.	The proposed ACEC would not be designated.
		Management prescriptions: In addition to the management prescriptions listed above for all ACECs, the following prescriptions would apply:		
		Lands and Realty:		
		• Linear ROWs: Avoid except in designated corridors		
		• Site-type LUAs: Exclude site type LUAs less than 5 acres except within designated corridors and within one quarter mile of the edge of a federal aid highway. Within designated corridors, limit site type LUAs less than 5 acres to those that are necessary for the operation of linear ROWs. Exclude site-type LUAs greater than 5 acres.	• Site-type LUAs: Avoid site-type LUAs less than 5 acres except within designated corridors. Exclude site-type LUAs greater than 5 acres.	
		• Material site ROWs: Closed		
		• Exclude landfills	No similar action	
		• Exclude military maneuvers	No similar action	
		• Allow commercial activities on a case-by-case basis	No similar action	
		Minerals:		
		• Fluid leasable: Closed • Solid leasable: Closed • Locatable: Pursue withdrawal • Saleable: Closed except for the disposal of excess materials associated with other permitted actions, trespass resolution, and free-use permits to the BLM.	• Fluid leasable: CSU • Solid leasable: Closed • Locatable: Open • Saleable: Open	
		Recreation:		
		• Camping: Allowed in designated areas. • Speed events: Excluded • Non-speed events: Allowed	• Camping: Prohibit camping except where specifically authorized and designated within	

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Bird Spring Valley ACEC (LVFO)				
		• Commercial activities: Allowed on a case-by-case basis if not in conflict with the protection and conservation of special status species and their habitat.	the Las Vegas SRMA. Allowed outside the Las Vegas SRMA. • Speed events: Motorcycle and ATV events allowed outside the Las Vegas SRMA. Closed to all larger-class vehicle events. • Non-speed events: Allowed • Commercial activities: Allowed	
		Travel Management: Limited to designated		
		Fish and Wildlife and Sensitive Species:		
		• Support installation of tortoise-proof fencing and culverts to allow tortoises to cross under highways and other heavily traveled roads.		
		• Allow commercial collection only upon completion of a credible study or investigation that demonstrates commercial collection does not adversely impact affected species or their habitat as determined by Clark County, BLM, FWS and NDOW.	No similar action	
		• Implement protection, conservation, mitigation and recovery actions dealing with management of the ACEC.	No similar action	
		• Trenching, grading, grubbing, and other similar mechanical ground-disturbing activities would be prohibited during April, May, September and October.	No similar action	
		• 3% disturbance cap on all new authorized and illegal disturbance, excluding all fire. Disturbance cap to be measured per ACEC.	No similar action	
		• Disturbed acres that count against the cap can be offset through reclamation and restoration of other disturbed areas within the ACEC	No similar action	

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Bird Spring Valley ACEC (LVFO)				
		(including disturbance existing prior to the RMP) in order to create space in the disturbance cap.		
		• The acres of reclaimed and restored areas can only be counted after the completion of the reclamation/restoration project.	No similar action	

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Bitter Springs ACEC (LVFO)				
ACEC-23	No similar action.	Designate and manage as a 61,733-acre ACEC to protect scenic values, bighorn sheep, and vegetation communities.		The proposed ACEC would not be designated.
		Management prescriptions: In addition to the management prescriptions listed above for all ACECs, the following prescriptions would apply:		
		Lands and Realty:		
		• Linear ROWs: Avoid.		
		• Site-type LUAs: Exclude site type LUAs less than 5 acres except within designated corridors and within one quarter mile of the edge of a federal aid highway. Within designated corridors, limit site type LUAs less than 5 acres to those that are necessary for the operation of linear ROWs. Exclude site-type LUAs greater than 5 acres.	• Site-type LUAs: Avoid site-type LUAs less than 5 acres except within one half mile of the edge of federal-aid highway ROWs. Exclude site-type LUAs greater than 5 acres.	
		• Material site ROWs: Closed		
		• Exclude landfills	No similar action	
		• Exclude military maneuvers	No similar action	
		• Allow commercial activities on a case-by-case basis	No similar action	
		Minerals:		
		• Fluid leasable: Closed	• Fluid leasable: CSU	
		• Solid leasable: Closed		
		• Locatable: Pursue withdrawal	• Locatable: Open	
		• Saleable: Closed except for the disposal of excess materials associated with other permitted actions, trespass resolution, and free-use permits to the BLM.		
		Recreation:		
		• Camping: Allowed in designated areas. • Speed events: Excluded • Non-speed events: Allowed • Commercial activities: Allowed on a case-by-case basis if not in conflict with the protection and conservation of special status species and their habitat.	• Camping: Allowed • Speed events: Motorcycle and ATV events allowed. Closed to all larger-class vehicle events. • Non-speed events: Allowed • Commercial activities: Allowed	

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Bitter Springs ACEC (LVFO)				
		Travel Management: Limited to designated		
		Fish and Wildlife and Sensitive Species:		
		• Support installation of tortoise-proof fencing and culverts to allow tortoises to cross under highways and other heavily traveled roads.	No similar action	
		• Allow commercial collection only upon completion of a credible study or investigation that demonstrates commercial collection does not adversely impact affected species or their habitat as determined by Clark County, BLM, FWS and NDOW.	No similar action	
		• Implement protection, conservation, mitigation and recovery actions dealing with management of the ACEC.	No similar action	
		• Trenching, grading, grubbing, and other similar mechanical ground-disturbing activities would be prohibited during April, May, September and October.	No similar action	
		• 3% disturbance cap on all new authorized and illegal disturbance, excluding all fire. Disturbance cap to be measured per ACEC.	No similar action	
		• Disturbed acres that count against the cap can be offset through reclamation and restoration of other disturbed areas within the ACEC (including disturbance existing prior to the RMP) in order to create space in the disturbance cap.	No similar action	

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Bitter Springs ACEC (LVFO)				
		• The acres of reclaimed and restored areas can only be counted after the completion of the reclamation/restoration project.	No similar action	

	Alternative 1	Alternative 1	Alternative 1	Alternative 1
California Wash ACEC (LVFO)				
ACEC-24	No similar action.	Designate and manage as an 11,998-acre ACEC to protect cultural and historic values and vegetation communities. **Management prescriptions:** In addition to the management prescriptions listed above for all ACECs, the following prescriptions would apply: **Lands and Realty:** ● Linear ROWs: Avoid ● Site-type LUAs: Exclude site type LUAs less than 5 acres except within designated corridors and within one quarter mile of the edge of a federal aid highway. Within designated corridors, limit site type LUAs less than 5 acres to those that are necessary for the operation of linear ROWs. Exclude site-type LUAs greater than 5 acres. ● Material site ROWs: Closed ● Exclude landfills ● Exclude military maneuvers ● Allow commercial activities on a case-by-case basis **Minerals:** ● Fluid leasable: Closed ● Solid leasable: Closed ● Locatable: Pursue withdrawal ● Saleable: Closed except for the disposal of excess materials associated with other permitted actions, trespass resolution, and free-use permits to the BLM. **Recreation:** ● Camping: Allowed in designated areas.	The proposed ACEC would not be designated.	

	Alternative 1	Alternative 1	Alternative 1	Alternative 1
California Wash ACEC (LVFO)				
		• Speed events: Excluded • Non-speed events: Allowed • Commercial activities: Allowed on a case-by-case basis if not in conflict with the protection and conservation of special status species and their habitat.		
		Travel Management: Limited to designated		
		Fish and Wildlife and Sensitive Species: • Support installation of tortoise-proof fencing and culverts to allow tortoises to cross under highways and other heavily traveled roads. • Allow commercial collection only upon completion of a credible study or investigation that demonstrates commercial collection does not adversely impact affected species or their habitat as determined by Clark County, BLM, FWS and NDOW. • Implement protection, conservation, mitigation and recovery actions dealing with management of the ACEC. • Trenching, grading, grubbing, and other similar mechanical ground-disturbing activities would be prohibited during April, May, September and October. • 3% disturbance cap on all new authorized and illegal disturbance, excluding all fire. Disturbance cap to be measured per ACEC.		

	Alternative 1	Alternative 1	Alternative 1	Alternative 1
California Wash ACEC (LVFO)				
		• Disturbed acres that count against the cap can be offset through reclamation and restoration of other disturbed areas within the ACEC (including disturbance existing prior to the RMP) in order to create space in the disturbance cap. • The acres of reclaimed and restored areas can only be counted after the completion of the reclamation/restoration project.		

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Coyote Springs ACEC (LVFO)				
ACEC-25	Manage as a 51,527-acre ACEC to protect desert tortoise critical habitat.			
	Management prescriptions: In addition to the management prescriptions listed above for all ACECs, the following prescriptions would apply:			
	Lands and Realty:			
	• Linear ROWs: Avoid except in designated corridors	• Linear ROWs: Exclude except in designated corridors		
	• Site-type LUAs: Exclusion except allow within one half mile of the center line of federal-aid highways.	• Site-type LUAs: Exclude site-type LUAs less than 5 acres except within designated corridors, within one quarter mile of the edge of federal-aid highway ROWs and those that meet ACEC-07 (p. 187). Within designated corridors: Limit site-type LUAs less than 5 acres to those that are integral to operation of linear ROWs. Exclude site-type LUAs greater than 5 acres.	• Site-type LUAs: Exclude site-type LUAs less than 5 acres except within designated corridors, within one half mile of the edge of federal-aid highway ROWs, and those that meet ACEC-07 (p. 187). Within designated corridors: Limit site-type LUAs less than 5 acres to those that are integral to operation of linear ROWs. Exclude site-type LUAs greater than 5 acres.	
	• Material site ROWs: Allow within one half mile of the center line of federal-aid highways.	• Material site ROWs: Allow within one quarter mile of the edge of federal-aid highway ROWs	• Material site ROWs: Allow within one half mile of the edge of federal-aid highway ROWs	
	• FHWA and NDOT mineral material site ROWs: Allow within one half mile of the center line of federal-aid highways.	• FHWA and NDOT mineral material site ROWs: Allow within one half mile of the edge of federal-aid highway ROWs		
	• Exclude new landfills.			
	• Do not authorize military maneuvers.	• Do not authorize ground-disturbing military maneuvers.		
	• Commercial activities may be permitted on a case-by-case basis if not in conflict with recovery of the desert tortoise.	No similar action.		
	Minerals:			
	• Fluid leasable: NSO	• Fluid leasable: Closed	• Fluid leasable: NSO (vehicle access and exploration limited to designated routes). There is a half-mile buffer along the lateral edges of the ACEC designated as NSO; all remaining areas within the interior of the ACEC beyond this buffer are designated as closed to fluid leasable mineral development.	
	• Solid leasable: Closed			

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Coyote Springs ACEC (LVFO)				
	● Locatable: Withdrawn			
	● Saleable: Closed except FUPs. Allow FUPs only within one half mile of the center line of federal and state highways and specified county roads. Issue FUPs to government entities only.	● Saleable: Closed except FUPs. Allow FUPs only within one half mile of the edge of federal and state highway rights-of-way and the center line of specified roads. Issue FUPs to government entities only.		
	Livestock Grazing: Closed			
	Wild Horse and Burros: Manage wild horses and burros for an AML of zero.	No similar action (area is not within a herd area).		
	Recreation: ● Camping: Allowed ● Speed events: Excluded ● Non-speed events: Allowed ● Commercial activities: Allowed			
	Travel Management: Limited to designated			
	Fish and Wildlife and Sensitive Species:			
	● Manage the ACEC specifically for desert tortoise recovery.			
	● Allow commercial collection of wildlife only upon completion of either a credible study or investigation that demonstrates commercial collection does not adversely impact affected species or their habitat, as determined by the Nevada Department of Wildlife. This action will not affect hunting, trapping, or casual collection as permitted by the state.			
	No similar action.	● For ground-disturbing activities, additional mitigation actions will be required to occur within the ACEC to maintain the integrity of the tortoise critical habitat unit.		
	● Implement inventory, monitoring, and research projects dealing with management issues within desert tortoise ACECs.			
	No similar action.	● Support installation of tortoise-proof fencing and culverts to allow tortoises to cross under highways and other heavily traveled roads.		
	No similar action.	● Trenching, grading, grubbing, and other similar mechanical ground-disturbing activities would be prohibited during April, May, September, and October.		
	No similar action.	● 160-acre cumulative disturbance cap for new site-type LUAs for Coyote Springs, Mormon Mesa, and Piute/Eldorado ACECs combined	● 320-acre cumulative disturbance cap for new site-type LUAs for Coyote Springs, Mormon Mesa, and Piute/Eldorado ACECs combined.	● 640-acre cumulative disturbance cap for new site-type LUAs for Coyote Springs, Mormon Mesa, and Piute/Eldorado ACECs combined.

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Coyote Springs ACEC (LVFO)				
	Fire: Minimize impacts to tortoise habitat during fire suppression by minimizing the use of mechanized equipment and, where possible, staying on existing roads and trails. However, give priority to keeping the wildfire to an absolute minimum.	**Fire:** ● Minimize impacts to tortoise habitat during response to wildland fire. Give priority to keeping the wildfire size to an absolute minimum. ● Allow prescribed fire use to meet resource objectives and habitat enhancement purposes in appropriate areas to support habitat recovery objectives.		
	Vegetation: Require reclamation of disturbed lands resulting from activities that result in loss or degradation of tortoise habitat with habitat to be reclaimed so that pre-disturbance condition can be reached within a reasonable time frame. Reclamation may include salvage and transplant of cactus and yucca, recontouring of the area, scarification of compacted soil, soil amendments, seeding, and transplant of seedling shrubs. Subsequent seeding or transplanting efforts may be required if monitoring indicates that the original effort was not successful.	**Vegetation:** ● Allow the use of approved herbicides following ground-disturbing activities to implement invasive species control methods and support habitat recovery objectives. ● Activities that result in loss or degradation of tortoise habitat would require reclamation to pre-disturbance condition within a reasonable time frame. Reclamation may include, but is not limited to, salvage and transplant of cactus and yucca, recontouring the area, scarification of compacted soil, soil amendments, seeding, and transplant of seedling shrubs. Subsequent seeding or transplanting efforts may be required if monitoring indicates that the original effort was not successful.		

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Crescent Townsite ACEC (LVFO)				
ACEC-26	Manage as a 436-acre ACEC to protect historic railroad construction and mining sites.	Release the ACEC and associated locatable withdrawal. Open to saleable and leasable mineral development.		
	Management prescriptions: In addition to the management prescriptions listed above for all ACECs, the following prescriptions would apply:			
	Lands and Realty: ● Linear ROWs: Avoid except in designated corridors ● Site-type LUAs: Exclude ● Material site ROWs: Closed			
	Minerals: ● Fluid leasable: NSO ● Solid leasable: Closed ● Locatable: Withdrawn ● Saleable: Closed			
	Recreation: ● Camping: Allowed ● Speed events: Excluded ● Non-speed events: Allowed ● Commercial activities: Allowed			
	Travel Management: Limited to existing			

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Devil's Throat ACEC (LVFO)				
ACEC-27	Manage as a 639-acre ACEC (wholly within the Gold Butte ACEC, Part A) to protect a natural hazard area.			
	Management prescriptions: In addition to the management prescriptions listed above for all ACECs, the following prescriptions would apply:			
	Lands and Realty:			
	● Linear ROWs: Avoid	● Linear ROWs: Exclude except for those that meet ACEC-07 (p. 187).		● Linear ROWs: Avoid
	● Site-type LUAs: Avoid except within designated corridors and within one half mile of the edge of federal-aid highway ROWs.	● Site-type ROWs/leases: Exclude except for those that meet ACEC-07 (p. 187).		● Site-type ROWs/leases: Avoid site-type LUAs less than 5 acres except within one half mile of the edge of federal-aid highway ROWs. Exclude site-type LUAs greater than 5 acres.
	● Material site ROWs: Closed			
	Minerals:			
	● Fluid leasable: NSO	● Fluid leasable: Closed		
	● Solid leasable: Closed			
	● Locatable: Withdrawn			
	● Saleable: Closed			
	Livestock Grazing: Closed			
	Wild Horse and Burros: Manage burros for an AML of zero.	**Wild Horse and Burros:** Pursue reverting area within ACEC from a herd management area into a herd area.		
	Recreation: ● Camping: Allowed ● Speed events: Excluded ● Non-speed events: Allowed ● Commercial activities: Allowed			
	Travel Management: Limited to designated			

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Gale Hills ACEC (LVFO)				
ACEC-28	No similar action.	Designate and manage as a 3,865-acre ACEC to protect scenic, cultural, botanical, and historic values.		The proposed ACEC would not be designated.
		Management prescriptions: In addition to the management prescriptions listed above for all ACECs, the following prescriptions would apply:		
		Lands and Realty: ● Acquisitions: Pursue contiguous parcels containing relevant and important values and incorporate into the ACEC. ● Linear ROWs: Avoid ● Site-type LUAs: Avoid site-type LUAs less than 5 acres. Exclude site-type LUAs greater than 5 acres. ● Material site ROWs: Closed		
		Minerals:		
		● Fluid leasable: Closed	● Fluid leasable: CSU	
		● Solid leasable: Closed	● Solid leasable: Open	
		● Locatable: Pursue withdrawal	● Locatable: Open	
		● Saleable: Closed except for the disposal of excess materials associated with other permitted actions, trespass resolution, and free-use permits to the BLM.		
		Recreation: ● Camping: Allowed ● Speed events: Excluded ● Non-speed events: Allowed ● Commercial activities: Allowed		
		Travel Management: Limited to designated		

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Gold Butte ACEC, Part A (LVFO)				
ACEC-29	Manage as a 186,566-acre ACEC to protect desert tortoise critical habitat.	Manage as a 186,064-acre ACEC (reduced acreage due to Bureau of Reclamation withdrawal) to protect desert tortoise critical habitat, relict leopard frog, scenic values, and cultural and historic values.	Manage as a 183,441-acre ACEC (reduced acreage due to Bureau of Reclamation withdrawal) to protect desert tortoise critical habitat, relict leopard frog, scenic values, and cultural and historic values.	
	Management prescriptions: In addition to the management prescriptions listed above for all ACECs, the following prescriptions would apply:			
	Lands and Realty:			
	• Linear ROWs: Avoid except in designated corridors	• Linear ROWs: Avoid		
	• Site-type LUAs: Exclusion except allow within one half mile of the center line of federal-aid highways.	• Site-type LUAs: Exclude site-type LUAs less than 5 acres except within one quarter mile of the edge of federal-aid highway ROWs and those that meet ACEC-07 (p. 187). Exclude site-type LUAs greater than 5 acres.	• Site-type LUAs: Exclude site-type LUAs less than 5 acres except within one half mile of the edge of federal-aid highway ROWs and those that meet ACEC-07 (p. 187). Exclude site-type LUAs greater than 5 acres.	
	• Material site ROWs: Allow within one half mile of the center line of federal-aid highways.	• Material site ROWs: Allow within one quarter mile of the edge of federal-aid highway ROWs.	• Material site ROWs: Allow within one half mile of the edge of federal-aid highway ROWs.	
	• FHWA and NDOT mineral material site ROWs: Allow within one half mile of the center line of federal-aid highways.	• FHWA and NDOT mineral material site ROWs: Allow within one half mile of the edge of federal-aid highway ROWs.		
	• Exclude new landfills.			
	• Do not authorize military maneuvers.	• Do not authorize ground-disturbing military maneuvers.		
	• Commercial activities may be permitted on a case-by-case basis if not in conflict with recovery of the desert tortoise.	No similar action.		
	Minerals:			

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Gold Butte ACEC, Part A (LVFO)				
	• Fluid leasable: NSO	• Fluid leasable: Closed	• Fluid leasable: NSO (vehicle access and exploration limited to designated routes). There is a half-mile buffer along the lateral edges of the ACEC designated as NSO; all remaining areas within the interior of the ACEC beyond this buffer are designated as closed to fluid leasable mineral development.	
	• Solid leasable: Closed			
	• Locatable: Withdrawn (186,566 acres)	• Locatable: Release the associated locatable withdrawal on 502 acres no longer managed as an ACEC.	• Locatable: Release the associated locatable withdrawal on 3,125 acres no longer managed as an ACEC.	
	• Saleable: Closed except FUPs. Allow FUPs only within one half mile of the center line of federal and state highways and specified county roads. Issue FUPs to government entities only.	• Saleable: Closed except FUPs. Allow FUPs only within one half mile of the edge of federal and state highway rights-of-way and the center line of specified roads. Issue FUPs to government entities only.		
	Livestock Grazing: Closed			
	Wild Horse and Burros: Manage burros for an AML of zero.	**Wild Horse and Burros:** Pursue reverting area within ACEC from a herd management area into a herd area.		
	Recreation: • Camping: Allowed • Speed events: Excluded • Non-speed events: Allowed • Commercial activities: Allowed			
	Travel Management: Limited to designated			
	Fish and Wildlife and Sensitive Species:			
	• Manage the ACEC specifically for desert tortoise recovery.			
	• Allow commercial collection of wildlife only upon completion of either a credible study or investigation that demonstrates commercial collection does not adversely impact affected species or their habitat, as determined by the Nevada Department of Wildlife. This action will not affect hunting, trapping, or casual collection as permitted by the state.			
	• Implement inventory, monitoring, and research projects dealing with management issues within desert tortoise ACECs.			
	No similar action.	• Support installation of tortoise-proof fencing and culverts to allow tortoises to cross under highways and other heavily traveled roads.		
	No similar action.	• Trenching, grading, grubbing, and other similar mechanical ground-disturbing activities would be prohibited during April, May, September, and October.		
	No similar action.	• For ground-disturbing activities, additional mitigation actions will be required to occur within the ACEC to maintain the integrity of the tortoise critical habitat unit.		

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Gold Butte ACEC, Part A (LVFO)				
	No similar action.	• 160-acre cumulative disturbance cap for new site-type LUAs for Gold Butte parts A, B, and C combined.	• 320-acre cumulative disturbance cap for new site-type LUAs for Gold Butte parts A, B, and C combined.	• 640-acre cumulative disturbance cap for new site-type LUAs for Gold Butte parts A, B, and C combined.
	Fire: Minimize impacts to tortoise habitat during fire suppression by minimizing the use of mechanized equipment and, where possible, staying on existing roads and trails. However, give priority to keeping the wildfire to an absolute minimum.	**Fire:** • Minimize impacts to tortoise habitat during response to wildland fire. Give priority to keeping the wildfire size to an absolute minimum. • Allow prescribed fire use to meet resource objectives and habitat enhancement purposes in appropriate areas to support habitat recovery objectives.		
	Vegetation: Require reclamation of disturbed lands resulting from activities that result in loss or degradation of tortoise habitat with habitat to be reclaimed so that pre-disturbance condition can be reached within a reasonable time frame. Reclamation may include salvage and transplant of cactus and yucca, recontouring of the area, scarification of compacted soil, soil amendments, seeding, and transplant of seedling shrubs. Subsequent seeding or transplanting efforts may be required if monitoring indicates that the original effort was not successful.	**Vegetation:** • Allow the use of approved herbicides following ground-disturbing activities to implement invasive species control methods and support habitat recovery objectives. • Activities that result in loss or degradation of tortoise habitat would require reclamation to pre-disturbance condition within a reasonable time frame. Reclamation may include, but is not limited to, salvage and transplant of cactus and yucca, recontouring the area, scarification of compacted soil, soil amendments, seeding, and transplant of seedling shrubs. Subsequent seeding or transplanting efforts may be required if monitoring indicates that the original effort was not successful.		

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Gold Butte ACEC, Part B (LVFO)				
ACEC-30	Manage as a 122,694-acre ACEC to protect cultural resources, scenic values, wildlife habitat and sensitive species. Gold Butte, Part B acreage includes the 160-acre Gold Butte Townsite ACEC.	Manage as a 116,734-acre ACEC to protect cultural resources, scenic values, wildlife habitat and sensitive species (acreage reduced to exclude Bureau of Reclamation withdrawal lands). Gold Butte, Part B acreage includes the 159-acre Gold Butte Townsite ACEC.		
	Management prescriptions: In addition to the management prescriptions listed above for all ACECs, the following prescriptions would apply:			
	Lands and Realty:			
	• Linear ROWs: Avoid			
	• Site-type LUAs: Avoid	• Site-type LUAs: Avoid site-type LUAs less than 5 acres. Exclude site-type LUAs greater than 5 acres.		
	• Material site ROWs: Allowed	• Material site ROWs: Closed		• Material site ROWs: Allowed
	Minerals:			
	• Fluid leasable: CSU	• Fluid leasable: Closed	• Fluid leasable: CSU	
	• Solid leasable: Closed			
	• Locatable: Withdrawn (122,694 acres)	Locatable: Release the associated locatable withdrawal on 5,960 acres no longer managed as an ACEC.		
	• Saleable: Closed	• Saleable: Closed except for the disposal of excess materials associated with other permitted actions, trespass resolution, and free-use permits to the BLM.		
	Livestock Grazing: Closed			
	Wild Horse and Burros: Open. AML 98	No similar action.		
	Recreation: • Camping: Allowed • Speed events: Excluded • Non-speed events: Allowed • Commercial activities: Allowed			
	Travel Management: Limited to existing	**Travel Management:** Limited to designated		
	Fish and Wildlife and Sensitive Species:			
	No similar action.	• Implement the Conservation Agreement Strategy for Relict Leopard Frog.		

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Gold Butte ACEC, Part C (Virgin Mountains) (LVFO)				
ACEC-31	Manage as a 35,707-acre ACEC to protect wildlife habitat, scenic values, and botanical values.			
	Management prescriptions: In addition to the management prescriptions listed above for all ACECs, the following prescriptions would apply:			
	Lands and Realty:			
	● Linear ROWs: Avoid			
	● Site-type LUAs: Avoid	● Site-type LUAs: Avoid site-type LUAs less than 5 acres. Exclude site-type LUAs greater than 5 acres.		
	● Material site ROWs: Closed			
	Minerals:			
	● Fluid leasable: CSU	● Fluid leasable: Closed	● Fluid leasable: CSU	
	● Solid leasable: Closed			
	● Locatable: Withdrawn			
	● Saleable: Closed	● Saleable: Closed except for the disposal of excess materials associated with other permitted actions, trespass resolution, and free-use permits to the BLM.		
	Livestock Grazing: Closed in allotments managed by the Southern Nevada District. Allotments managed by the Arizona Strip District are outside the scope of this RMP.			
	Recreation: ● Camping: Allowed ● Speed events: Excluded ● Non-speed events: Allowed ● Commercial activities: Allowed			
	Travel Management: Limited to existing	**Travel Management:** Limited to designated		
	Fish and Wildlife and Sensitive Species:			
	No similar action.	● Implement the Conservation Agreement Strategy for Relict Leopard Frog.		

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Gold Butte Townsite ACEC (LVFO)				
ACEC-32	Manage as a 159-acre ACEC (wholly within the Gold Butte ACEC, Part B) to protect historic mining resources.			
	Management prescriptions: In addition to the management prescriptions listed above for all ACECs, the following prescriptions would apply:			
	Lands and Realty:			
	• Linear ROWs: Avoid			
	• Site-type LUAs: Avoid	• Site-type LUAs: Avoid site-type LUAs less than 5 acres. Exclude site-type LUAs greater than 5 acres.		
	• Material site ROWs: Closed			
	Minerals:			
	• Fluid leasable: NSO	• Fluid leasable: Closed		
	• Solid leasable: Closed			
	• Locatable: Withdrawn			
	• Saleable: Closed	• Saleable: Closed except for the disposal of excess materials associated with other permitted actions, trespass resolution, and free-use permits to the BLM.		
	Livestock Grazing: Closed			
	Wild Horse and Burros: Open. AML 98	No similar action.		
	Recreation: • Camping: Allowed • Speed events: Excluded • Non-speed events: Allowed • Commercial activities: Allowed			
	Travel Management: Limited to existing	**Travel Management:** Limited to designated		

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Grapevine Spring ACEC (PFO)				
ACEC-33	No similar action.	Designate and manage as a 87-acre ACEC to protect the Spring Mountains pyrg and the Southeast Nevada pyrg.		
		Management prescriptions: In addition to the management prescriptions listed above for all ACECs, the following prescriptions would apply:		
		Lands and Realty: ● Linear ROWs: Avoid ● Site-type LUAs: Avoid site-type LUAs less than 5 acres. Exclude site-type LUAs greater than 5 acres. ● Material site ROWs: Closed		
		Minerals:		
		● Fluid leasable: Closed		
		● Solid leasable: Closed		
		● Locatable: Pursue withdrawal		
		● Saleable: Closed		
		Livestock Grazing: Closed		
		Recreation: ● Camping: Allowed ● Speed events: Excluded ● Non-speed events: Allowed ● Commercial activities: Allowed		
		Travel Management: Limited to designated		
		Water Rights: Seek to obtain water rights to support the maintenance of the water table and surface flow.		

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Hidden Valley ACEC (LVFO)				
ACEC-34	Manage as a 3,357-acre ACEC to protect prehistoric habitation and rock art.	Manage as a 3,357-acre ACEC to protect prehistoric habitation, rock art, and scenic values.		
	Management prescriptions: In addition to the management prescriptions listed above for all ACECs, the following prescriptions would apply:			
	Lands and Realty:			
	● Private property: Ensure access	No similar action.		
	● Linear ROWs: Exclude except for those that meet ACEC-07 (p. 187).			
	● Site-type LUAs: Exclude except for those that meet ACEC-07 (p. 187).			
	● Material site ROWs: Closed			
	Minerals:			
	● Fluid leasable: NSO	● Fluid leasable: Closed		
	● Solid leasable: Closed			
	● Locatable: Withdrawn			
	● Saleable: Closed	● Saleable: Closed except for the disposal of excess materials associated with other permitted actions, trespass resolution, and free-use permits to the BLM.		
	Recreation:			
	● Camping: Allowed			
	● Speed events: Excluded			
	● Non-speed events: Closed to motorized and mechanized events.			
	● Commercial activities: Allowed	● Commercial activities: Allowed only outside wilderness.		
	Travel Management: Closed			

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Hiko Wash ACEC (LVFO)				
ACEC-35	No similar action.	Designate and manage as an 709-acre ACEC to protect cultural resources and prehistoric rock art and remains, wildlife habitat, and riparian areas.		The proposed ACEC would not be designated.
		Management prescriptions: In addition to the management prescriptions listed above for all ACECs, the following prescriptions would apply:		
		Lands and Realty: ● Linear ROWs: Avoid except in designated corridors. ● Site-type LUAs: Avoid site-type LUAs less than 5 acres. Exclude site-type LUAs greater than 5 acres. ● Material site ROWs: Closed		
		Minerals: ● Fluid leasable: Closed ● Solid leasable: Closed ● Locatable: Pursue withdrawal ● Saleable: Closed		
		Recreation: ● Camping: Allowed ● Speed events: Excluded ● Non-speed events: Allowed ● Commercial activities: Allowed		
		Travel Management: Limited to designated		
		Water Rights: Seek to obtain water rights to support the maintenance of the water table and surface flow.		

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Ivanpah Valley ACEC (LVFO)				
ACEC-36	Manage as an 31,857-acre ACEC to protect desert tortoise.			
	Management prescriptions: In addition to the management prescriptions listed above for all ACECs, the following prescriptions would apply:			
	Lands and Realty:			
	• Linear ROWs: Avoid except in designated corridors.			
	• Site-type LUAs: Land-use authorizations and small site-type ROWs (5 acres or less) would be considered on a case-by-case basis. Exclude large site-type ROWs (greater than 5 acres).	• Site-type LUAs: Avoid site-type LUAs less than 5 acres except within designated corridors. Exclude site-type LUAs greater than 5 acres.		
	• ROWs for construction and operation of the Ivanpah Valley Airport and associated facilities are allowed in the ACEC subject to an approved Airport Final Environmental Impact Statement and Record of Decision and subject to compliance with the Endangered Species Act.			
	• Material site ROWs: No similar action.	• Material site ROWs: Allow within one half mile of the center line of federal-aid highways.		
	• Do not authorize military maneuvers.			
	Minerals:			
	• Fluid leasable: CSU. BLM may require that a proposed facility or activity be relocated by more than 200 meters from a proposed location if necessary to achieve the desired level of resource protection.			
	• Solid leasable: Closed			
	• Locatable: Open			
	• Saleable: Closed except for the disposal of excess materials associated with other permitted actions, trespass resolution, and free-use permits to the BLM.			
	Livestock Grazing: Closed			
	Recreation: • Camping: Allowed • Speed events: Allowed • Non-speed events: Allowed. Activities will require a desert tortoise spotter during the tortoise active season. BLM will monitor activities to ensure there are no adverse impacts to tortoise. • Commercial activities: Allowed			
	Travel Management: Limited to existing routes	**Travel Management:** Limited to designated		
	Fire: • Allow prescribed fire use to meet resource objectives and habitat enhancement purposes in appropriate areas to support habitat recovery objectives.			
	Vegetation: • Allow the use of approved herbicides following ground-disturbing activities to implement invasive species control methods and support habitat recovery objectives.			

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Ivanpah Valley ACEC (LVFO)				
	● Activities that result in loss or degradation of tortoise habitat would require reclamation to pre-disturbance condition within a reasonable time frame. Reclamation may include, but is not limited to, salvage and transplant of cactus and yucca, recontouring the area, scarification of compacted soil, soil amendments, seeding, and transplant of seedling shrubs. Subsequent seeding or transplanting efforts may be required if monitoring indicates that the original effort was not successful.			

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Jean Lake ACEC (LVFO)				
ACEC-37	No similar action.	Designate and manage as an 11,606-acre ACEC to protect vegetation communities.		Designate and manage as a 9,138-acre ACEC to protect vegetation communities.
		Management prescriptions: In addition to the management prescriptions listed above for all ACECs, the following prescriptions would apply:		
		Lands and Realty:		
		● Linear ROWs: Avoid except in designated corridors		
		● Site-type LUAs: Exclude site type LUAs less than 5 acres except within designated corridors and within one quarter mile of the edge of a federal aid highway. Within designated corridors, limit site type LUAs less than 5 acres to those that are necessary for the operation of linear ROWs. Exclude site-type LUAs greater than 5 acres.	● Site-type LUAs: Avoid site-type LUAs less than 5 acres except within designated corridors. Exclude site-type LUAs greater than 5 acres.	
		● Material site ROWs: Closed		
		● Exclude landfills	No similar action.	
		● Exclude military maneuvers	No similar action.	
		● Allow commercial activities on a case-by-case basis	No similar action.	
		Minerals:		
		● Fluid leasable: Closed	● Fluid leasable: CSU	
		● Solid leasable: Closed		
		● Locatable: Pursue withdrawal		● Locatable: Open
		● Saleable: Closed except for the disposal of excess materials associated with other permitted actions, trespass resolution, and free-use permits to the BLM.		
		Recreation:		
		● Camping: Allowed in designated areas. ● Speed events: Excluded ● Non-speed events: Allowed ● Commercial activities: Allowed on a case-by-case basis if not in conflict with the protection and conservation of special status species and their habitat.	● Camping: Allowed ● Speed events: Allowed ● Non-speed events: Allowed ● Commercial activities: Allowed	
		Travel Management: Limited to designated		

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Jean Lake ACEC (LVFO)				
		Fish and Wildlife and Sensitive Species:		
		• Support installation of tortoise-proof fencing and culverts to allow tortoises to cross under highways and other heavily traveled roads.	No similar action.	
		• Allow commercial collection only upon completion of a credible study or investigation that demonstrates commercial collection does not adversely impact affected species or their habitat as determined by Clark County, BLM, FWS and NDOW.	No similar action.	
		• Implement protection, conservation, mitigation and recovery actions dealing with management of the ACEC.	No similar action.	
		• Trenching, grading, grubbing, and other similar mechanical ground-disturbing activities would be prohibited during April, May, September and October.	No similar action.	
		• 3% disturbance cap on all new authorized and illegal disturbance, excluding all fire. Disturbance cap to be measured per ACEC.	No similar action.	
		• Disturbed acres that count against the cap can be offset through reclamation and restoration of other disturbed areas within the ACEC (including disturbance existing prior to the RMP) in order to create space in the disturbance cap.	No similar action.	
		• The acres of reclaimed and restored areas can only be	No similar action.	

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Jean Lake ACEC (LVFO)				
		counted after the completion of the reclamation/restoration project.		

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Keyhole Canyon ACEC (LVFO)				
ACEC-38	Manage as a 240-acre ACEC to protect prehistoric habitation and rock art.	Manage as a 639-acre ACEC to protect prehistoric habitation, rock art, scenic values, and desert tortoise habitat.		Manage as a 240-acre ACEC to protect prehistoric habitation, rock art, scenic values, and desert tortoise habitat.
	Management prescriptions: In addition to the management prescriptions listed above for all ACECs, the following prescriptions would apply:			
	Lands and Realty:			
	• Linear ROWs: Avoid			
	• Site-type LUAs: Avoid	• Site-type LUAs: Avoid site-type LUAs less than 5 acres. Exclude site-type LUAs greater than 5 acres.		
	• Material site ROWs: Closed			
	Minerals:			
	• Fluid leasable: NSO	Fluid leasable: Closed	Fluid leasable: NSO (vehicle access and exploration limited to designated routes)	
	• Solid leasable: Closed			
	• Locatable: Withdrawn (240 acres)	• Locatable: 240-acre pre-existing ACEC withdrawn. Pursue withdrawal on 399 acres added to the ACEC.		• Locatable: Withdrawn
	• Saleable: Closed	• Saleable: Closed except for the disposal of excess materials associated with other permitted actions, trespass resolution, and free-use permits to the BLM.		
	Recreation:			
	• Camping: Allowed	• Camping: Closed	• Camping: Allowed	
	• Speed events: Excluded • Non-speed events: Allowed • Commercial activities: Allowed			
	Travel Management: Limited to existing	**Travel Management:** Limited to designated		

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Lava Dune ACEC (PFO)				
ACEC-39	No similar action.	Designate and manage as a 437-acre ACEC to protect the BLM sensitive species Big Dune endemic beetle species.		The proposed ACEC would not be designated.
		Management prescriptions: In addition to the management prescriptions listed above for all ACECs, the following prescriptions would apply:		
		Lands and Realty: ● Linear ROWs: Avoid ● Site-type LUAs: Exclude except for those that meet ACEC-07 (p. 187). ● Material site ROWs: Closed		
		Minerals: ● Fluid leasable: Closed ● Solid leasable: Closed ● Locatable: Pursue withdrawal ● Saleable: Closed except for the disposal of excess materials associated with other permitted actions, trespass resolution, and free-use permits to the BLM.		
		Recreation: ● Camping: Closed ● Speed events: Excluded ● Non-speed events: Excluded ● Commercial activities: Allowed		
		Travel Management: Closed		
		Fish and Wildlife and Sensitive Species:		
		● Maintain and restore sand dune habitat in a natural condition to support all species dependent upon dune habitat with emphasis on special status species.	● Maintain sand dune habitat in a natural condition to support all species dependent upon dune habitat with emphasis on special status species.	

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Logandale ACEC (LVFO)				
ACEC-40	No similar action.	Designate and manage as a 6,073-acre ACEC to protect scenic, cultural, and vegetation communities. **Management prescriptions:** In addition to the management prescriptions listed above for all ACECs, the following prescriptions would apply: **Lands and Realty:** ● Linear ROWs: Avoid ● Site-type LUAs: Exclude except for those that meet ACEC-07 (p. 187). ● Material site ROWs: Closed **Minerals:** ● Fluid leasable: CSU ● Solid leasable: Closed ● Locatable: Pursue withdrawal ● Saleable: Closed except for the disposal of excess materials associated with other permitted actions, trespass resolution, and free-use permits to the BLM. **Recreation:** ● Camping: Allowed ● Speed events: Excluded ● Non-speed events: Allowed ● Commercial activities: Allowed **Travel Management:** Limited to designated	The proposed ACEC would not be designated.	

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Lower Mormon Mesa ACEC (LVFO)				
ACEC-41	No similar action.	Designate and manage as a 64,559-acre ACEC to protect a rare geologic feature.	Designate and manage as a 25,478-acre ACEC to protect a rare geologic feature.	The proposed ACEC would not be designated.
		Management prescriptions: In addition to the management prescriptions listed above for all ACECs, the following prescriptions would apply:		
		Lands and Realty:		
		• Linear ROWs: Avoid		
		• Site-type LUAs: Avoid site-type LUAs less than 5 acres except within one quarter mile of the edge of federal-aid highway ROWs. Exclude site-type LUAs greater than 5 acres.	• Site-type LUAs: Avoid site-type LUAs less than 5 acres except within one half mile of the edge of federal-aid highway ROWs. Exclude site-type LUAs greater than 5 acres.	
		• Material site ROWs: Allow within one quarter mile of the edge of federal-aid highway ROWs	• Material site ROWs: Open	
		Minerals:		
		• Fluid leasable: Closed	• Fluid leasable: CSU	
		• Solid leasable: Closed	• Solid leasable: Open	
		• Locatable: Pursue withdrawal	• Locatable: Open	
		• Saleable: Closed except FUPs. Allow FUPs only within one quarter mile of the edge of federal and state highway rights-of-way and the center line of specified roads. Issue FUPs to government entities only.	• Saleable: Closed except FUPs. Allow FUPs only within one half mile of the edge of federal and state highway rights-of-way and the center line of specified roads. Issue FUPs to government entities only.	
		Recreation: • Camping: Allowed • Speed events: Motorcycle and ATV events allowed. Closed to all larger-class vehicle events. • Non-speed events: Allowed • Commercial activities: Allowed		
		Travel Management: Limited to designated		

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Mesa Milkvetch ACEC (LVFO)				
ACEC-42	No similar action.	Designate and manage as a 9,144-acre ACEC to protect BLM sensitive species and cultural/historic values.	Designate and manage as a 3,500-acre ACEC to protect BLM sensitive species and cultural/historic values.	The proposed ACEC would not be designated.
		Management prescriptions: In addition to the management prescriptions listed above for all ACECs, the following prescriptions would apply:		
		Lands and Realty:		
		• Linear ROWs: Avoid		
		• Site-type LUAs: Avoid site-type LUAs less than 5 acres except within one quarter mile of the edge of federal-aid highway ROWs. Exclude site-type LUAs greater than 5 acres.	• Site-type LUAs: Avoid site-type LUAs less than 5 acres except within one half mile of the edge of federal-aid highway ROWs. Exclude site-type LUAs greater than 5 acres.	
		• Material site ROWs: Closed	• Material site ROWs: Allow within one half mile of the edge of federal-aid highway ROWs	
		Minerals:		
		• Fluid leasable: Closed	• Fluid leasable: CSU	
		• Solid leasable: Closed		
		• Locatable: Pursue withdrawal	• Locatable: Open	
		• Saleable: Closed except for the disposal of excess materials associated with other permitted actions, trespass resolution, and free-use permits to the BLM.		
		Recreation: • Camping: Allowed • Speed events: Motorcycle and ATV events allowed. Closed to all larger-class vehicle events. • Non-speed events: Allowed • Commercial activities: Allowed		
		Travel Management: Limited to designated		

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Moapa Mesquite ACEC (LVFO)				
ACEC-43	No similar action.	Designate and manage as a 1,214-acre ACEC to protect cultural and historic sites and riparian areas.	Designate and manage as a 1,304-acre ACEC to protect cultural and historic sites and riparian areas.	The proposed ACEC would not be designated.
		Management prescriptions: In addition to the management prescriptions listed above for all ACECs, the following prescriptions would apply:		
		Lands and Realty:		
		● Linear ROWs: Avoid except in designated corridors		
		● Site-type LUAs: Avoid site-type LUAs less than 5 acres except within designated corridors and within one quarter mile of the edge of federal-aid highway ROWs. Exclude site-type LUAs greater than 5 acres.	● Site-type LUAs: Avoid site-type LUAs less than 5 acres except within designated corridors and within one half mile of the edge of federal-aid highway ROWs. Exclude site-type LUAs greater than 5 acres.	
		● Material site ROWs: Closed		
		Minerals:		
		● Fluid leasable: Closed	● Fluid leasable: CSU	
		● Solid leasable: Closed		
		● Locatable: Pursue withdrawal	● Locatable: Open	
		● Saleable: Closed except for the disposal of excess materials associated with other permitted actions, trespass resolution, and free-use permits to the BLM.		
		Recreation: ● Camping: Allowed ● Speed events: Excluded ● Non-speed events: Allowed ● Commercial activities: Allowed		
		Travel Management: Limited to designated		
		Water Rights: Seek to obtain water rights to support the maintenance of the water table and surface flow.		

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Mormon Mesa ACEC (LVFO)				
ACEC-44	Manage as a 150,489-acre ACEC to protect desert tortoise critical habitat.	Manage as a 169,124-acre ACEC to protect desert tortoise critical habitat.		Manage as a 161,176-acre ACEC to protect desert tortoise critical habitat.
	Management prescriptions: In addition to the management prescriptions listed above for all ACECs, the following prescriptions would apply:			
	Lands and Realty:			
	• Linear ROWs: Avoid except in designated corridors	• Linear ROWs: Exclude except in designated corridors or for those that meet ACEC-07 (p. 187).		
	• Site-type LUAs: Exclusion except allow within one half mile of the center line of federal-aid highways.	• Site-type LUAs: Exclude site-type LUAs less than 5 acres except within designated corridors, within one quarter mile of the edge of federal-aid highway ROWs, and those that meet ACEC-07 (p. 187). Within designated corridors: Limit site-type LUAs less than 5 acres to those that are integral to operation of linear ROWs. Exclude site-type LUAs greater than 5 acres.	• Site-type LUAs: Exclude site-type LUAs less than 5 acres except within designated corridors, within one half mile of the edge of federal-aid highway ROWs, and those that meet ACEC-07 (p. 187). Within designated corridors: Limit site-type LUAs less than 5 acres to those that are integral to operation of linear ROWs. Exclude site-type LUAs greater than 5 acres.	
	• Material site ROWs: Allow within one half mile of the center line of federal-aid highways.	• Material site ROWs: Allow within one quarter mile of the edge of federal-aid highway ROWs.	• Material site ROWs: Allow within one half mile of the edge of federal-aid highway ROWs.	
	• FHWA and NDOT mineral material site ROWs: Allow within one half mile of the center line of federal-aid highways.	• FHWA and NDOT mineral material site ROWs: Allow within one half mile of the edge of federal-aid highway ROWs.		
	• Exclude new landfills.			
	• Do not authorize military maneuvers.	• Do not authorize ground-disturbing military maneuvers.		
	• Commercial activities may be permitted on a case-by-case basis if not in conflict with recovery of the desert tortoise.	No similar action.		
	Minerals:			

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Mormon Mesa ACEC (LVFO)				
	• Fluid leasable: NSO	• Fluid leasable: Closed	• Fluid leasable: NSO (vehicle access and exploration Limited to designated routes). There is a half-mile buffer along the lateral edges of the ACEC designated as NSO; all remaining areas within the interior of the ACEC beyond this buffer are designated as closed to fluid leasable mineral development.	
	• Solid leasable: Closed			
	• Locatable: Withdrawn (150,489 acres)	• Locatable: 150,489-acre pre-existing ACEC withdrawn. Pursue withdrawal on 18,635 acres added to the ACEC.		• Locatable: 150,489-acre pre-existing ACEC withdrawn. Pursue withdrawal on 10,687 acres added to the ACEC.
	• Saleable: Closed except FUPs. Allow FUPs only within one half mile of the center line of federal and state highways and specified county roads. Issue FUPs to government entities only.	• Saleable: Closed except FUPs. Allow FUPs only within one half mile of the edge of federal and state highway rights-of-way and the center line of specified roads. Issue FUPs to government entities only.		
	Livestock Grazing: Closed			
	Wild Horse and Burros: Manage wild horses and burros for an AML of zero.	No similar action (area is not within a herd area).		
	Recreation: • Camping: Allowed • Speed events: Excluded • Non-speed events: Allowed • Commercial activities: Allowed			
	Travel Management: Limited to designated			
	Fish and Wildlife and Sensitive Species:			
	• Manage the ACEC specifically for desert tortoise recovery. • Allow commercial collection of wildlife only upon completion of either a credible study or investigation that demonstrates commercial collection does not adversely impact affected species or their habitat, as determined by the Nevada Department of Wildlife. This action will not affect hunting, trapping, or casual collection as permitted by the state. • Implement inventory, monitoring, and research projects dealing with management issues within desert tortoise ACECs.			
	No similar action.	• Support installation of tortoise-proof fencing and culverts to allow tortoises to cross under highways and other heavily traveled roads.		
	No similar action.	• Trenching, grading, grubbing, and other similar mechanical ground-disturbing activities would be prohibited during April, May, September, and October.		
	No similar action.	• For ground-disturbing activities, additional mitigation actions will be required to occur within the ACEC to maintain the integrity of the tortoise critical habitat unit.		

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Mormon Mesa ACEC (LVFO)				
	No similar action.	• 160-acre cumulative disturbance cap for new site-type LUAs for Coyote Springs, Mormon Mesa and Piute/Eldorado ACECs combined.	• 320-acre cumulative disturbance cap for new site-type LUAs for Coyote Springs, Mormon Mesa and Piute/Eldorado ACECs combined.	• 640-acre cumulative disturbance cap for new site-type LUAs for Coyote Springs, Mormon Mesa and Piute/Eldorado ACECs combined.
	Fire: Minimize impacts to tortoise habitat during fire suppression by minimizing the use of mechanized equipment and, where possible, staying on existing roads and trails. However, give priority to keeping the wildfire to an absolute minimum.	**Fire:** • Minimize impacts to tortoise habitat during response to wildland fire. Give priority to keeping the wildfire size to an absolute minimum. • Allow prescribed fire use to meet resource objectives and habitat enhancement purposes in appropriate areas to support habitat recovery objectives.		
	Vegetation: Require reclamation of disturbed lands resulting from activities that result in loss or degradation of tortoise habitat with habitat to be reclaimed so that pre-disturbance condition can be reached within a reasonable time frame. Reclamation may include salvage and transplant of cactus and yucca, recontouring of the area, scarification of compacted soil, soil amendments, seeding, and transplant of seedling shrubs. Subsequent seeding or transplanting efforts may be required if monitoring indicates that the original effort was not successful.	**Vegetation:** • Allow the use of approved herbicides following ground-disturbing activities to implement invasive species control methods and support habitat recovery objectives. • Activities that result in loss or degradation of tortoise habitat would require reclamation to pre-disturbance condition within a reasonable time frame. Reclamation may include, but is not limited to, salvage and transplant of cactus and yucca, recontouring the area, scarification of compacted soil, soil amendments, seeding, and transplant of seedling shrubs. Subsequent seeding or transplanting efforts may be required if monitoring indicates that the original effort was not successful.		

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Mt. Schrader ACEC (PFO)				
ACEC-45	No similar action.	Designate and manage as a 283-acre ACEC to protect sensitive cultural and historic resources.		The proposed ACEC would not be designated.
		Management prescriptions: In addition to the management prescriptions listed above for all ACECs, the following prescriptions would apply:		
		Lands and Realty: ● Linear ROWs: Avoid except in designated corridors ● Site-type LUAs: Avoid site-type LUAs less than 5 acres except within designated corridors. Within designated corridors: Limit site-type LUAs less than 5 acres to those that are integral to operation of linear ROWs. Exclude site-type LUAs greater than 5 acres. ● Material site ROWs: Closed		
		Minerals:		
		● Fluid leasable: Closed	● Fluid leasable: NSO (vehicle access and exploration limited to designated routes)	
		● Solid leasable: Closed		
		● Locatable: Pursue withdrawal		
		● Saleable: Closed		
		Recreation: ● Camping: Allowed ● Speed events: Excluded ● Non-speed events: Excluded ● Commercial activities: Allowed		
		Travel Management: Closed		

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Muddy Mountains ACEC (LVFO)				
ACEC-46	No similar action.	Designate and manage as a 36,196-acre ACEC to protect bighorn sheep.		The proposed ACEC would not be designated.
		Management prescriptions: In addition to the management prescriptions listed above for all ACECs, the following prescriptions would apply:		
		Lands and Realty:		
		• Linear ROWs: Avoid except in designated corridors		
		• Site-type LUAs: Exclude site type LUAs less than 5 acres except within designated corridors and within one quarter mile of the edge of a federal aid highway. Within designated corridors, limit site type LUAs less than 5 acres to those that are necessary for the operation of linear ROWs. Exclude site-type LUAs greater than 5 acres.	• Site-type LUAs: Avoid site-type LUAs less than 5 acres except within designated corridors and within one half mile of the edge of federal-aid highway ROWs. Exclude site-type LUAs greater than 5 acres.	
		• Material site ROWs: Closed	• Material site ROWs: Open	
		• Exclude landfills	No similar action	
		• Exclude military maneuvers	No similar action	
		• Allow commercial activities on a case-by-case basis	No similar action	
		Minerals:		
		• Fluid leasable: Closed	• Fluid leasable: CSU	
		• Solid leasable: Closed	• Solid leasable: Open	
		• Locatable: Pursue withdrawal	• Locatable: Open	
		• Saleable: Closed except for the disposal of excess materials associated with other permitted actions, trespass resolution, and free-use permits to the BLM.	• Saleable: Open	
		Recreation:		
		• Camping: Allowed in designated areas. • Speed events: Excluded • Non-speed events: Allowed • Commercial activities: Allowed on a case-by-case basis if not in conflict with the protection and	• Camping: Allowed • Speed events: Motorcycle and ATV events allowed. Closed to all larger-class vehicle events. • Non-speed events: Allowed	

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Muddy Mountains ACEC (LVFO)				
		conservation of special status species and their habitat.	• Commercial activities: Allowed	
		Travel Management: Limited to designated		
		Fish and Wildlife and Sensitive Species:		
		• Support installation of tortoise-proof fencing and culverts to allow tortoises to cross under highways and other heavily traveled roads.	No similar action	
		• Allow commercial collection only upon completion of a credible study or investigation that demonstrates commercial collection does not adversely impact affected species or their habitat as determined by Clark County, BLM, FWS and NDOW.	No similar action	
		• Implement protection, conservation, mitigation and recovery actions dealing with management of the ACEC.	No similar action	
		• Trenching, grading, grubbing, and other similar mechanical ground-disturbing activities would be prohibited during April, May, September and October.	No similar action	
		• 3% disturbance cap on all new authorized and illegal disturbance, excluding all fire. Disturbance cap to be measured per ACEC.	No similar action	
		• Disturbed acres that count against the cap can be offset through reclamation and restoration of other disturbed areas within the ACEC (including disturbance existing	No similar action	

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Muddy Mountains ACEC (LVFO)				
		prior to the RMP) in order to create space in the disturbance cap.		
		• The acres of reclaimed and restored areas can only be counted after the completion of the reclamation/restoration project.	No similar action	

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Old Spanish Trail ACEC (LVFO)				
ACEC-47	No similar action.	Designate and manage three segments of the National Historic Trail as a 49,844-acre ACEC, in three units (Lower Mormon Mesa Old Spanish Trail National Historic Trail Management Corridor, Stump Springs Old Spanish Trail National Historic Trail Management Corridor, California Wash Old Spanish Trail National Historic Trail Management Corridor), to protect cultural resources.	Designate and manage two segments of the National Historic Trail as a 33,848-acre ACEC, in two units (Lower Mormon Mesa Old Spanish Trail National Historic Trail Management Corridor, Stump Springs Old Spanish Trail National Historic Trail Management Corridor), to protect cultural resources.	The proposed ACEC would not be designated.
		Management prescriptions: In addition to the management prescriptions listed above for all ACECs, the following prescriptions would apply:		
		Lands and Realty: ● Linear ROWs: Avoid except in designated corridors ● Site-type LUAs: Avoid site-type LUAs less than 5 acres except within designated corridors. Within designated corridors: Limit site-type LUAs less than 5 acres to those that are integral to operation of linear ROWs. Exclude site-type LUAs greater than 5 acres. ● Material site ROWs: Closed		
		Minerals:		
		● Fluid leasable: Closed	● Fluid leasable: NSO (vehicle access and exploration Limited to designated routes). There is a half-mile buffer along the lateral edges of the ACEC designated as NSO; all remaining areas within the interior of the ACEC beyond this buffer are designated as closed to fluid leasable mineral development.	
		● Solid leasable: Closed		
		● Locatable: Pursue withdrawal	● Locatable: Open	
		● Saleable: Closed except for the disposal of excess materials associated with other permitted actions, trespass resolution, and free-use permits to the BLM.		
		Recreation:		

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Old Spanish Trail ACEC (LVFO)				
		● Camping: Allowed		
		● Speed events: Excluded	● Speed events: Allowed	
		● Non-speed events: Allowed		
		● Commercial activities: Allowed		
		Travel Management: Limited to designated		

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Pahrump Valley ACEC (PFO)				
ACEC-48	No similar action.	Designate and manage as a 36,826-acre ACEC to protect wildlife habitat and vegetation communities.	Designate and manage as a 20,903-acre ACEC to protect wildlife habitat and vegetation communities.	The proposed ACEC would not be designated.
		Management prescriptions: In addition to the management prescriptions listed above for all ACECs, the following prescriptions would apply:		
		Lands and Realty:		
		● Linear ROWs: Avoid except in designated corridors		
		● Site-type LUAs: Avoid site-type LUAs less than 5 acres. Exclude site-type LUAs greater than 5 acres.	● Site-type LUAs: Avoid site-type LUAs less than 5 acres except within designated corridors and within one half mile of the edge of federal-aid highway ROWs. Exclude site-type LUAs greater than 5 acres.	
		● Material site ROWs: Closed	● Material site ROWs: Open	
		Minerals:		
		● Fluid leasable: Closed	● Fluid leasable: CSU	
		● Solid leasable: Closed	● Solid leasable: Open	
		● Locatable: Pursue withdrawal	● Locatable: Open	
		● Saleable: Closed except for the disposal of excess materials associated with other permitted actions, trespass resolution, and free-use permits to the BLM.	● Saleable: Open	
		Recreation: ● Camping: Allowed ● Speed events: Excluded ● Non-speed events: Allowed ● Commercial activities: Allowed		
		Travel Management: Limited to designated		
		Water Rights: Seek to obtain water rights to support the maintenance of the water table and surface flow.		

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Perkins Ranch ACEC (LVFO)				
ACEC-49	No similar action.	Designate and manage as a 408-acre ACEC to protect cultural and historic resources, riparian values, and wildlife habitat.		
		Management prescriptions: In addition to the management prescriptions listed above for all ACECs, the following prescriptions would apply:		
		Lands and Realty: ● Linear ROWs: Avoid ● Site-type LUAs: Avoid site-type LUAs less than 5 acres. Exclude site-type LUAs greater than 5 acres. ● Material site ROWs: Closed		
		Minerals: ● Fluid leasable: Closed ● Solid leasable: Closed ● Locatable: Pursue withdrawal ● Saleable: Closed except for the disposal of excess materials associated with other permitted actions, trespass resolution, and free-use permits to the BLM.		
		Livestock Grazing: Closed		
		Recreation: ● Camping: Allowed ● Speed events: Excluded ● Non-speed events: Allowed ● Commercial activities: Allowed		
		Travel Management: Limited to designated		
		Fish and Wildlife and Sensitive Species: ● Implement the Conservation Agreement Strategy for Relict Leopard Frog.		

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Piute/Eldorado ACEC (LVFO)				
ACEC-50	Manage as a 323,710-acre ACEC to protect desert tortoise critical habitat.	Manage as a 347,633-acre ACEC to protect desert tortoise critical habitat, bighorn sheep, and scenic qualities.		Manage as a 338,769-acre ACEC to protect desert tortoise critical habitat.
	Management prescriptions: In addition to the management prescriptions listed above for all ACECs, the following prescriptions would apply:			
	Lands and Realty:			
	• Linear ROWs: Avoid except in designated corridors	• Linear ROWs: Exclude except in designated corridors		
	• Site-type LUAs: Exclusion except allow within one half mile of the center line of federal-aid highways.	• Site-type LUAs: Exclude site-type LUAs less than 5 acres except within designated corridors, within one quarter mile of the edge of federal-aid highway ROWs, and those that meet ACEC-07 (p. 187). Within designated corridors: Limit site-type LUAs less than 5 acres to those that are integral to operation of linear ROWs. Exclude site-type LUAs greater than 5 acres.	• Site-type LUAs: Exclude site-type LUAs less than 5 acres except within designated corridors, within one half mile of the edge of federal-aid highway ROWs, and those that meet ACEC-07 (p. 187). Within designated corridors: Limit site-type LUAs less than 5 acres to those that are integral to operation of linear ROWs. Exclude site-type LUAs greater than 5 acres.	• Site-type LUAs: Avoidance.
	• Material site ROWs: Allow within one half mile of the center line of federal-aid highways.	• Material site ROWs: Allow within one quarter mile of the edge of federal-aid highway ROWs.	• Material site ROWs: Allow within one half mile of the edge of federal-aid highway ROWs.	
	• FHWA and NDOT mineral material site ROWs: Allow within one half mile of the center line of federal-aid highways.	• FHWA and NDOT mineral material site ROWs: Allow within one half mile of the edge of federal-aid highway ROWs.		
	• Exclude new landfills.			
	• Do not authorize military maneuvers.	• Do not authorize ground-disturbing military maneuvers.		
	• Commercial activities may be permitted on a case-by-case basis if not in conflict with recovery of the desert tortoise.	No similar action.		
	Minerals:			

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Piute/Eldorado ACEC (LVFO)				
	• Fluid leasable: NSO	• Fluid leasable: Closed	• Fluid leasable: NSO (vehicle access and exploration limited to designated routes). There is a half-mile buffer along the lateral edges of the ACEC designated as NSO; all remaining areas within the interior of the ACEC beyond this buffer are designated as closed to fluid leasable mineral development.	
	• Solid leasable: Closed			
	• Locatable: Withdrawn (323,710 acres)	• Locatable: 323,710-acre pre-existing ACEC withdrawn. Pursue withdrawal on 23,923 acres added to the ACEC.		• Locatable: 323,710-acre pre-existing ACEC withdrawn. Pursue withdrawal on 15,059 acres added to the ACEC.
	• Saleable: Closed except FUPs. Allow FUPs only within one half mile of the center line of federal and state highways and specified county roads. Issue FUPs to government entities only.	• Saleable: Closed except FUPs. Allow FUPs only within one half mile of the edge of federal and state highway rights-of-way and the center line of specified roads. Issue FUPs to government entities only.		
	Livestock Grazing: Closed			
	Wild Horse and Burros: Manage wild horses and burros for an AML of zero.	No similar action (area is not within a herd area).		
	Recreation:			
	• Camping: Allowed. Allow development of campgrounds only if consistent with the objectives of the Tortoise Recovery Plan.			
	• Speed events: Excluded		• Speed events: Excluded except for the McCullough Pass ACEC expansion area where one truck/buggy race and one motorcycle/ATV race per year may be conducted.	• Speed events: Excluded
	• Non-speed events: Allowed subject to restrictions identified in the Recreation (p. 104) section.			
	• Commercial activities: Allowed subject to restrictions identified in the Recreation (p. 104) section.			
	Travel Management: Limited to designated			
	Fish and Wildlife and Sensitive Species:			
	• Manage the ACEC specifically for desert tortoise recovery. • Allow commercial collection of wildlife only upon completion of either a credible study or investigation that demonstrates commercial collection does not adversely impact affected species or their habitat, as determined by the Nevada Department of Wildlife. This action will not affect hunting, trapping, or casual collection as permitted by the state. • Implement inventory, monitoring, and research projects dealing with management issues within desert tortoise ACECs.			
	No similar action.	• Support installation of tortoise-proof fencing and culverts to allow tortoises to cross under highways and other heavily traveled roads.		

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Piute/Eldorado ACEC (LVFO)				
	No similar action.	● Trenching, grading, grubbing, and other similar mechanical ground-disturbing activities would be prohibited during April, May, September, and October.		
	No similar action.	● For ground-disturbing activities, additional mitigation actions will be required to occur within the ACEC to maintain the integrity of the tortoise critical habitat unit.		
	No similar action.	● 160-acre cumulative disturbance cap for new site-type LUAs for Coyote Springs, Mormon Mesa and Piute/Eldorado ACECs combined.	● 320-acre cumulative disturbance cap for new site-type LUAs for Coyote Springs, Mormon Mesa and Piute/Eldorado ACECs combined.	● 640-acre cumulative disturbance cap for new site-type LUAs for Coyote Springs, Mormon Mesa and Piute/Eldorado ACECs combined.
	Fire: Minimize impacts to tortoise habitat during fire suppression by minimizing the use of mechanized equipment and, where possible, staying on existing roads and trails. However, give priority to keeping the wildfire to an absolute minimum.	**Fire:** ● Minimize impacts to tortoise habitat during response to wildland fire. Give priority to keeping the wildfire size to an absolute minimum. ● Allow prescribed fire use to meet resource objectives and habitat enhancement purposes in appropriate areas to support habitat recovery objectives.		
	Vegetation: Require reclamation of disturbed lands resulting from activities that result in loss or degradation of tortoise habitat with habitat to be reclaimed so that pre-disturbance condition can be reached within a reasonable time frame. Reclamation may include salvage and transplant of cactus and yucca, recontouring of the area, scarification of compacted soil, soil amendments, seeding, and transplant of seedling shrubs. Subsequent seeding or transplanting efforts may be required if monitoring indicates that the original effort was not successful.	**Vegetation:** ● Allow the use of approved herbicides following ground-disturbing activities to implement invasive species control methods and support habitat recovery objectives. ● Activities that result in loss or degradation of tortoise habitat would require reclamation to pre-disturbance condition within a reasonable time frame. Reclamation may include, but is not limited to, salvage and transplant of cactus and yucca, recontouring the area, scarification of compacted soil, soil amendments, seeding, and transplant of seedling shrubs. Subsequent seeding or transplanting efforts may be required if monitoring indicates that the original effort was not successful.		

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Rainbow Gardens ACEC (LVFO)				
ACEC-51	Manage as a 38,764-acre ACEC to protect geological, scientific, and scenic values; cultural resources (320 acres); and sensitive plants.	Manage as a 35,353-acre ACEC (reduced acreage due to the removal of the Sunrise Landfill and the East Community Pit from the ACEC) to protect geological, scientific, and scenic values; cultural resources (320 acres); and sensitive plants.		
	Management prescriptions: In addition to the management prescriptions listed above for all ACECs, the following prescriptions would apply:			
	Lands and Realty:			
	• Linear ROWs: Avoid except in designated corridors			
	• Site-type LUAs: Avoid except in designated corridors	• Site-type LUAs: Avoid site-type LUAs less than 5 acres except within designated corridors, communication sites, and within one quarter mile of the edge of federal-aid highway ROWs. Exclude site-type LUAs greater than 5 acres.	• Site-type LUAs: Avoid site-type LUAs less than 5 acres except within designated corridors, communication sites, and within one half mile of the edge of federal-aid highway ROWs. Exclude site-type LUAs greater than 5 acres.	
	• Material site ROWs: Closed			
	Minerals:			
	• Fluid leasable: NSO	• Fluid leasable: NSO (vehicle access and exploration limited to designated routes). There is a half-mile buffer along the lateral edges of the ACEC designated as NSO; all remaining areas within the interior of the ACEC beyond this buffer are designated as closed to fluid leasable mineral development.		
	• Solid leasable: Closed			
	• Locatable: Withdrawn	• Locatable: Withdrawn (38,764 acres). Release the associated locatable withdrawal on 3,411 acres no longer managed as ACEC.		
	• Saleable: Closed	• Saleable: Closed except for the disposal of excess materials associated with other permitted actions, trespass resolution, and free-use permits to the BLM.		
	Recreation:			
	• Camping: Open	• Camping: Prohibit camping except where specifically authorized and designated.		
	• Speed events: Excluded			
	• Non-speed events: Allowed			
	• Commercial activities: Allowed			
	• **Travel Management:** Limited to designated			

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Red Rock Spring ACEC (LVFO)				
ACEC-52	Manage as a 638-acre ACEC (wholly within the Gold Butte ACEC, Part A) to protect prehistoric habitation and rock art.	Manage as a 638-acre ACEC (wholly within the Gold Butte ACEC, Part A) to protect prehistoric habitation, rock art, and relict leopard frog habitat.		
	Management prescriptions: In addition to the management prescriptions listed above for all ACECs, the following prescriptions would apply:			
	Lands and Realty:			
	• Linear ROWs: Avoid			
	• Site-type LUAs: Avoid	• Site-type LUAs: Avoid site-type LUAs less than 5 acres. Exclude site-type LUAs greater than 5 acres.		
	• Material site ROWs: Closed			
	Minerals:			
	• Fluid leasable: NSO	• Fluid leasable: Closed		
	• Solid leasable: Closed			
	• Locatable: Withdrawn			
	• Saleable: Closed	• Saleable: Closed except for the disposal of excess materials associated with other permitted actions, trespass resolution, and free-use permits to the BLM.		
	Livestock Grazing: Closed			
	Wild Horse and Burros: Manage burros for an AML of zero.	**Wild Horse and Burros:** Pursue reverting area within ACEC from a herd management area into a herd area.		
	Recreation: • Camping: Allowed • Speed events: Excluded • Non-speed events: Allowed • Commercial activities: Allowed			
	Travel Management: Limited to designated			
	No similar action.	**Fish and Wildlife and Sensitive Species:** Implement the Conservation Agreement Strategy for Relict Leopard Frog.		
	No similar action.	**Water Rights:** Seek to obtain water rights to support the maintenance of the water table and surface flow.		**Water Rights:** Do not seek to obtain.

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
River Mountains ACEC (LVFO)				
ACEC-53	Manage as an 11,029-acre ACEC to protect desert bighorn sheep habitat and scenic viewsheds for Henderson and Boulder City.	Manage as a 6,697-acre ACEC (reduced acreage due to Bureau of Reclamation withdrawal) to protect desert tortoise, bighorn sheep habitat, and scenic viewsheds for Henderson and Boulder City.		
	Management prescriptions: In addition to the management prescriptions listed above for all ACECs, the following prescriptions would apply:			
	Lands and Realty:			
	• Linear ROWs: Avoid except in designated corridors			
	• Site-type LUAs: Avoid except in designated corridors	• Site-type LUAs: Avoid site-type LUAs less than 5 acres except within designated corridors and within one quarter mile of the edge of federal-aid highway ROWs. Exclude site-type LUAs greater than 5 acres.	• Site-type LUAs: Avoid site-type LUAs less than 5 acres except within designated corridors and within one half mile of the edge of federal-aid highway ROWs. Exclude site-type LUAs greater than 5 acres.	
	• Material site ROWs: Closed			
	Minerals:			
	• Fluid leasable: NSO	• Fluid leasable: Closed		• Fluid leasable: NSO (vehicle access and exploration limited to designated routes)
	• Solid leasable: Closed			
	• Locatable: Withdrawn	• Locatable: Release the associated locatable withdrawal on 4,332 acres no longer managed as an ACEC.		
	• Saleable: Closed	• Saleable: Closed except for the disposal of excess materials associated with other permitted actions, trespass resolution, and free-use permits to the BLM.		
	Recreation:			
	• Camping: Prohibit camping on public lands in the SRMA, except where specifically authorized and designated.	• Camping: Prohibit camping except where specifically authorized and designated.		
	• Speed events: Closed to individual, organized, and competitive off-road use and vehicle events including off-road casual use.	• Speed events: Motorized excluded. Bicycle events allowed.		
	• Non-speed events: Allowed			
	• Commercial activities: Allowed			
	Travel Management: Limited to existing	**Travel Management:** Limited to designated		

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Sandy Valley ACEC (LVFO)				
ACEC-54	No similar action.	Designate and manage as a 210-acre ACEC to protect vegetation communities. **Management prescriptions:** In addition to the management prescriptions listed above for all ACECs, the following prescriptions would apply: **Lands and Realty:** ● Linear ROWs: Avoid ● Site-type LUAs: Avoid site-type LUAs less than 5 acres. Exclude site-type LUAs greater than 5 acres. ● Material site ROWs: Closed **Minerals:** ● Fluid leasable: Closed ● Solid leasable: Closed ● Locatable: Pursue withdrawal ● Saleable: Closed except for the disposal of excess materials associated with other permitted actions, trespass resolution, and free-use permits to the BLM. **Recreation:** ● Camping: Allowed ● Speed events: Excluded ● Non-speed events: Allowed ● Commercial activities: Allowed **Travel Management:** Limited to designated	The proposed ACEC would not be designated.	

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Specter Hills ACEC (PFO)				
ACEC-55	No similar action.	Designate and manage as a 5,420-acre ACEC to protect BLM sensitive species.		The proposed ACEC would not be designated.
		Management prescriptions: In addition to the management prescriptions listed above for all ACECs, the following prescriptions would apply:		
		Lands and Realty:		
		● Linear ROWs: Avoid except in designated corridors		
		● Site-type LUAs: Avoid site-type LUAs less than 5 acres except within designated corridors. Within designated corridors: Limit site-type LUAes less than 5 acres to those that are integral to operation of linear ROWs. Exclude site-type LUAs greater than 5 acres.	● Site-type LUAs: Avoid site-type LUAs less than 5 acres except within designated corridors and within one half mile of the edge of federal-aid highway ROWs. Within designated corridors: Limit site-type LUAs less than 5 acres to those that are integral to operation of linear ROWs. Exclude site-type LUAs greater than 5 acres.	
		● Material site ROWs: Closed		
		Minerals:		
		● Fluid leasable: Closed	● Fluid leasable: CSU	
		● Solid leasable: Closed		
		● Locatable: Pursue withdrawal	● Locatable: Open	
		● Saleable: Closed except for the disposal of excess materials associated with other permitted actions, trespass resolution, and free-use permits to the BLM.		
		Recreation: ● Camping: Allowed ● Speed events: Allowed ● Non-speed events: Allowed ● Commercial activities: Allowed		
		Travel Management: Limited to designated		

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Spirit Mountain ACEC (LVFO)				
ACEC-56	No similar action.	Designate and manage as a 9,488-acre ACEC to protect cultural/historic values.		The proposed ACEC would not be designated.
		Management prescriptions: In addition to the management prescriptions listed above for all ACECs, the following prescriptions would apply:		
		Lands and Realty:		
		● Linear ROWs: Avoid		
		● Site-type LUAs: Avoid site-type LUAs less than 5 acres. Exclude site-type LUAs greater than 5 acres.		
		● Material site ROWs: Closed		
		Minerals:		
		● Fluid leasable: Closed	● Fluid leasable: CSU	
		● Solid leasable: Closed		
		● Locatable: Pursue withdrawal	● Locatable: Open	
		● Saleable: Closed except for the disposal of excess materials associated with other permitted actions, trespass resolution, and free-use permits to the BLM.	● Saleable: Open	
		Recreation: ● Camping: Allowed ● Speed events: Motorcycle and ATV events allowed. Closed to all larger-class vehicle events. ● Non-speed events: Allowed ● Commercial activities: Allowed		
		Travel Management: Limited to designated		

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Stewart Valley ACEC (PFO)				
ACEC-57	No similar action.	Designate and manage as a 5,204-acre ACEC to protect cultural and prehistoric sites and vegetation communities.	Designate and manage as a 3,249-acre ACEC to protect cultural and prehistoric sites and vegetation communities.	The proposed ACEC would not be designated.
		Management prescriptions: In addition to the management prescriptions listed above for all ACECs, the following prescriptions would apply:		
		Lands and Realty:		
		● Linear ROWs: Avoid except in designated corridors		
		● Site-type LUAs: Avoid site-type LUAs less than 5 acres except within designated corridors. Within designated corridors: Limit site-type LUAs less than 5 acres to those that are integral to operation of linear ROWs. Exclude site-type LUAs greater than 5 acres.		
		● Material site ROWs: Closed	● Material site ROWs: Open	
		Minerals:		
		● Fluid leasable: Closed	● Fluid leasable: CSU	
		● Solid leasable: Closed	● Solid leasable: Open	
		● Locatable: Pursue withdrawal	● Locatable: Open	
		● Saleable: Closed except for the disposal of excess materials associated with other permitted actions, trespass resolution, and free-use permits to the BLM.	● Saleable: Open	
		Recreation: ● Camping: Allowed ● Speed events: Excluded ● Non-speed events: Allowed ● Commercial activities: Allowed		
		Travel Management: Limited to designated		

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Stuart Ranch ACEC (LVFO)				
ACEC-58	No similar action.	Designate and manage as a 278-acre ACEC to protect cultural resources, special status species and riparian habitats.		
		Management prescriptions: In addition to the management prescriptions listed above for all ACECs, the following prescriptions would apply:		
		Lands and Realty:		
		● Linear ROWs: Exclude except for those that meet ACEC-07 (p. 187).		● Linear ROWs: Avoid
		● Site-type LUAs: Avoid site-type LUAs less than 5 acres. Exclude site-type LUAs greater than 5 acres.		
		● Material site ROWs: Closed		
		Minerals: ● Fluid leasable: Closed ● Solid leasable: Closed ● Locatable: Pursue withdrawal ● Saleable: Closed except for the disposal of excess materials associated with other permitted actions, trespass resolution, and free-use permits to the BLM.		
		Livestock Grazing: Closed		
		Recreation: ● Camping: Allowed ● Speed events: Excluded ● Non-speed events: Allowed ● Commercial activities: Allowed		
		Travel Management: Limited to designated		
		Fish and Wildlife and Sensitive Species: ● Support installation of tortoise-proof fencing and culverts to allow tortoises to cross under highways and other heavily traveled roads. ● Implement the Conservation Agreement Strategy for Relict Leopard Frog.		
		Water Rights: Seek to obtain water rights to support the maintenance of the water table and surface flow.		

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Stump Spring ACEC (LVFO)				
ACEC-59	Manage as a 647-acre ACEC to protect a prehistoric camp and historic trail/camp.			
	Management prescriptions: In addition to the management prescriptions listed above for all ACECs, the following prescriptions would apply:			
	Lands and Realty:			
	• Linear ROWs: Avoid except in designated corridors	• Linear ROWs: Avoid		
	• Site-type LUAs: Allow within one half mile of the center line of federal-aid highways.	• Site-type LUAs: Avoid site-type LUAs less than 5 acres. Exclude site-type LUAs greater than 5 acres.		
	• Material site ROWs: Closed			
	Minerals:			
	• Fluid leasable: NSO	• Fluid leasable: Closed		
	• Solid leasable: Closed			
	• Locatable: Withdrawn			
	• Saleable: Closed	• Saleable: Closed except for the disposal of excess materials associated with other permitted actions, trespass resolution, and free-use permits to the BLM.		
	Recreation: • Camping: Allowed • Speed events: Excluded • Non-speed events: Allowed • Commercial activities: Allowed			
	Travel Management: Limited to existing	**Travel Management:** Limited to designated		
	No similar action.	**Water Rights:** Seek to obtain water rights to support the maintenance of the water table and surface flow.		**Water Rights:** Do not seek to obtain.

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Upper Las Vegas Wash ACEC (LVFO)				
ACEC-60	No similar action.	Designate and manage as a 12,296-acre ACEC to protect sensitive species habitat and cultural and paleontological resources.		The proposed ACEC would not be designated.
		Management prescriptions: In addition to the management prescriptions listed above for all ACECs, the following prescriptions would apply:		
		Lands and Realty:		
		● Linear ROWs: Avoid		
		● Site-type LUAs: Avoid site-type LUAs less than 5 acres. Exclude site-type LUAs greater than 5 acres.	● Site-type LUAs: Avoid site-type LUAs less than 5 acres except within one half mile of the edge of federal-aid highway ROWs. Exclude site-type LUAs greater than 5 acres.	
		● Material site ROWs: Closed		
		Minerals: ● Fluid leasable: Closed ● Solid leasable: Closed ● Locatable: Pursue withdrawal ● Saleable: Closed except for the disposal of excess materials associated with other permitted actions, trespass resolution, and free-use permits to the BLM.		
		Recreation: ● Camping: Prohibit camping except where specifically authorized and designated. ● Speed events: Excluded ● Non-speed events: Allowed ● Commercial activities: Allowed		
		Travel Management: Limited to designated		

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Virgin River ACEC (LVFO)				
ACEC-61	Manage as a 6,185-acre ACEC to protect threatened and endangered species habitat and cultural resources (on 5,000 acres).	Manage as a 8,500-acre ACEC to protect threatened and endangered species habitat and cultural resources (on 5,000 acres).		Manage as a 7,493-acre ACEC to protect threatened and endangered species habitat and cultural resources (on 5,000 acres).
	Management prescriptions: In addition to the management prescriptions listed above for all ACECs, the following prescriptions would apply:			
	Lands and Realty:			
	• Acquisitions: Pursue in-holdings and/or contiguous parcels containing relevant and important values and incorporate into the ACEC.			
	• Linear ROWs: Avoid except in designated corridors	• Linear ROWs: Avoid		
	• Site-type LUAs: Avoid except in designated corridors	• Site-type LUAs: Avoid site-type LUAs less than 5 acres except within one quarter mile of the edge of federal-aid highway ROWs. Exclude site-type LUAs greater than 5 acres.	• Site-type LUAs: Avoid site-type LUAs less than 5 acres except within one half mile of the edge of federal-aid highway ROWs. Exclude site-type LUAs greater than 5 acres.	
	• Material site ROWs: Closed			
	Minerals:			
	• Fluid leasable: NSO	• Fluid leasable: Closed		
	• Solid leasable: Closed			
	• Locatable: Withdrawn	• Locatable: 6,185-acre pre-existing ACEC withdrawn. Pursue withdrawal on 2,315 acres added to the ACEC.		• Locatable: 6,185-acre pre-existing ACEC withdrawn. Pursue withdrawal on 1,308 acres added to the ACEC.
	• Saleable: Closed	• Saleable: Closed except for the disposal of excess materials associated with other permitted actions, trespass resolution, and free-use permits to the BLM.		
	Livestock Grazing: Closed			
	Recreation:			
	• Camping: Allowed	• Camping: Closed north of the Riverside Bridge		
	• Speed events: Excluded			
	• Non-speed events: Allowed			
	• Commercial activities: Allowed			
	Travel Management: Limited to existing	**Travel Management:** Limited to designated		
	Wildlife: Maintain, restore, and/or improve 400 acres of aquatic and riparian habitat by utilizing treatment methods that involve, but are not limited to, the removal of tamarisk and replacement with native species.	**Fish and Wildlife and Sensitive Species:** • Maintain, restore, and/or improve aquatic and riparian habitat by utilizing treatment methods that involve, but are not limited to, the removal of tamarisk and replacement with native species.		
	Water Rights: Seek to obtain water rights to support the maintenance of the water table and surface flow.			

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Whitney Pocket ACEC (LVFO)				
ACEC-62	Manage as a 160-acre ACEC (wholly within the Gold Butte ACEC, Part A) to protect prehistoric habitation and rock art.			
	Management prescriptions: In addition to the management prescriptions listed above for all ACECs, the following prescriptions would apply:			
	Lands and Realty:			
	• Linear ROWs: Avoid			
	• Site-type LUAs: Avoid	• Site-type LUAs: Avoid site-type LUAs less than 5 acres. Exclude site-type LUAs greater than 5 acres.		
	• Material site ROWs: Closed			
	Minerals:			
	• Fluid leasable: NSO • Solid leasable: Closed • Locatable: Withdrawn (160 acres) • Saleable: Closed	• Fluid leasable: Closed • Solid leasable: Closed • Locatable: Withdrawn (160 acres) • Saleable: Closed except for the disposal of excess materials associated with other permitted actions, trespass resolution, and free-use permits to the BLM.		
	Livestock Grazing: Closed			
	Wild Horse and Burros: Manage burros for an AML of zero.	**Wild Horse and Burros:** Pursue reverting area within ACEC from a herd management area into a herd area.		
	Recreation: • Camping: Allowed • Speed events: Excluded • Non-speed events: Allowed • Commercial activities: Allowed			
	Travel Management: Limited to designated			

2.5.4.2. National Trails

Table 2.40. National Trails Management Actions

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Goal 1: Identify, safeguard, conserve, and preserve national historic trail resources to ensure they are available for appropriate use by present and future generations.				
Objective 1.1: Reduce imminent threats from natural or human-caused deterioration and resolve potential conflicts with other resource uses. **Objective 1.2:** Provide opportunities for scientific and educational use of national historic trails. **Objective 1.3:** Restore altered landscapes and identify trail-era conditions sympathetic to the qualities, values, and associated settings. **Objective 1.4:** Provide premier trail visitor experiences for public benefit. **Objective 1.5:** Maximize opportunities for shared National Trails stewardship.				
NHT-01	No similar action.	Preserve the trace and viewshed of the Old Spanish Trail across Mormon Mesa.		
NHT-02	No similar action.	Determine potential for eligible trail segments within the Southern Nevada District, including Old Spanish Trail, Mormon Road, Arrowhead, and Mojave. Avoid impacts to the trail(s) and, as necessary, develop treatment plans.		
NHT-03	For those areas within the planning area that contain the Old Spanish National Historic Trail (NHT) but are outside of the areas established as the Old Spanish Trail ACEC/National Historic Trail Management Corridor segments through this planning effort, 1) the BLM would continue to inventory the resources, qualities, values, and associated settings and the primary use or uses of the Old Spanish NHT (note, this does not preclude continued inventory within the ACECs) ; 2) the BLM would amend the land-use plan to establish a National Historic Trail Management Corridor in other areas, as applicable, including identifying allowable uses, management actions, and restrictions for other resources and uses within the corridor; and 3) would consider site-specific projects along the trail under the provisions of BLM M6280 and other applicable policy. The BLM would not allow activities that would substantially interfere or be incompatible with the nature and purposes of the Old Spanish NHT. The BLM would avoid adverse impacts or effects to the resources, qualities, values, and associated settings and the primary use or uses of the Old Spanish NHT. The analysis of the impacts/effects of any BLM action will include consultation with SHPO and the general public, especially interested trail organizations and individuals. Consideration of both direct and indirect effects to cultural resources, such as visual effects and effects to setting, feeling, and association, will be conducted within the viewshed of National Register-eligible Old Spanish NHT segments, identified high potential historic sites and high potential route segments, and the congressionally designated and/or ground-truthed route. Any effects that are determined to be adverse will be resolved through preparation of a Memorandum of Agreement with affected parties and the Nevada SHPO, per requirements of BLM Nevada's Protocol Agreement. Consideration of impacts to Old Spanish NHT-related scenic, recreation, and natural resources, qualities, values and associated settings, and the primary use or uses of the trail will occur. Avoidance of adverse effects under the NHPA and adverse impacts under the NTSA as described by Manual 6280 is preferred. If avoidance is not possible, the BLM will implement appropriate measures that will minimize or mitigate the effects/impacts to the Old Spanish NHT to the extent practicable in accordance with BLM policy.			

2.5.4.3. Wild and Scenic Rivers

Maps:

- Wild and Scenic Rivers, Alternative 1 (p. 2143)
- Wild and Scenic Rivers, Alternative 2 (p. 2143)
- Wild and Scenic Rivers, Alternative 3 (p. 2143)

Table 2.41. Wild and Scenic Rivers Management Actions

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Goal 1: Review all eligible river segments to determine suitability for congressional designation into the National Wild and Scenic Rivers System (NWSRS).				
Objective 1.1: Manage selected rivers, or segments of rivers, and their immediate environments for the protection of their outstandingly remarkable values, free-flowing condition, water quality, and tentative classification until Congress designates the river(s) or releases it (them) for other uses, giving consideration to other resource values and uses.				
WSR-01	Manage seven river segments as eligible for inclusion in the National Wild and Scenic Rivers System with the following tentative classifications: **Recreational:** ● Virgin River (LVFO) ○ Segment 1 (10 BLM miles/14 total miles) ○ Segment 2 (5 BLM miles/10 total miles) ○ Segment 3 (3 BLM miles/6 total miles) ● Muddy River (1.5 BLM miles/11 total miles) (LVFO) **Scenic:** ● Meadow Valley Wash (6 BLM miles/11 total miles) (LVFO) **Wild:** ● Hiko Spring (2 BLM miles/2 total miles) (LVFO) ● Carson Slough (1 BLM mile/1 total mile) (PFO) No rivers or river segments are recommended as suitable for designation as a WSR. In keeping with BLM Manual 6400, 3.5 and 4.2, suitability determinations would not be made for any of the eligible river segments.	All seven eligible river segments would be determined suitable for WSR designation (28.5 BLM miles/55 total miles) with the following tentative classifications: **Recreational:** ● Virgin River (LVFO) ○ Segment 1 (10 BLM miles/14 total miles) ○ Segment 2 (5 BLM miles/10 total miles) ○ Segment 3 (3 BLM miles/6 total miles) ● Muddy River (1.5 BLM miles/11 total miles) (LVFO) **Scenic:** ● Meadow Valley Wash (6 BLM miles/11 total miles) (LVFO) **Wild:** ● Hiko Spring (2 BLM miles/2 total miles) (LVFO) ● Carson Slough (1 BLM mile/1 total mile) (PFO) *Alternative 2 map (p. 2143)*	One eligible river segment would be determined suitable for WSR designation with the following tentative classification: **Recreational:** ● Meadow Valley Wash (3 BLM miles/3 total miles) (LVFO) Meadow Valley Wash, which is classified as scenic in Alternative 2, is classified as recreational in Alternative 3 to allow BLM to install fish barriers to protect BLM sensitive species such as the Meadow Valley Wash desert sucker and the Meadow Valley Wash speckled dace. The relict leopard frog is not currently located in the wash, but a frog conservation team has proposed putting it there, which would require some manipulation of the wash to create stable, suitable habitat. *Alternative 3 map (p. 2143)*	No river segments would be determined suitable for WSR designation.

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
	They would remain eligible and would be managed to protect their outstandingly remarkable values, free-flowing condition, and tentative classification to the degree that the BLM has authority (BLM lands within the corridor) until such time as suitability determinations were made. *Alternative 1 map (p. 2143)*			
WSR-02	Provide interim management protection for the eligible river segments to consider the potential effect on the river's free-flow, outstandingly remarkable values, water quality, and its tentative classification as wild, scenic and recreational.	River segments found to be suitable for designation or designated by Congress will be managed to protect their free-flowing condition, water quality, and outstandingly remarkable values and maintain the tentative classification up to one quarter mile from the high water mark on each bank.		No eligible stretches of river would be found suitable.
		Wild: • **Minerals:** Closed to oil and gas leasing, pursue withdrawal from locatable mineral entry, and closed for solid leasable. Closed for saleable minerals except for the disposal of excess materials associated with other permitted actions, trespass resolution, and free-use permits to the BLM. • **Motorized Travel:** Closed to OHV use. • **Lands and Realty:** Exclude new proponent-generated ROWs. • **Visual Resource Management:** Class I **Scenic:** • **Minerals:** Open to oil and gas leasing subject to major constraints (no surface occupancy), pursue withdrawal from locatable mineral entry, closed for solid leasable, and	**Recreational:** • **Minerals:** Open to oil and gas leasing subject to major constraints (no surface occupancy), pursue withdrawal from locatable mineral entry, closed for solid leasable, and closed for saleable minerals with the following exceptions: Free-use permits and mineral material sales contracts for the disposal of excess mineral materials associated with other permitted actions or trespasses can be issued as needed. Free-use permits for BLM uses can be issued when needed to provide resource protection and for human health and safety. • **Lands and Realty:** Avoid new proponent-generated ROWs. • **Visual Resource Management:** Class II	

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
		closed for saleable minerals with the following exceptions: Free-use permits and mineral material sales contracts for the disposal of excess mineral materials associated with other permitted actions or trespasses can be issued as needed. Free-use permits for BLM uses can be issued when needed to provide resource protection, and for human health and safety. ● **Lands and Realty:** Exclude new proponent-generated ROWs. ● **Visual Resource Management:** Class II **Recreational:** ● **Minerals:** Open to oil and gas leasing subject to major constraints (NSO), pursue withdrawal from locatable mineral entry, closed for solid leasable, and closed for saleable minerals with the following exceptions: Free use-permits and mineral material sales contracts for the disposal of excess mineral materials associated with other permitted actions or trespasses can be issued as needed. Free-use permits for BLM uses can be issued when needed to provide resource protection and for human health and safety. ● **Lands and Realty:** Avoid new proponent-generated ROWs. ● **Visual Resource Management:** Class II		

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
WSR-03	No similar action.		All eligible segments found not suitable would be released from further study, and protective management would no longer be required.	
WSR-04	Protective interim management of eligible or suitable rivers would not involve assertion of federal reserved water rights.			No similar action.
WSR-05	No similar action.	Allow activities within the suitable river segment corridors on a case-by-case basis and in accordance with WSR-02, as long as their outstandingly remarkable values, free-flowing condition, water quality, and tentative classification would be protected. See BLM Manual-6400, Section 3.5, for implementation guidance. Minor improvements of fish and wildlife habitat would be allowed, and existing structures may be maintained as long as they are similar to present structures.		No similar action.

Table 2.42. Management Actions on Rivers Studied for Inclusion in the Wild and Scenic Rivers System

Management Actions on Rivers Studied for Inclusion in the Wild and Scenic Rivers System				
	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Virgin River, segments 1, 2, and 3 • **Tentative classification:** Recreational • **Outstandingly remarkable values:** Scenery, wildlife, fish, and cultural	**Visual Resource Management:** Class II **ACECs:** Virgin River ACEC **Minerals:** • **Fluid Leasables:** NSO • **Solid Leasables:** Closed • **Locatables:** Withdrawn • **Saleables:** Closed **Lands and Realty:** • **Disposals:** Bunkerville overlaps corridors • **Corridors:** There no corridors that cross the river segment. • **Solar:** Exclusion and avoidance • **Wind:** Exclusion	**Visual Resource Management:** Class II **ACECs:** Virgin River ACEC **Minerals:** • **Fluid Leasables:** Closed • **Solid Leasables:** Closed • **Locatables:** Withdrawn • **Saleables:** Closed **Lands and Realty:** • **Disposals:** Bunkerville overlaps corridors • **Corridors:** There no corridors that cross the river segment. • **Solar:** Exclusion and avoidance • **Wind:** Exclusion	**Visual Resource Management:** Class II **ACECs:** Virgin River ACEC **Minerals:** • **Fluid Leasables:** Closed • **Solid Leasables:** Closed • **Locatables:** Withdrawn • **Saleables:** Closed **Lands and Realty:** • **Disposals:** Bunkerville overlaps corridors • **Corridors:** There no corridors that cross the river segment. • **Solar:** Exclusion • **Wind:** Exclusion	**Visual Resource Management:** Class II **ACECs:** Virgin River ACEC **Minerals:** • **Fluid Leasables:** Closed • **Solid Leasables:** Closed • **Locatables:** Withdrawn • **Saleables:** Closed **Lands and Realty:** • **Disposals:** Bunkerville overlaps corridors • **Corridors:** There no corridors that cross the river segment. • **Solar:** Exclusion • **Wind:** Exclusion
Muddy River • **Tentative classification:** Recreational • **Outstandingly remarkable values:** Wildlife, fish, and cultural	**Visual Resource Management:** Class III **ACECs:** None **Minerals:** • **Fluid Leasables:** Closed and NSO • **Solid Leasables:** Closed • **Locatables:** Open • **Saleables:** Closed **Lands and Realty:** • **Disposals:** Moapa-Glendale disposal area • **Corridors:** There are two corridors that cross the river segment.	**Visual Resource Management:** Class II **ACECs:** None **Minerals:** • **Fluid Leasables:** Closed and NSO • **Solid Leasables:** Closed • **Locatables:** Open • **Saleables:** Closed **Lands and Realty:** • **Disposals:** Moapa-Glendale disposal area • **Corridors:** There is one corridor that crosses the river segment.	**Visual Resource Management:** Class II **ACECs:** None **Minerals:** • **Fluid Leasables:** Open • **Solid Leasables:** Closed • **Locatables:** Withdrawn • **Saleables:** Open **Lands and Realty:** • **Disposals:** Moapa-Glendale disposal area • **Corridors:** There is one corridor that crosses the river segment. • **Solar:** Avoidance	**Visual Resource Management:** Class II **ACECs:** None **Minerals:** • **Fluid Leasables:** Open • **Solid Leasables:** Open • **Locatables:** Open • **Saleables:** Open **Lands and Realty:** • **Disposals:** Moapa-Glendale disposal area • **Corridors:** There is one corridor that crosses the river segment. • **Solar:** Avoidance

Management Actions on Rivers Studied for Inclusion in the Wild and Scenic Rivers System				
	Alternative 1	**Alternative 2**	**Alternative 3**	**Alternative 4**
	• **Solar:** Exclusion and avoidance • **Wind:** Exclusion	• **Solar:** Exclusion • **Wind:** Exclusion	• **Wind:** Exclusion	• **Wind:** Exclusion
Meadow Valley Wash • **Tentative classification:** Scenic • **Outstandingly remarkable values:** Wildlife, fish, and cultural	**Visual Resource Management:** Class III **ACECs:** Mormon Mesa ACEC **Minerals:** • **Fluid Leasables:** NSO • **Solid Leasables:** Closed • **Locatables:** Pursue withdrawal and withdrawn • **Saleables:** Closed **Lands and Realty:** • **Disposals:** Moapa-Glendale disposal area • **Corridors:** There are two corridors that cross the river segment. • **Solar:** Exclusion and avoidance • **Wind:** Exclusion	**Visual Resource Management:** Class II **ACECs:** Mormon Mesa ACEC, Stuart Ranch ACEC, and Moapa Mesquite ACEC **Minerals:** • **Fluid Leasables:** Closed • **Solid Leasables:** Closed • **Locatables:** Pursue withdrawal and withdrawn • **Saleables:** Closed **Lands and Realty:** • **Disposals:** Moapa-Glendale disposal area • **Corridors:** There is one corridor that crosses the river segment. • **Solar:** Exclusion • **Wind:** Exclusion	**Visual Resource Management:** • **Meadow Valley North:** Class II • **Meadow Valley South:** Class II **ACECs:** • **Meadow Valley North:** Mormon Mesa ACEC and Stuart Ranch ACEC • **Meadow Valley South:** Moapa Mesquite ACEC **Minerals:** • **Fluid Leasables:** ○ **Meadow Valley North:** Closed ○ **Meadow Valley South:** Open and NSO • **Solid Leasables:** ○ **Meadow Valley North:** Closed ○ **Meadow Valley South:** Open • **Locatables:** ○ **Meadow Valley North:** Withdrawn ○ **Meadow Valley South:** Open • **Saleables:** ○ **Meadow Valley North:** Closed ○ **Meadow Valley South:** Open	**Visual Resource Management:** • **Meadow Valley North:** Class III • **Meadow Valley South:** Class IV **ACECs:** • **Meadow Valley North:** Mormon Mesa ACEC and Stuart Ranch ACEC • **Meadow Valley South:** None **Minerals:** • **Fluid Leasables:** ○ **Meadow Valley North:** Closed ○ **Meadow Valley South:** Open and NSO • **Solid Leasables:** ○ **Meadow Valley North:** Closed ○ **Meadow Valley South:** Open • **Locatables:** ○ **Meadow Valley North:** Withdrawn ○ **Meadow Valley South:** Pursue withdrawal • **Saleables:** ○ **Meadow Valley North:** Closed ○ **Meadow Valley South:** Open

Management Actions on Rivers Studied for Inclusion in the Wild and Scenic Rivers System				
	Alternative 1	**Alternative 2**	**Alternative 3**	**Alternative 4**
			Lands and Realty: • **Disposals:** ○ **Meadow Valley North:** None ○ **Meadow Valley South:** Moapa-Glendale disposal area • **Corridors:** ○ **Meadow Valley North:** None ○ **Meadow Valley South:** There are two corridors that cross the river segment. • **Solar:** Exclusion • **Wind:** Exclusion	**Lands and Realty:** • **Disposals:** ○ **Meadow Valley North:** None ○ **Meadow Valley South:** Moapa-Glendale disposal area • **Corridors:** ○ **Meadow Valley North:** None ○ **Meadow Valley South:** There are two corridors that cross the river segment. • **Solar:** Exclusion • **Wind:** Exclusion
Hiko Spring • **Tentative classification:** Wild • **Outstandingly remarkable values:** Wildlife, geology, cultural, scenery, and recreation	**Visual Resource Management:** Class II **ACECs:** None **Minerals:** • **Fluid Leasables:** Closed • **Solid Leasables:** Closed • **Locatables:** Pursue withdrawal • **Saleables:** Closed **Lands and Realty:** • **Disposals:** None • **Corridors:** There no corridors that cross the river segment. • **Solar:** Avoidance • **Wind:** Exclusion	**Visual Resource Management:** Class I **ACECs:** Hiko Spring ACEC **Minerals:** • **Fluid Leasables:** Closed • **Solid Leasables:** Closed • **Locatables:** Pursue withdrawal • **Saleables:** Closed **Lands and Realty:** • **Disposals:** None • **Corridors:** There no corridors that cross the river segment. • **Solar:** Exclusion • **Wind:** Exclusion	**Visual Resource Management:** Class I **ACECs:** Hiko Spring ACEC **Minerals:** • **Fluid Leasables:** Closed • **Solid Leasables:** Closed • **Locatables:** Pursue withdrawal • **Saleables:** Closed **Lands and Realty:** • **Disposals:** None • **Corridors:** There no corridors that cross the river segment. • **Solar:** Exclusion • **Wind:** Exclusion	**Visual Resource Management:** Class II **ACECs:** None **Minerals:** • **Fluid Leasables:** Open • **Solid Leasables:** Open • **Locatables:** Open • **Saleables:** Open **Lands and Realty:** • **Disposals:** None • **Corridors:** There no corridors that cross the river segment. • **Solar:** Exclusion • **Wind:** Exclusion
Carson Slough • **Tentative classification:** Wild	**Visual Resource Management:** Class IV **ACECs:** Ash Meadows ACEC	**Visual Resource Management:** Class I **ACECs:** Ash Meadows ACEC	**Visual Resource Management:** Class I **ACECs:** Ash Meadows ACEC	**Visual Resource Management:** Class III

Management Actions on Rivers Studied for Inclusion in the Wild and Scenic Rivers System				
	Alternative 1	**Alternative 2**	**Alternative 3**	**Alternative 4**
• **Outstandingly remarkable values:** Wildlife and cultural	**Minerals:** • **Fluid Leasables:** NSO • **Solid Leasables:** Closed • **Locatables:** Withdrawn • **Saleables:** Closed **Lands and Realty:** • **Disposals:** None • **Corridors:** There are no corridors that cross the river segment. • **Solar:** Exclusion • **Wind:** Exclusion	**Minerals:** • **Fluid Leasables:** Closed • **Solid Leasables:** Closed • **Locatables:** Withdrawn • **Saleables:** Closed **Lands and Realty:** • **Disposals:** None • **Corridors:** There are no corridors that cross the river segment. • **Solar:** Exclusion • **Wind:** Exclusion	**Minerals:** • **Fluid Leasables:** Closed • **Solid Leasables:** Closed • **Locatables:** Withdrawn • **Saleables:** Closed **Lands and Realty:** • **Disposals:** None • **Corridors:** There are no corridors that cross the river segment. • **Solar:** Exclusion • **Wind:** Exclusion	**ACECs:** Ash Meadows ACEC **Minerals:** • **Fluid Leasables:** Closed • **Solid Leasables:** Closed • **Locatables:** Withdrawn • **Saleables:** Closed **Lands and Realty:** • **Disposals:** None • **Corridors:** There are no corridors that cross the river segment. • **Solar:** Exclusion • **Wind:** Exclusion

2.5.4.4. Wilderness

Maps:

- Wilderness and Lands With Wilderness Characteristics, Alternative 1 (p. 2139)
- Wilderness and Lands With Wilderness Characteristics, Alternative 2 (p. 2139)
- Wilderness and Lands With Wilderness Characteristics, Alternative 3 (p. 2139)
- Wilderness and Lands With Wilderness Characteristics, Alternative 4 (p. 2139)

Table 2.43. Wilderness Management Actions

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Goal 1: Manage those units of the National Wilderness Preservation system to preserve the wilderness character of the areas for present and future generations.				
Objective 1.1: Manage existing and future congressionally designated wilderness areas to preserve the wilderness character of the areas and administer the areas for other purposes.				
WILD-01	Manage the following wilderness areas (all are located in the Las Vegas Field Office): ● Arrow Canyon Wilderness (27,531 acres) ● Eldorado Wilderness (5,700 acres) ● Ireteba Peaks Wilderness (10,446 acres) ● Jumbo Springs Wilderness (4,631 acres) ● Lime Canyon Wilderness (24,156 acres) ● Mt. Charleston Wilderness (2,154 acres) ● Muddy Mountains Wilderness (44,498 acres) ● South McCullough Wilderness (44,245 acres) ● Spirit Mountain Wilderness (605 acres) ● Wee Thump Joshua Tree Wilderness (6,050 acres) ● Meadow Valley Range Wilderness (1,817 acres) ● Mormon Mountains Wilderness (10,938 acres)			
WILD-02	No similar action.	Attain no net unmitigated decrease in the benchmark conditions generally prevailing in each wilderness at the time of congressional designation. Maintain, or when possible, improve the benchmark quality of wilderness character. Mitigation may include on- or off-site actions.		Mitigate permanent and temporary impacts to the wilderness resource from activities on adjacent public lands on a case-by-case basis.
Objective 1.2: Manage wilderness-related support facilities and access points adjacent to existing and future congressionally designated wilderness areas, giving consideration to other resource values and uses.				
WILD-03	No similar action.	Allow facilities adjacent to wilderness that would support management within wilderness.		
WILD-04	No similar action.	Limit the number of access points to existing and future congressionally designated wilderness by designating roads, primitive roads, and trails through travel and transportation management.		
Objective 1.3: Manage congressionally designated wilderness areas in a coordinated and adaptive manner where areas cross jurisdictional boundaries.				
WILD-05	No similar action.	Participate in cooperative research efforts that advance wilderness management in the Mojave ecoregion.		
WILD-06	No similar action.	Develop wilderness management plans that strive for consistent management practices across agency boundaries and consensus in all discretionary management practices.		

2.5.4.5. Wilderness Study Areas

Maps:

- Wilderness and Lands With Wilderness Characteristics, Alternative 1 (p. 2139)
- Wilderness and Lands With Wilderness Characteristics, Alternative 2 (p. 2139)
- Wilderness and Lands With Wilderness Characteristics, Alternative 3 (p. 2139)
- Wilderness and Lands With Wilderness Characteristics, Alternative 4 (p. 2139)

Table 2.44. Wilderness Study Areas Management Actions

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Goal 1: Provide management direction for prolonged stewardship of wilderness study areas (WSAs), including instant study areas (ISAs), to maintain the area's suitability for preservation as wilderness until Congress acts on a WSA by either designating the area as wilderness or releasing it for other purposes.				
Objective 1.1: Ensure that the characteristics on certain lands that caused them to be inventoried and designated as WSAs are maintained and not diminished or lessened in any way that might constrain or limit Congress' final wilderness designation decisions.				
WSA-01	Manage wilderness study areas in accordance with current BLM policy.	Manage the following WSAs: ● Mount Stirling WSA (4,607 acres) (LVFO and PFO) ● Million Hills WSA (22,604 acres) (LVFO) ● Resting Springs WSA (4,392 acres) (PFO) ● Virgin Mountain ISA (5,850 acres) (LVFO) *Alternatives 2–4 map (p. 2139)*		
WSA-02	See TRV-03. (p. 152)	Retain primitive routes within WSAs in accordance with existing policy until the areas are either congressionally designated as wilderness or released for other purposes. Manage released areas in accordance with allocations of areas as open, limited to designated, or closed as described in the Travel and Transportation section (p. 149) of this RMP.		
WSA-03	No similar action.	Attain no net unmitigated decrease in the wilderness characteristics of all WSAs from activities on adjacent public lands on a case-by-case basis. Mitigation may include on- or off-site actions.		Mitigate permanent and temporary impacts to WSAs from activities on adjacent public lands on a case-by-case basis.
Objective 1.2: Provide management direction for wilderness study areas not designated as wilderness by Congress and released for other purposes.				
WSA-04	No similar action.	Manage lands released from wilderness study area designation by Congress in accordance with the goals, objectives, and management prescriptions established in this RMP. Examine proposals in the released areas on a case-by-case basis until a plan amendment can be written to determine future management directions, when necessary.		
WSA-05	Manage released lands to generally maintain the existing aesthetic qualities through multiple use management of those areas and to provide for semi-primitive recreation opportunities. Adopt limited use OHV, visual resource management, and recreation opportunity spectrum designations consistent with designations already in place on adjacent non-wilderness study area lands.	See WSA-04.		

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
WSA-06	Manage lands released by Congress to allow opportunities for mineral exploration and development in accordance with current laws and regulations and consistent with decisions for mineral management on adjacent lands.	See WSA-04.		
Goal 2: Provide management direction for formally designated Natural Areas[a] for the protection of unusual flora and fauna that is found nowhere else in southern Nevada.				
Objective 2.1: Provide for continued protection of unique resource values and allow uses compatible with the primary purpose of the area.				
WSA-07	Protect and manage the Virgin Mountain Natural Area as per guidelines contained in the CFR Develop an information base on the Natural Area and develop and implement a resource monitoring and visitor service system. If use warrants, prepare a RAMP on the area. Coordinate the RAMP with other activity plans.	Remove the "natural area" designation for Virgin Mountain and have these lands fall into the multiple-use management category. (See the ACEC section for management actions pertaining to Virgin Mountain).		

[a] Designated in the Notice of Proposed Classification of Public Lands for Multiple-Use Management (published in the Federal Register, Vol. 35, No. 187; Friday September 25, 1970) vested in the Secretary of the Interior under the Act of September 19, 1964, and pursuant to the regulations in 43 CFR Part 2400

2.5.5. Social and Economic

2.5.5.1. Public Health and Safety

Table 2.45. Public Health and Safety Management Actions

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Goal 1: Ensure public health and safety from hazards associated with formerly used defense sites (FUDS) and other prior Department of Defense sites associated with past military activities.				
Objective 1.1: Prevent and reduce risks to public health and the environment where hazards may exist resulting from military defense activities.				
PHS-01	No similar action.	Manage the following sites identified by the Department of Defense, U.S. Army Corps of Engineers, and other agencies, e.g., Department of Energy, to avoid and/or limit exposure to areas that may contain hazards associated with munitions and explosives of concern. For a general location of FUDS within the planning area, refer to Map 3.5.2.3-1 (p. 2144). The sites listed below are the best available information; however, the information may not be all inclusive of prior Department of Defense sites associated with past military activities (i.e. munitions response sites, etc.): ● Nellis Air Force Base Range, Area of Interest E ● Nellis Small Arms Range (AX) ● Lake Mead Base Munitions and explosives of concern may include unexploded ordnance, discarded military munitions, and munitions constituents when munitions constituents are present in high enough concentrations to pose an explosive hazard . The sites may also be contaminated with munitions constituents that are not present in high enough concentrations to represent an explosive hazard, but in high enough concentrations to be a toxicity hazard in soil, groundwater, surface water, and/or air.		
PHS-02	No similar action.	Close or restrict areas on subsurface activities, including disposal of lands, as appropriate.		
PHS-03	No similar action.	Coordinate uses on BLM lands with federal and state military agencies to ensure public and aviation safety. Develop, as needed, cooperative management agreements and/or Memorandums of Understanding to ensure communication, coordination, and safe use of public lands.		
Lands and Realty				
L&R-17	BLM will not acquire contaminated property.			

2.6. Comparative Summary of Alternatives

See Appendix Q (p. 2139) for a complete list of maps.

Table 2.46. Comparative Summary of the Alternatives

Comparative Summary of the Alternatives				
	Alternative 1	**Alternative 2**	**Alternative 3**	**Alternative 4**
Visual Resource Management (p. 69) Maps (p. 2139)				
Class I	47,562 acres	472,574 acres	230,372 acres	230,372 acres
Class II	917,200 acres	948,521 acres	1,149,827 acres	897,796 acres
Class III	1,622,226 acres	834,364 acres	848,909 acres	836,152 acres
Class IV	523,297 acres	856,378 acres	882,617 acres	1,148,446 acres
Lands With Wilderness Characteristics (p. 76) Maps (p. 2139)				
	No similar action.	Protect, preserve, and maintain 242,214 acres of lands with wilderness characteristics.	Protect, preserve, and maintain 36,033 acres of lands with wilderness characteristics.	Protect, preserve, and maintain 29,840 acres of lands with wilderness characteristics.
Livestock Grazing (p. 83) Maps (p. 2139)				
	Close all allotments to livestock grazing within the planning unit, with the following exceptions: Hidden Valley, Mount Stirling, Lower Mormon Mesa, Roach Lake, White Basin, Muddy River, Wheeler Wash, Mesa Cliff, Arrow Canyon in Battleship Wash, Flat Top Mesa, Jean Lake, and Arizona-administered allotments. That portion of the Jean Lake allotment within the desert tortoise area of critical environmental concern would be closed to grazing. Close all land disposal areas to livestock grazing.	Close all allotments to livestock grazing within the planning area.	The following allotments would be unavailable to livestock grazing: ● Roach Lake (LVFO) ● White Basin (LVFO) ● Mesa Cliff (LVFO) ● Muddy River (LVFO) ● Wheeler Wash (PFO) ● Arrow Canyon (LVFO) ● Arrow Canyon in Battleship Wash (LVFO) ● Jean Lake (LVFO) The following allotments would be available for livestock grazing(43 CFR 4130.2[a]): ● Hidden Valley (LVFO) ● Lower Mormon Mesa (LVFO) ● Flat Top Mesa (LVFO) ● Arizona-administered allotments	The following allotments would be unavailable to livestock grazing: ● Roach Lake ● White Basin ● Mesa Cliff ● Arrow Canyon in Battleship Wash ● Jean Lake The following allotments would be available for livestock grazing (43 CFR 4130.2[a]): ● Hidden Valley ● Lower Mormon Mesa ● Flat Top Mesa ● Muddy River ● Wheeler Wash ● Arizona-administered allotments Close all land disposal areas to

Comparative Summary of the Alternatives				
	Alternative 1	Alternative 2	Alternative 3	Alternative 4
			Close all land disposal areas to livestock grazing.[a]	livestock grazing.[a]
Minerals — Fluid Leasable Minerals (p. 89) Maps (p. 2139)				
Open with standard stipulations	No similar action.	311,521 acres	1,281,291 acres	1,818,010 acres
Controlled surface use (CSU)	121,234 acres	78,750 acres	362,314 acres	130,494 acres
No surface occupancy (NSO)	2,640,278 acres	0 acres	294,301 acres	202,315 acres
Closed to leasing	349,937 acres	2,721,963 acres	1,173,464 acres	962,314 acres
Minerals — Solid Leasable Minerals (p. 94) Maps (p. 2140)				
Open	1,916,135 acres	1,373,556 acres	1,702,600 acres	1,791,582 acres
Closed	1,195,212 acres	1,737,791 acres	1,408,747 acres	1,319,765 acres
Minerals — Locatable Minerals (p. 97) Maps (p. 2140)				
Open	1,956,677 acres	1,356,970 acres	1,809,403 acres	1,573,533 acres
Pursue withdrawal	6,184 acres	608,942 acres	166,883 acres	395,272 acres
Withdrawn	1,148,448 acres	1,145,407 acres	1,135,676 acres	1,146,560 acres
Minerals — Saleable Minerals (p. 100) Maps (p. 2140)				
Open	2,131,283 acres	1,604,225 acres	1,858,359 acres	2,032,485 acres
Closed	980,048 acres	1,507,105 acres	1,252,971 acres	1,079,495 acres
Recreation (p. 104) Maps (p. 2141)				
	Maintain eight existing special recreation management areas (SRMAs) (593,188 acres) and one extensive recreation management area (ERMA) (2,517,984 acres).	Focus SRMAs to seven high-use recreation areas (754,676 acres) with seven ERMAs (2,354,032 acres) and eight recreation management zones (RMZs) (153,422 acres).	Manage seven SRMAs (879,321 acres), seven ERMAs (2,235,485 acres), and four RMZs (127,166 acres).	Manage two SRMAs (32,037 acres), four ERMAs (912,197 acres), and one RMZ (17,829 acres).
Travel Management — OHV Area Allocations (p. 149) Maps (p. 2141)				
Open	26,563 acres	15,881 acres	15,880 acres	15,586 acres
Limited to existing roads, trails, and dry washes	1,628,460 acres	0 acres	0 acres	0 acres
Limited to designated	1,136,598 acres	2,669,582 acres	2,912,805 acres	2,913,100 acres

Comparative Summary of the Alternatives				
	Alternative 1	**Alternative 2**	**Alternative 3**	**Alternative 4**
Closed	319,408 acres	424,840 acres	181,617 acres	181,616 acres
Lands & Realty — Potential Disposal Areas (p. 158) Maps (p. 2141)				
Las Vegas Field Office	121,874 acres	72,296 acres	112,766 acres	116,437 acres
Pahrump Field Office	42,044 acres	6,203 acres	42,513 acres	78,301 acres
Renewable Energy — Solar (p. 172) Maps (p. 2142)				
	Solar energy applications, except grandfathered applications received by Oct. 28, 2011, will adhere to the programmatic design features for solar energy development identified in Appendix A of the Final Solar PEIS (incorporated by reference) and adopted in the Solar PEIS-Record of Decision (incorporated by reference) and the mitigation measures identified in the programmatic biological opinion (Service File No. 84320–20 I 2–F-0200).			
	No similar action.		Proposed solar energy zones (SEZs) will adhere to the design features identified in Appendix A of the Final Solar PEIS (incorporated by reference) and adopted in the Solar PEIS-Record of Decision (incorporated by reference) and the mitigation measures identified in the programmatic biological opinion (Service File No. 84320–20 I 2–F-0200).	
Solar exclusion	2,129,838 acres	2,838,097 acres	2,654,966 acres	2,401,660 acres
Solar avoidance (variance)	968,148 acres	258,833 acres	417,010 acres	541,175 acres
Open for solar	14,128 acres	13,921 acres	39,113 acres	168,255 acres
Renewable Energy — Wind (p. 172) Maps (p. 2142)				
	Wind energy applications will adhere to the best management practices for wind energy development established in the Wind PEIS Record of Decision (incorporated by reference).			
Wind exclusion	1,098,385 acres	2,556,580 acres	2,497,299 acres	1,787,654 acres
Open for wind	2,013,097 acres	172,537 acres	183,861 acres	485,067 acres
Wind avoidance	No similar action.	381,576 acres	429,453 acres	865,232 acres
Areas of Critical Environmental Concern (ACEC) (p. 180) Maps (p. 2142)				
	Maintain 23 existing ACECs (1,014,301 acres).	Maintain and expand 21 existing ACECs, release two ACECs, and designate 23 new ACECs for a total of 44 (1,444,548 acres).	Maintain and expand 21 existing ACECs, release two ACECs, and designate 20 new ACECs for a total of 41 (1,292,216 acres).	Maintain 21 existing ACECs, release two ACECs, and designate four new ACECs for a total of 25 (1,021,365 acres).
Wild and Scenic Rivers (p. 259) Maps (p. 2143)				

Comparative Summary of the Alternatives				
	Alternative 1	**Alternative 2**	**Alternative 3**	**Alternative 4**
	Recommend no rivers or river segments as suitable for designation as wild and scenic rivers.	Six eligible river segment corridors would be determined suitable for WSR designation (28.5 BLM miles/55 total miles), with the tentative classifications of wild (3 BLM miles/3 total miles), scenic (6 BLM miles/11 total miles), or recreational (19.5 BLM miles/41 total miles).	One eligible river segment corridor would be determined suitable for WSR designation (3 BLM miles/3 total miles) with the tentative classifications of recreational.	No river corridors would be determined suitable for inclusion in the National Wild and Scenic River System.
Wilderness (p. 268) Maps (p. 2139)				
	Manage the following wilderness areas (all are located in the Las Vegas Field Office): ● Arrow Canyon Wilderness (27,531 acres) ● Eldorado Wilderness (5,700 acres) ● Ireteba Peaks Wilderness (10,446 acres) ● Jumbo Springs Wilderness (4,631 acres) ● Lime Canyon Wilderness (24,156 acres) ● Mt. Charleston Wilderness (2,154 acres) ● Muddy Mountains Wilderness (44,498 acres) ● South McCullough Wilderness (44,245 acres) ● Spirit Mountain Wilderness (605 acres) ● Wee Thump Joshua Tree Wilderness (6,050 acres) ● Meadow Valley Range Wilderness (1,817 acres) ● Mormon Mountains Wilderness (10,938 acres)			
Wilderness Study Areas (p. 259) Maps (p. 2139)				
	Manage wilderness study areas in accordance with current BLM policy.	Manage the following WSAs: ● Mount Stirling WSA (4,607 acres) (LVFO and PFO) ● Million Hills WSA (22,604 acres) (LVFO) ● Resting Springs WSA (4,392 acres) (PFO) ● Virgin Mountain ISA (5,850 acres) (LVFO)		

[a] In accordance with 43 CFR §4110.4-2(2)(b), grazing permittees/leasees will be given two year's notice prior to any BLM land sale that would result in cancelation or modification of their grazing permit, lease, or preference.

Chapter 3. Affected Environment

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3.1. How to Read this Chapter

This chapter provides a description of the biological, physical, and socioeconomic characteristics, including human uses, that could be affected by implementing the action alternatives for this RMP/EIS as described in Chapter 2. Information from broad-scale assessments was used to help set the context for the planning area. The information and direction for BLM resources has been further broken down into fine-scale assessments and information where possible. Specific aspects of each resource discussed in this section (e.g., weeds, fire, and OHV use) were raised during the public and agency scoping process. The level of information presented in this chapter is commensurate with and sufficient to assess potential effects of the action alternatives in Chapter 4.

The public lands administered by the Las Vegas and Pahrump field offices are managed for multiple uses. Multiple-use management includes the management of resource uses and resource values. The planning area is important for its natural areas and values, such as the large number of areas of critical environmental concern (ACECs) and special status species/habitats. The resources in the planning area have also provided the context for diverse land uses. The existing condition of the planning area's resources will provide the context in which management can continue to ensure the sustained yield of multiple uses.

3.2. Resources

3.2.1. Air Quality

3.2.1.1. Regulatory Framework

The BLM's fundamental role in air resource management is to ensure that agency activities comply with applicable air quality laws, regulations, and standards and that BLM-authorized leases, permits, and land-use actions include conditions and stipulations that also require compliance with applicable federal, state, and local air quality laws, regulations, and standards. This is done through interagency coordination, compliance with state implementation plans, and environmental impact analyses, in accordance with the National Environmental Policy Act of 1969 (NEPA), regulations codified in Title 40, Code of Federal Regulations, and adaptive management policies and practices as identified in the BLM Handbook H-1790-1.

3.2.1.1.1. National Ambient Air Quality Standards

The Federal Clean Air Act (CAA) and the subsequent Federal Clean Air Act Amendments of 1990 (CAAA) require the U.S. Environmental Protection Agency (EPA) to develop National Ambient Air Quality Standards (NAAQS) (40 CFR part 50) to identify air pollutants considered harmful to human health and the environment. Section 109 of the act identifies two types of national ambient air quality standards, primary and secondary, that provide an extra margin of environmental protection. Primary standards provide protection to public health, and secondary standards provide protection to the environment, including decreased visibility and damage to animals, crops, vegetation, and buildings. The EPA has established NAAQS for principal pollutants that are known as "criteria pollutants." They are ozone, (O_3), particulate matter (PM_{10}, $PM_{2.5}$), carbon monoxide (CO), nitrogen oxides (NO_2), sulfur dioxide (SO_2), and lead (Pb). These federal NAAQS represent the maximum allowable atmospheric concentrations, measured in parts per million (ppm) by volume, parts per billion (ppb) by volume, and micrograms per cubic meter of air (µg/m3).

Table 3.1. National Ambient Air Quality Standards*

Pollutant	Averaging Period	National Ambient Air Quality Standards	
		Primary	***Secondary***
Sulfur dioxide (SO_2)	3-hour	—	0.5 ppm
	24-hour	0.14 ppm	—
	Annual	0.03 ppm	—
Particulate matter less than or equal to 10 microns in diameter (PM_{10})	24-hour	150 µg/m3	150 µg/m3
	Annual	50 µg/m3	50 µg/m3
Particulate matter less than or equal to 2.5 microns in diameter ($PM_{2.5}$)	24-hour	65 µg/m3	65 µg/m3
	Annual	15 µg/m3	15 µg/m3
Carbon monoxide (CO)	1-hour	35 ppm	—
	8-hour	9 ppm	—
Nitrogen dioxide (NO_2)	Annual	0.053 ppm	0.053 ppm
Lead (Pb)	Quarterly	1.5 µg/m3	1.5 µg/m3
Ozone (O_3)	1-hour	0.12 ppm	0.12 ppm
	8-hour	0.08 ppm	0.08 ppm

*Sources: U.S. Environmental Protection Agency 2003a, 2003b, 2003c, 2003d, 2003e, 2003f, 2003g, 2003h, 2003i; Notes: ppm = parts per million; g/m3 = micrograms per cubic meter

The standards contained in the CAA classify the United States into attainment and nonattainment areas. The areas that exceed the NAAQS are designated by the EPA as nonattainment for the specific pollutant or pollutants. These areas are usually designated by county or metropolitan statistical areas, and it is the responsibility of the governor of each state to ensure compliance with the requirements of the CAA. Where nonattainment exists, states are required by the EPA to demonstrate how nonattainment areas will be brought into compliance with the NAAQS and other components of the CAA through the development of a state implementation plan. In addition, designated nonattainment areas may be expanded, per Section 107(d) of the CAA, which defines a nonattainment area as "any area that does not meet (or that contributes to ambient air quality in a nearby area that does not meet) the national primary or secondary ambient air quality standards for the pollutant."

3.2.1.1.2. Ambient Air Quality Concentrations

Ambient air quality in a given location is described by the mass of pollutants present in a volume of air and can be reported in units of micrograms per cubic meter (µg/m3) or parts per million. Air quality concentration is determined by the type and amount of pollutants emitted into the atmosphere, the size and topography of the airshed, and meteorological conditions related to the prevailing winds.

The Clark County Department of Air Quality Management routinely operates air quality instruments at monitoring stations to measure the ambient concentrations of the criteria pollutants of particulate matter less than 10 microns in diameter (PM_{10}), particulate matter less than 2.5 microns in diameter ($PM_{2.5}$), carbon monoxide (CO), ozone (O_3), nitrogen oxides (NO and NO_2), sulfur dioxide (SO_2), chlorine (CL_2), ammonia (NH_3), and hydrogen sulfide (H_2S), as well as visibility and haze, which are closely related to particulate concentrations. These monitoring sites are located throughout the Las Vegas Valley and outlying sites based on emission source distribution and population exposure. Clark County Department of Air Quality Management operated 16 monitoring stations in the county in 2009 (DAQEM 2010a).

Air resources in Nye County are monitored by the State of Nevada Department of Environmental Protection; as such, there is little data available for Nye County. There are monitoring stations in Pahrump that measure PM_{10} levels. Other parameters of the national air quality standards are not measured in the planning area of Nye County.

Table 3.6 (p. 286) below shows the total exceedances for each Pahrump station and the average of each 3-year period (i.e. the design value). Compliance with the NAAQS is met when the average number of exceedances in the 3-year period is less or equal to 1. Numbers in **bold** indicate exceedance conditions.

Table 3.2. Total Number of Exceedances of the PM_{10} 24-Hour Standard Between 2000 and 2010 – Pahrump Stations[a]

	Linda Street	Church	Manse Elementary School	Glenoaks Street	Community Pool	Willow Creek
1998-2000	—	—	—	—	—	—
1999-2001	—	—	—	—	**4 (1.3)**	—
2000-2002	—	—	—	—	**18 (6.0)**	—
2001-2003	—	—	—	—	**21 (7.0)**	—
2002-2004	—	—	—	—	**14 (4.7)**	—

	Linda Street	Church	Manse Elementary School	Glenoaks Street	Community Pool	Willow Creek
2003-2005	—	—	—	—	**19 (6.3)**	—
2004-2006	0	0	—	—	2 (0.7)	2 (0.7)
2005-2007	0	0	0	—	—	1 (0.3)
2006-2008	0	0	0	—	—	1 (0.3)
2007-2009	0	0	0	—	—	—
2008-2010	0	0	0	0	—	—

[a]Source: Nevada Air Quality Trend Report, 2000-2010; Citation: Nevada Division of Environmental Protection, Nevada Air Quality Trend Report, 2000-2010.

3.2.1.2. Current Condition

The planning area consists of multiple locales that are classified as both attainment and nonattainment for the NAAQS. The BLM Southern Nevada District Office is composed of three field offices, Pahrump, Las Vegas, and the Red Rock/Sloan National Conservation Areas. The unicorporated township of Pahrump is in Nye County and currently meets attainment standards for all criteria pollutants as set forth in the NAAQS. In 2003, the EPA, state, town board and Nye County agreed to use a Memorandum of Understanding (MOU) to successfully address a nonattainment classification for PM_{10}. The MOU required Pahrump to fully implement control strategies by 2006, maintaining them into the future and provided cooperative agencies until 2009 to bring the area back into attainment. The compliance oversight for air quality in Pahrump is the Nevada Department of Environmental Protection, Bureau of Air Quality Planning.

The Las Vegas Field Office, including the Red Rock and Sloan NCAs, is located in the compliance jurisdiction of Clark County. At present, portions of Clark County are classified as nonattainment for particulate matter with a mean aerodynamic diameter of 10 µm or less (PM_{10}) (serious); carbon monoxide (CO) (serious); ozone (O_3), (8-hour standard) (subpart 1, basic). A maintenance plan and redesignation request for PM_{10} has been submitted to the EPA by Clark County Comprehensive Planning. The county submitted a Milestone Acheivement Report in June 2007, and in August 2010, EPA published a redesignation of the area to attainment (75 FR 45485). Additionally, a Natural Events Action Plan has been developed to describe how the effects of particulate matter during high wind events affect air quality and how these events will be mitigated in Clark County. Typically, the highest concentrations of CO, O_3, PM_{10}, and $PM_{2.5}$ are generally associated with naturally occurring wind events and unfavorable meteorological conditions. The Natural Events Action Plan exceeds EPA's Exceptional Events Rule.

3.2.1.3. Regional Air Quality

The local air district uses National Ambient Air Quality Standards to determine the potential impact of BLM-proposed actions. Additional requirements for both construction and operation are in place to manage emissions of fugitive dust (PM_{10}). Any approved construction or new significant source of stationary (point) and nonpoint sources of air pollution in Clark and Nye counties would be required by the Clark County Department of Air Quality and the Nevada Department of Environmental Protection, respectively, to adhere to the prescribed regulations, best management practices, and control measures to minimize dust emissions and control engine exhaust emissions. Nevada is divided into hydrographic areas that are used to define local airsheds (see Table 3.9, State of Nevada Hydrographic Basins Within the Planning Area (p. 304)).

3.2.1.4. Trends

The Ambient Air Quality Program, implemented by the Bureau of Air Quality Planning in Nye County, operates a state-of-the-art network of gaseous and particulate pollutant monitors throughout rural Nevada, which includes the planning area. The locations of the monitors are selected through a process using EPA guidance and are generally located near populous areas. The data collected is used to demonstrate compliance with the NAAQS and progress toward meeting ambient air quality goals and standards for the state. The Bureau of Air Quality Planning publishes statewide monitoring data, site descriptions, air quality standards, and health and pollutant information, including demographics monitoring programs and air quality trends, in an annual Trend Report, which identifies, by pollutant, the air quality status and trends for the state's monitoring jurisdiction.

Las Vegas experienced a 10-year trend reduction in carbon monoxide exceedances (but not necessarily violations) of the NAAQS, which frequently totaled 40 or more per year in the 1980s. During 1997 and 1998, the Las Vegas Valley encountered only four unhealthful events and three exceedance days, all recorded at the Sunrise Acres monitoring station. Exceedances and violations of the 8-hour CO standard eased by 1999, and there have been no recorded exceedances of the CO standard in Las Vegas since then (CO SIP Revision, Clark County, Oct. 2005).

On August 3, 2010, and September 16, 2010, the EPA finalized the rules to redesignate the Las Vegas Valley to attainment for NAAQS for PM_{10} and CO, respectively, and approved both maintenance plans and requests for redesignation.

Table 3.3. Annual CO Exceedances (Clark County)

Year	Exceedance		Year	Exceedance		Year	Exceedance
1981	27		1991	6		2001	0
1982	32		1992	2		2002	0
1983	33		1993	3		2003	0
1984	24		1994	4		2004	0
1985	31		1995	1		2005	0
1986	32		1996	3		2006	0
1987	18		1997	1		2007	0
1988	22		1998	2		2008	0
1989	27		1999	0		2009	0
1990	13		2000	0		2010	0

3.2.1.5. Forecast

In 1998, the Southern Nevada Public Lands Management Act made approximately 52,000 acres of public lands available for disposal in Southern Nevada. Shortly thereafter, due to high demand for development, the number of acres available for disposal was increased by approximately 22,000 acres.

The historic rate of land disposal in the early 2000s was nearly 4,000 acres annually. It was forecasted that upward of 10,000 acres annually would be nominated for public land disposal subsequent to the issuance of the final Land Disposal EIS (LV Valley Disposal Boundary EIS, Dec. 2004).

Later in the decade, a nationwide economic downturn occurred in the housing and commercial real estate markets. As a result, public land disposal activities appreciably reduced, and about 50 acres of public land or less were nominated for disposal between 2007 and 2010.

While the housing and commercial markets in Southern Nevada may never reach the development boom of the early 2000s, it is conceivable that the market will rebound to increased levels within the next decade, and land disposal activities will resume to improved levels.

3.2.1.6. General Climatic / Meteorological Summary

Nye County, the largest county in Nevada, is located in south central Nevada. Pahrump, an unicorporated town, comprises a large part of the planning area and is situated in the southeast corner of Nye County, approximately 60 miles west of Las Vegas and 60 miles east of Death Valley. The Spring Mountain Range surrounds the valley to the east and the Nopah Mountains to the west. The average rainfall in Pahrump is less than 5 inches annually, with less than an inch of snowfall. Pahrump is the nation's driest region with the lowest relative humidity in the country and with just over 200 days of sunshine per year, second only to Yuma, Arizona. Summers are hot and dry and typical of the high desert, and the nights cool down to the 70s and 80s. Spring and fall temperatures are moderate in the 60s to 90s, and the winter nights often drop below freezing, while temperatures elevate to the 50s during shorter winter days.

Las Vegas, located in Clark County, is situated in a broad desert valley in the southernmost portion of Nevada. Mountain ranges surround the valley and extend 2,000 to 10,000 feet above the valley floor. The Las Vegas Valley comprises about 600 square miles and stretches from northwest to southeast. For most of the area, the valley floor slopes downward from west to east. This affects the local climatology in terms of driving variations in wind and precipitation.

The valley is bounded on the north by the Sheep Range, while Sloan Canyon National Conservation Area and the Lake Mead National Recreation Area are generally considered its southern extent. To the west are the Spring Mountains, which include Mt. Charleston, the region's highest peak at 11,918 feet. Several smaller ranges line the eastern rim of the valley, including the Muddy Mountains, the Black Mountains, and the Eldorado Range. The four seasons are well defined in Las Vegas (Wood 1996), although they differ from the traditional view of seasonal variation. Summers display dry, hot, desert southwest characteristics. Winters, on the whole, are mild and pleasant. The spring and fall seasons are generally considered ideal, although rather sharp temperature fluctuations can occur. Overall, the region experiences extreme fluctuations of daily temperatures, strong seasonal winds, and generally clear skies.

As in Pahrump, the Las Vegas Valley is situated on the edge of the Mojave Desert and experiences an arid climate typical of the southern Mojave Desert. Monthly average precipitation shows the average rainfall to be around 4.5 inches per year. Due to the "rain shadow" effect of the Sierra Nevada Range and Spring Mountains to the west, moisture associated with storms originating in the Pacific Ocean rarely reaches the valley as the mountains act as effective barriers to moisture (DAQEM 2010a). Dry air masses move over the valley, resulting in clear to partly cloudy skies with 85 percent sunshine for the average year. During July and August, thunderstorms are common, contributing between 25 and 30 percent of annual precipitation. These storms are often of sufficient intensity to produce localized flash flooding (BLM 2010a). High winds associated with storms can produce winds over 50 mph, but are infrequent. However, the winds can degrade visibility and increase health hazards by blanketing dust and sand over much of the region. Snow accumulation is rare in Las Vegas. Flurries are observed once or twice during most winters, but

snowfall of an inch or more occurs only once every four to five years. Snowfall is common in the mountains surrounding Las Vegas. The Spring Mountains can receive between five and 10 feet annually. Tornadoes are rare in the Las Vegas Valley but have occurred in every month of the year. All of the 13 tornadoes reported in Clark County since 1950 have been very weak, at most F1 of the Fujita tornado scale (National Oceanic and Atmospheric Administration [NOAA] 2004). Humidity is below 40 percent most of the year, but during the winter and during and after summer rains, humidity can get above 50 percent.

The temperature in the Las Vegas Valley is very similar to the Pahrump Valley and ranges from an average daily maximum in July of approximately 104°F to an average daily maximum in January of approximately 56°F. The average daily temperature minimum ranges from 33 degrees in January to 75 degrees in July. Winters generally have afternoon temperatures averaging near 60 degrees and mostly clear skies. Summers have daily high temperatures that typically exceed 100 degrees with lows in the 70s. Normal 90-degree days extend from May 22 through September 27. Normal 100-degree days extend from June 17 through August 28 (NOAA 2011). Table 3.3, Las Vegas Monthly Temperature Averages (p. 290), illustrates the normal temperatures for Las Vegas.

3.2.1.7. Temperatures

Table 3.4. Las Vegas Monthly Temperature Averages [a]

Month	Maximum temperature	Minimum temperature	Average temperature	Heating degree days*	Cooling degree days*
January	57.1	36.8	47.0	574	0
February	63.0	41.4	52.2	375	0
March	69.5	47.0	58.3	244	20
April	78.1	53.9	66.0	83	98
May	87.8	62.9	75.4	16	323
June	98.9	72.3	85.6	0	602
July	104.1	78.2	91.2	0	796
August	101.8	76.7	89.3	0	739
September	93.8	68.8	81.3	0	474
October	80.8	56.5	68.7	57	157
November	66.0	44.0	55.0	318	4
December	57.3	36.6	47.0	571	0
Annual	**79.9**	**56.3**	**68.1**	**2,238**	**3,213**

[a]Source: U.S. Weather Service Web Page. Period of record is from 1971 through 2000. Temperatures in degrees Fahrenheit. http://www.wrh.noaa.gov/vef/climate/page1.php

*Heating and cooling degree days based on a 65-degree standard (e.g., a mean temperature of 75 degrees would equate to 10 cooling degree days or a mean temp of 50 degrees would equate to 15 heating degree days).

The summer heat is made more bearable as there is relative low humidity in the region. The exception is several weeks each summer when, typically, during July and August, the area experiences a moist monsoonal flow from the south. During this time, there are often desert thunderstorms associated with significant flash flooding and strong winds (Clark County Department of Air Quality and Environmental Management 2010a).

Freezing temperatures occur with some regularity in the planning area. Based on the 1971-2000 period of record, the average first occurrence of the first freeze in the fall is November 21; the average last occurrence is March 7 (NOAA 2011).

3.2.1.8. Local Air Quality

The Las Vegas Valley was designated as a serious nonattainment area for PM_{10} in early 1993. In 2004, the U.S. Environmental Protection Agency approved the PM_{10} attainment plan for the Las Vegas Valley and granted the state of Nevada's request to extend the applicable attainment date from December 31, 2001, to December 31, 2006 (Federal Register 75:148, 2010). The Las Vegas Valley attained the 24-hour PM_{10} NAAQS by the applicable attainment date. However, an attainment designation has not been finalized because a maintenance plan meeting the requirements of the Federal Clean Air Act has not been approved by the EPA. The PM_{10} classification and designation status remains as serious nonattainment for the Las Vegas Valley until the state of Nevada meets the CAA requirements for redesignation to attainment (Federal Register 75:148, 2010).

Parts of Clark County have also been designated as nonattainment for ozone. Portions of Clark County (near Las Vegas), including hydrographic areas 164A, 164B, 165, 166, 167, 212, 213, and 214, were designated as nonattainment for the federal 8-hour ozone standard in April 2004. The Phase 1 Implementation Rule issued by the EPA on June 15, 2004, classified these parts of Clark County as a "basic" nonattainment area under Subpart 1 of the CAA. Clark County was an attainment area for the previous 1-hour ozone standard. In June 2007, the United States Court of Appeals for the District of Columbia Circuit vacated the Phase 1 Implementation Rule, thus obligating Clark County to develop an early progress plan to obtain transportation conformity budgets. Thus, there currently is no formal ozone nonattainment classification for this area. A state implementation plan for ozone has not yet been developed. However, the Clark County Department of Air Quality is preparing a maintenance plan under the requirements of the 1997 ozone 8-hour standard of 0.08 ppm. In March 2008, the EPA promulgated a new ozone standard of 0.075 20 ppm.

The Las Vegas Valley (HA 212) in Clark County was previously in nonattainment for carbon monoxide but is currently designated as a serious maintenance area. The county submitted a maintenance plan for carbon monoxide and formally requested the EPA to redesignate the Las Vegas Valley from nonattainment to attainment of the 8-hour carbon monoxide NAAQS (with demonstration of continued attainment through 2020) because it had not exceeded the carbon monoxide NAAQS since 2000. In June 2005, the EPA determined the Las Vegas Valley had attained the NAAQS for carbon monoxide by the applicable date of December 31, 2000, and was eligible for redesignation to attainment status for carbon monoxide (DAQEM 2008). In September 2010, the EPA approved and finalized the request to redesignate the Las Vegas carbon monoxide nonattainment area to attainment (Fed Reg. 75:186, 2010).

3.2.1.9. Visibility

Class I Areas: The Clean Air Act defines Class I Areas in which visibility is protected more stringently than under the National Ambient Air Quality Standards. These areas are considered as having predominately pristine air quality. They include national parks greater than 6,000 acres; wilderness areas greater than 5,000 acres; monuments, greater than 5,000 acres; one international park; and other areas of special national and cultural significance. The planning area does not include any Federal Class I areas. The nearest Class I area to the planning area is Jarbidge Wilderness Area, which is located in northeastern Elko County, outside the 50-mile radius as set forth in the regulation.

3.2.1.10. Regional Haze

Haze is a basic form of air pollution and degrades visibility of scenic areas throughout the United States and the world. Haze is managed primarily a regional issue and is caused by tiny particles of pollution, i.e., dust, soot, emissions, etc., that come in contact with sunlight. This combination reduces the color and clarity of what we see when we look at scenic landscapes, particularly on humid days. Since 1988, the federal government has been monitoring visibility in the form of regional haze and associated with designated Class I Areas, as defined in Section 169A of the CAA. Section 169A sets forth national goals for visibility which is the "prevention of any future, and the remedying of any existing, impairment of visibility in Class I Areas which impairment results from man-made air pollution."

The Nevada Regional Haze State Implementation Plan implements the federal CAA Regional Haze rule requiring states to prevent any future, or remedy any existing man-made visibility impairment of Class I airsheds through a Regional Haze Program. The EPA is the compliance oversight for air quality in Region 9, which includes the planning area in southern Nevada.

3.2.1.11. Greenhouse Gas Emissions

Ongoing scientific research has revealed potential impacts of climate-changing pollutants on the global climate. These pollutants are commonly know as greenhouse gases. They include CO_2; methane; nitrous oxide; water vapor; and several types of trace gas emissions. Through a complex set of interactions, both on a regional and global scale, these emissions have been known to cause a net warming effect of the atmosphere basically by decreasing the amount of heat energy radiating back to earth from space. Climate-changing pollutant levels have varied for millennia, along with variations in climatic conditions, as a result of industrial processes and the burning of fossil fuel carbon from sources associated with man-made industrial processes. These CO_2 concentrations are anticipated to increase dramatically in the foreseeable future and are likely to contribute to overall climatic changes. These changes are typically referred to as global warming.

Global mean surface temperatures have increased nearly 1.0°C (1.8°F) from 1890 to 2006 (Goddard Institute for Space Studies 2007). The Intergovernmental Panel on Climate Change recently published a comprehensive report assessing the current body of knowledge on climate change and its potential impacts to the environment and some options for adaptive management strategies and mitigation measures. According to the report, global climate change could contribute to a rise in sea level, the destruction of estuaries and coastal wetlands, and changes in regional temperature and historic rainfall patterns. This could have major implications to agricultural and coastal communities. It is suggested that the average global surface temperature could rise 1 to 4.5 degrees Fahrenheit as soon as within the next 50 years, with significant regional variations. The National Academy of Sciences (2006) concurs with these findings and went further by concluding that the uncertainties derived by these changes will affect regions differently. Computer models indicate that such increases in temperature will not be equally distributed globally, but are likely to be accentuated at higher latitudes, such as in the Arctic, where the temperature increase may be more than double the global average (BLM 2007c).

BLM acknowledges and recognizes the importance of global climate change and the potential effects these increased emissions may have on BLM-administered lands, especially on a regional scale. For example, several common activities occur within the planning area that may generate emissions of climate changing pollutants. These include the recreational use of combustion engines and seasonal wildfires that can produce large amounts of CO_2 and methane. In contrast,

other activities can help sequester carbon emissions through the management of native vegetation, favoring perennial grasses that increase vegetative cover, reducing fuels from fire, and building organic carbon in the soil that act as "carbon sinks."

3.2.1.12. Emission Sources

Major Sources: Currently, the only major point source within the planning area is the coal-generating Reid Gardner Generation Station, located approximately 60 miles northeast of Las Vegas. On May 1, 2014, Nevada Energy announced a plan to replace Reid Gardner and three other coal-fired power plants in Nevada with cleaner energy sources. The plan is to replace 800 megawatts of coal-generated electricity with an array of natural gas and solar energy facilities, including the Reid Gardner Station. The utility plans to end coal-fire electrical generation by 2019 and attain the 274-megawatt natural gas-fired Las Vegas Cogeneration units and the 222-megawatt Sun-Peak Generating Facility. Closing Reid Gardner and replacing it with more renewable energy sources will reduce the production of harmful emissions, that when mixed with sunlight can cause the formation of ozone and smog, and limit climate-disrupting carbon pollution in the planning area. Other major point and nonpoint sources of emissions in the planning area include major highways, railways, landfills, pipelines, and various mining and crushing operations on public and private lands that are all closely monitored and inspected for regulatory compliance and fugitive emissions by Clark and Nye counties. Within the planning area, on- and off-road vehicles represent the largest single air-pollutant source category. Emissions from all types of vehicles include nitrogen dioxide, carbon monoxide, and particulate matter of ten microns or less (PM_{10}). Construction development, vehicles traveling on unpaved roads, and some recreation activities, such as off-road racing, are the largest sources of PM_{10} emissions within the planning area. Current fugitive dust control measures such as posted speed limits and regulatory best management practices reduce the amount of PM_{10} emissions generated.

Non-Permitted Sources: There are a variety of smaller point and nonpoint emissions sources within the planning area that do not require operating permits. However, in these instances, these sources do not produce the quantity and levels of pollution that would affect local and regional air quality conditions. Agricultural operations are located throughout the planning area in both Clark and Nye counties, but they fall within a category of emission sources that do not require air quality control permits, nor are their operations likely to affect local and regional air quality control conditions.

3.2.2. Geology

3.2.2.1. Physiography

The planning area lies entirely within the Basin and Range physiographic province, which owes its name to the extensional geologic events that have resulted in the present day landscape of alternating mountain ranges and deep, sediment filled basins. The trend of the ranges is not uniform everywhere, but a general north-south orientation is apparent. The Las Vegas Valley cuts diagonally across much of Clark County, following a line of north-trending ridges that bend toward the west at the northern end of the valley and toward the east in the south. The Grand Wash Cliffs, a few miles beyond the eastern edge of Clark County, mark the boundary between the Basin and Range Province and the Colorado Plateau Province. Most of the planning area lies within the Colorado River Basin and is externally drained by the Colorado River and its tributaries. The remaining portions drain either to the Central Region or Death Valley (BLM 2010).

The range fronts are marked by broad, coalescing alluvial fans that slope moderately to the valley floors. Elevations range from 470 feet in the Colorado River to 11,916 feet on Mt. Charleston in the Spring Mountains in Clark County. The elevation of the valley floors in the district varies from about 1,900 feet in the Las Vegas Valley to 2,700 feet in Crater Flats near Beatty, Nevada (BLM 2010).

Lowlands comprise a large percentage of the total surface area. A few of the large valleys, including the Muddy and Virgin valleys, drain into the Colorado River system. Others, such as the Amargosa Valley, Indian Springs Valley, Dry Lake Valley, Eldorado Valley, and the upper portion of the Las Vegas Valley, are enclosed basins with no external drainage.

3.2.2.2. Geologic Overview

Since the Paleozoic Era, approximately the past 300 million years, the geologic history of Southern Nevada includes repeated periods of deposition, uplift, igneous activity, and erosion. Thick sequences of marine sedimentary deposits accumulated throughout Paleozoic and Mesozoic times. Approximately 50 million years ago, thick volcanic materials were extruded over broad areas of the region, then were uplifted and deformed by faulting (see Figure 3.1, Generalized Stratigraphic Column for LaMadre Mountain in the Spring Mountains West of Las Vegas Valley (p. 295)). Since the mountain building periods, Southern Nevada has been geologically quiet, with activity restricted largely to depositional and erosional forces.

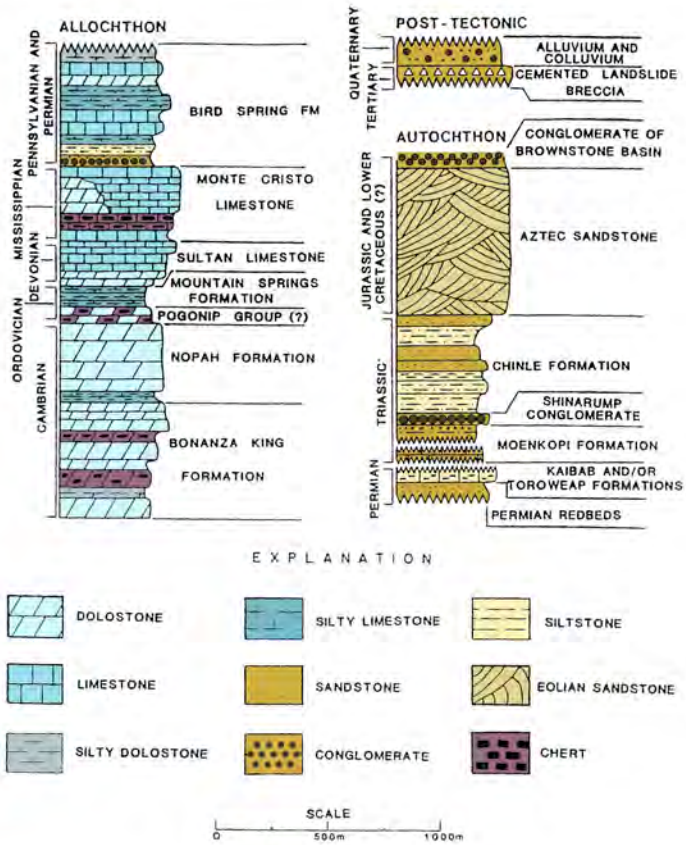

Figure 3.1. Generalized Stratigraphic Column for La Madre Mountain in the Spring Mountains West of Las Vegas Valley, Modified from Axen (2000)

The mountain ranges are characterized by abundant exposures of Late Precambrian to Mesozoic marine and continental sediments and Tertiary volcanic rocks, with lesser amounts of plutonic rocks and Precambrian igneous and metamorphic rocks. These rocks have been exposed to extensive folding and faulting from multiple tectonic events that have affected the region.

The western portion of Clark County and southern Nye County, which make up about two-thirds of the planning area, are located within the Walker Lane structural corridor. The Walker Lane extends from Oregon to California and consists of a broad, northwest trending zone of strike-slip faulting with diverse orientations of mountain ranges and faults. The strike-slip faults in the Walker Lane are accommodating part, between 15 and 25 percent, of the differential movement of the Pacific Plate and the North American Plate (Faulds et al., 2005; Faulds and Henry, 2008; McGuire et al., 2011). The Walker Lane represents a transition zone between the northwest moving Sierra Nevada Block and the east-west extending province of the Basin and Range (see Map 3.2.2.3 - 1 (p. 2143)).

The Colorado River extensional corridor is a north-south trending zone of east-to-west extension that is roughly centered on the Colorado River. It is a 30- to 60-mile wide corridor of low-angle normal faults (detachment faults) and metamorphic core complexes that expose deep ductilely deformed rocks of Precambrian age. Its northern terminus is located at the southern end of the Walker Lane near Lake Mead, and it extends south into Arizona and California. The northern terminus is marked by two major strike-slip transfer fault systems, the Las Vegas Valley Shear

Zone and the Lake Mead fault system. These regional fault structures are important features with regard to concentration of metal deposits, some industrial mineral occurrences, the general appearance of the Basin and Range physiographic province, and seismic and earthquake activity/potential within the Southern Nevada area (BLM 2010). These are addressed in the Minerals (p. 427) section. The geologic history of the region is described largely in structural terms (see Table 3.5, "Southern Nevada Geologic Summary" (p. 297)).

The entire district has geologic and mineralogic features that make it unique from unusual geological features to mineable resources. The region is tectonically active because it is located with the Walker Lane, and as noted earlier, relieves approximately 15 to 25 percent of the crustal pressure along the San Andreas fault system in California. The evolution of these features has created a vast mineral estate. The development of the vast mineral resources within the district is addressed under the Minerals (p. 427) section.

Table 3.5. Southern Nevada Geologic Summary

Southern Nevada Geologic Summary		
Period/Age	**Tectonic/Geologic events**	**Mineral deposits and geologic features**
Precambrian to mid-Jurassic (1.7 billion years to 160 million years)	During this period, the Southern Nevada region was a quiet tectonic setting with deposition of thousands of feet of sedimentary rocks in shallow marine to continental environments. Paleozoic rocks deposited along a continental shelf with carbonate rocks to the east and shale and sandstone to the west. Mesozoic sediments contain significant amounts of sandstones and siltstones in coastal dunes and fluvial sediments.	1. Important limestone, gypsum and silica-sand deposits occurred here. Apex limestone, American Silica, Sloan Mt. limestone, Arden silica, Blue Diamond gypsum deposits. 2. Limestone – Devonian Sultan Formation (Fm.); Mississippian Monte Cristo Fm.; Permian Bird Spring Fm. 3. Gypsum – Permian to Triassic rocks of the Supai, Kaibab, Toroweap, Moenkopi, and Chinle formations. 4. Silica sands – Ordovician Eureka quartzite; Permian Supai; Jurassic Aztec sandstone. 5. Virgin Mountains –Vermiculite in Precambrian gneiss (Gold Butte District) and copper/cobalt/nickel in Precambrian dikes (Copper King District).
Mid-Jurassic to Cretaceous (160 million years to 65 million years)	Mesozoic plate convergence. Rocks of Southern Nevada underwent shortening associated with folding and thrusting (from west to east) during the Sevier Orogeny. Some southwest directed folding and thrusting occurred in Nye County (Bare Mts.) and may have occurred in earlier orogenic events.	1. Silica deposit – Simplot Silica located near Overton, NV in the Cretaceous Baseline Fm. 2. Base metal and precious metal deposits – Goodsprings, Johnnie, and Crescent districts may be Cretaceous in age. 3. Major Sevier thrust faults surrounding Las Vegas Valley i.e. Keystone, Red Springs, Wilson Cliffs, and the Muddy Mountains thrusts – provide potential oil and gas traps.
Late Cretaceous to Miocene (65 million years to 17 million years)	By early to middle Cenozoic, much of the western North American convergent plate margin was replaced by a strike-slip margin, the San Andreas Fault. Extension and strike-slip faulting also began in the Great Basin.	1. Walker Lane strike-slip faulting began. 2. Formation of the Las Vegas Valley Shear Zone – a right slip fault zone that has produced the prominent easterly bend at La Madre Mountain and the western bend along the southern tip of the Las Vegas Range. The Las Vegas Valley Shear has an estimated lateral offset of about 25 miles continuing into the Miocene epoch. 3. Goodsprings and Johnnie District metal deposits could have formed during this period.
Miocene to Present (< 17 million years)	Major period of Basin and Range normal faulting that produced present day topography.	1. Continued strike-slip faulting along the Walker Lane. 2. Left lateral faulting along the Lake Mead fault system. 3. Extension along both low (detachments) and high angle faults that may be continuing today. Detachment faulting moved and rotated the Sunrise and Frenchman Mountain blocks approximately 35 miles west from the Colorado Plateau. 4. Most sand and gravel deposits develop near the base of alluvial fans along range fronts. 5. The Miocene is an important age for precious metal deposits development — Bare Mountain, Searchlight, and Nelson districts.

Southern Nevada Geologic Summary		
Period/Age	**Tectonic/Geologic events**	**Mineral deposits and geologic features**
		6. Manganese deposits in River Mountains (Muddy Creek Fm.) 7. Large gypsum deposits in Boulder Basin (Muddy Creek) – Pabco and Pioneer mines. 8. Small borate deposits in the Gale Hills (Muddy Creek Fm.). 9. Freshwater limestone near Logandale in the North Muddy Mountains. 10. Clay deposits in Amargosa Valley. 11. Widespread volcanic activity in Nye County and Boulder Basin area of Lake Mead.

3.2.3. Soil Resources

Soils are the basic building blocks for good watershed health. They provide the medium for most plant life forms and serve to capture, store, and supply water to support plant growth. The ability of the soil to function in desert ecosystems is a factor of the soil's physical, biological, and chemical properties. Natural events and various land management actions can affect these soil properties and alter the ability of the soil to support a healthy desert ecosystem.

Desert soils tend to be poorly developed with a high content of mineral particles and little organic matter. This is caused by low plant productivity, which restricts the soil-building properties of microorganisms that convert organic matter into the humus components of soils. In the arid desert conditions that prevail at all but the highest elevations, there is little downward movement of the soluble constituents of the soil. Most leaching is confined to the translocation of the soluble material (usually lime) from the surface to the subsoil with the resultant formation of a hardpan. These soluble salts are usually leached to a depth of only one to two feet.

In this climate, soil formation occurs due to rock weathering by disintegration rather than by decomposition. Mechanical breakdown of rock formations is more common than chemical action; as a result, mountains are covered with a thin veneer of rock fragments. Storm events move large volumes of material into washes and valleys, forming alluvial fans of the coarser material. The fine material is washed into the lowlands.

Soil erosion involves two processes: (1) a detachment or loosening influence, and (2) transportation by means of floating, rolling, dragging, and splashing. Freezing and thawing, flowing water, and rain impact provide the detaching agents. Raindrop splash and especially running water can carry away loosened soil. On comparatively smooth soil surfaces, the beating of raindrops results in most of the detachment. In the vegetation types offering generally sparse cover, little interception of precipitation or protection from overland flow of water occurs.

As is the case for water erosion, the loss of soil by wind movement also involves detachment and transportation. The abrasive action of the wind results in some detachment of tiny soil grains from the granules or clods of which they are a part. When the wind is laden with soil particles, its abrasive action is greatly increased. The impact of these rapidly moving grains dislodges other particles from soil clods and aggregates. The cutting and abrasive effects upon tender leaves and vegetation are harmful, especially the effects of sand.

Aeolian landforms are produced by wind erosion, transportation, and deposition of fine-grained sediment. These landforms are formed into islands of small sand dunes and sheets, which are often habitats for special status vegetation species.

Desert pavements are prominent features in arid environments and consist of a surface layer of closely packed gravel that overlies a thin, gravel-poor soil horizon. These structures, along with their silt- and clay-rich texture, control infiltration and hence the overall hydrologic conditions in the soil profile. Desert pavement clasts rise vertically on an accreting eolian mantle, and the underlying vesicular horizon co-evolves with pavement formation. Eolian material is transported from the ground surface to pedogenesis of vesicular horizons interiors, thereby increasing the thickness of the vesicular horizon underlying desert pavements. In other words, desert pavement traps and binds dust. Through this action, soil horizons are created and the soil thickness increases.

Biological soil crusts are recognized as having an influence on terrestrial ecosystems where they occur. These communities are referred to as cryptogamic, cryptobiotic, microbiotic,

or microphytic soil crusts. These crusts serve as a living mulch by retaining soil moisture and discouraging the growth of annual weeds. They can reduce wind and water erosion, fix atmospheric nitrogen into a form usable by plants, and contribute to the soil organic matter (Williams et al. 2012). These crusts can be used as indicators of ecological health, as well as indicators of physical disturbance. Biological soil crusts are common on various soil surfaces throughout the planning area (USDOI 2001, Pietrasiak et al 2011, Williams et al. 2013).

The importance of biological soil crusts is recognized by the scientific community and by the BLM. The organisms associated with biological soil crust often include filamentous and non-filamentous cyanobacteria, mosses, lichens, liverworts, and fungi (Belnap et al. in press). Biological soil crusts are common throughout Southern Nevada. Damage to intact desert soils with biotic crusts and the resulting increased siltation during flooding and dust can adversely impact desert ecosystems (Pietrasiak et al. 2014). Biological crusts protect the soil and hold weeds at bay. These living soil crusts naturally sequester carbon dioxide and thus are a pool for carbon that can help offset climate change impacts, as long as they are not mechanically disturbed (Williams et al. 2013).

"The presence of these organisms on the soil surface increases soil stability. Because they are photosynthetic, they also contribute carbon to the underlying soils. Free-living and lichenized cyanobacteria can also convert atmospheric nitrogen into bio-available nitrogen, and thus are an important source of this often limiting nutrient." (Rosentreter, Bowker, and Belnap 2010)

Gypsum is a soft mineral composed of calcium sulfate. A common mineral, gypsum has thick evaporate beds and is often associated with sedimentary rock. In the Mojave Desert, gypsum is typically found within old spring mounds and lacustrine deposits. Soils with high gypsum content tend to be habitats for gypsum endemic plant species.

Soils within the Mormon Mesa area are considered to be rare and unique at more than 5.5 million years old. Mormon Mesa, which is approximately 60 miles north of Las Vegas, is a flat-topped mesa that extends north and south from the Mormon Mountains to Lake Mead. The height of the mesa is approximately 650 feet above the Virgin River to the east with the Muddy River and Meadow Valley Wash to the west. Regionally, Mormon Mesa is important because of its relationship to the lower Colorado River and its connection to stream incision (Brock at Buck 2009).

Soils within the planning area are fragile and poorly developed. These resources are managed for both conservation and public use. Impacts to soil resources result from natural and anthropogenic forces. Natural impacts include erosion from wind and water, wildland fire, and disturbance from wild horses and burros. Anthropogenic impacts include driving off-road vehicles; grading for ROWs; permitted livestock use; roads, trails, and associated drainage; dumping; and invasive weeds.

Indicators that reflect good physical condition of soil resources include:

- Healthy vegetative conditions.
- Stable slopes, no visible erosion conditions.
- Biological soil crust formation.
- Compaction.
- Intact desert pavement areas.

3.2.3.1. Affected Environment

Soil information and classification for the planning area is obtained from the Natural Resource Conservation Service (NRCS) by means of four third-order soil surveys for Southern Nevada. These surveys consist of the following publications by the NRCS:

- Soil Survey of the Las Vegas Valley Area, Nevada, Part of Clark County (2007).
- Soil Survey of Clark County Area, Nevada (2007).
- Soil Survey of the Virgin River Area, Nevada and Arizona (2009).
- Soil Survey of Nye County, Nevada, Southwest Part (2006).

Frequency, utilization, and rangeland health assessments have been completed at key management areas (KMAs) within all herd management areas (HMAs). These key management areas represent the dominant ecological sites found within the herd management areas. As more information is collected, more key management areas may be established to include in rangeland assessments. However, only limited trend data has been collected to determine vegetative trends.

Protecting soils from water and wind erosion hazards and keeping them stabilized with proper vegetation and litter cover, desert pavement, and biological soil crust is important. The Natural Resource Conservation Service designation of wind erodibility group (WEG) is a grouping of soils that have similar properties affecting their susceptibility to wind erosion in cultivated areas. The soils assigned to Group 1 are the most susceptible to wind erosion, and those assigned to Group 8 are the least susceptible. Approximately 10 percent of the planning area has soils with high (WEG 1, 2, & 3) wind erosion hazards (see Map 3.2.3.1 - 2 (p. 2143)).

Water erosion hazard was calculated using the Natural Resource Conservation Service ratings indicating the hazard or risk of soil loss from off-road and off-trail areas after disturbance activities that expose the soil surface, and are based on slope and soil erodibility factor K. The soil loss is caused by sheet or rill erosion in off-road or off-trail areas where the surface has been disturbed by grazing, mining, or other kinds of disturbance. Approximately 12 percent of the planning area contains soils with severe water erosion hazards (see Map 3.2.3.1 - 1 (p. 2143)). The term “severe” indicates that erosion is very likely and that erosion-control measures, including revegetation of bare areas, are advised; “very severe” indicates that significant erosion is expected, loss of soil productivity and off-site damage are likely, and erosion-control measures are costly and generally impractical.

A route inventory was completed across all Clark County lands within the planning area in 2009. This survey identified all routes, including roads, OHV trails, motorcycle trails, hiking trails, and equestrian trails. This study identified more than 9,293 miles of routes in Clark County within the planning area. Increased use of public lands through both casual and permitted activities has resulted in more acres of disturbed lands and disturbed soil resources. A more detailed description of soil-disturbing activities, including acres of soil disturbance, is provided in the Integrated Vegetation (p. 313) section.

Important soil resources within the planning area include Mormon Mesa soils, gypspherious soils, biological soil crusts, and aeolian sands. These soil types are very fragile and are often habitats for special status plant species. Once disturbed, these soils can take several decades to millennia to recover.

3.2.4. Water Resources

This section will address both surface and groundwater quality and quantity. Water resources are particularly important in the desert environment. BLM manages water resources both for resource values (watershed health, wildlife, riparian, etc.) and resource uses (recreation, water supply, etc.) within the framework of applicable laws, regulations, and agency policies. The water resources traverse BLM-administered lands and could be affected by BLM management activities; however, BLM has limited decision-making authority for the resource.

The Southern Nevada District Office is located within the Basin and Range Physiographic Province and is characterized by north-to-south trending mountain ranges that are separated by broad valleys. As the driest state in the nation, Nevada's water resources are scarce and valuable. Most of the planning area is encompassed within the Mojave Desert, which is a high desert receiving less than six inches of average yearly precipitation. Water resources in Southern Nevada include surface water mostly in the form of springs and a few perennial rivers and groundwater resources, including shallow local and deep regional aquifers.

The planning area contains portions of four hydrographic basins or 6th Level hydrologic units: the Central Nevada Desert Basin (160600), the Northern Mojave Basin (180902), the Lower Colorado - Lake Mead Basin (150100), and the Lower Colorado Basin (150301). These four basins are further divided into 66 watersheds (10th level hydrolic unit codes [HUC]) which are totally or partially within the boundary of the planning area (see Map 3.2.4.4 - 2 (p. 2143)). Table 3.6, "10th Level NHD Hydrolic Unit Codes Within the Planning Area" (p. 303) identifies the watersheds located within each of the four basins.

3.2.4.1. Surface Water

Surface water sources are less abundant than groundwater in the planning area. There are only three major perennial streams, the Muddy River, Virgin River, and Meadow Valley Wash, all located within the Colorado River drainage area.

Meadow Valley Wash is a tributary to the Muddy River with the confluence near Glendale. These streams, with the Virgin River, drain to the Overton Arm of Lake Mead. Meadow Valley Wash originates in southern Lincoln County and is formed by the junction of Patterson Wash and Spring Valley Creek at Condor Canyon. It is characterized by peak flows in February and March due to snow melt and by low flows in September or October. Flow records from 1951 to 2008 (57 years), measured at the Caliente gaging station, indicate a mean annual flow of 10 cubic feet per second (cfs) with a peak flow of 8,000 cfs (estimated) (2005) and a low flow of 0 cfs at times.

Perennial flow in the Muddy River originates from springs located southeast of Arrow Canyon, a distance of approximately 25 miles from Lake Mead. These springs, referred to as the Warm Springs and Muddy River Springs, are perennial thermal groundwater-fed springs with stable flows showing little seasonal fluctuations. The 58-year record measured at the Glendale gaging station indicates a mean annual flow of 42 cfs with a peak flow of 16,400 cfs (1981) and a low flow of 15 cfs (1997). Peak flows usually occur in January and February, and low flows in June and July.

The Virgin River is fed by tributaries from the Tule Desert, Beaver Dam, and Sand Hollow washes, as well as many drainages in the Virgin and Mormon mountains. The 78-year record measured at the Littlefield, Arizona, gaging station indicates a mean annual streamflow to be 241

cfs with the lowest flow occurring in 1966 at 40 cfs and a peak flow of 36,500 cfs, measured in 2005. There was a high flow of 61,000 cfs in 1989 that was due to the failure of the Quail Creek Dam. High flows usually occur in April and May as a result of snowmelt runoff from Utah. The lowest flows usually occur in June and July.

Willow Creek originates on U.S. Forest Service lands on the northern part of the Spring Mountains National Recreation Area, in the vicinity of the community of Cold Creek, and usually runs for about one mile on BLM land toward Indian Spring before becoming dry. High flows usually occur in March and April as a result of snowmelt runoff from the Spring Mountains. Flows are generally less than 1 cfs.

Numerous ephemeral washes transect the planning area, conveying flows only in response to storm events. These drainages are subject to short duration, high-intensity thunderstorms that produce rapid runoff and at times flash flooding of downslope areas. Flood and sediment damage occurs throughout the planning area. Most damage on BLM-administered lands is in the form of gully cutting and sheet erosion. Damage to state and private lands is much more severe, including damage to roads and highways, croplands, and residential areas. In some areas, loss of life has occurred.

Within the planning area, springs are important water sources. Little precipitation occurs in Southern Nevada and therefore very few other surface water sources are present. Springs are typically the only perennial water in most watersheds and offer vast biological diversity. There are currently more than 400 documented springs within Southern Nevada. These springs are important havens for local wildlife, many of which are listed as threatened or endangered species by the U.S. Fish and Wildlife Service. While most high elevation springs are fed by perched aquifers, the most productive springs, such as those located in Ash Meadows are fed by groundwater from the regional aquifer.

Table 3.6. 10th Level NHD Hydrolic Unit Codes Within the Planning Area

HUC	HUC name		HUC	HUC name
1501000507	Trail Rapids Wash-Colorado River		1503010203	Lower Piute Wash
1501000508	Mud Wash-Virgin River		1606001419	Lower Indian Springs Valley
1501000509	Valley of Fire Wash-Virgin River		1606001423	Frenchman Flat
1501000510	Echo Wash		1606001501	Wheeler Wash
1501000511	Catclaw Wash-Virgin River		1606001502	Town of Pahrump
1501000512	Government Wash-Colorado River		1606001502	Town of Pahrump
1501000513	Gypsum Wash-Colorado River		1606001503	Stewart Valley
1501000603	Black Wash		1606001504	Calvada Springs
1501000604	Cottonwood Wash		1606001505	Pahrump Valley
1501000606	Lower Grand Wash		1606001506	Lovell Wash
1501001005	Toquop Wash		1606001507	Potosi Wash
1501001006	Sand Hollow Wash-Virgin River		1606001508	Mesquite Valley
1501001007	Halfway Wash-Virgin River		1606001509	Goodsprings Valley
1501001202	Upper Pahranagat Wash		1606001510	Devil Canyon
1501001203	Middle Pahranagat Wash		1606001511	Lucy Gray Mountains
1501001204	Elbow Canyon		1606001512	Town of Ivanpah
1501001205	Lower Pahranagat Wash		1606001513	Ivanpah Lake
1501001206	Dry Lake Valley		1606001514	Jean Lake
1501001207	California Wash		1606001515	Hidden Valley
1501001208	Upper Muddy River		1606001516	McCullough Spring

HUC	HUC name		HUC	HUC name
1501001209	Lower Muddy River		1606001517	Ora Hanna Spring
1501001309	Lower Meadow Valley Wash		1606001518	Eldorado Valley
1501001501	White Sage Flat-Three Lakes Valley		1809020203	Rhyolite
1501001502	Deer Creek-Las Vegas Wash		1809020204	Headwaters Amargosa River
1501001503	Kyle Canyon-Las Vegas Wash		1809020205	Crater Flat
1501001504	Nellis Air Force Base		1809020206	Big Dune
1501001505	Red Rock Wash		1809020207	Funeral Mountains
1501001506	Vegas Creek-Las Vegas Wash		1809020211	Topopah Wash
1501001507	Duck Creek-Las Vegas Wash		1809020212	Lower Fortymile Canyon
1503010101	Jumbo Wash-Colorado River		1809020213	Mercury Valley
1503010102	Colorado River-Lake Mohave		1809020214	Amargosa Flat
1503010103	Silver Creek Wash-Colorado River		1809020215	Rock Valley
1503010201	Upper Piute Wash		1809020216	Greenwater Canyon-Amargosa River

3.2.4.2. Groundwater

With so few surface water sources, groundwater systems are important water sources within the planning area for both riparian ecosystems and local public water supplies. Principal groundwater aquifers in Southern Nevada include basin-fill aquifers, carbonate-rock aquifers, and volcanic rock aquifers. Of the aquifer types, any or all may be in, or underlie, a particular basin and constitute separate sources of water. Interconnection between the aquifers exist and are understood to interconnect many of the basins within the plan area (Nevada State Engineer 2014).

The State of Nevada has delineated specific hydrographic areas as groundwater basins throughout the state (see Map 3.2.4.4 - 1 (p. 2143)). Within the planning area, there are 29 hydrographic areas (see Table 3.7, “State of Nevada Hydrographic Basins Within the Planning Area” (p. 304)).

Table 3.7. State of Nevada Hydrographic Basins Within the Planning Area

Basin ID	Basin name		Basin ID	Basin name
160	Frenchman Flat		215	Black Mountains Area
161	Indian Springs Valley		216	Garnet Valley
162	Pahrump Valley		217	Hidden Valley
163	Mesquite Valley		218	California Wash
164A	Ivanpah Valley		219	Muddy River Springs Area
164B	Ivanpah Valley		220	Lower Moapa Valley
165	Jean Lake Valley		222	Virgin River Valley
166	Hidden Valley		223	Gold Butte Area
167	Eldorado Valley		224	Greasewood Basin
205	Lower Meadow Valley Wash		225	Mercury Valley
210	Coyote spring Valley		226	Rock Valley
211	Three Lakes Valley		227A	Fortymile Canyon
212	Las Vegas Valley		229	Crater Flat
213	Colorado Valley		230	Amargosa Desert
214	Piute Valley			

The basin-fill aquifers, which are composed primarily of alluvial, colluvial, and lacustrine deposits, are the most important and most developed aquifers in the planning area. Virtually all major groundwater development has been in the basin-fill aquifers with the withdrawals occurring from the first few hundred feet. Each hydrologic area is characterized by a structural

basin filled by thousands of feet of sediment eroded from adjacent mountain ranges (Welch et al. 2008). The thickness of the basin-fill deposits can range throughout a valley and, in some areas, can be several thousand feet thick.

The carbonate-rock aquifer is comprised of thick sequences of carbonate rock underlying many of the hydrographic basins forming a complex regional aquifer system that is largely undeveloped. The carbonate-rock aquifer is regionally extensive and underlies nearly two-thirds of the Great Basin and the majority of the planning area (Plume 1996). Flow through the carbonate-rock occurs through a network of fractures and dissolution channels. It underlies the majority of the Amargosa Desert, interconnects many of the hydrographic groundwater basins (i.e. Kane Springs, Coyote Springs, Hidden Valley, Garnet Valley, Muddy River Springs Area and California Wash) and supplies water to numerous springs that are thermal in nature and are typically habitats for special status species.

The volcanic rock aquifer is located in the northwest portion of the planning area, mostly within the Department of Energy/Department of the Interior withdrawal lands. A small portion of the aquifer is located within the planning area, composed of mostly rhyolite and basalt. This aquifer has a wide range of physical and hydraulic properties that can act as flow barriers (Plume 1996). Most groundwater recharge in Southern Nevada is derived from winter and spring precipitation, representing approximately half of the total annual precipitation. The moisture is stored in snowpack at elevations of 7,000 to 8,000 feet and higher. Precipitation reaches the groundwater reservoirs when it melts and enters streams that eventually discharge onto the alluvial aprons or when it infiltrates directly into the consolidated rock and percolates both vertically and laterally until it reaches the valley fill aquifer. Additional inputs come from localized intense storms and short-term cycle climatic variations. In addition to input from precipitation, many hydrographic areas receive groundwater from adjacent areas, referred to as interbasin flow.

Many of the higher elevation springs are fed by perched aquifers that are not impacted by groundwater withdraw. However, these springs are sensitive to variable precipitation and are likely to go dry in a multiyear drought of two or more years.

Natural discharge of groundwater in the basins of the planning area occurs as a result of transpiration from phreatophytes (deep-rooted plants that obtain their water from the water table or the layer of soil just above it), spring discharge, evaporation from bare soil, interbasin flow, and base flow to streams such as the Virgin River and Muddy River. A well inventory was completed in 2000 and identified nearly 135 wells within the planning area. Many of these wells areabandoned and are remnants from permitted activities, such as mineral exploration and withdrawal. Several of the wells are actively monitored by the BLM, U.S. Geological Survey, Southern Nevada Water Authority, and other entities for water levels and chemistry. Most of this data is available through the U.S. Geological Survey's National Water Information System (USGS NWIS) web interface.

3.2.4.3. Water Quality

In Southern Nevada, one of the most critical water resource problems is the poor quality of much of the surface and groundwater. Several factors contribute to the high quantities of chemicals and solids in water within the planning area. High evaporation rates leave concentrations of salts at or near the soil surface after rainfall. Secondly, the rocks are composed predominantly of calcium, magnesium carbonate, and silicate minerals. Metallic and nonmetallic mineral deposits, such as sulfides, borate, gypsum, and halite are also prevalent. This composition of soil and rock is

reflected in the quality of both surface and groundwater. As water slowly moves into and through the soil profile, it dissolves these constituents. In addition, dust containing salts is blown from playas onto standing surface water and onto soil where it enters both surface and groundwater.

The EPA primary drinking water standards refer to the maximum contaminant level allowable for public water supplies which, if exceeded, could adversely affect public health. Secondary standards refer to maximum levels for constituents which, if exceeded, could adversely affect the public welfare. Secondary standards apply to constituents, which might affect taste, odor, appearance, or other aesthetic qualities of water. It is important to note that these drinking water standards are for public water supplies, not necessarily springs, seeps, etc. found in the natural environment. These standards may, however, be used to evaluate the quality of naturally occurring waters in terms of suitability for consumption, untreated, by man.

In addition to the federal water quality standards, the state of Nevada has established various water quality criteria for designated beneficial uses. These uses include watering of livestock, irrigation, aquatic life, recreation, municipal or domestic supply, industrial supply, and propagation of wildlife. These criteria are water quality characteristics based upon available scientific and technical information and are used as guidelines in establishing water quality standards.

Within the planning area, the state of Nevada has established site-specific numeric standards for the Colorado River Basin, Virgin River, and Muddy River (NDEP website, 2010). These standards include both criteria designed to protect the beneficial uses and antidegradation requirements. The antidegradation is addressed through the establishment of requirements to maintain existing higher quality (RMHQs). Requirements to maintain existing higher quality are set when existing water quality (as evidenced by the monitoring data) for individual parameters is higher than the criteria necessary to protect the beneficial uses. This system of directly linking antidegradation to water quality standards provides a manageable means for implementing antidegradation through the permit program and other programs (NDEP website 2010).

Numeric standards for toxics for various beneficial uses can be found in NAC 445A.144. Nevada relies on EPA criteria when establishing numeric water quality standards for toxics. EPA criteria are derived from laboratory studies of biological organisms' sensitivity to specific chemicals. In these studies, a variety of fish, benthic macro-invertebrates, and zooplankton are exposed to known concentrations of a chemical under varying conditions (NDEP website 2010). Section 303(d) of the Clean Water Act requires states to develop a list of waterbodies needing additional work beyond existing controls to achieve or maintain water quality standards. This list, referred to as the Section 303(d) List, provides a comprehensive inventory of waterbodies impaired by both point and nonpoint sources of pollution (State of Nevada 2009).

Salinity contributions to the Colorado River Basin are a concern within the planning area. In 1974, Congress enacted the Colorado River Basin Salinity Control Act with subsequent amendments. In the 1984 amendment, Congress directed the BLM to implement a comprehensive program to reduce salt loading to the Colorado River System. Nearly 53 percent of the planning area is located within the Colorado River Basin. Salt retention is achieved by minimizing grazing impacts, restoring riparian buffers, reducing off-road vehicle impacts and managing vegetation cover, and reducing soil erosion.

3.2.4.4. Affected Environment

3.2.4.4.1. Surface Water

Surface water resources within the planning area are extremely limited. These resources are managed for both conservation and public use. Impacts to surface water resources result from both natural and anthropogenic forces. Natural impacts include erosion from wind and water, wildland fire, disturbance from wildlife, and high-precipitation events resulting in high flow. Anthropogenic impacts include driving off-road vehicles, grading for ROWs, permitted livestock use, roads, trails and associated drainage, dumping, invasive weeds, groundwater development, and water use by water right holder.

Indicators that reflect good physical condition of surface water resources include:

- Healthy riparian vegetation conditions.
- Stable banks, no signs of trampling or headcuts.
- No visible signs of sedimentation.

Stream and spring data for Southern Nevada can be found through the U.S. Geological Survey's National Water Information System (USGS NWIS web). The USGS NWIS website contains current and historic discharge data from real-time and periodically measured sites. Generally speaking, stream and spring discharges across the west have decreased over the past decade primarily due to drought conditions and increased water use.

Long-term drought conditions have resulted in overall decreases in rainfall and mountain snowpacks throughout the planning area. Decreases in annual precipitation have resulted in decreased runoff to streams and recharge to local springs. Use of surface water for activities such as agriculture and mining and increased groundwater development have also resulted in lower stream and spring discharges.

Past and current water use and drought conditions within Southern Nevada will continue to result in lower stream and spring discharges. Increasing demand and development of groundwater has put additional strain on water resources within Southern Nevada and across the southwest. Many of the hydrographic basins are fully appropriated for water rights, and several of these are over-appropriated. The signs of excessive use are already visible in some of the most sensitive systems.

3.2.4.4.1.1. Key Features

Perennial systems including rivers and springs area very limited within the planning area. Current water use and drought conditions are further impacting these systems, making them extremely valuable within the arid environment.

3.2.4.4.2. Groundwater

Groundwater resources within the planning area are extremely limited. These resources are managed mostly for public use. Impacts to groundwater resources result from both natural and anthropogenic forces. Natural impacts include dissolution of aquifer rock material and lowered recharge rates due to lower precipitation. Anthropogenic impacts include groundwater development, abandoned wells, and unsecured wells.

Indicators that reflect good physical condition of groundwater resources include:

- Stable groundwater levels consistent with natural variability.
- Stable spring discharges consistent with natural variability.
- Water quality meets EPA standards.
- All wells are secure.

Groundwater levels data for Southern Nevada can be found through the United States Geological Survey's National Water Information System (USGS NWIS web). The USGS NWIS website contains both current and historic water level data from real-time and periodically measured sites. Generally speaking, water levels across the west have decreased over the past decade primarily due to drought conditions resulting in lower recharge rates and increased groundwater use.

Long-term drought conditions have resulted in overall decreases in rainfall and mountain snowpacks throughout the planning area. Decreases in annual precipitation have resulted in decreased recharge to local and regional aquifers. Increased groundwater development for activities such as public water supplies, agriculture, and mining have resulted in lower water tables and an overall decrease in groundwater supply. In some wells, an increase in water levels has been seen between 2006 and 2009, which was generally associated with the large precipitation events and snowpacks from the winter of 2005-2006.

Past and current groundwater pumping have stressed many of the most sensitive spring systems in Southern Nevada, putting the wildlife they support at risk.

Increasing demand and development has put additional strain on water resources within Southern Nevada and across the southwest. Many of the hydrographic basins are fully appropriated for water rights, and several of these are over-appropriated. The signs of excessive use are already visible in some of the most sensitive systems.

3.2.4.4.2.1. Key Features

Almost all of the groundwater basins within the planning area are fully appropriated for water rights, and most are over-appropriated. Because surface water resources are so limited in the arid southwest, groundwater resources are extremely important.

3.2.4.4.3. Water Quality

Water quality resources within the planning area are extremely important due to the limited water resources. Impacts to water quality result from both natural and anthropogenic forces. Natural impacts include erosion from wind and water, wildland fire, and disturbance from wildlife. Anthropogenic impacts include driving off-road vehicles; grading for ROWs; permitted livestock use; roads, trails and associated drainage; dumping; and invasive weeds.

Indicators that reflect good water quality include:

- Meeting EPA and local water quality standards.
- Healthy riparian areas.
- Healthy macroinvertebrate and algal species.
- Low turbidity and total dissolved solid contents.

Table 3.8, "303(d) Listed Waterbodies Within the Planning Area" (p. 309) lists all of the listed waterbodies within the planning area. Additional waterbodies exist within the Southern Nevada

District Office, including Flamingo Wash, the Colorado River, the Las Vegas Wash, Las Vegas Creek, and the Las Vegas Wash above the treatment plants, but these waterbodies are not included in this list because they do not cross BLM-managed lands. However, these waterbodies could be indirectly impacted by activities on BLM-managed lands if they are located downstream. Willow Creek, Cold Creek, and the Amargosa River are all fully supporting but have no beneficial uses. Pahranagat Wash and Meadow Valley Wash were not assessed within the planning area.

Table 3.8. 303(d) Listed Waterbodies Within the Planning Area

Waterbody ID	Size (miles)	Water name	Location	Parameter	Total maximum daily load priority
NV13-CL-07_00	2.6	Virgin River	From Arizona state line to Mesquite	Selenium, water temperature, total phosphorous, iron	Low
NV13-CL-09_00	24.4	Virgin River	From Mesquite to river mouth at Lake Mead	Manganese, total phosphorus, water temperature, iron	Low
NV13-CL-11_00	11.8	Muddy River	From river source to Glendale	Dissolved oxygen, total phosphorus, water temperature, iron	Low
NV13-CL-12_01	5.6	Muddy River	From Glendale to Wells Siding Diversion	Boron, iron, water temperature	Low
NV13—CL-12_02	10.8	Muddy River	From Wells Siding Diversion to river mouth at Lake Mead	Boron, iron, manganese, molybdenum, water temperature	Low
NV13-CL-45_00	21.2	Duck Creek	From its origin to Las Vegas Wash	Total dissolved solids, selenium	Low

The Virgin River is the only waterbody in the planning area with a total maximum daily load (TMDL). TMDLs are an assessment of the amount of pollutant a waterbody can receive and not violate water quality standards. TMDLs also provide a means to integrate the management of both point and nonpoint sources of pollution through the establishment of wasteload allocations for point source discharges and load allocations for nonpoint sources. The TMDL developed for the Virgin River is for boron from the Nevada-Arizona state line to Lake Mead. The TMDL was submitted to the EPA in 2002 and approved in 2003. Total phosphorus impairments on the Virgin River will be addressed in the future (NDEP 2002).

Water quality data for Southern Nevada can be found through the United States Geological Survey's National Water Information System, the Nevada Division of Environmental Protection, and the Southern Nevada Water Authority. The USGS NWIS web site contains both current and historic water level data from real-time and periodically measured sites.

Groundwater quality tends to be high in minerals within the arid southwest. The geology of the planning area is primarily carbonate rock. Dissolution of minerals within the rock results in high concentrations of calcium carbonate, and water is considered to be hard. Arsenic is also a groundwater quality concern within the planning area. High concentrations of arsenic are generally associated with one of four geochemical environments: (1) basin-fill deposits of alluvial-lacustrine origin, particularly in semiarid areas, (2) volcanic deposits, (3) geothermal systems, and (4) uranium and gold-mining areas (Welch et al. 2006). The towns of Mesquite and Searchlight have had to install arsenic treatment systems to meet drinking water standards.

The Environmental Protection Agency sets the primary and secondary drinking water standards per the Safe Drinking Water Act.

Overall water quality has improved over the past 15 year. Several of the livestock grazing allotments have been closed, and herd managements areas are being managed to hold capacity. In the 1998 RMP, coliform bacteria was found in several springs that were tested. This type of bacteria indicates contamination of a water body by warm-blooded animals. In the case of most water sources within the planning area, which are primarily springs, the source of this contamination was most likely livestock. Since the management of allotments has changed, PFC assessments have shown that water quality has improved with the removal of livestock, but not in actively used herd management areas.

3.2.4.4.3.1. Key Features

Surface and groundwater resources are limited within the planning area. Impacts to the water quality of these resources can be detrimental to both wildlife and humans.

3.2.4.5. Riparian

Riparian and wetland areas are sensitive vegetative or physical ecosystems that develop in association with surface or subsurface water (USDOI 1992). Riparian and wetland ecological systems comprise only a small portion of the million acres of public lands administered by the BLM in Southern Nevada, but they are among the most important, productive, and diverse ecosystems on the landscape. Benefits from riparian/wetland ecosystems are essential to human and wildlife values and include:

- Maintaining clean renewable water supplies.
- Providing for diverse plant and wildlife ecosystems, including special status species and fisheries.
- Importance in cultural and historic values.
- Economic value derived from sustainable uses (open space, hunting, livestock grazing, commercial recreation).
- Greenbelt-associated recreation and scenic values.
- Thermal/shade protection, which is especially important within the arid southwest.

Riparian/wetland habitats are fragile resources and are often among the first landscape features to reflect impacts from management activities. These habitats are used as indicators of overall land health and watershed condition. Some of the functions of healthy riparian systems are to filter and purify water as it moves through the riparian zone; reduce sediment loads and enhance soil stability; reduce destructive energies associated with flood events; provide physical and thermal micro-climates in contrast to surrounding uplands; and contribute to groundwater recharge and base flow.

Riparian and wetland areas include, but are not limited to, areas adjacent to waterways (whether waters are surface, subsurface, or ephemeral), springs, potholes, wet meadows, sloughs, marshes, swamps, bogs, floodplains, lakes, and reservoirs. Riparian areas are recognized as “a form of wetland transition” between permanently saturated wetlands and upland areas (USDOI 1992). For BLM purposes, riparian and wetland areas are referred to synonymously unless specifically discerned. BLM utilizes various tools to describe, analyze, and evaluate riparian/wetland ecosystems relative to their potential and capability to achieve a properly functioning and healthy ecosystem.

Within most riparian/wetland systems in the arid southwest, the potential of a riparian/wetland ecosystem is strongly dependent upon the availability of water. The degree, timing, and source of water availability, among other physical factors, is commonly referred to in terms of perennial (yearlong), interrupted (perennial flow discontinuous in space), intermittent (seasonal), or ephemeral (storm) water sources.

The BLM specifically manages and monitors riparian/wetland resources in terms of lotic and lentic ecosystems. Lotic riparian areas are those ecosystems associated with running waters, streams, springs, or drainages, while lentic riparian areas are those associated with standing water ecosystems, such as marshes, swamps, lakes, springs, seeps, low-velocity backwater areas, or areas where permanent soil moisture is available. Ecological evaluations based on ecosystem attributes and processes differ between lotic and lentic systems.

Regardless of the type of riparian or wetland ecosystem, proper functioning condition (PFC) is assessed for each stream or varying segments. Functioning condition is rated by category to reflect ecosystem health as affected by management practices. Definitions follow below (USDOI 1998, USDOI 1999):

Proper functioning condition: Lentic and lotic riparian-wetland areas are functioning properly when adequate vegetation, landform, or debris is present to dissipate energy associated with wind action, wave action, overland flow from adjacent sites and high waterflow, thereby reducing erosion and improving water quality; filter sediment, capture bedload and aid floodplain development; improve flood water retention and groundwater recharge; develop root masses that stabilize streambanks, islands and shoreline features from cutting action; restrict water percolation; develop diverse ponding and channel characteristics to provide habitat and water depth, duration, and temperature necessary for fish production, waterfowl breeding and other uses; and support greater biodiversity.

If a riparian-wetland area is not in proper functioning condition, it is placed into one of three categories:

- **Functional-at risk:** Riparian-wetland areas that are in functional condition but have an existing soil, water or vegetation attribute that makes them susceptible to degradation.
- **Nonfunctional:** Riparian-wetland areas that clearly are not providing adequate vegetation, landform, or woody debris to dissipate energies associated with flow events and thus are not reducing erosion, improving water quality, etc.
- **Unknown:** Riparian-wetland areas for which there is a lack of sufficient information to make any form of determination.

3.2.4.5.1. Affected Environment

Across the southwest, 95 percent of riparian woodlands and mesquite woodlands have been lost to human activity (Krueger 1998, 1999, Sada and Vinyard 2002, Shepard 1993). Riparian woodlands, mesquite acacia woodlands, and desert washes occupy approximately 1.5 percent of the planning area. More than 90 percent of the historic distribution of mesquite and acacia woodlands in Southern Nevada have been lost to anthropogenic activities. Historic accounts of the Las Vegas Valley describe stands of mesquite woodlands more than a mile wide extending from the present-day Springs Preserve to the Colorado River. Mesquite and acacia woodlands in the Virgin River, Muddy River, Meadow Valley Wash, and Ash Meadows were converted to agricultural use in the late 1800s and early 1900s. Mesquite stands in Pahrump, Sandy Valley, and Stewart Valley are some of the most important remaining examples of this vegetation community in the

region. These vegetation types support a disproportionately high diversity of wildlife and are often the focus of human activities because of the water and shelter they provide. Willow (*Salix spp.*) and cottonwood (*Populus fremontii*) dominate riparian woodlands in the planning area. Honey mesquite (*Prosopis glandulosa*) and catclaw acacia (*Acacia greggii*) dominate mesquite and acacia woodlands. Mesquite and acacia woodlands typically occur on the edges of large watercourses such as perennial rivers and streams, but also occur growing in scattered clumps on sandy hummocks and near desert springs where groundwater levels are high.

In the riparian woodlands of the Virgin and Muddy rivers, BLM is aggressively treating tamarisk and non-native species under a SNPLMA-funded conservation initiative. Because of tamarisk and other non-native species, most low-elevation riparian woodlands in the planning area are classified as condition Class 3, at a high risk of losing key ecosystem components (see Wildland Fire Ecology and Management (p. 390) section). The condition of riparian woodlands in the planning area is likely to be stable. Natural recovery and restoration activities (tamarisk removal) that have created additional riparian woodland have likely been offset by losses due to fire and illegal cattle grazing along the Virgin River. The quality of riparian woodlands in the planning area should improve as tamarisk in the Virgin River, Muddy River, and Meadow Valley Wash is attacked and weakened by the tamarisk beetle, a biological control agent released in Utah.

Fire is a serious threat to all mesquite acacia stands. In 1995, 235 acres burned in the Moapa area, and more than 50 acres burned in 1997 and 1998 in the Pahrump area (BLM 1999). Groundwater pumping is lso a threat to mesquite acacia woodland. Although mesquite trees are extremely deep-rooted (phreatophytes), they are dependent on subsurface water. As ground water levels decline, the potential for new individuals to establish would be reduced. To track this potential threat, BLM is currently monitoring shallow ground water levels at populations in Stewart Valley, Moapa, and Stump Spring.

Mesquite acacia woodlands in the planning area have declined due to disposal actions. Fire, illegal woodcutting, recreational OHV activity, and colonization by non-native tamarisk trees continue to degrade the quality of remaining stands. Natural regeneration of mesquite acacia stands is poor with recruitment only observed at two of eight mesquite stands (BLM 1999). Since 1998, BLM has performed mesquite plantings at the Moapa, Cactus Spring, and Pahrump stands; however, these relatively small restoration actions do not offset declines elsewhere. Approximately 20 percent of all mesquite woodlands are within the Pahrump disposal boundary. Impacts to this stand has been especially due to groundwater withdrawal.

Desert washes are present throughout the planning area and are important to wildlife because the ephemeral water supports xeric shrubs that provide thermal cover and a food source for wildlife. Unmanaged OHV activity and cattle grazing, fire, and invasive non-native species are threats to this vegetation type. Evidence of natural regeneration (recruitment) of native trees and the presence of non-native tamarisk (*Tamarix spp.*) are good indicators of quality. The area covered by desert washes in the planning area has decreased.

3.2.5. Integrated Vegetation

3.2.5.1. Vegetation

Native plant communities are complex and interdependent groups of plant species that capture energy, cycle nutrients, and influence the atmosphere, water, and soil. Native plant communities provide humans with direct and indirect economic benefits such as livestock grazing; wildlife habitat; soil, water, and air protection; a setting for recreation; and are an important component of viewshed. Native plant communities are managed under the Department of Interior strategy to manage native plant communities as part of healthy landscapes and ecosystems. The Federal Land Policy and Management Act of 1976 directs sustainable and multiple use of BLM-managed native plant communities. BLM implements restoration of vegetation and native plant communities across 18 different program subactivities and 31 program elements. The BLM Integrated Vegetation Management Handbook 1740 directs BLM field offices to take a holistic approach and coordinate vegetation management activities across multiple programs. Under 1740, Bureau policy is to manage for biologically diverse. resilient and productive native plant communities to sustain health and productivity of the public lands.

Healthy native plant communities are generally defined as self-sustaining systems that are resilient to disturbance and require little or no human management. Resilience in this sense is the capacity to regain fundamental structure and processes and recover when subjected to stressors or disturbances such as drought, livestock grazing, or wildfire (Allen et al, 2005, Hollings 1973, Walker et al. 1999). There is a tight connection between ecosystem sustainability and resilience to disturbance and invasive species (Folke et. al. 2002). A major challenge for BLM vegetation management is that the two dominant native plant communities in the planning area, (creosote bursage scrub and blackbrush scrub) are poorly adapted to disturbance (Chambers et. al. 2013) and have low resilience to disturbance and invasive species (Browns 1973, Brooks and Chambers 2011). Another challenge is that the rainfall needed to create the conditions for recovery seldom occurs and most Mojave native plant species are adapted to survive harsh growing conditions rather than recover quickly from disturbance. Precipitation in the Mojave Desert is highly variable, and most native plant species have evolved reproductive strategies to take advantage of infrequent high rainfall years. Rainfall often is associated with shifts in regional weather patterns, such as El Nino, which typically occur once or twice every decade. However, appropriate climatic conditions for some Mojave Desert plant species may occur only a few times in a hundred or thousand years (Bainbridge 2007).

In the Mojave ecoregion, the impacts of human activities on native plant communities are magnitudes higher than any natural disturbance (Webb et. al. 2009). BLM management efforts center on managing human activities (and disturbance). Five factors have a profound effect on the quality, quantity, and management of vegetation in the planning area: (1) the extremely slow rate of recovery from disturbance; (2) the introduction of non-native annual grasses; (3) the introduction of fire; (4) climate change; and (5) increasing fragmentation. Any BLM management actions addressed must consider these factors. Each is discussed below in relation to current conditions and trends from 1998 to present.

3.2.5.1.1. Rate of Recovery

The Mojave ecoregion is unique because Mojave Desert native plant communities will not fully recover from temporary disturbances within the lifetime of a BLM resource management plan.

The rate at which native plant communities recover from disturbance is a result of the nature, magnitude, and frequency of the impacts (Picket and White 1985, Allen 1988, Bainbridge 1990, Aronson et.al. 1993). Using a survey of 47 studies examining natural re-establishment after a variety of disturbances, such as fire, abandoned roads, power line corridors, and a linear regression, Scott Abella (2010) estimates that without active restoration, it takes the Mojave Desert 76 years for re-establishment of perennial plant cover and 215 years for re-establishment of perennial and annual species cover. Given this natural rate of recovery, the impact of many BLM-authorized activities are still with us today.

Most BLM-authorized activities such as livestock grazing and off-highway vehicle use cause compaction and soil degradation that affects native plant communities (Wilshire and Nakata 1976, Scholl 1986, Web 2002, Brooks and Lair 2009). Soil compaction limits the establishment and growth of plants and reduces water availability by inhibiting water infiltration (Brooks and Lair 2009, Bainbridge 2010). In some cases, a single pass from a heavy vehicle or equipment can be enough to cause measurable effects and long-lasting impacts on the establishment of plants (Bainbridge 2009). Many World War II training activities conducted in the Mojave Desert are still clearly visible 70 years later.

Grazing affects the composition and production of native plant communities through selective foraging. It is generally agreed that present-day Mojave ecosystems did not evolve with significant selective pressure from large-bodied herbivores (Beever et. al. 2003, Brown and McDonald 1995, Grayson 1987, Hall 1946), and desert vegetation is very slow to recover if overgrazed or disturbed (Abella et.al 2007, Tueller 1989, Chambers 2013). For example, at the Nevada National Security Site, where grazing has been excluded for more than 50 years, the blackbrush community has a healthy understory of desert needlegrass (*Stipa speciosa*) that is lacking in blackbrush sites that have been grazed (Tueller 1989). Brooks (1995) reported increased forb biomass, shrub cover, and seed biomass after 12 to 14 years of livestock exclusion at the Desert Tortoise Research Natural Area in California. BLM rangeland heath assessments completed on allotments in the planning area that were closed to livestock grazing between 1998 and 2013 show a significant departure from reference site conditions; this suggests these allotments have not fully recovered.

3.2.5.1.2. Introduction of Fire

Fire can be an ecosystem stressor or critical ecosystem process depending on when, where, and under what conditions it occurs on the Southern Nevada landscape (Brooks et.al. 2013). Historically, fire was rare in low elevation vegetation communities including creosote bursage and blackbrush scrub (Brooks, et.al. 2013). In these vegetation communities, fire is an ecosystem stressor. In higher elevation communities of the planning area, including sagebrush, pinyon juniper, and ponderosa pine community, fire is a critical ecosystem process. In lower elevation communities, non-native annual grasses are now responsible for an annual grass/fire cycle that did not exist before (Brooks 1999, Brooks et al. 2004). This is largely because the spaces between individual shrubs were bare, and acted as a fuel break. Now, non-native annual grasses create a nearly continuous fuel load that carries fire between shrubs (Brooks 1999). Following fire, non-native annual grasses are some of the first species to return. If fire returns too quickly, the surviving native plants do not have enough time to grow and produce the seed needed for recovery.

Fire frequency and the amount of burned area in the planning area is increasing (see Wildland Fire Ecology and Management (p. 390) section). Since 1970, fire has become more frequent across the Mojave (Brooks 1999). Between 1972 and 2007, approximately 1 million acres burned in Lincoln and Clark counties as a result of 116 large fires. The number of fires and area burned may

have been unprecedented in the historic record extending back to the late 1800s (McKinley et. al. 2013). In Southern Nevada, fire is episodic and coincides with climate conditions that create exceptionally good growing conditions for red brome. Using fire history in the planning area from 1999 to 2008, an average of 89,000 acres burn each year. Using this average, approximately 1.3 million acres, more than one-third of the planning area, potentially burned under the previous resource management plan.

Given the natural rate of recovery, it can take decades for burned sites to recover to a point where they provide the same ecosystem services provided on similar unburned sites. There is evidence some blackbrush Joshua tree vegetation sites in the planning area may never recover and are converting to an entirely new vegetation community. In some sites, diversity and density of native plants may never return because they have burned too often.

3.2.5.1.3. Introduction of Non-Native Species

Globally, non-native species are one of the largest threats to native plant communities and healthy ecosystems. Non-native Mediterranean grass (*Schismus spp*), filaree (*Erodium cicutarium*), and red brome are now the most abundant winter annual plants in the Mojave Desert, far outnumbering all native species combined (Brooks 2009). In the Mojave, introduced annual grasses including red brome (*Bromus madritensis ssp rubens*) and cheat grass (*Bromus tectorum*) are one of the largest threats to lower elevation native plant communities (Brooks 2009). Non-native plants have been implicated in the decline of native plant communities in the Mojave through direct competition (Brooks 2000, DeFalco et.al. 2003) and the alteration of fire regimes (Brooks 1999, Brooks and Pike 2001, Brooks and Esque 2002, Brooks and Matchett 2006, Brooks and Minnich 2006). In the 1970s, only 9 percent of the Mojave Desert flora was composed of non-native plant species (Rowlands et. al. 1982- see Brooks 2009), and by the end of the 1990s, this increased to 13 percent (Brooks and Esque 2002 – see Brooks 2009). During the 1960s and 1970s, monitoring plots at the Nevada National Security Site had fewer than 10 red brome plants per square meter. By the late 1980s, red brome populations exploded, and the same plots had more than 2,000 plants per square meter (Hunter 1991). Invasive non-native plants are a major threat to native plant communities because they thrive in disturbed areas and are better competitors for water, nutrients, and space than many native species (Mack 1981, Billings 1990, Vitousek, 1990, D'Antonio and Vitousek, 1992, Salo 2005, Defalco, 2007). This competition slowly reduces the stability and resiliency of native plant communities because it gradually reduces the amount of seed produced by native species and, subsequently, the amount available for recovery.

Because of the non-native annual grass fire cycle, fire condition class modeling is a reasonable indicator of how far non-native annual grasses have degraded native plant communities. Fire condition class modeling integrates many factors to classify how far a native plant community has departed from historical conditions (see Wildland Fire Ecology and Management (p. 390) section). Using fire condition class modeling, an estimated 95 percent of the planning area or 2.9 million acres is classified as fire regime condition class 2 and 3 because of moderate to high densities of non-native annual grasses.

Under condition class 1, fire regimes are within an historical range, and the risk of losing key ecosystem components is low. Vegetation attributes (species composition and structure) are intact and functioning and are within a historical range. Under condition class 2, fire regimes have been moderately altered from their historical range. The risk of losing key ecosystem components is moderate. In the planning area, condition class 2 means that non-native annual grasses have a significant presence and are at densities high enough to warrant management concern because the

non-native annual grass fire cycle has begun or could begin. Under condition class 3, fire regimes have been significantly altered from their historical range. The risk of losing key ecosystem components is high. Fire frequencies have departed from historical frequencies by multiple return intervals. Vegetation attributes have been significantly altered from their historical range. In the planning area, this condition class means that the native plant community is well into the non-native annual grass fire cycle and is not expected to recover.

3.2.5.1.4. Climate Change

Temperature and precipitation are the primary factors that determine the composition and structure of native plant communities because they affect plant establishment, growth, reproduction, and mortality. An analysis of past climate records for the southwestern U.S. prepared by the National Oceanic and Atmospheric Administration (NOAA) (Kunkel et. al. 2013) indicate the average annual temperature in the Mojave Desert has increased over the past 115 years. The length of the frost-free season has increased substantially and now averages about two weeks longer than in the 1960s and 1970s and about a month longer than in the early part of the 20th century. Climate space trend modeling generated as part of the Mojave Rapid Ecoregional Assessment (REA) (NatureServe 2013) show statistically significant increases in temperature have already occurred and will continue to occur. Modeling completed for precipitation did not show a statistically significant change, but did suggest a there could be slight upward trend in the amount of fall precipitation. Older regional climate modeling completed by Seager et.al. (2007) suggest precipitation patterns in the southwest will shift under climate change with less winter rainfall and more intense summer monsoon events.

Two long-term data sets provide direct evidence that native plant species are shifting their elevational distribution in response into climate change that has already occurred over the past 30 years. A 2009 resampling of 30-year-old vegetation plots in the Newberry Mountains in Southern Nevada (Guida 2011) and 2007 resampling of 30-year monitoring transects in Deep Canyon in the Santa Rosa Mountains near Palm Springs, California, (Kelly and Goulden 2008) describe species shifts along elevational gradients. In the Newberry Mountains, mid-elevation pinyon pine (*Pinus monophylla*) appears to have shifted its range upward in elevation 75 meters, and low-elevation Mojave yucca (*Yucca schidigera*) shifted 30 meters upward out of valley bottoms (Guida 2011). In Deep Canyon, low-elevation creosote bush (*Larrea tridentata*) shifted its range 142 meters, and low-elevation bursage (*Ambrosia dumosa*) shifted its range 118 meters.

The BLM also expects shifts in distribution and shifts in species composition to continue in response to climate change. As part of a bureau-wide strategy to adapt to future climate change, BLM completed a rapid ecoregional assessment (REA) for the Mojave Desert in 2013. The Mojave REA predicts that most of the Mojave landscape will be affected by changes in temperature; however, some areas will resist climate change because of unique topographic features. In the planning area, Gold Butte is the area most likely to resist the effects of climate change. This prediction is also supported by a niche modeling study for the desert tortoise in the Lake Mead National Recreation Area that was completed by the University of California, Riverside (Barrows and Murphy 2011). This modeling effort suggests that desert tortoise habitat in the park and on adjacent BLM lands in the Piute/Eldorado Valley will become less favorable to desert tortoise, while habitat in Gold Butte will persist.

3.2.5.1.5. Fragmentation of Native Plant Communities

Human activities are causing disturbances that are fragmenting the Mojave Desert and reducing its ability to recover. Fragmentation is cumulative because the Mojave Desert has so little natural resiliency. Fragmentation is the interruption of ecological processes (such as pollination, dispersal of seeds, migration, and recovery) needed to sustain healthy native plant communities and ecosystems. Fragmentation of native plant communities is a result of disturbances such as roads and utility corridors or through the loss of metapopulation segments. It can operate on a local scale (such as pollination) or a landscape scale (such as seed dispersal by migratory birds). It is difficult to make generalized predictions about fragmentation because its effects operate on a species-by-species basis (Barrow and Allen 2004). The extremely slow recovery rate of native plant communities in the Mojave Desert is why fragmentation of native plant communities is a concern for the BLM. Managing for connectivity is the most important way to prevent fragmentation. The importance of managing for connectivity has only recently been recognized and was not a major resource management focus under the previous resource management plan.

3.2.5.1.6. Potential Impacts to Native Plant Communities 1998 to Present

Human use of native plant communities in the planning area has been unprecedented. Disturbance to native plant communities in the planning area is increasing as a function of higher human populations in the region. Nevada is the fastest-growing state in the country. The rate of population growth in Southern Nevada is roughly 5 percent per year. Since the 1998 RMP, the population of Clark County rose almost 1½ times, from 1,265,590 people in 1998 to 2,000,759 in 2013 (Clark County Comprehensive Planning, 2013). Recreational activity in the planning area has increased even faster (see Recreation (p. 450) section).

The BLM does not track disturbance to native plant communities. However, using the number of BLM lands and minerals authorizations, direct impacts to the desert tortoise, and casual recreation as surrogates, is it possible to understand potential impacts to native plant communities resulting from BLM actions during the 1998 RMP.

3.2.5.1.7. BLM Lands and Minerals Authorizations

Using records from the LR2000 database from 1998 to August 2013, the Southern Nevada District Office issued 2,775 land sales and rights-of-way authorizations that potentially directly and indirectly affected 250,000 acres (approximately 8 percent) of the planning area. Using records from the LR2000 database for the same time period, BLM issued 142 authorizations under the minerals program that affected up to 54,000 acres (approximately 2 percent of the planning area). This estimate includes at least 450 acres of fluid mineral leases and other authorizations that will not or have not resulted in ground disturbance. This is a total of 2,917 authorizations, roughly one authorization for every 1,062 acres of the planning area. Combined, potentially 10 percent of the planning area was directly and/or indirectly affected by BLM rights-of-way authorizations issued during the 1998 RMP.

Using records of Section 7 mitigation fees paid to BLM for projects on public lands, a total of 32,775 acres of desert tortoise habitat were directly disturbed between 2002 and 2013. Using the median acres of habitat disturbed each year (1,893 acres) instead of the average (because it was skewed by the 2006 economic boom), up to 40,000 acres of desert tortoise habitat (roughly 2 percent of creosote bursage scrub in the planning area) was affected by BLM actions that directly

removed or damaged desert tortoise habitat. This does not include indirect impacts to desert tortoise habitat. This does not include BLM sale of desert tortoise habitat.

3.2.5.1.8. Recreation Use

OHV activity is the primary recreation activity that affects native plant communities. Plants are affected by OHV activities in several ways. Soil compaction affects plant growth by reducing moisture availability and precluding adequate taproot penetration to deeper soil horizons. In turn, the size and abundance of native plants may be reduced. Above-ground portions of plants also may be reduced through breakage or crushing, potentially leading to reductions in photosynthetic capacity, poor reproduction, and diminished litter cover. Likewise, blankets of fugitive dust raised by OHV traffic can disrupt photosynthetic processes, thereby suppressing plant growth and vigor, especially along OHV routes. In turn, reduced vegetation cover may permit invasive and/or non-native plants — particularly non-native annual grasses and early successional species capable of rapid establishment and growth — to spread and dominate the plant community, thus diminishing overall endemic biodiversity. It is difficult to quantify impacts to native plant communities because most OHV damage is unauthorized, unreported, and the effects accumulate gradually over time.

In general, special recreation permits (SRPs) are expected to have a low direct effect on BLM native plant communities because BLM issues permits on existing race courses and roads. BLM also has the ability to ensure compliance through cost recovery accounts. Some course widening and corner-cutting occurs. In the past two years, BLM has tracked and assessed fines to competitive events for these impacts. On average, one to two acres of new disturbance per racing event was recorded.

Since 2007, casual visitor use in the Las Vegas Field Office has increased by approximately 11 percent annually (see Recreation (p. 450) section). Casual recreation is estimated to have directly impacted between 3,000 to 6,000 acres (0.12 percent to 0.25 percent) of native plant communities in the Las Vegas Field Office under the 1998 RMP. As of 2009, there is an estimated 11,151 miles (estimated 13,500 acres) of dirt roads and trails present in the Las Vegas Field Office. This represents 0.56 percent in the field office. Similar percentages are likely in the Pahrump Field Office.

3.2.5.1.9. Summary of Impacts to Native Plant Communities 1998 to Present

As previously discussed, direct and indirect impacts are cumulative in the Mojave Desert because natural recovery rates are so slow. In general, increasing direct and indirect impacts place higher stress on native plant communities. In the Mojave ecoregion, stress generally manifests as fewer shrubs and grasses; a lower number of species present in a given area; fewer seeds of native species in the soil seed bank; lower regeneration; lower soil stability; increased soil compaction; and higher numbers and more space occupied by non-native species. These changes reduce the ecosystem services that native plant communities provide. An extreme example of the relationship between human use and cumulative resource damage is areas experiencing heavy OHV activity where landscapes can be largely devoid of vegetation. Examples of this in the planning area occur in the open play areas of Nellis Dunes and Big Dune. Similar examples exist at Stoddard Wells and Dumont Dunes in California.

Almost all native plant communities in the planning area are being subjected to at least two environmental stressors: climate change and competition with non-native species. This includes

wilderness areas and areas of critical environmental concern. It is reasonable to assume that most native plant communities are subject to at least one additional stressor — fire, grazing, or casual recreation use. Some native plant communities, especially those in special recreation management areas and multiple-use lands, are potentially being subjected to four or more environmental stressors. For example, in the Jean Special Recreation Management Area, climate change, non-native annual grasses, utility corridors, and casual OHV recreation are all present and affecting native plant communities.

Table 3.9, "Summary of Stressors, Trends, and Effects to Native Plant Communities in the Planning Area" (p. 319) shows a summary of stressors to native plant communities, trends, and number of acres potentially affected under the previous resource management plan.

Table 3.9. Summary of Stressors, Trends, and Effects to Native Plant Communities in the Planning Area

Stressor	Trend 1998 to 2013	Area affected
Non-native species	Increase in area occupied	Estimated 2.9 million acres (or 94 percent) of the planning area are moderately to heavily impacted and are in fire condition classes 2 and 3.
Fire	Increase in number of acres burned and frequency of repeat burning	Estimated 1.3 million acres (or 42 percent) of planning area burned from 1998 to present.
Grazing	Decrease in the number of active grazing allotments, grazing use relatively constant in herd management areas	Three active allotments in the Las Vegas Field Office, including 106,007 acres. One wild horse and burro herd management area, 177, 662 acres. Combined roughly 9.2 percent of the planning area is being grazed.
Climate change	Increasing	Entire 3.1 million acres in the planning area are affected.
Lands and minerals use authorizations	Increasing number of authorizations issued that mirror economic trends.	BLM issued 2,917 lands and minerals authorizations directly and indirectly affecting 304,000 acres (roughly 9.8 percent) of the planning area between 1998 and 2013.
Direct impacts to creosote bursage scrub on BLM lands	Increasing, closely mirrors economic trends for the area	Based on desert tortoise Section 7 fees, an estimated 40,000 acres of creosote bursage scrub was impacted between 1998 and 2013.
Recreation use	Increasing	Estimated 3,000 to 6,000 acres (0.1 to 0.2 percent) of the planning area directly impacted between 1998 and 2013. Unknown acres of indirect impacts.

3.2.5.1.10. BLM Restoration Activities

At best, restoration actions in the Mojave facilitate natural recovery. Unless disturbance is very minimal, restoration efforts cannot return disturbed sites to their pre-disturbance condition. Vegetation communities on restored sites are not expected to resemble the undisturbed areas for many decades. Restoration is limited because it is dependent on infrequent high rainfall years,

which may occur only once or twice a decade, and because genetically appropriate native seed, which will perform the best, is often not available.

The final success of a restoration effort is directly proportional to cost. Given the economic cost of restoration and low real estate value of the land affected, it has been difficult for the BLM to justify much more than passive restoration techniques. Passive restoration techniques include recontouring/decompacting soils, seeding, and relying on natural rainfall to initiate seed germination and establishment.

In 2001, the Las Vegas Field Office developed guidance for revegetating post-project disturbance. Currently, the Southern Nevada District Office implements this guidance on a project-by-project basis at the discretion of the field manager as a project-impact minimization measure. Typically, this guidance is applied to large projects such as transmission lines and pipelines. An estimated 25 projects have been required to implement a restoration plan since 2001. This guidance sets performance targets for re-establishing a minimum 70 percent of the dominant diversity of the surrounding native vegetation within five years, but it has been difficult for most projects to achieve this criteria. Most ground-disturbing activities authorized through the minerals program are subject to regulatory requirements to reclaim and stabilize mine sites. The primary goal of reclamation is to re-establish the natural contour and stabilize the soil surface. From 1998 to 2013, less than 50 minerals reclamation projects are estimated to have been implemented. On a competitive basis, the BLM funds post-fire rehabilitation treatments (i.e. seeding, fencing, weed treatments) through the Emergency Stabilization (ES) and the Burned Area Rehabilitation (BAR) programs (Collectively referred to as the ESR program). ESR treatments do not seek to replace what is damaged by fire, but to stabilize and reduce damage from erosion. Often, genetically appropriate native seed is not available in the quantities needed. ESR seeding treatments in 2005 and 2006 met with limited effectiveness. Because of the seed mix that was available and used, the vegetation composition remains different from adjacent unburned areas.

There is not a specific BLM cost center for funding restoration and revegetation projects. Instead, projects are funded competitively across the bureau, most often through the wildlife, range, and fire programs. From 1998 to 2013, fewer than 10 restoration projects were funded in this manner. Between 2006 and the present, BLM implemented soil preparation and native plant seeding and transplanting on approximately 1,917 acres and decommissioned 50.4 miles of roads using grant money from the Southern Nevada Public Lands Management Act. While restoration activities are complete, the sites are not expected have the same species composition as undisturbed sites for many decades.

3.2.5.1.11. Native Plant Communities

The vegetation land-cover categories discussed in this section comprise the major native plant communities and associations in the planning area. Special status plant species (federally listed, BLM sensitive, and state listed) are included in the Special Status Species (p. 342)section. The ecological systems in the project area are predominantly from the North American Warm Desert, Intermountain Basins Ecological Divisions, with elements from the Rocky Mountain and Colorado Plateau ecological systems in the eastern portion of the planning area (Comer et al. 2003). BLM guidance does not specifically describe desired conditions for vegetation communities. Instead, BLM manages vegetation consistent with existing land-use designations, obligations under the Clark County Multi-Species Habitat Conservation Plan, the Endangered Species Act, and agency regulations and policy for BLM sensitive species.

Vegetative communities within the planning area are based on mapping of land cover and ecological systems conducted by the U.S. Geological Survey during the Southwest Regional Gap Analysis Project (SWReGAP) (USGS 2004; Lowry et al. 2005). Ecological systems within SWReGAP are defined as a group of plant community types (associations) that tend to co-occur within landscapes with similar ecological processes, substrates, and/or environmental gradients (Comer et al. 2003). Within the planning area, there are 32 SWReGAP classifications. These ecological systems and classifications have been combined into 16 vegetation community categories (see Table 3.10, "Vegetation Categories and Southwest Regional Gap Analysis Project Ecological Systems in the Planning Area" (p. 321)). The distribution of these community categories within the planning area is illustrated in Map 3.2.5.11 - 1 (p. 2143). Developed lands, agricultural lands, and open water are not included in the discussion below.

Table 3.10. Vegetation Categories and Southwest Regional Gap Analysis Project Ecological Systems in the Planning Area

BLM vegetative communities with SWReGAP land classifications		Planning area acreage	Percentage of area
Upland Communities			
Creosote Bursage		**2,173,321**	**70.56 percent**
	Sonora-Mojave Creosote bush-White Bursage Desert Scrub	2,173,321	
Blackbrush		**532,930**	**17.3**
	Colorado Plateau Blackbrush-Mormon Tea Shrubland	851	—
	Mojave Mid-Elevation Mixed Desert Scrub	532,079	—
Saltbush Scrub		**62,276**	**2.02 percent**
	Sonora-Mojave Mixed Salt Desert Scrub	62,276	
Sagebrush		**6,348**	**0.21 percent**
	Inter-Mountain Basins Big Sagebrush Shrubland	12	—
	Inter-Mountain Basins Montane Sagebrush Steppe	324	—
	Inter-Mountain Basins Semi-Desert Grassland	6	—
	Inter-Mountain Basins Semi-Desert Shrub Steppe	4,092	—
	Mogollon Chaparral	1,913	—
Pinyon Juniper		**30,820**	**1 percent**
	Great Basin Pinyon-Juniper Woodland	30,542	—
	Rocky Mountain Gambel Oak-Mixed Montane Shrubland	241	—
	Sonora-Mojave Semi-Desert Chaparral	37	—
Mixed Conifer		**1,561**	**0.05 percent**
	Rocky Mountain Montane Dry-Mesic Mixed Conifer Forest and Woodland	21	
	Rocky Mountain Montane Dry-Mesic Mixed Conifer Forest and Woodland	14	
	Rocky Mountain Ponderosa Pine Woodland	1,526	
Badlands, Barren Landscapes, Bedrock Cliffs, and Outcrops			
	North American Warm Desert Badland	3,616	—
	Colorado Plateau Mixed Bedrock Canyon and Tableland	493	—
	North American Warm Desert Pavement	13,105	—
	North American Warm Desert Volcanic Rockland	5142	—
	North American Warm Desert Bedrock Cliff and Outcrop	174,056	—
Sand Dunes		**2,848**	**0.09 percent**

BLM vegetative communities with SWReGAP land classifications		Planning area acreage	Percentage of area
	North American Warm Desert Active and Stabilized Dune	2,848	—
Desert Playa		**22,181**	**0.72 percent**
	North American Warm Desert Playa	22,181	—
Developed Lands and Agriculture		**4,203**	**0.14 percent**
	Agriculture	253	—
	Developed, Medium – High Intensity	3,460	—
	Developed, Open Space – Low Intensity	491	—
Riparian, Wetlands, and Drainages			
Riparian Woodland		**3,398**	**0.11 percent**
	North American Warm Desert Lower Montane Riparian Woodland and Shrubland	6	—
	North American Warm Desert Riparian Woodland and Shrubland	0.45	—
	Invasive Southwest Riparian Woodland and Shrubland	3,391	—
Mesquite Woodland		**3,332**	**0.11 percent**
	North American Warm Desert Riparian Mesquite Bosque	3,332	—
Desert Wash		**39,828**	**1.29 percent**
	North American Warm Desert Wash	39,828	—
Wet Meadows		**503**	**0.02 percent**
	North American Arid West Emergent Marsh	503	—
Open Water		**101**	**0**
	Open Water	101	—
Total		**3,080,062**	**100 percent**

3.2.5.1.11.1. Creosote Bursage

Creosote bursage scrub is the most abundant vegetation type, occupying roughly 70 percent of the planning area. Creosote bush (*Larrea tridentata*) and bursage (*Ambrosia dumosa*) are generally the most conspicuous plant species present. This vegetation community occurs below 4,000 feet and is the primary habitat for the desert tortoise. Within the planning area, this vegetation category is composed entirely of the Sonora-Mojave creosote bush-white bursage desert scrub ecosystem. This vegetation consists of large, open expanses of vegetation that gradually integrated with saltbush scrub near valley bottoms and blackbrush at higher elevations.

There have been declines of this vegetation type since 1998 because of BLM realty actions and congressionally mandated land transfers (land sales, patents, and rights-of-way authorizations). This decrease has predominantly been on multiple-use lands within designated disposal boundaries and utility corridors. Important threats to this ecosystem include direct and indirect impacts resulting from anthropogenic activity, invasion by non-native annual grasses and increased fire frequency. Anthropogenic activities include grazing; development; highway and road construction; utility corridor construction; and recreational activity (casual OHV, concentrated OHV activities, and competitive races). Disturbances associated with these activities have fragmented habitat, increased edge effects, and created conditions that facilitate establishment on non-native annual grasses.

Since 1998, a significant portion of creosote bursage scrub in the planning area has burned due to colonization by non-native grasses. Compared to historic conditions, the quality of creosote bursage scrub in the planning area has also decreased because of non-native grasses. Due to the

presence of non-native annual grasses, currently most of this vegetation category is classified as condition Class 2 at a moderate risk of losing key ecosystem components (see Wildland Fire Ecology and Management (p. 390)section). Higher densities of non-native annual grasses and increased fire frequency lead to decreased ecosystem functioning, a higher risk of wildfire, and result in lower quality habitats for wildlife. Historically, the Sonora-Mojave creosote bush-white bursage desert scrub ecosystem burned infrequently and contained substantial bare interspaces between shrubs with only low densities of annual grasses present. Currently, non-native annual grasses, including red brome (*Bromus madritensis ssp rubens*), cheat grass (*Bromus tectorum*), and Mediterranean grass (*Schismus sp.*), grow in significant densities under and between shrubs and create standing dead material that carries fire between shrubs and increases fire return intervals.

Temporary impacts to vegetation in this category can take decades to centuries to recover depending on the impact. If disturbance is too frequent, recovery may be delayed or prevented entirely as soils become eroded or severely compacted. Slow recovery from disturbance means most impacts to this vegetation community will accumulate over time. The BLM restoration program is designed to facilitate natural recovery and reduce cumulative impacts to this vegetation type. Because this vegetation category does not recover quickly from disturbance, conservation actions may conflict with some multiple use management objectives.

3.2.5.1.11.2. Blackbrush

Blackbrush scrub is the second most abundant vegetation category, occupying roughly 17 percent of the planning area. Blackbrush (*Coleogyne ramosissima*) is a slow-growing and long-lived (up to 400 years), densely branched shrub that gets its name from its dark stems and branches that appear even darker when the shrub is dormant. Blackbrush has been characterized as a paleoendemic whose range was once more widespread but has been reduced to relict areas (Callison et al. 1985). Blackbrush scrub typically occurs at elevations between 1,900 to 5,300 feet at the transition between creosote-bush scrub and sagebrush scrub. In the planning area, important stands of blackbrush scrub are located in the Gold Butte Area, Virgin Mountains, McCullough Mountains, Crescent Peak Area, Highland Range, and the west side of the Spring Mountains.

This vegetation type does not recover from disturbance quickly due to infrequent seed production (every three to five years during mass fruiting events) and limited longevity in the soil seed bank (due to extremely high granivory). Invasion by non-native annual grasses has increased the potential for this community to burn. The main threat to this vegetation type is fire. This vegetation community is extremely slow to recover from fire and may not to return to pre-disturbance conditions within 10 to 15 years. Following fire, this vegetation community can be expected to be dominated by non-native annual grasses and non-native annual forbs for an extended time. Outside the planning area, in the Red Rock National Conservation Area, there has been no establishment of blackbrush seedlings five years post fire. Callison et al. (1985) did not observe colonization on a 37-year-old burn scar. Once burned, this vegetation category may convert into a different vegetation type, such as non-native annual grassland. Due to the presence of non-native annual grasses, most of this vegetation category is classified as condition Class 3, a high risk of losing key ecosystem components (see Wildland Fire Ecology and Management (p. 390) section).

The BLM does not have specific quantitative information to determine how much of this vegetation type has been burned or colonized by non-native annual grasses. Blackbrush scrub is not subject to the same level of development and OHV pressures experienced by lower elevation native plant communities; however, recreational activity in blackbrush scrub is expected to

increase as recreational opportunities are lost at lower elevations. Anthropogenic disturbance facilitates the spread of non-native annual grasses. This vegetation type is experiencing more OHV activity in the southern and western portions of the planning area than areas within the Gold Butte and Virgin Mountains ACECs in the east. Wind energy development in the Crescent Peak area (see the Renewable Energy (p. 470) section) would be expected to fragment and increase fire in blackbrush scrub in the southern portion of the planning area. Population growth in Pahrump would likely increase recreation use in blackbrush scrub on the west side of the Spring Mountains.

3.2.5.1.11.3. Saltbush

Saltbush scrub is the third most abundant vegetation category, occupying roughly 2 percent of the planning area. Fourwing saltbush (*Atriplex canescens*) and shadscale (*Atriplex polycarpa*) are the most conspicuous plant species present in this vegetation type. This vegetation community occurs in valley bottoms around the margins of dry lakes where soils are saline and higher in silt and clay. In most of the planning area, saltbush intergrades with creosote bursage scrub. In some areas, honey mesquite (Prosopis glandulosa) and mesquite acacia woodlands are present.

Within the planning area, the largest areas of saltbush scrub are located north of Las Vegas in the Upper Las Vegas Wash and west of Pahrump adjacent to the California state line. Both areas experience moderate to heavy recreational use and development pressure. Depending on location and size, the quality of small stands is variable, with those within or near areas experiencing OHV activity showing the highest densities of non-native species. Much of this vegetation type is within the current Pahrump disposal area and within the proposed boundary of the Pahrump supplemental airport.

Where soils are less saline, invasion by non-native annual grasses is a threat because of the increased potential for fire. The harsh soils that support this vegetation type are not favorable and limit the ability of this community to recover from disturbance and fire. Saline soils also support invasive weeds in the mustard family, such as African mustard (*Malcomia africana*), that can compete with native species. Due to the presence of non-native annual grasses, most of this vegetation category is classified as fire condition Class 3, a high risk of losing key ecosystem components (see the Wildland Fire Ecology and Management (p. 390) section). The area occupied by this vegetation type is declining due to land disposal actions, right-of-way authorizations, and cumulative impacts from multiple-use activities that remove vegetation. The quality of this vegetation type is declining due to colonization by non-native annual grasses and weeds.

3.2.5.1.11.4. Sagebrush, Pinyon Juniper, and Mixed Conifer

The sagebrush, pinyon juniper, and mixed conifer vegetation types occur at higher elevations of the Virgin Mountains in the eastern portion of the planning area and in the McCullough Mountains in the southern portion of the planning area. Combined, these vegetation types cover less than 1.5 percent of the planning area. Floristically, vegetation in the Virgin Mountains has a closer affinity to the Colorado Plateau and Rocky Mountains and represents the westernmost distribution of some species. Vegetation in the McCullough Mountains is more similar to native plant communities in the Sonoran and Mojave deserts. In the Virgin Mountains, these vegetation types are all within the Virgin Mountains ACEC in remote, difficult-to-access areas. Most of the highest elevation portion in the McCullough Mountains is within wilderness lands. The Crescent Peak Area and Highland Range also contain key features of this community.

Anthropogenic activities, including recreational hunting and hiking, are limited because of the remote and rugged terrain. Some areas were previously open to grazing, but there currently are no active allotments in either the Virgin or McCullough mountains. Invasion by non-native annual grasses is a potential threat to these higher-elevation vegetation types, although the threat is lower than in the creosote bursage and blackbrush vegetation communities. Most of these vegetation communities have been identified as fire condition Class 3; the risk of losing key ecosystem components is high due to the potential for invasion by non-native annual grasses (see the Wildland Fire Ecology and Management (p. 390) section).

Due to the remote location and conservation within the ACEC, sagebrush, pinyon juniper, and mixed conifer in the Virgin Mountains is likely to remain stable. In the McCullough Mountains, the quality of sagebrush, pinyon juniper, and mixed conifer could decline if recreational OHV activity shifts from lower to higher elevations. Road proliferation in the McCullough Mountains could exacerbate this trend, as additional roads would provide new avenues for non-native annual grasses to enter the area.

3.2.5.1.11.5. Badlands, Barren Landscapes, Bedrock Cliffs and Outcrops, Sand Dunes, and Desert Playa

These land-cover categories range from sparsely vegetated to devoid of vegetation, and occupy roughly 7.2 percent of the planning area. Many of these land-cover categories provide specialized habitat for native plants and wildlife, as well as recreational opportunities for the public. Gypsum badlands in the planning area provide specialized habitat for several rare and sensitive plants. Desert pavement, rock outcroppings, and areas with exposed bedrock provide important foraging and nesting habitat for desert-dwelling wildlife. Sand dune systems in the planning area support vegetation to different degrees and provide habitat for specialized plants and wildlife, including several BLM special status species. Desert playas and dry lakebeds do not support vegetation but provide ephemeral water for wildlife and can be a source of windblown sediments that enrich soils.

Temporary impacts on soils can take decades to centuries to recover depending on the level of impact. If disturbance is too frequent, recovery may be delayed or prevented entirely as soils become eroded or severely compacted. Impacts to these land-cover types will accumulate over time due to the slow recovery from disturbance. The BLM restoration program is intended to facilitate natural recovery and reduce cumulative impacts in these land-cover types.

Both the area occupied and quality of these land-cover types are expected to continue to decline if land disposal actions, right-of-way authorizations, and multiple-use activities reduce surface-stabilizing agents. The quality of the vegetation types has declined in areas experiencing frequent anthropogenic disturbances, such as the Rainbow Gardens ACEC. Restoration actions (such as post and cable fencing) that define existing roads and trails are an effective tool for mitigating these impacts and for allowing natural recovery to occur in areas such as Rainbow Gardens. Areas within these land-cover types are important sources for recreation and locatable and saleable minerals, or they have been proposed for renewable energy development.

3.2.5.2. Riparian and Wetlands

Riparian and wetland areas are sensitive vegetative or physical ecosystems that develop in association with surface or subsurface water (USDOI 1992). Riparian and wetland ecological systems comprise only a small portion of the million acres of public lands administered by the BLM in Southern Nevada, but they are among the most important, productive, and diverse

ecosystems on the landscape. Benefits from riparian/wetland ecosystems are essential to both human and wildlife values and include the following:

- Maintaining clean renewable water supplies.
- Providing for diverse plant and wildlife ecosystems, including special status species and fisheries.
- Importance in cultural and historic values.
- Economic value derived from sustainable uses (open space, hunting, livestock grazing, commercial recreation).
- Greenbelt-associated recreation and scenic values.
- Thermal/shade protection, which is especially important within the arid Southwest.

Riparian resources are present in the Virgin River, Muddy River, and Meadow Valley Wash. There are eight mesquite acacia woodlands: Moapa, Amargosa Flat, Stewart Valley, Pahrump, Stump Spring, Sandy Valley, Dry Lake, and Cactus Spring. There are approximately 110 springs with riparian characteristics within the planning area.

Riparian and wetland areas include, but are not limited to, areas adjacent to waterways (whether waters are surface, subsurface, or ephemeral), springs, potholes, wet meadows, sloughs, marshes, swamps, bogs, floodplains, lakes, and reservoirs. Riparian areas are recognized as a form of wetland transition between permanently saturated wetlands and upland areas (USDOI 1992). For BLM purposes, riparian and wetland areas are referred to synonymously unless specifically discerned. The BLM utilizes various tools to describe, analyze, and evaluate riparian/wetland ecosystems relative to their potential and capability to achieve a properly functioning and healthy ecosystem.

Riparian/wetland habitats are fragile resources and are often among the first landscape features to reflect impacts from management activities. These habitats are used as indicators of overall land health and watershed condition. A healthy riparian system will filter and purify water as it moves through the riparian zone; reduce sediment loads and enhance soil stability; reduce destructive energies associated with flood events; provide physical and thermal micro-climates in contrast to surrounding uplands; and contribute to groundwater recharge and base flow. Within most riparian/wetland systems in the arid southwest, the potential of a riparian/wetland ecosystem is strongly dependent upon the availability of water. The degree, timing, and source of water availability, among other physical factors, is commonly referred to in terms of perennial (yearlong), interrupted (perennial flow discontinuous in space), intermittent (seasonal), or ephemeral (storm) water sources.

Riparian resources within the planning area are extremely limited. These resources are managed for conservation and public use. Impacts to surface water resources result from both natural and anthropogenic forces. Natural impacts include erosion from wind and water, wildland fire, disturbance from wildlife, and high precipitation events resulting in high flow. Anthropogenic impacts include driving off-road vehicles; grading for rights-of-ways, permitted livestock use; roads, trails and associated drainage; dumping; invasive weeds; groundwater development; and water use by water rights holders.

Indicators that reflect good physical condition of surface water resources include:

- Healthy riparian vegetation conditions.
- Stable banks, no signs of trampling or headcuts.
- No visible signs of sedimentation.

Riparian areas within the planning area are primarily associated with springs and perennial streams. There are only three perennial streams greater than a half mile in length: the Muddy River, Virgin River, and Meadow Valley Wash. Of these three, only the Virgin River has a significant riparian area on public lands. This area, totaling 194 acres, covers nine miles of the river's length. Riparian conditions in this section range from poor to fair, depending on the location along the river, and are in a downward trend. The vegetative component consists primarily of tamarisk (*Tamarix sp.*), saltgrass (*Distichlis sp.*), greasewood (*Sarcobatus mariiculatus*), big saltbush (*Atriplex lentiformis*), and arrowweed (*Puichea sericea*), with tamarisk and arrowweed being predominant. Tamarisk has become a problem within the floodplain of the Virgin River due to the plant's high water consumption, ability to concentrate salts, and its characteristic rapid spread. Additional activities along the Virgin River, including surface water diversions, dams, OHV activity, and cattle grazing, are also resulting in impacts to riparian areas on BLM lands.

3.2.5.2.1. Riparian Woodland, Mesquite Acacia Woodland, Desert Wash

Across the southwest, 95 percent of riparian woodlands and mesquite woodlands have been lost to human activity. Riparian woodlands, mesquite acacia woodlands and desert washes occupy approximately 1.5 percent of the planning area. More than 90 percent of the historic distribution of mesquite acacia woodlands in Southern Nevada has been lost to anthropogenic activities. Historic accounts of the Las Vegas Valley describe stands of mesquite woodlands over a mile wide extending from the present day Springs Preserve to the Colorado River. Mesquite acacia woodlands in the Virgin River, Muddy River, Meadow Valley Wash, and Ash Meadows were converted to agricultural use in the late 1800s. Mesquite stands in Pahrump, Sandy Valley, and Stewart Valley are some of the most important remaining examples of this vegetation community in the region. These vegetation types support a disproportionately high diversity of wildlife and are often the focus of human activities because of the water and shelter they provide. Willow (*Salix spp.*) and cottonwood (*Populus fremontii*) dominate riparian woodlands in the planning area. Honey mesquite (*Prosopis glandulosa*) and catclaw acacia (*Acacia greggii*) dominate mesquite acacia woodlands. Mesquite acacia woodlands typically occur on the edges of large watercourses such as perennial rivers and streams, but they can also grow in scattered clumps on sandy hummocks and near desert springs where groundwater levels are high.

In the riparian woodlands of the Virgin and Muddy rivers, the BLM is aggressively treating tamarisk and non-native species under a SNPLMA-funded conservation initiative. Because of tamarisk and other non-native species, most low-elevation riparian woodlands in the planning area are classified as fire condition Class 3, at a high risk of losing key ecosystem components (see the Wildland Fire Ecology and Management (p. 390) section). The condition of riparian woodlands in the planning area is likely to be stable. Natural recovery and restoration activities (tamarisk removal) that have created additional riparian woodlands have likely been offset by losses due to fire and illegal cattle grazing along the Virgin River. The quality of riparian woodlands in the planning area should improve as tamarisk in the Virgin River, Muddy River, and Meadow Valley Wash is attacked and weakened by the tamarisk beetle, a biological control agent released in Utah.

Because of their perennial water sources, mesquite acacia woodland habitats support some of the largest and richest riparian woodlands in the planning area. A 1999 mesquite acacia woodland habitat management plan describes eight stands in the planning area: Moapa, Amargosa Flat, Stewart Valley, Pahrump, Stump Spring, Sandy Valley, Dry Lake, and Cactus Spring (BLM 1999). The largest remaining stands of mesquite acacia woodlands are near Pahrump, though much of this is within or adjacent to the Pahrump disposal area. The BLM and the Nature Conservancy

have partnered to establish a mitigation bank adjacent to the conservation transfer area in the Las Vegas Valley, and funds will be used to restore degraded mesquite acacia woodlands within the mitigation bank.

Fire is a serious threat to all mesquite acacia stands. In 1995, 235 acres burned in the Moapa area, and more than 50 acres burned in 1997 and 1998 in the Pahrump area (BLM 1999). Groundwater pumping is also a threat to mesquite acacia woodlands. Although mesquite trees are extremely deep-rooted (phreatophytes), they are dependent on subsurface water. As groundwater levels decline, the potential for new individuals to establish would be reduced. To track this potential threat, the BLM is monitoring shallow groundwater levels at populations in Stewart Valley, Moapa, and Stump Spring.

Mesquite acacia woodlands in the planning area have declined due to disposal actions. Fire, illegal woodcutting, recreational OHV activity, and colonization by non-native tamarisk trees continue to degrade the quality of remaining stands. Natural regeneration of mesquite acacia stands is poor with recruitment observed at only two of eight mesquite stands (BLM 1999). Since 1998, BLM has performed mesquite plantings at the Moapa, Cactus Spring, and Pahrump stands; however, these relatively small restoration actions do not offset declines elsewhere. The areas occupied by mesquite acacia woodlands are likely to decrease due to increased demand on groundwater, future disposal actions, renewable energy development, and other rights-of-way authorizations. The quality of mesquite acacia woodlands is also likely to decline because of fire, recreational activity, and poor recruitment. Approximately 20 percent of all mesquite woodlands are within the Pahrump disposal area. Impacts to this stand, especially due to groundwater withdrawal, are likely to continue.

Desert washes are present throughout the planning area and are important to wildlife because the ephemeral water supports xeric shrubs that provide thermal cover and a food source. OHV activity, cattle grazing, fire, and invasive non-native species are threats to this vegetation type. Evidence of natural regeneration (recruitment) of native trees and the presence of non-native tamarisk (*Tamarix spp.*) are good indicators of quality. The area covered by desert washes in the planning area has decreased.

3.2.5.2.2. Wet Meadow

Occupying roughly 503 acres, less than two one-hundredths (0.02 percent) of the planning area, wet meadows provide habitat for wildlife and rare and sensitive plants. Wet meadows are supported by riparian areas or springs and occur anywhere in the planning area where conditions are appropriate. Some areas are dominated by salt grass (*Distichlis spicata*) and alkali sacaton (*Sporobolus airoides*); in other areas, sedges and rushes are prevalent. The largest and most important wet meadows within the planning area are within the Ash Meadows ACEC. These wet meadows support six federally listed plant species. Smaller wet meadows are present in the Virgin River, Muddy River, and Meadows Valley Wash, as well as isolated springs and seeps throughout the planning area.

Important threats to this ecosystem include direct and indirect impacts resulting from anthropogenic activity, invasion by non-native species, and increases in fire frequency. Historically, anthropogenic activities included draining and water diversions, agricultural development, peat mining, and cattle grazing. Anthropogenic threats and activities were largely discontinued in the late 1980s when the Ash Meadows ACEC and the U.S. Fish and Wildlife Service Ash Meadows National Wildlife Refuge were established. In the 1980s, BLM removed

wild horses and burros and controlled OHV activity in the area by fencing portions of the ACEC and refuge boundaries.

Wet meadows in the planning area are generally in good condition, but they remain highly fragmented and degraded by noxious aquatic plants that thrive under disturbed conditions, such as cattail (*Typha domingensis*) and common reed (*Phragmites australis*), and agricultural weeds, including Russian knapweed (*Acroptilon repens*) and tamarisk. The Fish and Wildlife Service has been actively removing tamarisk trees on the refuge and on BLM lands within the Ash Meadows ACEC.

3.2.5.3. Noxious / Invasive Species

Public lands in the planning area are negatively impacted by the invasion and spread of noxious and invasive weeds. The planning area is also impacted by invasive animal species (such as insects, aquatic invertebrates, fish, etc.).

The BLM defines a weed as "a plant that interferes with management objectives for a given area of land at a given point in time." Noxious weeds are plant species designated as "noxious" by law. Nevada Revised Statute (NRS) 555.005 says noxious weeds are "any species of plant which is, or is likely to be, detrimental or destructive and difficult to control or eradicate." An invasive species is defined as a species whose introduction does or is likely to cause economic or environmental harm or harm to human health (Executive Order 13112). For this document, the term "weed" will be utilized to include vegetation that meets the NRS criteria and applies to native, non-native, invasive, and noxious plants.

Noxious weeds and invasive plants displace native vegetation, degrade wildlife and plant habitats, reduce recreation opportunities, and negatively impact water quality, runoff, and sedimentation. Weeds can cause drastic changes in the composition, structure, and productivity of vegetation communities and change the state of ecological sites (West, 1999). The cost and complexity of managing noxious weeds and invasive plants and restoring native habitats increases the longer these situations are not adequately addressed. Counties, private landowners, tribal governments, and federal and state agencies are concerned with negative impacts associated with noxious weeds and invasive plants and are pursuing weed control on lands under their ownership and/or jurisdiction.

Noxious and invasive weeds have become an increasing problem on BLM lands within the planning area since the 1998 RMP (see Map 3.2.5.13 - 1 (p. 2143)). The 1998 RMP listed only one designated noxious weed, puncture vine, as being present in the planning area. In 2013, the planning area has 22 of the 47 state-listed noxious weeds. The existing condition of weeds in the planning area follows the established pattern of similar landscapes in the southwest. Weed populations exist in mixed degrees among regions and vegetation types. Red brome, cheat grass, filaree, and schismus are ubiquitous in the landscape, and Russian thistle and Sahara mustard are prevalent along roadsides. The term "noxious" is a legal designation and is administered by both state and federal agencies. The Nevada Department of Agriculture maintains a list of weeds in accordance with NAC 555.010 (effective 10-31-05). Listed plants are categorized into one of three levels depending upon infestation characteristics.

3.2.5.3.1. Category A Weeds

The weeds in Table 3.11, "Category A Weeds" (p. 330) are not found or are limited in distribution throughout the state. These species are subject to active exclusion from the state, active eradication wherever found, and active eradication from the premises of a dealer of nursery stock. In terms of treatment prioritization, Class A weeds receive the highest priority. The BLM management emphasis for Category A noxious weeds is for complete control (BLM Manual 9015).

Table 3.11. Category A Weeds

Common name	Scientific name	Present in planning area?
Austrian peaweed	*Sphaerophysa salsula*	No
Austrian fieldcress	*Rorippa austriaca*	No
African rue	*Peganum harmala*	Yes
Black henbane	*Hyoscyamus niger*	No
Camelthorn	*Alhagi pseudalhagi*	Yes
Common crupina	*Crupina vulgaris* **	No
Dalmatian toadflax	*Linaria dalmatica*	No
Dyer's woad	*Isatis tinctoria*	No
Eurasian water-milfoil	*Myriophyllum spicatum*	No
Giant Salvinia	*Salvinia molesta* **	No
Giant reed	*Arundo donax*	Yes
Goats rue	*Galega officinalis* **	No
Green fountain grass	*Pennisetum setaceum*	Yes
Houndstongue	*Cynoglossum officinale*	No
Hydrilla	*Hydrilla verticillata* **	No
Iberian starthistle	*Centaurea iberica*	No
Klamath weed	*Hypericum perforatum*	No
Malta starthistle	*Centaurea melitensis*	Yes
Mayweed chamomile	*Anthemis cotula*	No
Mediterranean sage	*Salvia aethiopis*	Yes
Purple loosestrife	*Lythrum salicaria, Lythrum virgatum*	Yes
Purple starthistle	*Centaurea calcitrapa*	No
Rush skeletonweed	*Chondrilla juncea*	No
Sow thistle	*Sonchus arvensis*	Yes
Spotted knapweed	*Centaurea maculosa*	Yes
Squarrose knapweed	*Centaurea virgata*	No
Sulfur cinquefoil	*Potentilla recta*	No
Syrian bean caper	*Zygophyllum fabago*	No
Yellow starthistle	*Centaurea solstitialis*	Yes
Yellow toadflax	*Linaria vulgaris*	No

** Indicates species that are also federally listed noxious weeds.

3.2.5.3.2. Category B Weeds

The weeds in Table 3.12, "Category B Weeds" (p. 331) are established in scattered populations in some counties of the state. These species are subject to active exclusion where possible and active eradication from the premises of a dealer of nursery stock. The BLM management emphasis for Category B noxious weeds is to control the spread and decrease the population size, and eventually eliminate the weed population when cost-effective technology is available (BLM Manual 9015).

Table 3.12. Category B Weeds

Common name	Scientific name	Present in planning area?
Carolina horse nettle	*Solanum carolinense*	No
Diffuse knapweed	*Centaurea diffusa*	Yes
Leafy spurge	*Euphorbia esula*	No
Medusahead	*Taeniatherum caput-medusae*	No
Musk thistle	*Carduus nutans*	Yes
Russian knapweed	*Acroptilon repens*	Yes
Sahara mustard	*Brassica tournefortii*	Yes
Scotch thistle	*Onopordum acanthium*	Yes
Silverleaf nightshade	*Solanum elaeagnifolium*	Yes

3.2.5.3.3. Category C Weeds

The weeds in Table 3.13, "Category C Weeds" (p. 331) are established and widespread in many counties of the state. These species are subject to active eradication from the premises of a dealer of nursery stock. The BLM management emphasis for Category C noxious weeds is to contain the spread to present population sizes or decrease the populations to manageable sizes (BLM Manual 9015).

Table 3.13. Category C Weeds

Common name	Scientific name	Present in planning area?
Canada thistle	*Cirsium arvense*	Yes
Hoary cress	*Cardaria draba*	Yes
Johnson grass	*Sorghum halepense*	Yes
Perennial pepperweed	*Lepidium latifolium*	Yes
Poison hemlock	*Conium maculatum*	No
Puncture vine	*Tribulus terrestris*	Yes
Tamarisk/Salt cedar	*Tamarix spp.*	Yes
Water hemlock	*Cicuta maculata*	No

3.2.5.3.4. Invasive Weeds

In addition to noxious weeds, other invasive species are problematic in the planning area. These plants are considered invasive because they displace and reduce the normal composition and productivity of native vegetation. Some raise the risk of wildland fire because of increased flammability, altered fire return frequency, and continuous fuel beds in areas that would otherwise be bare. Annual grasses, mainly dominated by red brome, are of particular concern throughout the planning area. Some of these invasive species are listed in Table 3.14, " Invasive Weeds" (p. 331).

Table 3.14. Invasive Weeds

Invasive Weeds		
Common name	**Scientific name**	**Present in planning area?**
Red brome	*Bromus madritensis rubens*	Yes
Cheat grass (aka Downy brome)	*Bromus tectorum*	Yes
Ripgut brome	*Bromus diandrus*	Yes
Chilean chess	*Bromus trinii*	Yes
Smooth brome	*Bromus inermis*	Yes
Arabian grass	*Schismus arabicus*	Yes

Invasive Weeds		
Common name	**Scientific name**	**Present in planning area?**
Halogeton (aka saltlover)	*Halogeton glomeratus*	Yes
Paloverde	*Parkinsonia aculeata*	Yes
Russian thistle	*Salsola spc.*	Yes
London rocket	*Sisymbrium irio*	Yes
Indian hedgemustard	*Sisymbrium orientale*	Yes
Tall tumblemustard	*Sisymbrium altissimum*	Yes
Pinnate tansymustard	*Descurainia sophia*	Yes
Filaree (aka stork's bill)	*Erodium cicutarium*	Yes
Cudweed	*Gnaphalium luteoalbum*	Yes
Gumweed	*Grindelia squarrosa*	Yes
Shortpod mustard	*Hirschfeldia incana*	Yes
Horehound	*Marrubium vulgare*	Yes
Sweetclover	*Melilotus alba*	Yes
Yellow sweetclover	*Melitotus officinalis*	Yes
Dallisgrass	*Paspalum dilatatum*	Yes
Annual bluegrass	*Poa annua*	Yes
Rabbitfootgrass	*Polypogon monspeliensis*	Yes
Curveseed butterwort	*Ranunculus testiculatus*	Yes
Common dandelion	*Taraxacum officinale*	Yes
Bermuda grass	*Cynodon dactylon*	Yes
Ravenna grass	*Saccharum ravennae*	Yes
Fivehook bassia	*Bassia hyssopifolia*	Yes
Kochia	*Bassia scoparia*	Yes
Russian olive	*Elaeagnus angustifolia*	Yes
Tree tobacco	*Nicotiana glauca*	Yes
Tumble pigweed	*Amaranthus albus*	Yes
Prostrate pigweed	*Amaranthus blitoides*	Yes
Bur buttercup	*Ranunculus testiculatus*	Yes
Field bindweed	*Convolvulus arvensis*	Yes
Prickly lettuce	*Lactuca serriola*	Yes
African mustard	*Malcomia africana*	Yes
Black medic	*Medicago lupulina*	Yes
Oleander	*Nerium oleander*	Yes
Date palm	*Phoenix dactylifera*	Yes
Common reed	*Phragmites australis*	Yes
Curly dock	*Rumex crispus*	Yes
Mullein	*Verbascum thapsus*	Yes
Fan palm	*Washingonia filifera*	Yes

Currently, weed presence is the most heavily concentrated in washes, roadsides, riparian corridors, and disturbed areas. Washes gather more precipitation than the surrounding landscape, and in a desert system, a small increase in water can be substantial. Roadways are the known vectors for many invasive species. In Southern Nevada, the combination of disturbed soil devoid of vegetation (for visibility, safety, and fire mitigation) and extra water from asphalt runoff make an ideal habitat for weeds such as Russian thistle, malta starthistle, Russian knapweed, and Sahara mustard to flourish. Riparian corridors are more actively infested due to the proximity of human populations. Human influence provides a source for many non-native species due to domestic plantings (such as fountain grass and tamarisk) and agricultural practices that introduce weed species (such as halogeton, white top, and thistles) from purchased crop seed and livestock feed products. Disturbed soils and irrigation aid the survival of introduced weeds, and riparian corridors provide suitable sites as seeds disperse. They also provide vectors on

clothing, equipment, and vehicles. Disturbed soil surface areas are also corridors and points for the expansion of invasive plants. These disturbance areas include, but are not limited to, roads, areas or intense recreational use, fire scars, range improvement sites, gravel pits, and mining activities. Many noxious and invasive weeds are disturbance colonizers and can invade and spread from these areas into adjacent native vegetation. Mitigation measures such as prevention and restoration can reduce the likelihood and extent of invasive weed spread.

Most noxious and invasive weeds were originally spread by European settlers who inadvertently brought them on ships to the United States in crop seed and livestock feed. Other invasive weeds such as Russian olive and salt cedar were introduced for specific purposes such as landscaping, windbreaks, and soil stabilization and have escaped into natural vegetation communities. Today noxious and invasive weeds continue to be spread by OHVs, vehicles, recreational activities, development, wildlife, livestock, wind, and other land management practices. In addition, weeds continue to spread onto public lands from adjacent private lands.

Tamarisk is abundant in the Virgin and Muddy rivers, the main tributaries to the Colorado River in Nevada. It is also present in the isolated springs and washes throughout the district. Control of tamarisk in small systems can be successful, but effective control along the larger river systems is a difficult and daunting task. Tamarisk along the Virgin River has been the focus of BLM project activity through the Fuels Program to reduce the threat of this highly flammable shrub to the surrounding communities of Mesquite and Bunkerville. More than 1,300 acres of tamarisk-dominated riparian land has been treated since 1998, complemented by seeding of native species to help return native vegetation communities. Under the Weeds and Restoration programs, multiple projects addressing tamarisk are either complete or in progress in washes and spring systems.

Biological insect control for tamarisk was released at sites in Utah in 2006 and has since migrated onto district lands within the planning area. Moving downstream along the Virgin River, the beetles made it to the Virgin Valley around 2009 and have had a presence in the vicinity of Mesquite and Bunkerville since 2011. Tamarisk beetles feed exclusively on the foliage of the tamarisk tree, therefore making it a very effective biological control species. Tamarisk does not usually die from a single defoliation from tamarisk beetles. However, repeated defoliation of tamarisk trees can lead to severe dieback the next season and death of the tree within several years. The rapid influx of these beetles and the associated defoliation of tamarisk along the Virgin River has created other problems. Specifically, a federally listed bird, the southwestern willow flycatcher, now uses the tamarisk trees as habitat because its preferred habitat of native riparian cottonwoods and willows has been displaced by the invasive tree. With rapid defoliation of the tamarisk trees from the beetle, without time to plan and implement native species restoration to provide habitat for this and other migratory birds, the birds are left exposed to predators and without suitable habitat. In 2012 and 2013, the beetles made their way down to the Las Vegas Wash. Studies of the effects of these beetles are preliminary, and long-term data is unavailable. Examples of beetles' impact can be seen in the Moab, Utah, area where the beetles have incurred mortality on tamarisk for many miles.

The rapid expansion of Sahara mustard occurred in 2007 when this weed went from barely noticed on the landscape to a widespread presence after an unusually high frequency of spring rains. Such altered system responses are evidence that the seed bed for this invasive species is extensive, and it explains the ability of this species to take advantage of favorable weather conditions or disturbances to a degree that alters the system permanently.

The greatest increase of non-native vegetation in the past decade was the expansion of red brome. It is present across nearly all the landscape and is strongly correlated to the incidence of wildfire. Historically, the native desert system did not burn frequently or in large enough patches to support dominance of fire-adapted plants. At present, red brome and cheat grass have invaded large portions of desert scrub vegetation types and now provide sufficient fuel loading to encourage fires year after year. Both small- and large-acre fires scars are not returning to native vegetation with a weed component, but instead are converting to a red brome-dominated system with a reduced native component.

The district created a weeds program in the early 2000s as the problems caused by invasive weeds became highly noticeable and widespread. The program has grown in recent years to one that is flexible and capable of identifying and controlling small, localized populations, as well as reducing the size of large invasions to more manageable levels. The district's noxious weed plan outlines the use of chemical, physical, biological, and cultural control methods. Treatments include hand-pulling, herbicide application, manual or mechanical cutting, and root plowing. Seeding and planting treatments are employed to deter and out-compete non-native plants. No biological controls have been implemented to date, but cultural controls are employed as mitigation measures for all projects in the scoping process. The number of acres treated in the planning area has fluctuated from anywhere between 100 to 1,0000 treated acres each year, dependent on resources and available funding.

Noxious weeds and invasive plants will continue to be spread and pose a hazard to native vegetation communities. They have and will continue to cause drastic changes in the composition, structure, and productivity of vegetation communities. They will reduce wildlife habitat quality, size, and structure and increase the fuel load, allowing fire to burn more frequently and severely. Noxious weeds that do not currently occur in the planning area may spread from neighboring lands. Vigilance at implementing early detection and rapid response and an integrated weed management program on a landscape scale will reduce these impacts.

3.2.5.3.5. Invasive Animal Species

In addition to noxious and invasive plants, invasive animal species have become an increasing problem within the planning area. While perhaps less conspicuous and less abundant than invasive plants, invasive animals can have significant ecological consequences in southern Nevada. Just as invasive plants do, invasive animal species can displace native wildlife and out-compete them for resources and space. Invasive aquatic species are of particular concern in the planning area. Some notable aquatic invasive species that occur in the planning area include the quagga mussel (*Dreissena rostriformis*), tilapia fish (*Tilapia* spp.), American bullfrogs (*Rana catesbeiana*), mosquitofish (*Gambusia* spp.), and the red shiner (*Notropis leutrensis*).

Other invasive species in the planning area are considered "nuisance species" because they create a threat to human health and safety in areas where people work and live. These include multiple species of insects (such as cockroaches, spiders, mosquitoes, crickets, etc.) as well as several species of rodents (Norway rats, house mice, etc.).

Current management of invasive animal species on BLM land in the planning area has been limited to treating "nuisance species," in areas where human health and safety is a concern. Treatment including pesticides, cultural methods, and mechanical methods are the most common. However, the need to treat and manage invasive animal species for threats to wildlife habitats and ecosystem function is growing more prevalent and necessary. With several threatened and

endangered fish species in the area, the need to treat invasive fish species that alter habitats will be necessary in the near future. Additionally, quagga mussels are growing more prevalent and can easily be spread from place to place with equipment that comes in contact with infested water (such as firefighting equipment, irrigation equipment, boats, vehicles, etc). Precautionary steps to minimize the risk of spreading the quagga mussel, as well as treating expanding invasions, may be necessary in the planning area.

3.2.6. Fish and Wildlife

Fish and wildlife resources include invertebrates, fish, amphibians, reptiles, birds, and mammals, as well as their habitats. Fish and wildlife are managed by the BLM through policy set forth in BLM Manual 6500 – Fish and Wildlife Conservation, BLM Manual 6720 — Aquatic Resource Management, and BLM Manual 6840 – Special Status Species Management. In general, the BLM is not directly responsible for the management of wildlife populations. The Nevada Department of Wildlife (NDOW) is responsible for managing both federally and non-federally protected wildlife populations found within the state borders, while the USFWS is responsible for all federally protected wildlife species under the Endangered Species Act (ESA) and other federal acts. For federally listed species, population management responsibility falls to the U.S. Fish and Wildlife Service (USFWS) and NDOW. These species are discussed in the Special Status Species (p. 342) section. Protective measures for migratory birds are provided in accordance with the Migratory Bird Treaty Act of 1918 (MBTA) (16 U.S.C. 703 *et. seq*.) and the Bald and Golden Eagle Protection Act of 1940 (BGEPA) (16 U.S.C. 668-668c).

The planning area is in the Mojave Desert ecoregion and encompasses an ecologically diverse variety of landforms, soil types, moisture regimes, and vegetative communities. This variability creates habitats for numerous wildlife species. These include approximately 48 reptiles, 12 amphibians, 39 fish, 73 mammals, and more than 270 species of birds. There are also an unknown number of invertebrates in the planning area. Some of these species are year-round residents or winter residents; others are migrants who may spend a few days or weeks in the area. Some of the species are classified by the Nevada Division of Wildlife game species for which hunting or fishing is allowed.

3.2.6.1. Wildlife Habitats

The BLM is responsible for managing wildlife habitats in a condition that will support desired population levels and distribution within the planning area. BLM works cooperatively with NDOW, USFWS, and other agencies to maintain and re-establish populations of native species that have used the historic range located within the planning area boundary through habitat management and restoration.

Wildlife population levels are linked to a variety of habitat factors. These include vegetation quality and quantity; adequate space, shelter, and cover; and water availability and distribution. Wildlife habitat needs vary significantly by species. To maintain diverse, viable, and abundant populations of wildlife, a mosaic of biologically and structurally diverse habitat types is necessary.

Wildlife species often use multiple habitat types throughout their life cycle. Movement along habitat types or between patches of similar vegetation occurs within corridors of vegetative cover acceptable to these species. These corridors can be critical for certain wildlife species in finding adequate food, water, and nesting or denning sites. Seasonal movement occurs within these corridors, which are also vital in seeking breeding opportunities.

3.2.6.2. Trends

Population trends for most of the wildlife species in the planning area are not known. Historically, the Southern Nevada District Office has done very little direct monitoring of populations, relying on information from other agencies and researchers. Species are assumed to be impacted by

activities such as mortality from vehicles, construction, hunting, and illegal shooting. Species can also be collected, legally or illegally, which can remove large numbers of individuals of some species from the environment.

Impacts to wildlife habitats can occur through habitat loss, fragmentation, or diminished quality due to urban, mining, and energy development; recreational activities; grazing; fire events; invasive species; drought; climate change; and alteration of water regimes. The Integrated Vegetation (p. 313) section has a detailed description of how different activities and forces impact vegetation communities and thus the habitats for wildlife.

While population augmentations can be done for a few species, habitat restoration and protection are the main tools available to help improve the status of most wildlife species. Riparian areas and wetlands are key features for a large number of wildlife species throughout the planning area. Riparian habitats and stream channel restoration will benefit a variety of species including fish, amphibians, mammals, and birds. Developing methods to inhibit the spread of invasive annuals and reduce the impact of wildfire on remaining native plant communities, in addition to continued restoration of habitats impacted by human uses, will also be important. Many endemic species occur within the planning area. Protection, maintenance, and/or restoration of their limited habitats are vital to the continued existence of the species. Water developments, whether constructed primarily for livestock or wildlife, can improve water availability in wildlife habitats. There are approximately 171 water developments, 33 for big game and 138 for small game, on lands managed by the BLM in the planning area.

3.2.6.3. Game Species

3.2.6.3.1. Mule Deer

Distribution of mule deer (*Odocoileus hemionus*) in the planning area is limited by the amount of suitable habitat (approximately 230,000 acres) and scarcity of water. Mule deer populations are low in density and restricted to several mountain ranges. Most of the mule deer habitat on the Spring Mountains is managed by the U.S. Forest Service. Marginal habitat and low densities do not warrant annual or periodic aerial surveys by the Nevada Division of Wildlife. Statewide, mule deer populations declined from 2005 to 2008, which was attributed to drought conditions (NDOW 2009). However, populations have been stable or slightly increasing in recent years (NDOW 2013). Natural springs are vital for habitat requirements, and water developments installed in strategic areas augment habitat suitability.

3.2.6.3.2. Rocky Mountain Elk

Elk (*Cervus elephus*) were first introduced into the Spring Mountains in the 1930s, but populations are low because of poor habitat. Habitat quality is affected by drought conditions and competition with wild horses. Elk typically occur on land managed by the U.S. Forest Service but will occasionally utilize lower elevation BLM lands. Forage is associated with seasonal changes in habitat. Production areas, or calving grounds, which are used from mid-May through June, are typically situated at higher elevations than winter ranges. Habitat generally consists of aspen, montane coniferous forest, grassland/meadow, and mountain brush. Population, although low, appears to be stable during the past couple of years (NDOW 2013).

3.2.6.3.3. Mountain Lions

Mountain lions (*Puma concolor*) are found in many of the mountain ranges that support mule deer populations. Lion habitat in Southern Nevada is composed of pinyon-juniper woodlands and rock outcrops that provide cover. Large home ranges and competition limit population sizes in suitable habitat. Due to the animal's large home range and its solitary nature, little data is available on mountain lion distribution and densities in the planning area. Based on harvest data, populations of mountain lions in Southern Nevada are assumed to be stable (NDOW 2013).

3.2.6.3.4. Doves

White-winged doves (*Zenaida asiatica*) can be found during their breeding season, and mourning doves (*Zenaida macroura*) can be found year-round within the planning area. High densities occur in agricultural areas and aroundwater sources. Availability of water is important as doves must drink water daily to survive. Cover is also an important habitat component for nesting and roosting; nesting usually occurs on the ground, under shrubs, or in trees near accessible water.

3.2.6.3.5. Chukar

Chukar (*Alectoris chuckar*) were first introduced into Nevada in the 1930s with 1,453 birds released in Clark County between 1939 and 1960. Chukar occurs at elevations between 1,000 and 8,000 feet. They do well in arid ranges as long as water is available. Rocky outcrops and rugged canyons are preferred for roosting and escape cover, and nesting may be located on steep, talus slopes. Small, scattered resident populations are found throughout the planning area, particularly in the Spring Mountains and the Bird Springs Range. Chukar depend upon succulent annuals to carry them through the winter and spring months. Seeds and leaves of annual grasses are important components of their diet. Insects are consumed in the spring, summer, and fall. As this species is highly dependent on available water, opportunities for habitat improvement rely primarily on water development.

3.2.6.3.6. Gambel's Quail

Gambel's quail (*Callipepla gambelii*) habitat is generally found throughout the planning area on alluvial fans that are dissected by washes at elevations ranging from 2,000 to 4,500 feet. Quail are well adapted to the desert and can survive without free water if succulent forage is available. Such forage is rarely available in the planning area during the summer. Water availability would then be the restricting factor. All springs, seeps, rivers, lakes, livestock waters, and water catchments are important use areas for the birds. In the past 70 years, NDOW has developed artificial waters in an effort to increase quail populations. Quail depend on habitat with cover for nesting, feeding, roosting, and dusting. Areas downcut by washes provide more numerous and diverse cover sites and a greater variety of forage.

Population density is difficult to estimate because of large annual fluctuations in quail numbers. Such perturbations are related to drought conditions that have continued throughout much of Southern Nevada, causing low to moderate quail populations (NDOW 2012). Habitat conditions for quail in the planning area vary from excellent to poor, depending upon water availability, precipitation, and forage conditions. Protection of riparian habitat, desert wash habitat, and water sources, both natural and artificial, are important management strategies for improving and maintaining quail habitat.

3.2.6.3.7. Wild Turkey

Wild turkeys (*Melagris gallopavo*) were released at the Overton Wildlife Management Area on the Overton Arm of Lake Mead in 1990 and in Lincoln County in 1999 (NDOW 2012). The introduced birds were the Rio Grande variety of wild turkeys, which are adapted to living in riparian habitats and accustomed to high heat. Wild turkey habitat in Southern Nevada is generally administered by the U.S. Forest Service, the National Park Service, or the state of Nevada. Riparian habitat along the Virgin River, from the Arizona/Nevada border to the Lake Mead National Recreation Area, is potentially suitable for wild turkeys. Merriam's turkeys were also introduced in the Spring Mountains in the early 1960s and in the 1980s. Merriam's turkey prefers open stands of large ponderosa pine for roosting, and this type of habitat is not available in the BLM portion of the range.

3.2.6.3.8. Ring-Necked Pheasants

Ring-necked pheasants (*Phasianus colchicus*) were released on state and private lands in Clark County during the 1950s and 1960s by NDOW. Habitat in Clark County is very limited, resulting in limited pheasant populations. Nye County populations are currently depressed. BLM-managed lands contain virtually no pheasant habitat, although birds may use some areas in the Moapa Valley or along the Virgin River.

3.2.6.3.9. Waterfowl

Numerous species of shorebirds and waterfowl migrate through the planning area or overwinter at Lake Mead, Ash Meadows, the Virgin River, and the Colorado River (Appendix XX Comprehensive List for the Planning Area). The majority of waterfowl habitat in Southern Nevada is managed by the National Park Service, Fish and Wildlife Service, Bureau of Reclamation, or state agencies. Much of the habitat along the Muddy and Virgin rivers is privately owned with the exception of BLM-administered riparian habitats. Small stands of riparian habitat are also scattered throughout the planning area at springs and seeps. These areas are, however, generally too small to support waterfowl.

3.2.6.3.10. Rabbits and Hares

Desert cottontail (*Sylvilagus audubonii*) and black-tailed jackrabbits (*Lepus californicus*) occur in the planning area within a variety of habitats. Populations in the low desert are experiencing stable to upward trends as a result of recent weather conditions. Due to the cyclic nature of rabbit and hare populations, this trend can change rapidly.

3.2.6.3.11. Furbearers

Furbearers in the planning area include both aquatic and terrestrial species. Raccoon (*Procyon lotor*), beaver (*Castor canadensis*), and muskrat (*Ondatra zibethica*) comprise the aquatic varieties, found in low densities within most suitable habitats in Clark and Nye counties (i.e. Virgin River and Lake Mead). The removal of beavers by Animal and Plant Health Inspection Service (APHIS, USDA) and NDOW agents generally exceed the harvest by private trappers in Clark County. Little harvesting of raccoons occurs due to the small numbers of raccoons

found near Lake Mead and its tributaries. Muskrats are found in the Colorado River and may occur in Lake Mead.

Terrestrial furbearers in Southern Nevada include bobcat (*Lynx rufus*), gray fox (*Urocyon cinereoargenteus*), kit fox (*Vulpes macrotis*), coyote (*Canis latrans*), striped skunk (*Mephitis mephitis*), spotted skunk (*Spilogale gracilis*), badger (*Taxidea taxus*), and ring-tailed cats (*Bassariscus astutus*). Gray fox populations are generally stable in the Mojave Desert area. Bobcat populations are increasing, but drought conditions may stabilize or depress these numbers. High fur prices have renewed trapper interest in bobcat (NDOW 2012). Coyote populations appear to be stable at a relatively lower level than the high densities reported in 1980. The kit fox population trend for the Mojave Desert is stable to downward; kit foxes are less mobile than other furbearers and are more dependent on a good prey base. Populations in the Mojave tend to fluctuate more than populations in the Great Basin Desert and are particularly susceptible in years of poor prey base availability. Other widely scattered populations are not harvested possibly due to low fur prices and the unprofitability associated with trapping these groups.

Population trend and status for the remaining terrestrial furbearers is undetermined. The other species occur throughout the planning unit and are seldom pursued for fur values. There are no indications that disease is a problem among any species at this time. Historical records indicate that the Southwestern otter (*Lutra canadensis sonorae*) once occurred in the Colorado River drainage north to the Virgin River. Occasional otter sightings are still reported along the Colorado River drainage both north and south of Lake Mead; it is possible a few otters remain in this region.

3.2.6.3.12. Fisheries

Fisheries habitat includes perennial and intermittent streams that support fish through at least a portion of the year. The condition of fisheries habitat is related to riparian habitat condition and stream channel characteristics. Previous stocking efforts by NDOW have established many non-native fish species in streams to provide for sport fishing opportunities. Aquatic invertebrates and amphibians are integral components of warm and cold fish communities.

3.2.6.4. Non-Game Species

Due to the variety of habitats found within the planning area, there is a high diversity of reptile, amphibian, and other wildlife species, including small mammals, birds, and invertebrates. Some of these species are of more concern due to level of public interest or specialized habitat needs that restrict their distribution or population size.

3.2.6.4.1. Migratory Birds

The planning area contains breeding, nesting, brood rearing, and wintering areas, as well as migration routes that are important for migratory birds. All migratory birds that occur or pass through the planning area are covered under the Migratory Bird Treaty Act. This act makes it unlawful to, among other things, pursue, hunt, take, capture, kill, or possess any migratory bird or part, nest, or egg of such bird listed in four separate wildlife protection treaties between the United States and Great Britain (on behalf of itself and Canada), Mexico, Japan, and the former Union of Soviet Socialist Republics. Some of these migratory birds are also federally listed or BLM sensitive species. These species are further discussed in the Special Status Species (p. 342) section. Under authority of the Fish and Wildlife Conservation Act of 1980,

as amended, the U.S. Fish and Wildlife Service has also identified some migratory birds in the region as Birds of Conservation Concern.

In addition to the Migratory Bird Treaty Act, Executive Order 13186 (Responsibilities of Federal Agencies to Protect Migratory Birds, signed in January 2001) requires the BLM to evaluate the effects of federal actions on migratory birds. In addition, there is a Memorandum of Understanding between the BLM and USFWS to promote the conservation of migratory birds. The purpose of the Memorandum of Understanding is to strengthen migratory bird conservation by identifying and implementing strategies that promote conservation and avoid or minimize adverse impacts on migratory birds through enhanced collaboration between the two agencies, in coordination with state, tribal, and local governments.

3.2.6.4.2. Raptors

There are many species of raptors found within the planning area, several of which are offered special protection by the state and/or federal government. These raptor species are discussed further in the Special Status Species section (p. 342). Raptors are also a commonly migratory species. The Migratory Birds section (p.) above also addressed raptors in relation to their nature as migratory birds. Special habitat needs for raptors include nest sites, foraging areas, and roosting or resting sites. Buffer zones are usually recommended around raptor nest sites during the early spring and summer when raptors are raising their young. The most utilized raptor nesting habitats in the planning area are generally found along riparian areas and cliff faces. Juniper-desert shrub transition areas are also identified as being important for nesting hawks.

3.2.6.4.3. Riparian and Aquatic Species

Most of the riparian and aquatic habitat in the planning area is associated with the Muddy, Virgin, and Colorado rivers and their tributaries. There are also many springs in the planning area, including the springs and their associated outflows at Ash Meadows. Many fish and wildlife species are highly dependent on riparian areas. These areas are also crucial to neo-tropical migrant birds. A primary concern in riparian areas is the long-term effect of decreased regeneration of cottonwood and willow stands and the invasion of non-native animal and plant species, such as tamarisk and Russian olive.

3.2.7. Special Status Species

Special status species include animals and plants that require specific management attention as a result of population or habitat concerns. The categories of these species include:

- Federally listed threatened and endangered species and their respective designated critical habitats.
- Federally proposed species and proposed critical habitats.
- Federal candidate species.
- Nevada BLM sensitive species.

The BLM also manages special status species and their habitats in conjunction and cooperation with four existing habitat conservation plans (HCPs): the Clark County Multiple Species HCP, the Coyote Springs Investments Multi-Species HCP, the Lathrop Wells HCP, and the Lower Colorado River Multiple Species Conservation Plan. These HCPs were developed as part of take permits for actions on private lands in compliance with Section 10 of the Endangered Species Act (ESA). A Section 10 permit is a permit granted to private land owners that allows them to conduct activities such as developing land that may unintentionally harm or kill a federally listed species.

The HCPs describe actions that will be taken to help mitigate for actions occurring on private lands. Many of these mitigation actions are conducted on surrounding federal lands, including lands managed by the BLM. The BLM considers effects to HCP-covered species and evaluation species during NEPA compliance. Many of the species covered by these HCPs are federally listed or BLM sensitive species and are discussed below. The HCPs may also cover additional species, which will not be discussed below. There are also other existing and planned Section 10 permits and HCPs that may propose to perform mitigation on lands managed by the BLM.

3.2.7.1. Federally Listed and Candidate Species

Federally listed species are currently managed in accordance with U.S. Fish and Wildlife Service (USFWS) recovery plans or conservation agreements; the Endangered Species Act of 1973, as amended; and BLM policy for Special Status Species Management (BLM Manual 6840). Some federally listed species have associated critical habitats that were identified and delineated for their crucial role in species recovery and viability. For those species that are listed and have not had critical habitat designations identified for them, BLM cooperates with the USFWS to identify and manage habitats of importance.

Within the planning area, there are multiple tracts of land that are not directly managed by the Las Vegas and Pahrump field offices but are under state or private ownership or managed by other federal agencies. Some of these tracts contain federally listed species that, although these species may not occur on BLM-managed lands, BLM actions may have indirect consequences to these species or their habitats.

3.2.7.1.1. Wildlife

There are nine endangered, two threatened, and two candidate wildlife species that occur within the planning area (see Table 3.15, “Endangered, Threatened, and Candidate Wildlife Species in the Planning Area” (p. 343)). Each of the endangered and threatened species has a USFWS recovery plan, and seven of the 11 listed species have designated critical habitats. Five of the listed species occur only within the Ash Meadows area and have a combined recovery plan that

also covers the listed plants described below. The two listed fish that occur in the Virgin River also have a combined recovery plan. The relict leopard frog, a candidate species, is managed under a conservation agreement.

Table 3.15. Endangered, Threatened, and Candidate Wildlife Species in the Planning Area

Common name	Scientific name	Federal status	Critical habitat
Birds			
Southwestern willow flycatcher	*Empidonax traillii extimus*	Endangered	Y
Yellow-billed cuckoo	*Coccyzus americanus*	Candidate	N/A
Yuma clapper rail	*Rallus longirostris yumanensis*	Endangered	N
Reptiles			
Desert tortoise	*Gopherus agassizii*	Threatened	Y
Amphibians			
Relict leopard frog	*Rana onca*	Candidate	N/A
Fish			
Ash Meadows Amargosa pupfish	*Cyprinodon nevadensis mionectes*	Endangered	Y
Ash Meadows speckled dace	*Rhinichthys osculus nevadensis*	Endangered	Y
Devils Hole pupfish	*Cyprinodon diabolis*	Endangered	N
Moapa dace	*Moapa coriacea*	Endangered	N
Pahrump poolfish	*Empetrichthys latos latos*	Endangered	N
Virgin River chub (Virgin River population only)	*Gila seminuda*	Endangered	Y
Warm Springs pupfish	*Cyprinodon navadensis pectoralis*	Endangered	N
Woundfin	*Plagopterus argentissimus*	Endangered	Y
Invertebrates			
Ash Meadows naucorid	*Ambrysus amargosus*	Threatened	Y

3.2.7.1.1.1. Birds

3.2.7.1.1.1.1. Southwestern Willow Flycatcher

The southwestern willow flycatcher was listed as endangered in 1995 (60 FR 10694). Critical habitat for the species was first designated in 1997, re-designated in 2005 (70 FR 60886), and then revised in 2013 (78 FR 30634). The southwestern willow flycatcher breeds in relatively dense riparian tree and shrub communities associated with rivers, swamps, and other wetlands, including lakes. Most of these habitats are classified as forested wetlands or scrub-shrub wetlands. The breeding range encompasses far western Texas, New Mexico, Arizona, southern California, southern portions of Nevada and Utah, southwestern Colorado, and possibly extreme northern portions of the Mexican states of Baja California del Norte, Sonora, and Chihuahua.

The historical status of the flycatcher in Southern Nevada is unclear as only three records before 1962 exist. Records and surveys after 1990 verified breeding flycatchers on the Virgin River and Muddy River (see Map 3.2.6.1 - 5 (p. 2144)), the Amargosa River drainage at Ash Meadows National Wildlife Refuge (NWR) see Map 3.2.6.1 - 1 (p. 2143)), Meadow Valley Wash, and the Pahranagat River drainage at Pahranagat NWR (McKernan and Braden 1999, Micone and Tomlinson 2000, USFWS 2002). Habitat requirements for wintering are not well known but include brushy savanna edges, second growth, shrubby clearings or pastures, and woodlands near water.

In the 2002 Recovery Plan for the species, the USFWS designated six recovery units (RUs). Two recovery units are in Nevada. The Basin and Mojave Recovery Unit includes the Amargosa River and Ash Meadows, and the Lower Colorado Recovery Unit includes the Colorado and Virgin rivers. The only critical habitat designated in the SNDO planning area portion of the Basin and Mojave Recovery Unit is on the Ash Meadows NWR. Critical habitat designated in the SNDO planning area portion of the Lower Colorado Recovery Unit includes all of the Virgin River, including lands managed by the BLM.

Threats to the species include habitat loss due to water impoundments and water management practices, introduction of non-native species, and fire. Southwestern willow flycatchers will use tamarisk, a non-native species that dominates large portions of the Virgin River, as nesting habitat in the absence of native cottonwood-willow vegetation. The recent introduction of the tamarisk leaf beetle (*Diorhabda carinualta*) into the Virgin River system could impact the habitat quality in the area. The beetle, introduced as a bio-control agent, defoliates tamarisk during flycatcher nesting season, which is thought to reduce nesting success due to changes in nest microclimate. Without active restoration of native species into these defoliated areas, many of the areas along the Virgin River that are currently used for nesting could become unsuitable.

3.2.7.1.1.1.2. Yellow-Billed Cuckoo

The yellow-billed cuckoo has been a candidate for listing under the Endangered Species Act of 1973 since 2001 (66 FR 38611) and is currently proposed for listing as a threatened species for the western distinct population segment (DPS). Western cuckoos breed in large blocks of riparian habitats, particularly woodlands with cottonwoods and willows. In the west, based on historic accounts, the species was widespread and locally common in California and Arizona; locally common in a few river reaches in New Mexico; common very locally in Oregon and Washington; generally local and uncommon in scattered drainages of the arid and semiarid portions of western Colorado, western Wyoming, Idaho, Nevada, and Utah; and, probably uncommon and very local in British Columbia (65 FR 8104). In Southern Nevada, this species is mostly limited to riparian woodlands along the Muddy and Virgin rivers. The loss, degradation, and fragmentation of riparian habitat have been identified as the primary factors causing yellow-billed cuckoo declines in the western United States. The overall population trend for the cuckoo in decreasing, but some areas are lacking information to determine a trend (USFWS 2003).

3.2.7.1.1.1.3. Yuma Clapper Rail

The Yuma clapper rail was listed as endangered on March 11, 1967 (32 FR 4001). No critical habitat has been designated for the species. A recovery plan was issued in 1983 and is under revision. Populations in the United States are concentrated along the Lower Colorado River from the vicinity of Laughlin to Yuma, and in Arizona within four national wildlife refuges. Southern Nevada is the most northern distributional limit for the rail. The species inhabits freshwater or brackish stream-sides and marshes with dense cattails, bulrush, and other aquatic vegetation. As marshes age and become decadent, they lose habitat suitability for clapper rails. Recent surveys for other bird species documented the presence of the rail around Lake Mead, Lake Mojave, the Las Vegas Wash, and in the lower Virgin and Muddy rivers of Southern Nevada, and northern Arizona (USFWS 2006b). Threats to the species include loss of habitat due to water impoundments, stream channelization, environmental contaminants, water diversions, drying and flooding of marshes, and other management practices. These threats contribute to increased loss, modification, and degradation of marsh habitats and alteration of stream hydrology.

3.2.7.1.1.2. Reptiles

3.2.7.1.1.2.1. Mojave Desert Tortoise

On August 4, 1989, the USFWS published an emergency rule listing the Mojave population of the desert tortoise as endangered (54 FR 32326). On April 2, 1990, the USFWS determined the Mojave population of the desert tortoise to be threatened (55 FR 12178) on the basis of significant population declines; loss of habitat from construction projects such as roads, housing, and energy developments and conversion of native habitat to agriculture; habitat degradation by grazing and off-highway-vehicle activities; illegal collection of desert tortoises; upper respiratory tract disease; predation on juvenile tortoises; fire; and collisions with moving vehicles. The Mojave population of the desert tortoise includes those living north and west of the Colorado River in the Mojave Desert of California, Nevada, Arizona, and southwestern Utah.

Critical habitat was designated on February 8, 1994, with an effective date of March 10, 1994 (59 FR 5820). This included six recovery units, two of which include portions of the planning area, the Northeastern Mojave Recovery Unit and the Eastern Mojave Recovery Unit. Within the two recovery units, three areas of critical habitat were designated in the planning area: Piute/Eldorado Critical Habitat Unit (CHU), Mormon Mesa CHU, and Gold Butte-Pakoon CHU (Map 3.2.6.1 - 3 (p. 2144) and Table 3.16, "Desert Tortoise Critical Habitat Units" (p. 345)). The 1998 RMP designated the majority of these critical habitat units as areas of critical environmental concern (ACEC) for the protection of desert tortoise habitat. Critical habitat is composed of specific geographic areas that contain the biological and physical features essential to the species' conservation known as primary constituent elements (PCEs). The Service has defined PCEs for desert tortoise critical habitat to include the following: sufficient space to support viable populations within each recovery unit and to provide for movement, dispersal, and gene flow; sufficient quality and quantity of forage species and the proper soil conditions to provide for the growth of these species; suitable substrates for burrowing, nesting, and overwintering; burrows, caliche caves, and other shelter sites; sufficient vegetation for shelter from temperature extremes and predators; and habitat protected from disturbance and human-caused mortality.

Table 3.16. Desert Tortoise Critical Habitat Units

Critical habitat unit (USFWS 1994)	Acres within the planning area	Total CHU Acres
Piute/Eldorado CHU	516,781	970,652
Mormon Mesa CHU	244,316	427,546
Gold Butte-Pakoon CHU	193,290	488,436
Total	**944,092**	**1,886,634**

The desert tortoise is predicted to be found throughout most of the planning area based on habitat modeling performed by USGS (Nussear et al, 2009) (Map 3.2.6.1 - 4 (p. 2144)). The model predicts habitat potential for desert tortoise and should not be interpreted to indicate actual presence of tortoises. The model also does not take into account some areas, such as in the Las Vegas Valley, that may have already been developed and thus no longer support tortoise habitat. Optimal habitat for the desert tortoise is composed of creosote bush scrub, two to eight inches of precipitation, high perennial plant diversity, and high ephemeral production (Luckenbach 1982, Turner 1982, Turner and Brown 1982). Throughout most of the Mojave region, tortoises occur most commonly on gently sloping terrain with sandy-gravel soils with scattered shrubs, and where there is abundant inter-shrub space for herbaceous plant growth. However, tortoises can be located in steeper, rockier areas. Soil friability must be adequate for digging burrows and firm

enough so that the burrows do not collapse. Desert tortoises can be found from below sea level to an elevation of 7,300 feet (Luckenbach 1982). Based on current information and data from recent range-wide monitoring efforts, the species has consistently been documented above 3,000 feet (USFWS 2006a; USFWS unpublished data).

In the planning area, tortoises occur in saltbush scrub, creosote scrub, and blackbrush scrub habitat types. Within these vegetation types, desert tortoises can potentially survive and reproduce provided their basic habitat requirements are met. These requirements include a sufficient amount and quality of forage species; shelter sites for protection from predators and environmental extremes; suitable substrates for burrowing, nesting, and overwintering; various plants for shelter; and adequate area for movement, dispersal, and gene flow.

Desert tortoises are the most active during the spring and early summer, taking advantage of the annual plant emergence. Additional activity occurs during the warmer fall months and occasionally after summer rainstorms. While desert tortoises spend most of the remainder of the year in burrows to escape the extreme conditions of the desert, the species may be above ground any month of the year. In Nevada and Arizona, tortoises are considered to be most active from approximately March 1 through October 31. Home range size varies with respect to location and year. Females have long-term home ranges that are approximately half that of the average male, which range from 25 to 200 acres. Over its lifetime, each desert tortoise may require more than 1.5 square miles of habitat and make forays of more than 7 miles at a time (Berry 1986). In drought years, the ability of tortoises to drink while surface water is available following rains may be crucial for tortoise survival. During droughts, tortoises forage over larger areas, increasing the likelihood of encountering sources of injury or mortality.

Threats to the desert tortoise include loss of habitat from construction projects such as roads, housing, and energy developments. Grazing and off-highway vehicle activities not only degrade tortoise habitat, but could also collapse burrows, killing any tortoises present. Also threatening the desert tortoise's continuing existence is illegal collection by humans for pets or consumption, predation on juvenile desert tortoises by common ravens (*Corvus corax*) and kit foxes (*Vulpes macrotis*), and collisions with vehicles on paved and unpaved roads. Fire is an increasingly important threat to desert tortoise habitat, mainly due to introduction of non-native annual grasses. Introduction of non-native plants can also impact tortoises by reducing the quantity and quality of forage that may stress tortoises and make them more susceptible to drought- and disease-related mortality. Anthropogenic changes to habitat or natural factors such as drought may enhance the effects of naturally occurring diseases in the desert tortoise.

Habitat fragmentation is also becoming a greater concern. Individual tortoises can make long-distance movements through restricted habitats, which may contribute to gene flow (Edwards et al. 2004), but it is not known to what extent individuals utilize narrow corridors of relatively intact habitat. The movements that maintain genetic diversity across populations occur over generations and not necessarily during the life span of a single desert tortoise. Therefore, for gene flow to happen reliably, populations need to be connected across the range by occupied areas of habitat that support sustainable numbers of desert tortoises (USFWS, 2013). The FWS has conducted some initial modeling efforts to start to identify corridors between areas that currently provide some level of protection for tortoises (e.g. ACECS, National Parks) (Averill-Murray et al, 2013). The FWS will be further refining these models through site-specific analysis at a more local scale across the landscape (USFWS, 2013; USFWS personal communication).

3.2.7.1.1.3. Amphibians

3.2.7.1.1.3.1. Relict Leopard Frog

This species was first described in 1975, but due to population declines owing to habitat loss, the last known specimen was collected in 1950. Rediscovery of the species at two springs in the Lake Mead National Recreation Area occurred in 1991, and seven populations have been identified since then. In 2002, a petition to list the species as endangered was filed. USFWS conducted a review of the species and determined that candidate status was appropriate (67 FR 40657). A coalition of agencies and interest groups has developed a conservation agreement and strategy (CAS) (RLFCT 2005). The goal is to expedite implementation of conservation measures and ensure long-term conservation for the relict leopard frog in Clark County; Mohave County, Arizona; and Washington County, Utah. Immediate conservation was needed to reduce threats to the species, increase size and number of population, and maintain associated riparian and wetland habitats. The goals of the conservation agreement and strategy are to preclude the need to list the species under the Endangered Species Act; however no guarantees have been made by the USFWS that the listing will not be necessary. Threats to the species include elimination or dramatic alteration of aquatic habitat due to dams, agriculture, marsh draining, and water development and the spread of predator and nonnative bullfrogs, crayfish, and predaceous fishes as well as fungal disease.

Efforts have been to reintroduce the relict leopard frog into what was thought to be its historical range before the construction of Hoover Dam. In accordance with the conservation agreement and strategy, the BLM is required to find three sites suitable for reintroduction. The species has been released into Red Spring and Quail Springs, both located in Gold Butte. BLM is also a partner with Clark County at a third site, Perkins Pond, where habitat restoration and reintroduction is in progress. The BLM is continuing efforts to evaluate other areas for possible habitat improvements and/or reintroduction for future projects.

3.2.7.1.1.4. Fish

3.2.7.1.1.4.1. Ash Meadows Amargosa Pupfish

The Ash Meadows Amargosa pupfish was listed as endangered in 1983 after an emergency listing in 1982 (48 FR 40178). The species is endemic to Ash Meadows in Nye County and is entirely within the Ash Meadows National Wildlife Refuge (Map 3.2.6.1 - 1 (p. 2143)). Small populations exist in several springs and their outflows and marsh areas at Ash Meadows NWR (USFWS 1990). Critical habitat was designated for the species on September 2, 1983. Designated critical habitat includes Fairbanks Spring, Rogers Spring, Longstreet Spring, Crystal Pool, Bradford Spring, Jack Rabbit Spring, Big Spring, Point of Rocks Spring, and three unnamed springs; included in the designation are the springs and their outflows and a terrestrial buffer zone.

As the habitats of the Amargosa pupfish comprise most of the surface water in the area, the habitats were the most altered during agricultural development and, as a result, now support the greatest variety of introduced organisms. All of the Amargosa pupfish habitats have been affected by diversion into earthen or concrete channels, impoundments, drying from groundwater pumping, or elimination of riparian vegetation. Restoration work in these habitats is ongoing. Because the habitat was previously threatened by agricultural use of the area (loss and degradation of habitat resulting from activities including water diversion and pumping) and by impending

residential development, the Nature Conservancy purchased property, which later became the Ash Meadows NWR. Introduced aquatic animals (fishes, crayfish, bullfrogs, and snails) remain another serious threat to the species. Largemouth bass eliminated the pupfish from the main pool of Crystal Spring, but pupfish that survived in the outflow reoccupied the spring when the bass were temporarily eradicated (Minckley and Deacon 1991). Nonnative centrachid fish, including bass, have subsequently reclaimed Crystal Spring reservoir and intermittently threaten to invade upstream into Crystal Spring outflow. Groundwater depletion in the surrounding area remains a threat to the species, and fire within riparian habitats also has been identified as a threat.

3.2.7.1.1.4.2. Ash Meadows Speckled Dace

First described as a full species in 1893, the Ash Meadows speckled dace was reduced to subspecies status in 1948. This dace is present in Ash Meadows NWR and was listed as endangered in 1983 after an emergency listing in 1982 (48 FR 608). Critical habitat was designated for the species in 1983 (48 FR 40178) (Map 3.2.6.1 - 1 (p. 2143)). Designated critical habitat includes Bradford Springs, Jackrabbit Spring, and Big Spring; included in the designation are the springs and their outflows and a terrestrial buffer zone. The population was more widespread at Ash Meadows but currently occurs in Jackrabbit Spring, Big Spring, the two western most springs of the Bradford Springs group, the outflows of these springs, and the outflow of Fairbanks Spring. Although a stable population, historic declines owing to water development activities (e.g., water diversion and excessive pumping) eliminated or degraded habitat. Former major threats from local dewatering and/or development were eliminated with the establishment of the Ash Meadows National Wildlife Refuge (USFWS 1990). The species still faces threats from the introduction of non-native species and groundwater depletion in the surrounding area.

3.2.7.1.1.4.3. Devils Hole Pupfish

The Devils Hole pupfish was listed as endangered in 1967 (32 FR 4001). The only wild population is naturally restricted to a single deep limestone pool at the bottom of Devils Hole, a cave on land owned by the National Park Service within the boundaries of Ash Meadows National Wildlife Refuge, which is surrounded by the Ash Meadows ACEC (Lee et al. 1980). First described in 1930, the Devils Hole pupfish differs in numerous physical characteristics from other members of its genus. In the 1970s, groundwater pumping for agriculture within the boundary of the refuge (prior to its establishment) lowered the level of water in the cave, drying areas used by the fish for feeding and reproduction. The Department of the Interior initiated litigation to protect the species, which ended with a ruling by the U.S. Supreme Court upholding a lower court decision that mandated the maintenance of a minimum water level. The recovery plan identifies that the water level must return to the pre-pumping level to meet recovery criteria for the species.

Several measures to save the pupfish have been attempted including transferring larval fish to be raised at the Willow Beach National Fish Hatchery (USFWS 1990). Most recently eggs of wild Devil's Hole pupfish have been recovered, hatched, and raised to adulthood at a new facility called the Ash Meadows Fish Conservation Facility, where husbandry efforts to establish a captive population of pure Devil's Hole pupfish are currently underway. The recovery plan for the Devils Hole pupfish stipulates a return to pre-pumping water level and other criteria before it can be downlisted to threatened (USFWS 1980, USFWS 1990). Because of its great vulnerability, the species can never be delisted. The recovery plan also identifies essential habitat for the species as including 21,760 acres encompassing the area where groundwater removal most influences the water level in Devil's Hole, which is necessary for the recovery of the species.

3.2.7.1.1.4.4. Moapa Dace

The Moapa dace was listed as endangered in 1967 under the Endangered Species Preservation Act of 1966 (32 FR 4001). The species retained its endangered status with the passage of the Endangered Species Act of 1973, as amended. No critical habitat has been designated for the species. A recovery plan was developed in 1983 and updated in 1996. Moapa dace are endemic to approximately six miles of stream habitats in thermal headwater spring systems and on the main stem of the Muddy River within the Warm Springs area of Clark County (Map 3.2.6.1 - 5 (p. 2144)). A majority of the population is located on the Warm Springs Natural Area and its outflows, which is managed as a nature preserve for protection of the Moapa dace. USFWS purchased the 7-12 Resort in 1979 and established the Moapa National Wildlife Refuge to protect habitat because streams on and immediately below the refuge provide the only remaining spawning habitat. Most or all of the springs originally containing Moapa dace still flow; however, the spring systems have been altered for recreation, irrigation, industrial, and municipal use.

Threats to the Moapa dace include introductions of non-native fishes and parasites; habitat loss through water diversions and impoundments; and reductions to surface spring-flows resulting from groundwater pumping, all of which impacts habitat for spawning, nursery, and food base. The BLM has installed three fish barriers south of the Warm Springs area to aid in keeping non-native fish from entering Moapa dace habitat.

3.2.7.1.1.4.5. Pahrump Poolfish

Formerly known as the Pahrump killifish, this species was listed under the Endangered Species Preservation Act of 1966 and retained its endangered status with the passage of the Endangered Species Act of 1973 as amended, with a recovery plan completed for this species in 1980 (USFWS 1980). The Pahrump poolfish is endemic to the Pahrump Valley in southern Nye County , Nevada . It is the only fish native to this valley and is one of two fish which constitute the genus *Empetrichthys*. The other form, the Ash Meadows killifish, *Empetrichthys merriami* Gilbert, became extinct in the late 1940's. In 1975, poolfish were extirpated from Manse Spring, their only known habitat, as a result of both desiccation of the spring from groundwater pumping and competition from non-native goldfish (USFWS 1980). Manse Spring had a constant temperature of 76ºF and, the Pahrump poolfish inhabited all areas of the spring. To preclude extinction, poolfish were transplanted to three locations in Nevada to ensure species survival. These include Corn Creek Spring on the Desert National Wildlife Range, north of Las Vegas, Nevada; Shoshone Springs southeast of Ely, Nevada; and in an irrigation reservoir at Spring Mountains Ranch State Park west of Las Vegas, Nevada. Prior to the introduction of poolfish into each of the three sites, all previously established fish were removed; however, the potential reestablishment of populations of competitors or predators remains a threat.

3.2.7.1.1.4.6. Virgin River Chub

The Virgin River chub was proposed for listing as endangered, with critical habitat, on August 23, 1978 (43 FR 37668). This proposal was withdrawn on September 30, 1980, in accordance with the 1978 amendments to the Endangered Species Act requiring that proposals pending for more than two years be withdrawn (45 FR 64853). A new proposal for listing as endangered, with critical habitat, was published on June 24, 1986 (51 FR 22949). The Virgin River chub was listed as endangered on August 24, 1989 (54 FR 35305). This listing covered only the Virgin River (Map 3.2.6.1 - 5 (p. 2144)), the known range of the chub, which was then considered a subspecies

of the roundtail chub (*Gila robusta seminuda*). On July 24, 1995, based on new taxonomic information, the USFWS proposed changing the species from a subspecies to a full species.

Critical habitat for the Virgin River chub was proposed with critical habitat for the woundfin in 1995, and a final rule was published in 2000. Critical habitat for the Virgin River chub includes the Virgin River and its 100-year floodplain from the Virgin River confluence with La Verkin Creek in Utah to Halfway Wash in Nevada.

The Virgin River chub is endemic to 134 miles of the Virgin River in southwest Utah, northwest Arizona, and southeastern Nevada (USFWS 1994), as well as to the Muddy River in southeastern Nevada where it is not federally listed (USFWS 1995). Historically, the Virgin River chub is believed to have occurred throughout most of the Virgin River from its original confluence with the main stem Colorado upstream to La Verkin Creek, near the town of Hurricane, Utah. Diversions have dewatered approximately 35 miles of the chub's natural habitat. With the construction of Hoover Dam and the impoundment of Lake Mead, an additional 40 miles of river was inundated, destroying almost 56 percent of the chub's original habitat. Additional threats to the species include other water impoundments and diversions, along with competition with and predation from non-native fish, particularly the red shiner (*Cyprinella lutrensis*) and large predaceous non-native species such as catfish and bass species. Designated critical habitat has been significantly altered due to dam construction and water diversions, which have resulted in decreased flows and thus available habitat throughout the Virgin River.

3.2.7.1.1.4.7. Warm Springs Pupfish

The Warm Springs pupfish was first described in 1948 and is the smallest subspecies in the *C. nevadensis* complex. It was listed as endangered in 1970, and the most recent recovery plan was implemented in 1990 (USFWS 1990, USFWS 1976). This pupfish currently occupies six small springs and their outflows within an area of less than a square mile west of Devils Hole within the Ash Meadows National Wildlife Refuge. All of the springs have been altered by water diversions, impoundments, livestock, and groundwater pumping. All of its populations are believed to be quite small because of limited available habitat. Essential habitat for this species includes 2,240 acres surrounding its entire habitat (USFWS 1976). This area is within the borders of Devils Hole pupfish essential habitat and represents an area where groundwater pumping is most likely to adversely affect spring discharge. In addition to groundwater pumping, this species has been severely impacted by non-native species, most notably the red swamp crayfish (*Procambarus clarkii*).

3.2.7.1.1.4.8. Woundfin

The woundfin was listed as endangered in 1970 (35 FR 16047). Critical habitat was proposed in the 1995 recovery plan (USFWS 1994), and a final rule was published in 2000 (65 FR 4140). Critical habitat for the woundfin includes the Virgin River (Map 3.2.6.1 - 5 (p. 2144)) and its 100-year floodplain from the Virgin River confluence with Las Verkin Creek in Utah to Halfway Wash in Nevada. Historically, the woundfin occurred from the mouth of the Gila River in Yuma, Arizona, to near the junction of the Salt and Verde rivers at Tempe, Arizona (Gilbert and Scofield 1989; Minckley 1973). The species also likely occurred in the main stem of the Colorado River from Yuma upstream to the Virgin River in Nevada. Except for the main stem of the Virgin River, woundfin are extirpated from most of their historical range. Woundfin presently range from Pah Tempe Springs (also called La Verkin Springs) on the mainstem of the Virgin River and the lower portion of La Verkin Creek in Utah, downstream to Lake Mead. Woundfin are now uncommon

to rare throughout the occupied range. Threats to the species include introduction of predatory non-native species and changes in river flow regimes due to impoundments and diversions.

3.2.7.1.1.5. Invertebrates

3.2.7.1.1.5.1. Ash Meadows Naucorid

This rare aquatic insect was first collected in 1951 and described two years later (La Rivers 1953). It is currently known to occur only in a restricted habitat where the outflow of Point of Rocks Springs, located within Ash Meadows National Wildlife Refuge, passes over rock and pebble substrates (USFWS 1990). It was listed as threatened on May 20, 1985, with critical habitat (50 FR 20777). The critical habitat is approximately 10 acres at Point of Rocks Springs. This species was listed in part due to severe habitat destruction. Little is known about its life history or habitat requirements, but the small size and vulnerability of its habitat makes it highly susceptible to extinction.

The Ash Meadows naucorid's habitat was greatly reduced from that known to have existed historically because of channelization of the springs' outflow for agricultural diversion and because of large-scale alteration of the Point of Rocks Springs area when a real estate developer impounded approximately 90 percent of the flowing water in the late 1970s. This species was then restricted to several stream channels less than 0.3 meters wide and 10 meters long (FR 1985). Following a restoration project and reintroduction effort into Kings Spring in 1997, the population grew to thousands of individuals occupying about 850 feet (260 m) of stream habitat (Fraser and Martinez 2002). The naucorid population in Kings Spring subsequently declined to extinction, however, and the species is now again restricted to several tiny stream channels. While restoration of habitat is presently occurring, the species still remains at risk due to groundwater depletion, introduction of non-native predators, and large flood events that could alter its narrow habitat.

3.2.7.1.2. Plants

The planning area includes the Las Vegas buckwheat, a federal candidate species. There are seven federally listed plants on BLM and U.S. Fish and Wildlife Service lands within the Ash Meadows ACEC (see Table 3.17, "Endangered, Threatened, and Candidate Plant Species in the Planning Area" (p. 352)). These include BLM and USFWS administered lands in the Ash Meadows area of Nye County. These plant species are currently managed in accordance with a USFWS combined recovery plan. All seven Ash Meadows species also have had critical habitats designated. At the time critical habitats were designated, the distributions of the species were poorly understood. Consequently, a significant portion of each species' critical habitat does not support the species. Where agricultural activities have altered the primary constituent elements, the condition of designated critical habitat is very poor and is not likely to support the species in the future because of irreversible changes in soil structure and composition. Portions of critical habitats that currently support the species are generally in moderate to excellent condition.

At the time of listing, threats posed to the Ash Meadows species included loss of habitat by groundwater pumping and development. These threats were largely abated when the Ash Meadows National Wildlife Refuge and the Ash Meadows ACEC were created. Threats due to OHV activity and wild horse and burro grazing were largely abated when BLM fenced the ACEC just outside of the refuge boundary in the late 1980s. Currently, competitive exclusion

by non-native species and overpumping of the regional aquifer are important threats to most of the Ash Meadows species.

Table 3.17. Endangered, Threatened, and Candidate Plant Species in the Planning Area

Common name	Scientific name	Federal status	Critical habitat
Amargosa niterwort	*Nitrophila mohavensis*	Endangered	Y
Ash Meadows blazing star	*Mentzelia leucophylla*	Threatened	Y
Ash Meadows gumplant	*Grindelia fraxino-pratensis*	Threatened	Y
Ash Meadows ivesia	*Ivesia kingii var. eremica*	Threatened	Y
Ash Meadows milkvetch	*Astragalus phoenix*	Threatened	Y
Ash Meadows sunray	*Enceliopsis nudicaulis var. corrugata*	Threatened	Y
Las Vegas buckwheat	*Eriogonum corymbosum var. nilesii*	Candidate	N/A
Spring-loving centaury	*Centaurium namophilum*	Threatened	Y

3.2.7.1.2.1. Amargosa Niterwort

The Amargosa niterwort is endemic to the Carson Slough in Nye County; Inyo County, California; and near Tecopa in Inyo County. (USFWS 2007). The Amargosa niterwort was listed as federally threatened on May 20, 1985 (50 FR 20777). In 1986, the species was added to the state of Nevada list of fully protected plant species and is protected under Nevada Revised Statute 572.260.300.

Critical habitat for the Amargosa niterwort was designated on May 20, 1985 (50 FR 20777-20794), on 1,200 acres in Inyo County, California, that includes: 1) W ½ section 5; E ½ section 6; NE ¼ and E ½ NW ¼ section 7; NW ¼ section 8, T25N R6E. The condition of critical habitat is unknown, the status of groundwater within niterwort critical habitat has not been monitored, and anecdotal observations suggest the size of the Amargosa niterwort population within designated critical habitat may be getting smaller.

Based on habitat and distribution, the Amargosa niterwort is a wetland species dependent on perennial surface and subsurface water flows. The presence of white salt crusts and co-occurrence of saltgrass (*Distichlis spicata*) also indicate that the species is tolerant of high soil salinity. Research by the U.S. Geological Survey indicates that the Amargosa niterwort is less tolerant of high salinity, has roots at greater depths, and has slower above-ground growth rates than saltgrass (DeFalco 2008). This suggests that the species likely allocates its resources to the production of roots that are needed to access deeper, less-saline subsurface flows (DeFalco 2007). Evidence suggests the species is sensitive to disturbance and does not recolonize sites where salt crust overlying the soil have been disturbed.

In addition to physiological adaptations to high soil salinity, soil cores taken from niterwort habitat consistently had a pH of 10 (DeFalco 2008). This indicates the Amargosa niterwort is also able to tolerate highly alkaline soil conditions. The Amargosa niterwort occupies the most localized habitat of the seven plant species endemic to Ash Meadows. It is limited to highly alkaline, moist, salt-encrusted fine clay soils (Reveal 1978; Knight and Clemmer 1987; USFWS 2007). Where it occurs, except for very low densities of saltgrass and western niterwort (*Nitrophila occidentalis*), it is typically the only plant species present (DeFalco 2008; SERG 2004). This suggests the Amargosa niterwort occupies a particular ecological niche unavailable to other species. It is likely the Amargosa niterwort avoids competition with other wetland plant species by growing in locations where the surface soil salinity and high alkalinity limits the growth and establishment of competitors, and its capacity for deep rooting allows the species to access deeper lower salinity water that is unavailable to other plants. This hypothesis is supported

by the fact that the Amargosa niterwort is most active and flowers and produces seed during the summer (June through September) when precipitation is at its lowest and evaporation increases soil surface salinity. The Amargosa niterwort appears sensitive to surface disturbance and does not re-invade sites where the salt crust overlying the soil has been disrupted. Plant species occasionally found in areas surrounding Amargosa niterwort habitat include shadscale (*Atriplex confertifolia*), short-stalk stink weed (*Cleomella brevipes*), Tecopa bird's beak (*Cordylanthus tecopensis*), Ash Meadows gumplant, and spring-loving centaury (Knight and Clemmer 1987).

When it was listed, the Amargosa niterwort was only known from a population in the lower Carson Slough near Death Valley junction. After listing, additional populations were identified on the Ash Meadows National Wildlife Refuge, immediately below Crystal Reservoir, the western boundary of the Ash Meadows National Wildlife Refuge, and near Tecopa, California. Approximately 198 acres of potential habitat were estimated in 1998, and 56 acres of this has been GPS mapped at five locations since (USFWS 2007). The presence and status of the species on the remaining 142 acres need further investigation. Two very small populations are present on the Ash Meadows National Wildlife Refuge boundary, and the largest population is within the Ash Meadows National Wildlife Refuge below Crystal Reservoir.

Little is known about the most basic aspects of Amargosa niterwort biology including reproductive biology, physiological ecology, demography, and community ecology. The Amargosa niterwort reproduces both sexually (by seed) and asexually by underground roots. It occurs in colonies of individual ramets (aboveground stems) linked by large, thick rhizomatous roots. This makes it difficult to identify individuals; therefore population numbers are typically expressed as the number of ramets instead of individuals. Because individual plants are generally long lived and can produce seed throughout their life, Amargosa niterwort populations are likely to be stable unless disturbed by an outside influence.

3.2.7.1.2.2. Ash Meadows Blazing Star

The Ash Meadows blazing star is endemic to the Ash Meadows area in Nye County (Knight and Clemmer 1987). The range of the Ash Meadows blazing star is the Ash Meadows National Wildlife Refuge and adjacent BLM lands. The Ash Meadows blazing star was listed as federally threatened on May 20, 1985 (50 FR 20777). In 1979, the species was added to the state of Nevada list of fully protected plant species and is protected under Nevada Revised Statute 572.260.300. Critical habitat for the Ash Meadows blazing star was designated at the time of listing on May 20, 1985 (50 FR 20777-20794), on approximately 1,240 acres in Nye County (Map 3.2.6.1 - 1 (p. 2143)).

The Ash Meadows blazing star grows between 2,200 and 2,350 feet elevation and occurs on hard, dry, alkaline, undisturbed soils in arroyos, canyon washes, barren bluffs, and near spring areas, but it is not associated with saturated soils (Morefield 2001, Knight and Clemmer 1987). Other plant species that share habitat with the Ash Meadows blazing star include shadscale, alkali goldenbush (*Isocoma acradenia*), yellow cryptantha (*Cryptantha confertiflora*), and Ash Meadows sunray (Knight and Clemmer 1987).

The Ash Meadows blazing star is the most narrowly distributed of the seven federally listed plant species on the Ash Meadows National Wildlife Refuge (Knight and Clemmer 1987) and is considered the rarest of all plant species endemic to Ash Meadows. Based on 1998 surveys and historic occurrences, there are an estimated 423 acres of occupied habitat in two major subpopulations. The two major subpopulations include: (1) near Marsh Spring south to Bradford

Spring: a large, sporadic, and dissected population occurs on arid bluffs surrounding the major spring complex in central Ash Meadows from Marsh Spring to Bradford Spring to Collins Ranch Spring in T17S R50E sections 35, 36 and T18S R50E sections 1, 2, 11, and 12 (Knight and Clemmer 1987); and (2) east of Roger Spring T17S R50E section 14 (BLM and USFWS 2000). The number of individual plants is likely variable but has been estimated to be between 400 and 700 (BLM and USFWS 2000, Morefield 2001).

Little is known about the most basic aspects of Ash Meadows blazing star biology including reproductive biology, physiological ecology, demography, and community ecology. Based on habitat and similar species, it is highly likely the Ash Meadows blazing star has physiologic adaptations to resist drought and likely invests considerable metabolic energy into the production and accumulation of resins and other complex molecules that likely protect it from herbivory. The Ash Meadows blazing star is a biennial or short-lived perennial. Like other Mojave Desert plant species with this life history strategy, the persistence of seeds in the soil seed bank is important to maintaining the species during unfavorable conditions. The recruitment of new individuals likely occurs infrequently, primarily during growing seasons with average to above average precipitation. Like biennial species, seed production is likely limited during the first growing season, when the plant is investing its energy into growth, with seed production peaking in subsequent growing seasons.

Pollination biology and ecology of the Ash Meadows blazing star is unknown. It is unknown if the species is self-compatible or if cross pollination is required. Pollinator requirements are also unknown. It is likely the species is pollinated by generalist pollinators, but the possibility that the species has co-evolved with a specialist pollinator cannot be ruled out. Although it has not been studied, there are no known problems with pollination and seed production. The local distribution of the small populations suggests the species is vulnerable to any land disturbance and past development for agriculture, trampling by wild horses and livestock, and off-road vehicle use has impacted the species distribution and population.

3.2.7.1.2.3. Ash Meadows Gumplant

The Ash Meadows gumplant is endemic to the Ash Meadows area in Nye County and Inyo County, California (Cochrane 1981; Knight and Clemmer 1987). The range of the Ash Meadows gumplant is the Ash Meadows National Wildlife Refuge and adjacent BLM and private lands (Cochrane 1981; Knight and Clemmer 1987). The Ash Meadows gumplant was listed as threatened on May 20, 1985 (50 FR 20777). It was listed as critically endangered by the state of Nevada in 1982 and is protected under Nevada Revised Statute 572.260.300. Critical habitat for the Ash Meadows gumplant was designated at the time of listing on May 20, 1985 (50FR 20777-20794), on 1,968 acres in California and Nevada (Map 3.2.6.1 - 1 (p. 2143)).

Based on habitat requirements, the Ash Meadows gumplant is considered a wetland or riparian species rather than a true desert xerophyte such as the creosote bush. The species often occurs in extremely alkaline and saline soils; therefore the species can be considered a halophyte. The Ash Meadows gumplant grows between 2,070 to 2,320 feet in elevation within the Mojave Desert ecosystem. The Ash Meadows gumplant grows in the transition zone between riparian areas, which are closely associated with seeps and springs, and the arid desert uplands. Its primary habitat is saltgrass meadow along streams and pools, but it occasionally occurs in alkali clay soils in drier areas (Cochrane 1981). Best population development is on moist intact (undisturbed) soils (Knight and Clemmer 1987), but it is known to colonize disturbed sites where competitor species have been removed (Cochrane 1981). The species is not found on rocky, sandy, and arid

upland sites (Knight and Clemmer 1987). Where the species occurs, is it often locally abundant and associated with saltgrass, shadscale, copperweed (*Iva acerosa*), alkali goldenbush, velvet ash (*Fraxinus velutina*), Emory baccharis (*Baccharis emoryi*), spring-loving centaury, and Tecopa bird's beak.

The Ash Meadows gumplant is widely distributed across the Ash Meadows National Wildlife Refuge with three major populations and 11 minor populations; all are centered on moist areas (BLM and USFWS 2000). These include: (1) Crystal Reservoir T18S R50E sections 10, 11, and 15; (2) west of Tubbs Ranch T18S R50E sections 14 and 23; and (3) lower Carson Slough T18S R50E sections 17, 20, 21, and T26N R6E sections 30 and 31. Ash Meadows gumplant population is estimated to contain 81,000 plants within 2,260 acres (BLM and USFWS 2000). This number, based on visual estimates, is a serious underestimate of the total number of plants because a 2002 survey of the California population, which used transects to develop a population estimate, estimated 241,514 ± 69,660 plants within 88 acres (SERG 2004). Other than the Inyo County, California, population, no quantitative population estimates have been made.

Pollination biology and most aspects of the ecology of the Ash Meadows gumplant is unknown. Dispersal of its small seeds is most likely accomplished by strong winds because seeds can be blown for some distance. The seeds that fall within close proximity of the parent plant may be further transported by water during the winter rainy season or during summer flash floods (Cochrane 1981). Mammals and birds may also be responsible for dispersal of seeds (Cochrane 1981). It is unknown whether the species is self-compatible or if cross pollination is required. It is likely the species is pollinated by generalist pollinators, but the possibility that the species has co-evolved with a specialist pollinator cannot be ruled out. Because the Ash Meadows gumplant is a riparian species and much of the wetlands on the Ash Meadows National Wildlife Refuge are perennial, successful seed germination and recruitment can occur in most years. High precipitation years likely increase the number of individuals that establish, as well as extend the range of the species into drier, less favorable habitat on the Ash Meadows National Wildlife Refuge. Ash Meadows gumplant populations are likely to be relatively stable if water and disturbance regimes remain constant.

3.2.7.1.2.4. Ash Meadows Ivesia

The Ash Meadows ivesia is restricted to the Ash Meadows area in Nye County (Beatley 1977, Knight and Clemmer 1987). The range of the Ash Meadows ivesia is the Ash Meadows National Wildlife Refuge and adjacent BLM and private lands (Knight and Clemmer 1987). The Ash Meadows ivesia was listed as threatened on May 20, 1985 (50 FR 20777). It was listed as critically endangered by the state of Nevada in 1987 and is protected under Nevada Revised Statute 572.260.300. Critical habitat for the Ash Meadows ivesia was designated on May 20, 1985 (50 FR 20777-20794), on 880 acres in Nye County (Map 3.2.6.1 - 1 (p. 2143)).

The species is best considered a wetland or riparian species adapted to extremely alkaline and saline soils. The Ash Meadows ivesia grows between 2,200 to 2,300 feet elevation within the Mojave Desert ecosystem. It grows only in saline seep areas and adjacent uplands on light colored, alkaline colored limestone soils (Beatley 1977). Beatley (1977) also noted associated species included alkali cord grass (*Spartina gracilis*), yerba mansa (*Anemopsis californica*), and black sedge (*Schoenus nigricans*). Knight and Clemmer (1987) identified additional associated species including saltgrass, spring-loving centaury, alkali goldenbush, Baltic rush (*Juncus balticus*), and Tecopa bird's beak.

There are an estimated 572 acres of occupied Ash Meadows ivesia habitat (BLM and USFWS 2000). Seven major populations are known with only two having more than 600 individuals; five of these populations occupy less than 30 acres (Knight and Clemmer 1987; BLM and USFWS 2000). These populations, as described in Knight and Clemmer (1987), include: (1) Old Rooker Ranch (2) Shaft-Chalk springs around two springs; (3) Mary Scott-Indian-School-Crystal pool springs; (4) Crystal Pool/Amargosa Reservoir; (5) sections 1 and 12 around the marsh and seeps of Collins Ranch; and (7) Tubbs-Love ranches.

Little is known about the life history of the Ash Meadows ivesia. It is a long-lived, slow-growing perennial species. Because the species is perennial, Ash Meadows ivesia populations are likely to be stable if water and disturbance regimes remain constant. Like many desert species, recruitment of individuals is likely dependent on growing seasons with increased precipitation; however, given that the species grows on and near perennial springs and seeps, recruitment may be possible at other times. It is unknown if the Ash Meadows ivesia is self-compatible or if cross pollination is required. Little is known about the pollination ecology, seed biology, and ecology of the species. Pollinator requirements are also unknown. It is likely the species is pollinated by generalist pollinators, but the possibility that the species has co-evolved with a specialist pollinator cannot be ruled out. Threats to the species have included trampling by wild horses and livestock, spring diversions, and groundwater pumping resulting in drying of soils and elimination of its habitat.

3.2.7.1.2.5. Ash Meadows Milkvetch

The Ash Meadows milkvetch is endemic to the Ash Meadows area in Nye County (Knight and Clemmer 1987). The range of the Ash Meadows sunray is the Ash Meadows National Wildlife Refuge and adjacent BLM lands. The Ash Meadows milkvetch was listed as federally threatened on May 20, 1985 (50 FR 20777). In 1979, the species was added to the state of Nevada list of fully protected plant species under Nevada Revised Statute 572.260.300. Critical habitat for the Ash Meadows milkvetch was designated on May 20, 1985 (50 FR 20777-20794), at the time of listing on 1,200 acres (Map 3.2.6.1 - 1 (p. 2143)).

The Ash Meadows milkvetch grows between 2,200 and 2,300 feet elevation and is restricted to calcareous soil outcroppings at Ash Meadows in creosote-bursage vegetation (Knight and Clemmer 1987). Beatley (1976) mentioned that Ash Meadows milkvetch soils were fine textured, poorly drained, and often with a shallow water table that contributed to surficial deposition of evaporate minerals. Such soils could be reliably wet from year to year, but high salt concentrations could also make the water physiologically unavailable (Pavlik et al. 2006). Other plant species that share habitat with the Ash Meadows milkvetch include Ash Meadows sunray, shadscale, alkali goldenbush, saltgrass, and Ash Meadows blazing star (Knight and Clemmer 1987). Based on 1998 surveys, there are an estimated 1,800 plants in six populations totaling roughly 847 acres of occupied habitat (BLM and USFWS 2000). The six subpopulations as described by Knight and Clemmer (1987) include: (1) The largest population at Rogers-Longstreet springs area in T17S R50E sections 14 and 15; (2) Old Rooker Ranch in T17S R50E section 21; (3) Five-Chalk-Shaft springs in T17S R50E sections 22, 23, and 26; (4) on arid knolls at Collins Ranch in T18S R50E sections 1 and 12; (5) Jackrabbit-Big springs T18S R51E sections 7, 18, and 19 and T18S R50E section 13; and (6) North-South County Road T18S R50E sections 14 and 24 (though much of this area has been disturbed by past agricultural practices). A portion of critical habitat located occurs outside of the Ash Meadows NWR, within the Ash Meadows ACEC and private lands. This habitat has not been surveyed, and it is unknown if it is occupied.

Like many desert perennial plant species, the Ash Meadows milkvetch is a long-lived, slow-growing perennial where seed germination and seedling establishment occurs infrequently. Because of these life history traits, there is likely to be very little year-to-year variation in the number of individual plants present, except during infrequent high rainfall growing seasons where the number of seedlings would be expected to increase. Because individual plants are generally long-lived and can produce seeds throughout their life, Ash Meadows milkvetch populations are likely to be relatively stable over time unless disturbed by an outside influence. Recently, the pollination biology and ecology of the Ash Meadows milkvetch has been investigated. It is an inbreeding species with no limitation on seed output imposed by lack of pollinators (Pavlik et al. 2006).

3.2.7.1.2.6. Ash Meadows Sunray

The Ash Meadows sunray is endemic to the Ash Meadows area in Nye County (Knight and Clemmer 1987). The range of the Ash Meadows sunray is the Ash Meadows National Wildlife Refuge and adjacent BLM lands. The Ash Meadows sunray was listed as federally threatened on May 20, 1985 (50 FR 20777). In 1987, the species was added to the state of Nevada list of fully protected plant species and is protected under Nevada Revised Statute 572.260.300. Critical habitat for the Ash Meadows sunray was designated on May 20, 1985 (50 FR 20777-20794), on 1,760 acres (Map 3.2.6.1 - 1 (p. 2143)).

The Ash Meadows sunray grows between 2,200 and 2,300 feet elevation and is found exclusively on calcareous soil outcroppings at Ash Meadows in creosote-bursage vegetation (Beatley 1971; Cronquist 1972; Knight and Clemmer 1987). The limestone soil outcroppings where the species occurs have been described as hard, clay, poorly drained, strongly alkaline and saline clay soils. The Ash Meadows sunray has been described as an upland species (Beatley 1971), and it has been assumed that much of the lower elevation alkali clay soils present at Ash Meadows have an underlying water table that makes them inappropriate habitat for the Ash Meadows sunray (Knight and Clemmer 1987). However, this assumption may not be entirely accurate as recent investigations with the Ash Meadows milkvetch, which often occur with the Ash Meadows sunray, suggest that such soils could be reliably wet from year to year because of the high water table, but high salt concentrations could also make the water physiologically unavailable (Pavlik et al. 2006).

While the Ash Meadows sunray and Ash Meadows milkvetch share different ecological niches than the other threatened plant species on the Ash Meadows National Wildlife Refuge, the ecophysiology of these species as they relate to water availability use needs research. Other plant species that share habitat with the Ash Meadows sunray include Ash Meadows milkvetch, shadscale, alkali goldenbush, white bearpoppy (*Arctomecon merriamii*), and yellow cryptantha (Knight and Clemmer 1987).

The Ash Meadows sunray is the most widespread of the seven federally listed plant species on the Ash Meadows National Wildlife Refuge (Knight and Clemmer 1987). Where it occurs, it is generally a common component of the perennial flora (Knight and Clemmer 1987). Based on 1998 surveys, there are an estimated 5,275 acres of occupied habitat in three major subpopulations and three minor subpopulations (BLM and USFWS 2000). The three major subpopulations include: (1) the Rogers-Purgatory-Longstreet springs area in T17S R50E sections 11, 14, 15 and the northern portion of sections 23 and 26 (Knight and Clemmer 1987); (2) the central Ash Meadows area with the species occurring from the terrace overlooking Old Rooker Ranch to Collins Ranch and southwest to Crystal Reservoir in T17 R50E sections 21, 22, 13, 26, 27, 28,

33, 34, and 35, T18S R50E sections 2 and 3, and T18S R51E sections 1 and 12 (Knight and Clemmer 1987); and (3) in southeastern Ash Meadows where the habitat runs from west of the county dirt road in T18S R50E sections 13 and 14, to Jackrabbit Spring in T18S R51E sections 7 and 18 and south nearly to Big Spring (Knight and Clemmer 1987). A portion of critical habitat located occurs outside of the Ash Meadows NWR, within the ACEC. This habitat has not been surveyed, and it is unknown if it is occupied.

Little is known about the most basic aspects of Ash Meadows sunray biology including reproductive biology, physiological ecology, demography, and community ecology (Pavlik and Manning 1986a). Like many desert perennial plant species, the Ash Meadows sunray is a long-lived, slow-growing perennial where seed germination and seedling establishment occurs infrequently. Because of these life history traits, it is likely there is little year-to-year variation in the number of individual plants present, except during infrequent, high rainfall growing seasons when the number of seedlings would be expected to increase. Because individual plants are generally long lived and can produce seed throughout their life, Ash Meadows sunray populations are likely to be relatively stable over time unless disturbed by an outside influence.

Pollination biology and ecology of the Ash Meadows sunray is unknown. It is unknown whether the species is self-compatible or if cross pollination is required. Pollinator requirements are also unknown. It is likely the species is pollinated by generalist pollinators, but the possibility that the species has co-evolved with a specialist pollinator cannot be ruled out. Although it has not been studied, there are no known problems with pollination and seed production.

3.2.7.1.2.7. Las Vegas Buckwheat

The Las Vegas buckwheat is a BLM special status species that became a federal candidate in 2008. The Las Vegas buckwheat is a woody perennial shrub in the Polygonaceae family that grows up to four feet high with a mounding shape that flowers in late September and early October. The Las Vegas buckwheat is differentiated from other subspecies in part by its preference for gypsum soils (Reveal 2002). It has been described as a gypsocline, a species that principally occurs on gypsum but is also found on other unusual substrates (Meyer 1986). Gypsum soil outcroppings occupied by Las Vegas buckwheat are typically sparsely vegetated with bare exposed soils covered with a cryptogrammic soil crust. Generally, the species habitat can be differentiated from typical Mojave creosote-bursage scrub and saltbush scrub vegetation communities that usually surround it by the presence of gypsophiles (gypsum obligate species) and other gypsoclines that occasionally share habitat, including the Las Vegas bearpoppy (*Arctomecon californica*), Parry's sandpaper plant (*Petalonyx parryi*), Palmer's phacelia (*Phacelia palmeri*), wingseed blazing star (*Mentzelia pterosperma*), and froststem suncup (*Camissonia multijuga*) (Meyer 1986). The species shares much of the same habitat preferences and range as the Las Vegas bearpoppy, but typically occurs on deeper soils (*Arctomecon californica*) (Drohan and Buck 2006). Elevation of known species locations average 2,900 feet with a range from 1,900 to 3,800 feet.

Roughly 95 percent of the historic distribution of the Las Vegas buckwheat in the Las Vegas Valley has been developed (74 FR 57853). In the planning area, the species is only presently known from about 2,500 acres of BLM-managed lands and less than 100 acres of Department of Defense-managed lands. This represents less than one-third of the overall known historic habitat in Clark County. The species and its habitat are threatened by habitat development, fire, gypsum mining, and recreation activities (e.g. OHV, equestrian).

3.2.7.1.2.8. Spring-Loving Centaury

The range of the spring-loving centaury is the Ash Meadows National Wildlife Refuge and adjacent BLM and private lands. Based on the literature and opinion of local botanists, populations in nearby Beatty, Nevada, and Death Valley, California, are considered to be taxonomically distinct and a different subspecies (USFWS 2001). The spring-loving centaury was listed as threatened on May 20, 1985 (50 FR 20777). It was listed as critically endangered by the state of Nevada in 1982 and is protected under Nevada Revised Statute 572.260.300. Critical habitat for the spring-loving centaury was designated on May 20, 1985 (50 FR 20777-20794), on 1,840 acres in Nye County.

The spring-loving centaury is adapted for mesic to wet alkaline clay soils, and water availability is probably a limiting factor for this species (Pavlik and Manning 1986b). The spring-loving centaury grows between 2,070 to 2,320 feet elevation in the Ash Meadows area. The spring-loving centaury grows in wet saltgrass meadows with scattered velvet ash and screwbean mesquite (*Prosopis pubescens*) in the vicinity of springs, streams, and seeps (Reveal et al 1973). It also occasionally occurs in alkaline clay soils in low uplands where water seeps are present (Reveal et al1973). The wet meadow ecosystem occupied by spring-loving centaury is typically dominated by saltgrass; other associates of the species in saltgrass meadows include the Ash Meadows gumplant, Emory baccharis, and yerba mansa. On drier sites, common associates include Ash Meadows ivesia and Tecopa bird's beak (Reveal et al 1973).

In 1973, Reveal, Brome, and Beatly noted the species was probably present in all the springs and seeps in the northern and eastern sections of the Ash Meadows area until development reduced the distribution to remnant patches of natural vegetation. Currently, the spring-loving centaury is concentrated in six major populations and several smaller ones on approximately 2,900 acres (BLM and USFWS 2000). Population occurrence was confirmed in 1998 on all previously known sites (Knight and Clemmer 1987), with the exception of one that occurs on private lands where access was not granted. In 1998, two small sites were documented just outside the eastern boundary of the Ash Meadows National Wildlife Refuge (Glenne 1998; Alexander 1998). The six major populations described by Knight and Clemmer (1987) include: (1) Pugatory-Rogers-Longstreet-Five springs-North Carson Slough, T17S R50E sections 14, 15, 16, 20, 21, 22, and 23; (2) Scruggs-Mary-Scott-Indian-School-Crystal-Marsh springs, T17S R50E sections 7, 8, 9, 10, 15, 16, 17, and 18; (3) unmapped seep west of the County Road, T18S R50E sections 14 and 23; (4) Point of Rocks Springs T18S R51E section 7 and into section 12; (5) Jackrabbit-Big Spring and from Jackrabbit Spring in T18S R51E section 18 to Big Spring in T18S R51E section 19 and extends west into sections 23 and 24; and (6) Last Chance-Bole-Brahma springs, T18S R51E sections 20, 29, and 30. A portion of critical habitat occurs outside of the Ash Meadows NWR within the Ash Meadows ACEC and private inholdings. This habitat has not been surveyed, and it is unknown if it is occupied.

The spring-loving centaury is an annual species that is dependent on wetlands. Unusually high rainfall years will probably increase the number of individuals. If habitat is undisturbed and water availability does not change dramatically from year to year, population numbers will likely remain constant from year to year. Water discharges from the springs on the Ash Meadows National Wildlife Refuge are stable, contributing to spring-loving centaury populations likely remaining stable. Nothing is known about seed ecology of the species, but, like other members of the genus *Centaurium*, the species is likely to have germination controls that allow it to persist in the soil seed bank over time. Given the small size of its seeds, 0.02 to 0.03 inches long, it is possible for the seeds to be dispersed by both biotic and abiotic mechanisms. It is likely that most of the seed

produced remains in the general vicinity of the individual plant that produced it. The pollinator requirements of the spring-loving centaury are unknown. It is also unknown whether the species is self-compatible. It is likely the species is pollinated by generalist pollinators, but the possibility that the species has co-evolved with a specialist pollinator cannot be ruled out.

3.2.7.2. BLM Sensitive Species

The BLM manages species designated as sensitive by the BLM state director. This includes species protected by the state of Nevada. State laws protecting species are applicable to all BLM programs and actions to the extent that they are consistent with the Federal Land Policy and Management Act of 1976 (FLPMA). These species are managed by the BLM through policy set forth in BLM Manual 6840. This policy states that actions authorized by the BLM shall further the conservation and/or recovery of federally listed species and conservation of Bureau sensitive species and that the BLM shall retain in federal ownership those habitats essential for the conservation of any listed species. Bureau sensitive species will be managed consistent with species and habitat management objectives in land use and implementation plans to promote their conservation and to minimize the likelihood and need for listing under the ESA. Table 3.18, "BLM Sensitive Wildlife Species in the Planning Area" (p. 361) and Table 3.19, "BLM Sensitive Plant Species in the Planning Area" (p. 374) list BLM sensitive species, not including the federally listed and candidate species discussed above, known to occur within or adjacent to the planning area.

BLM policy provides these species with the same level of protection that is provided for candidate species in BLM Manual 6840, which is to "ensure that actions authorized, funded, or carried out do not contribute to the need for the species to become listed." The sensitive species designation is normally used for species that occur on BLM-administered lands for which BLM has the capability to significantly affect the conservation status of the species through management. As outlined in BLM Manual 6840, a native species may be listed as sensitive if it:

1. Could become endangered or extirpated from a state, or within a significant portion of its range in the foreseeable future.
2. Is under status review by the USFWS and/or National Marine Fisheries Service.
3. Is undergoing significant current or predicted downward trends in habitat capability that would reduce a species' existing distribution and/or population or density such that federally listed, proposed, candidate, or state-listed status may become necessary.
4. Typically consists of small and widely dispersed populations.
5. Inhabits ecological refugia, or specialized or unique habitats.
6. Is state-listed but may be better conserved through application of BLM sensitive species status.

3.2.7.2.1. Wildlife

In addition to the federally listed, proposed, and candidate species, there are 70 wildlife species designated as sensitive species within the planning area (see Table 3.18, "BLM Sensitive Wildlife Species in the Planning Area" (p. 361)). This includes 22 mammals, 13 birds, six reptiles, five fish, and 24 invertebrates. Some of these species are found only on lands managed by other agencies but may be impacted by actions taken by the BLM. If known, a description of the population trend of each species is provided.

Table 3.18. BLM Sensitive Wildlife Species in the Planning Area

Common name	Scientific name	State status
Mammals		
Desert bighorn sheep	*Ovis canadensis nelsoni*	Game mammal
Pale kangaroo mouse	*Microdipodops pallidus*	Protected
Allen's big-eared bat	*Idionycteris phyllotis*	Protected
Big brown bat	*Eptesicus fuscus*	
Big free-tailed bat	*Nyctinomops macrotis*	
Brazilian free-tailed bat	*Tadarida braziliensis*	Protected
California leaf-nosed bat	*Macrotus californicus*	Sensitive
California myotis	*Myotis californicus*	
Cave myotis	*Myotis velifer*	
Fringed myotis	*Myotis thysanodes*	Protected
Greater western mastiff bat	*Eumops perotis californicus*	Sensitive
Hoary bat	*Lasiurus cinereus*	
Long-eared myotis	*Myotis evotis*	
Long-legged myotis	*Myotis volans*	
Pallid bat	*Antrozous pallidus*	Protected
Silver-haired bat	*Lasionycteris noctivagans*	
Small-footed myotis	*Myotis ciliolabrum*	
Spotted bat	*Euderma maculatum*	Threatened
Townsend's big-eared bat	*Corynorhinus townsendii*	Sensitive
Western pipistrelle	*Pipistrellus hesperus*	
Western red bat	*Lasiurus blossevilli*	Sensitive
Yuma myotis	*Myotis yumanensis*	
Birds		
Bald eagle	*Haliaeetus leucocephalus*	Endangered
Bendire's thrasher	*Toxostoma bendirei*	Protected
Brewer's sparrow	*Spizella breweri*	Sensitive
Ferruginous hawk	*Buteo regalis*	Protected
Golden eagle	*Aquila chrysaetos*	Protected
LeConte's thrasher	*Toxostoma lecontei*	Protected
Lewis's woodpecker	*Melanerpes lewis*	Protected
Loggerhead shrike	*Lanius ludovicianus*	Sensitive
Peregrine falcon	*Falco peregrines*	Endangered
Pinyon jay	*Gymnorhinus cyanocephalus*	Protected
Swainson's hawk	*Buteo swainsoni*	Protected
Western burrowing owl	*Athene cunicularia*	Protected
Western snowy plover	*Charadrius alexandrinus nivosus*	Protected
Reptiles		
Banded Gila monster	*Heloderma suspectum cinctum*	Protected
Chuckwalla	*Sauromalus ater*	
Desert glossy snake	*Arizona elegans eburnata*	
Mojave Desert sidewinder	*Crotalus cerastes cerastes*	
Mojave shovel-nosed snake	*Chionactis occipitalis occipitalis*	
Nevada shovel-nosed snake	*Chionactis occipitalis talpina*	
Fish		
Meadow Valley speckled dace	*Rhinichthys osculus ssp.*	
Meadow Valley Wash desert sucker	*Catostomus clarki ssp.*	Sensitive
Moapa speckled dace	*Rhinichthys osculus moapae*	Sensitive
Virgin River chub (Muddy R. pop. only)	*Gila seminuda*	Sensitive
Virgin spinedace	*Lepidomeda mollispinis mollispinis*	Protected
Invertebrates		

Common name	Scientific name	State status
Big Dune aphodius scarab	*Aphodius spp*	
Giuliani's Big Dune scarab	*Pseudocotalpa giulianii*	
Large aegialian scarab	*Aegialia magnifica*	
Rulien's miloderes weevil	*Miloderes spp*	
MacNeil sooty wing skipper	*Hesperopsis gracielae*	
Northern Mojave blue	*Euphilotes mojave virginensis*	
Mojave gypsum bee	*Andrena balsamorhiza*	
Mojave poppy bee	*Perdita meconis*	
Moapa pebblesnail	*Pyrgulopsis avernalis*	
Moapa Valley pyrg	*Prygulopsis carinifera*	
Crystal springsnail	*Pyrgulopsis crystalis*	
Spring mountains pyrg	*Pyrgulopsis deaconi*	
Ash Meadows pebblesnail	*Pyrgulopsis erythropoma*	
Fairbanks springsnail	*Pyrgulopsis fairbanksensis*	
Elongate gland springsnail	*Pyrgulopsis isolatus*	
Distal gland springsnail	*Pyrgulopsis nanus*	
Median gland Nevada pyrg	*Pyrgulopsis pisteri*	
Southeast Nevada pryg	*Pyrgulopsis turbatrix*	
Sportinggoods tryonia	*Tryonia angulate*	
Point of Rocks tryonia	*Tryonia elata*	
Minute tryonia	*Tryonia ericae*	
Amargosa tryonia	*Tryonia variegata*	
Devils Hole warm spring riffle beetle	*Stenelmis calida calida*	
Moapa warm spring riffle beetle	*Stenelmis moapa*	

3.2.7.2.1.1. Mammals

3.2.7.2.1.1.1. Desert Bighorn Sheep

The earliest archaeological record for desert bighorn sheep indicates the species has occurred in Nevada for the past 28,000 years (Buck et al. 1997). As eyesight is fundamentally the species' primary sense for predator detection (Bleich et al. 1990b), bighorn sheep habitat preference includes open, usually treeless vegetation types with plant communities containing grasses, sedges, and forbs for foraging, typically in close proximity to steep, rocky terrain for predator escape where they exhibit remarkable agility. While quality of diet varies greatly among years, it usually is highest in late winter and spring (Wehausen 1992), coinciding with peak of lambing season. Desert bighorns have a lengthy lambing season that can begin in December and end in June (Thompson and Turner 1982, Bunnell 1982, Wehausen 1990). Moisture is primarily derived through their diet of a variety of desert plants, however, surface waters are a vital component of their survival and important to population health (Festa-Bianchet 1999; Turner and Weaver 1980).

The mountain ranges within the planning area are characterized by scarce rainfall and high summer temperatures that curb vegetative growth to low stature. Nevada has one of the largest populations of desert bighorn sheep in the United States. The planning area approximately encompasses a combined 884,754 acres of habitat and potential habitat for the species (crucial range – 247,227 acres, winter range – 557,403 acres, historic, unoccupied range – 80,124 acres; see Map 3.2.6.1 - 2 (p. 2143)). The River Mountains ACEC contains bighorn sheep habitat and was established to help protect that resource value.

Proper habitat management is particularly important for populations that occur within the planning area owing to considerable movement between mountain ranges. This movement is a significant

component for preserving genetic connectivity, decreasing the likelihood of inbreeding, as well as colonization of vacant habitat. (Schwartz et al. 1985; Bleich et al. 1990b).

Threats to population health and stability comprise anthropogenic-induced effects such as competition for surface water resources and forage with wild horses and burros and livestock; habitat fragmentation through urban expansion; and most significantly, disease contracted from domestic animals. Bighorn sheep are exceptionally vulnerable to viral and bacterial diseases carried by livestock, principally domestic sheep. In some reported cases, bighorn sheep exposure to these diseases has resulted in the decimation of entire populations. Vectors include nose-to-nose contact and wet soils associated with areas of concentrated use, particularly watering ponds. Domestic sheep grazing on public lands does not occur in the planning area. There is still a risk of disease spread, though, from domestic sheep on private property.

Management of bighorn sheep is guided by the Rangewide Plan for Managing Habitat of Desert Bighorn Sheep on Public Lands (BLM 1989) and the Mountain Sheep Ecosystem Management Strategy in the 11 Western States and Alaska (BLM 1995). The plans follow three objectives: 1) maintain or enhance habitat currently supporting viable populations; 2) enhance habitat with remnant herds that are capable of supporting viable populations; and 3) maintain and enhance historic habitat to allow reintroduction and re-establishment of viable populations. Goals for facilitation of recovery follow these objectives and require cooperation and dialogue from organizations such as the Nevada Department of Wildlife and the Desert Bighorn Sheep Council. During the past two decades, statewide bighorn populations have increased. Upward trends are continued to be predicted as bighorn sheep are reintroduced into historic habitat, natural surface waters are restored, water developments are created, and as favorable land-use decisions are implemented. Individual populations, though, are still at risk due to disease outbreaks, localized drought conditions, competition with wild horses and burros, and nearby development.

3.2.7.2.1.1.2. Pale Kangaroo Mouse

The pale kangaroo mouse is a Great Basin species found mostly in the central part of Nevada. In the planning area, it is found in the northwest portion of Clark County and the central portion of Nye County. It is a sand-obligate that is restricted to fine, loose, sandy soils (with little or no gravel overlay) in valley bottoms dominated by saltbush and greasewood. It is sometimes found near sagebrush at the upper end of its elevation range. The species primarily eats grasses and a variety of forbs, but in the summer, its diet is supplemented with insects.

Based on trapping results, the pale kangaroo mouse is among the least abundant of the nocturnal desert rodents in the sandy habitats of the Great Basin. These studies, though, documented that the geographical distribution of this species has remained mostly unchanged over the past 75 years (WAPT 2012).

3.2.7.2.1.1.3. Bats

There are 20 BLM sensitive bat species of the 23 species in Nevada that are known to occur within the planning area. Little population information is known for most bat species within the planning area, therefore; most trends are unknown with the exception of six species (cave myotis, Townsend's big-eared bat, western pipistrelle, fringed myotis, long-eared myotis, and long-legged myotis) that are experiencing downward trends. In general, the long-term persistence of North American bat species is threatened by the loss of clean, open water; modification or destruction of roosting and foraging habitat; and, for hibernating species, disturbance or destruction of

hibernacula. Chemicals in the environment that affect bats or their prey are also threats. Currently, the greatest threat to bat species nationally is white nose syndrome, a rapidly spreading fungus disease responsible for mortality of more than 90 percent in caves with hibernating bats and more than 7 million bat deaths to date. Low fecundity, high juvenile mortality, and long generational turnover may leave many bat populations vulnerable to human-induced pressures.

3.2.7.2.1.1.3.1. Allen's Big-Eared Bat

Summer habitat consists of high elevation pine and oak woodlands but can include a variety of riparian woodlands across a wide elevational gradient. Winter habitat consists of creosote bush to pinyon-juniper at lower elevations. This species generally day roosts in trees, specifically large snags, but will utilize mines and caves, as well (Bradley et al. 2006).

3.2.7.2.1.1.3.2. Big Brown Bat

This species occurs in pinyon-juniper, blackbrush, creosote, sagebrush, agriculture, and urban habitats. Day roosts include caves, trees, mines, buildings, and bridges. Night roosts are similar with preference for more open roost sites within those settings (Bradley et al. 2006).

3.2.7.2.1.1.3.3. Big Free-Tailed Bat

Big free-trailed bats are generally associated with very rocky country or canyonlands and can be found in arroyo, scrub desert, riparian areas, and woodland habitats, although more generally a floodplain-arroyo association. Roosting habitats include crevices in cliff faces, but the species will occasionally use buildings and caves (Bradley et al. 2006).

3.2.7.2.1.1.3.4. Brazillian Free-Tailed Bat

Brazilian free-tailed bats can be found in a variety of habitats ranging from low desert to high mountain habitats. Day roosts include cliff faces, mines, caves, buildings, bridges, and hollow trees. Roosting colonies in Nevada can number from several hundred to several thousand, but colonies are much larger elsewhere (Bradley et al. 2006).

3.2.7.2.1.1.3.5. California Leaf-Nosed Bat

California leaf-nosed bat occurs in the extreme southern portion of Nevada. It is dependent on caves and mines for day roosting, but night roosting occurs in a variety of places including buildings, cellars, porches, bridges, rock shelters, and mines. Habitat includes low-elevation desert scrub in proximity to desert riparian areas (Bradley et al. 2006).

3.2.7.2.1.1.3.6. California Myotis

This species is found in habitats ranging from lower Sonoran Desert scrub to forests. The California myotis prefers to roost in crevices within caves, buildings, rock crevices, hollow trees, and under exfoliating bark during the day. Night roosts comprise a wider variety of structures (Bradley et al. 2006).

3.2.7.2.1.1.3.7. Cave Myotis

Distribution for this species includes a single historical record, in 1964, at a mine in the southern portion of the Lake Mead National Recreation Area west of Lake Mohave. This mine was recently relocated and verified to still contain the species, although apparently numbers were not as high as what was previously reported. Cave myotis can be found at lower elevations in arid habitat dominated by creosote bush, palo verde, brittlebush, cactus, and desert riparian areas (Bradley et al. 2006).

3.2.7.2.1.1.3.8. Fringed Myotis

Fringed myotis can be found in a wide range of habitats from low desert scrub to high elevation coniferous forests. They use mines, caves, trees, and buildings for day and night roost sites and are very sensitive to roost disturbance (Bradley et al. 2006).

3.2.7.2.1.1.3.9. Greater Western Mastiff Bat

Until recently, a single specimen found dead in Las Vegas in 1966 was the only known record for this species. Since 2001, multiple acoustic records of this species have been collected from the Spring Mountains (O'Farrell 2002), the Las Vegas Wash (O'Farrell per. com. as cited in Bradley et al. 2006), Meadow Valley Wash (Tomlinson and Kenney 2005), and along the Colorado River near Laughlin (Brown and Berry 2003). Western mastiff bats can be found in desert scrub, chaparral, montane, and coniferous forests with distribution tied to availability of suitable roosting habitat. Day roosts include crevices in cliff faces and cracks in boulders, but the species will occasionally use buildings, as well.

3.2.7.2.1.1.3.10. Hoary Bat

Hoary bats are tree-associated species found primarily in forested upland habitats, as well as gallery-forest riparian areas and agriculture habitats. They may be found in urban settings, particularly parks and gardens. Day roosts consist of trees, with foliage 3 to 12 meters above ground in both coniferous and deciduous trees (Bradley et al. 2006).

3.2.7.2.1.1.3.11. Long-Eared Myotis

Long-eared myotis occurs at higher elevations associated with coniferous forests, usually Ponderosa pine or other high elevation tree species. Day roosts include hollow trees, under exfoliating bark, crevices in small rock outcrops, and occasionally in mines, caves, or buildings. They also have been found night roosting in caves, mines, and under bridges (Bradley et al. 2006).

3.2.7.2.1.1.3.12. Long-Legged Myotis

Habitat preference includes mid to high elevations in areas of pinyon-juniper, Joshua tree woodlands, and montane coniferous forests; they do not occur in low desert habitats. Day roosts include hollow trees, particularly large-diameter snags or live trees with lightning scars, rock crevices, caves, mines, and buildings. Night roosts include caves and mines (Bradley et al. 2006).

3.2.7.2.1.1.3.13. Pallid Bat

Pallid bats occur in a variety of habitats, from low desert to brushy terrain, to higher elevation coniferous forests and non-coniferous woodlands. Day roost sites include rock outcrops, mines (maternity colonies have been found in geothermally influenced adits), caves, hollow trees, buildings, and bridges. In addition to caves and mines, night roosts are commonly found under bridges (Bradley et al. 2006).

3.2.7.2.1.1.3.14. Silver-Haired Bat

Silver-haired bats are confined primarily to forested habitats. They are more common in mature forests but can be found in riparian corridors in this area. Silver-haired bats roost almost exclusively in trees during the summer; winter roosts include hollow trees, rock crevices, mines, caves, and houses (Bradley et al. 2006).

3.2.7.2.1.1.3.15. Spotted Bat

Spotted bat distribution is patchy and linked to availability of cliff-roosting habitat. They can be found in a wide variety of habitats from low-elevation desert scrub to high-elevation coniferous forest habitats, including pinyon-juniper, sagebrush, riparian, and on urban high-rise (cliff analog) habitats (Bradley et al. 2006).

3.2.7.2.1.1.3.16. Townsend's Big-Eared Bat

Distribution is strongly correlated with availability of caves and abandoned mines. In addition, the species will utilize trees and buildings. Townsend's big-eared bats are found primarily in rural settings, low deserts, and in mid to high-elevation mixed coniferous-deciduous forest (Bradley et al. 2006).

3.2.7.2.1.1.3.17. Western Pipistrelle

Habitat requirements for this species are composed of blackbrush, creosote, salt desert shrub, and sagebrush, with occasional occurrence in ponderosa pine and pinyon-juniper, usually in association with rock features such as granite boulders and canyons. (Bradley et al. 2006).

3.2.7.2.1.1.3.18. Western Small-Footed Myotis

Western small-footed myotis occur in a variety of habitats including desert scrub, grasslands, sagebrush steppe, blackbrush, pinyon-juniper, pine forests, and urban areas. Roost sites have been located in caves, mines, and trees (Bradley et al. 2006).

3.2.7.2.1.1.3.19. Yuma Myotis

Yuma myotis occur in a variety of habitats from low- to mid-elevations, including sagebrush, salt desert scrub, agriculture, playa, and riparian habitats. They use buildings, trees, mines, caves, bridges, and rock crevices for roost sites during the day. Night roosts consist of buildings, bridges, or other man-made structures. Owing to the type of roosting habitat favored, Yuma myotis is somewhat tolerant to human development and thrives in a relatively urbanized environment (Bradley et al. 2006).

3.2.7.2.1.1.3.20. Western Red Bat

The western red bat is extremely rare in Nevada, and limited documentation exists. Western red bats have been found in the Muddy River drainage. This species can be found primarily in wooded habitats, including mesquite bosque and cottonwood/willow riparian areas. The western red bat day roosts in trees (Bradley et al. 2006).

3.2.7.2.1.2. Birds

Owing to rapid population growth in Southern Nevada, most avian species occurring in the planning area have experienced loss and modification of habitat with consequent reductions in population levels. Concurrent with habitat losses have been increases in predators and other exotic wildlife, which can introduce disease, inhibit reproductive success, and further reduce population levels. As the human population increases in the area, interactions with species can also increase. In addition to the species discussed below, numerous bird species of concern migrate through Southern Nevada and may temporarily utilize the same habitats but typically will not nest at these locations. In addition to being BLM sensitive species, the species below are also covered under the Migratory Bird Treaty Act (p.).

3.2.7.2.1.2.1. Bald Eagle

The bald eagle was previously a federally listed species but was officially delisted in 2007. The bald eagle is also protected by the Bald and Golden Eagle Protection Act (16 USC 668–668d, 54 Stat. 250, as amended) which prohibits the taking or possession of, or commerce in, bald and golden eagles with limited exceptions for permitted scientific research and Native American religious purposes. The USFWS does issue incidental take permits under certain circumstances.

In the planning area, no nesting bald eagles have been observed, but eagles do winter in the area, mostly along the shores of Lake Mead and Lake Mohave. Winter roosts include tall trees or cliffs near water bodies that are their source of food. Most of the suitable winter habitat in the planning area is managed by the National Park Service, but there is potential winter habitat on BLM lands along the Virgin and Muddy rivers. Winter eagle counts performed the by the National Park Service have shown an increase in wintering bald eagles in the area in recent years.

3.2.7.2.1.2.2. Bendire's Thrasher

In Southern Nevada, Bendire's thrashers occur mostly in Joshua tree woodlands with dense grass, but they can also occur in desert scrub habitats with cholla or mesquite or in sagebrush with scattered junipers. They normally avoid dense woodlands and areas with very sparse vegetation. They typically nest in mesquite, cholla, juniper, Joshua trees, and other yucca species. Their population trend in Southern Nevada is unknown, but they are declining in other parts of their range.

3.2.7.2.1.2.3. Brewer's Sparrow

Brewer's sparrow is a Great Basin species and is highly associated with sagebrush habitats. It nests in the planning area in areas with sagebrush and will winter in desert scrub habitats. Brewer's sparrows nest in sagebrush, other shrubs, and cacti. Although this is a common and numerous sagebrush species, their populations have declined recently.

3.2.7.2.1.2.4. Ferruginous Hawk

The ferruginous hawk occurs year-round in central and northern Nevada. They do not nest in the planning area but will overwinter in the area. They occur in open areas such as agricultural fields and desert scrub habitat. Their numbers appear to be stable (WAPT 2012).

3.2.7.2.1.2.5. Golden Eagle

Generally the golden eagle can be found in open country, open wooded country, and barren areas, especially in hilly or mountainous regions. Nesting typically occurs on rock ledges, cliffs, or in large trees. They hunt while soaring or from tall perches and can have territories ranging from 35 to 90 square miles. Population trends in Nevada are unknown, but golden eagles can be impacted due to loss or fragmentation of habitat and mortality due to collisions with vehicles or wind turbines or electrocution by power lines. The golden eagle is also protected by the Bald and Golden Eagle Protection Act. The 1978 amendment to the act authorizes the Secretary of the Interior to permit the taking of golden eagle nests that interfere with resource development or recovery operations.

3.2.7.2.1.2.6. LeConte's Thrasher

LeConte's thrasher is a year-round resident in the Mojave Desert of Southern Nevada. In Nevada, they are associated with saltbush flats and wash systems and nest in cholla cactus, sagebrush, small trees, or shrubs (WAPT 2012). This thrasher prefers open habitats for foraging with sparse vegetation for cover and is a good indicator of habitat quality. Their population trend in Southern Nevada is unknown.

3.2.7.2.1.2.7. Lewis' Woodpecker

This species breeds and winters in the planning area. Habitat for this species includes open tree canopy, a brushy understory with ground cover, and snags for nest cavities. They also prefer downed woody debris for perch sites and areas with abundant insects. In addition, they can be found in woodlands, orchards, pinyon-woodlands, open coniferous forests and agriculture lands. This woodpecker typically nests in natural, abandoned, or previously used cavities due to morphological features not well-adapted to excavate cavities in hard woods. Range-wide, this species has experienced a decline of more than 25 percent, but in Nevada, the trend is unknown (WAPT 2012).

3.2.7.2.1.2.8. Loggerhead Shrike

This species prefers open country with nesting habitat preference toward scattered trees and shrubs. They are commonly found in shrub habitat types comprising savanna, desert scrub, and occasionally, open woodland. Perches are an important habitat component used for hunting. If natural perches are unavailable, they will perch on poles, wires or fence posts. Population trend data in Nevada has shown an unexplained 5 percent decline per year since 1966 (WAPT 2012).

3.2.7.2.1.2.9. Peregrine Falcon

Formerly a federally listed species, the peregrine falcon was delisted in 1999. This raptor is a permanent resident throughout Nevada, and the current population trend for this falcon is

increasing. Habitat generally involves areas near open water, desert scrub, and marshes, all of which are usually in close association with suitable nesting cliffs. Mountains, open forested regions, and human-populated areas with tall structures can also be used as habitat. Nesting in Nevada has occurred on ledges or holes on faces of rocky cliffs or crags and ledges of city high-rise buildings (WAPT 2012).

3.2.7.2.1.2.10. Pinyon Jay

This jay is a permanent resident in Nevada but is tied to pinyon pine habitats because pinyon nuts are their primary food item (NPIFWG 1999). This species can also be found nesting in scrub oak and sagebrush. Since 1966, this species has experienced a range-wide population decline of 50 percent, and in Nevada, population declines of almost 10 percent (WAPT 2012).

3.2.7.2.1.2.11. Swainson's Hawk

Swainson's hawks occur in open grasslands and shrublands and are well adapted to agricultural areas. In Nevada, they are found mostly in the central and northern part of the state, but have been recorded breeding in the Ash Meadows National Wildlife Refuge. They nest in trees near open areas where they forage. While other raptor species have increased in numbers recently, the Swainson's hawk still appears to be declining due to loss of habitat and mortality in its wintering grounds in South America.

3.2.7.2.1.2.12. Western Burrowing Owl

Optimum habitat for the burrowing owl includes low-stature vegetation and presence of fresh small mammal burrows. The owl generally occurs in open desert scrub, grasslands, sagebrush, and sagebrush-steppe, but they can also occur in open areas such as empty lots near human habitation. Burrowing owls nest underground in burrows. They rarely excavate their own burrows, preferring to use burrows constructed by other species such as desert tortoise, kit fox, or badger. The population trend in the planning area is unknown (WAPT 2012).

3.2.7.2.1.2.13. Western Snowy Plover

The western snowy plover nests on the ground on broad open beaches or salt or dry mud flats where vegetation is sparse or absent. In Nevada, it mostly occurs in the central and northern part of the state but has been observed recently nesting along the Virgin River in the planning area. Its population trend in Southern Nevada is unknown, but in Nevada overall, its numbers have been stable. It is susceptible to loss of habitat due to changes in an area's hydrology.

3.2.7.2.1.3. Reptiles

Owing to rapid population growth in Southern Nevada, most reptilian species occurring in the planning area have experienced habitat loss and modification with consequent reductions in population levels. Habitat degradation may be caused by urban, mineral, and energy development; construction activities; military operations; agriculture; recreation activities such as OHV/ORV; fire; or invasive plant introduction. Transportation, such as roads, highways, and railroads have also blocked migration and limited genetic mixing. There also have been increases in predators and exotic wildlife introduction, which can introduce disease, inhibit reproductive success, and further reduce population levels. As the human population increases in the area, interactions with

species increases and can lead to illegal shooting or collecting, accumulation of garbage and litter, and an increase in noise and vibration that can displace natural nesting and hibernation activities.

3.2.7.2.1.3.1. Banded Gila Monster

Gila monsters, the only venomous lizard in the United States, occur in desert washes and rocky upland desert scrub at elevations below 5,000 feet. Banded Gila monsters frequently utilize lower slopes of mountains and nearby plains. They will use and are occasionally encountered out in gentler terrain of alluvial fans. Hence, Gila monster habitat overlaps habitats of both the desert tortoise and chuckwalla (WAPT 2012). Their population trends in the planning area are unknown, but they are susceptible to habitat loss and illegal collection.

3.2.7.2.1.3.2. Chuckwalla

Chuckwalla occur in rocky desert, lava flows, hillsides, and rock outcrops where creosote bush is typically the dominant plant species. Chuckwalla will seek shelter in rock crevices and bask on rocks during the day. They are herbivorous, preferring annuals, but they will also eat perennial vegetation. Chuckwallas are relatively common throughout their Nevada range and may be commercially collected with a permit from the Nevada Department of Wildlife. Their population trends in the planning area are unknown but may be declining due to loss of habitat and overcollection.

3.2.7.2.1.3.3. Desert Glossy Snake

This desert glossy snake inhabits a variety of habitats including creosote scrub, saltbush scrub, blackbrush scrub, and Joshua tree woodlands. It can occur in open sandy areas or rocky areas. Population trends for this species are unknown, but it is assumed to be impacted by habitat loss and overcollection.

3.2.7.2.1.3.4. Mojave Desert Sidewinder

This species primarily inhabits areas of wind-blown sands, desert flats with sandy washes, or sand dunes that are sparsely vegetated. They are also sometimes found in hardpan, open flats, rocky hillsides, and other desert areas, especially areas with creosote bush where the terrain is open and not obstructed by rocks or vegetation. The population trends of desert sidewinders in the planning area are unknown.

3.2.7.2.1.3.5. Mojave and Nevada Shovel-Nosed Snakes

The Mojave and Nevada shovel-nosed snakes are closely related subspecies. In general, the species occurs in the southwestern U.S. in dry desert habitats with loose sand and often with little vegetation (i.e. washes, dunes, sandy flats, and rocky hillsides). In the planning area, the Mojave shovel-nosed snake occurs mostly in Clark County, while the Nevada shovel-nosed snake occurs mostly in Nye County. Population trends of the two subspecies are unknown, but the species is assumed to be impacted due to habitat loss and excessive OHV recreation in some areas.

3.2.7.2.1.4. Fish

Current threats for native fish species are habitat modification or loss and the introduction and establishment of non-native fish, particularly red shiner and tilapia. Decline of fish species has been associated with major changes in the ecosystem including water diversion, water depletion, and construction and operation of dams. The building of dams and associated reservoirs, water diversion structures, canals, laterals, aqueducts, and dewatering of streams can cause loss or degradation of available habitats and block migration routes. The introduction of the shortfin molly (*Poecilia mexicana*), blue tilapia (*Oreochromis aureus*), common carp (*Cyprinus carpio*), channel catfish (*Ictalurus punctatus*), largemouth bass (*Micropterus salmoides*), fathead minnow (*Pimephales promelas*), and black bullhead (*Ameiurus melas*) into aquatic habitats has contributed to population declines of native species. Prior fish introductions have introduced fish parasites including tapeworms (*Bothriocephalus acheilognathi*), nematodes (*Contracaecum spp.*), and anchor worms (*Lernaea spp.*) that have adversely affected native fishes in many systems.

In addition, terrestrial activities, such as human impacts associated with agriculture, mining, groundwater pumping, and urbanization, are factors degrading instream habitat through runoff, decreased streambank stability, and impaired water quality. The decline in species' range and population numbers is due to the physical reduction in available habitats within the various river systems caused by water projects. This loss of habitat has been exacerbated due to the introduction and establishment of exotic species, further reducing the suitability of remaining habitats. The threats are magnified by the naturally limited range of most fish species in the planning area.

3.2.7.2.1.4.1. Meadow Valley Speckled Dace

The Meadow Valley speckled dace inhabits a small range in the Meadow Valley Wash. Habitat preference for this species includes streams with deep cover or overhead protection from vegetation and woody debris. Similar to the Meadow Valley Wash desert sucker, habitat for this species can be patchy due to the frequent floods and ephemeral nature of portions of the wash. Population trends are thought to be stable.

3.2.7.2.1.4.2. Meadow Valley Wash Desert Sucker

Meadow Valley Wash desert sucker is a subspecies of the desert sucker or Gila Mountain desert sucker. It occurs in the Meadow Valley Wash mostly in Lincoln County, but it may reach into Clark County depending on flow rates. This species prefer streams with gravelly bottoms, which is important habitat for feeding and spawning. Meadow Valley Wash is subject to frequent flood events and ephemeral flows along some portions during summer months. These lead to a patchy distribution of suitable habitat. Populations are thought to be stable with multiple isolated populations.

3.2.7.2.1.4.3. Moapa Speckled Dace

The Moapa speckled dace has been documented in the middle Muddy River, downstream from the Warm Springs area. The Moapa speckled dace prefers stream habitat with deep cover or overhead protection from vegetation or woody debris. This species is known to co-occur with the Virgin River chub. Populations are thought to be declining due to introduction of non-native fish and loss of habitat due to groundwater and surface water developments.

3.2.7.2.1.4.4. Virgin River Chub (Muddy River populations only)

This fish is restricted to a portion of the middle Muddy River near Moapa. This population of Virgin River chub was regarded by DeMarais et al. (1992) as "distinctive," and it is apparently reproductively and physically isolated from the Virgin River population. It occurs in the river mostly in deeper pools with slow to moderate water velocities and instream cover such as boulders or root snags. Recent surveys have shown a decline in chub population numbers in the Muddy River.

3.2.7.2.1.4.5. Virgin Spinedace

The Virgin spinedace occurs mostly in tributary streams of the Virgin River and is rarely found in the mainstem Virgin River itself. Therefore, in Nevada, it is mostly limited to the Beaver Dam Wash, which is outside the planning area. There is a chance, though, for the species to occur in the Virgin River in the planning area in the future. The species is found mostly in rocky riffles, runs, and pools associated with small rivers and headwaters. Population trends for the spinedace are stable to increasing in the areas along the Virgin River where it is found.

3.2.7.2.1.5. Invertebrates

Threats to aquatic invertebrates include spring degradation by wild horses and burros and cattle, diversion of water for urban development and agriculture, and introduction of exotic species into spring ecosystems. Threats to terrestrial invertebrates include habitat disturbance to host plants from grazing, fire, OHV/ORV recreational activities, and increased urban and energy development. Introduction of exotic plant species that take over native habitats can also threaten habitat quality or potential.

3.2.7.2.1.5.1. Dune Beetles

Giuliani's Dune scarab beetle, large aegialian scarab beetle, and Big Dune Aphodius scarab beetle are endemic to Big Dune and Lava Dune in the Amargosa Desert of Nye County. Rulien's Miloderes weevil was also documented at Big Dune, but further information is needed to determine its full distribution. Both the Giuliani's Dune scarab beetle and the large aegialian scarab beetle were petitioned for listing under the Endangered Species Act in 1978 and 2010, and threats to the species included mining, solar development, and ORV use. However, listing was found to not be warranted after a 12-month status review by the USFWS (77 FR 42238). The Nevada Natural Heritage Program considers Big Dune and Lava Dune of the "highest conservation priority", ranking the dual sites among the most important in the state for only known or highest quality populations of highly imperiled species (NNHP 2006).

These invertebrates are associated with the sandpaper plant (*Petalonyx thurberi*), which occurs on the periphery of the dunes. Therefore, any area on or surrounding the dune where the sandpaper plant occurs is potential habitat. Other vegetation around and on the dunes includes creosote bush (*Larrea tridentata*), prickly poppy (*Argemone corybosa*) and astragalus (*Astragalus lentiginosus* var. *variabilis*). These plants provide food, mating sites and when covered with sand, shelter and food for their larvae. The beetles also burrow into the harder layers of sand when they are inactive. Historical surveys have indicated that Giuliani's dune scarab beetle has a higher concentration on the northwest side of the dune. Limited information is known about these species and the dunes themselves.

The dunes are a dynamic system as they shift continuously depending on the wind and the source of the sand. Therefore, the beetle habitat is also dynamic. The optimal habitat for the species may change with the movement of the dune. It is estimated that a total of approximately 1,706 acres of potential habitat for the large aegialian scarab and approximately 1,253 acres of potential habitat for Giuliani's Dune scarab surround Big Dune and Lava Dune (77 FR 42238). The Big Dune ACEC was designated as such for its special status species habitat value and encompasses most of the beetle habitat. The unvegetated area of Big Dune also carries a designation as a BLM special recreation management area.

3.2.7.2.1.5.2. MacNeil Sootywing Skipper

The only known populations of MacNeil sootywing skipper in the planning area are scattered colonies along the Muddy River. Its larval host plant is quailbush (*Atriplex lentiformis*). Known nectar plants include saltcedar, heliotrope (*Heliotropium curassavicum*), and alfalfa (*Medicago sativa*). Population trends in the planning area are unknown.

3.2.7.2.1.5.3. Northern Mojave Blue Butterfly

The Northern Mojave blue butterfly is known in Nevada only from the Virgin Mountains. Its larval host plants are annual species of buckwheat (*Eriogonum* sp.). Nectar plants include buckwheats and cryptanthas. Population trends in the planning area are unknown but assumed to be stable.

3.2.7.2.1.5.4. Mojave Gypsum Bee

This bee occurs in and around Lake Mead and the Las Vegas area where it is restricted to gypsum soils associated with its host plant, silverleaf sunray (*Enceliopsis argophylla*). This bee is presumed to excavate nests in the ground because soil nesting is characteristic of Andrenidae, the family to which the species belongs. It pollinates only silverleaf sunray, which is the sole food source for its offspring (Griswold et al 1999). Population trends for this species are unknown.

3.2.7.2.1.5.5. Mojave Poppy Bee

This bee is presumed to be a ground-nesting bee that is present in areas of diverse soils from gypsum to sand. This bee is a specialist on a few large flowered plants from the poppy family (Papaveraceae) including bearpoppies (*Arctomecon californica* and *A. humilis*), and several prickly poppy species (*Argemone sp.*). It has not been found on white bearpoppy (Griswold et al. 1999). Population trends are unknown.

3.2.7.2.1.5.6. Springsnails

Springsnails, including the BLM sensitive species in the genera *Pyrgulopsis* and *Tyronia*, are a diverse group of very small freshwater gastropods that are found in the outflow of springs. Due to the isolation of most springs, there has been a large amount of speciation in the group. Therefore, many of the species are endemic to a single or couple of springs within the planning area. Of the 14 species of springsnail on the BLM sensitive species list, 10 of them are found mostly on or near the Ash Meadows National Wildlife Refuge. Population trends for most of the species are unknown, but springsnails are very sensitive to changes in spring hydrology and water quality. All of the species were included as part of a bigger list of springsnails petitioned to be listed in

2009. The USFWS determined that listing may be warranted for all of the species in the planning area, and they are currently undergoing a full status review by the USFWS (76 FR 56608).

3.2.7.2.1.5.7. Devils Hole and Moapa Warm Spring Riffle Beetles

The two sensitive warm spring riffle beetles occur in outflow areas of warm water springs. The Devils Hole warm spring riffle beetle occurs in Devils Hole managed by the National Park Service. The Moapa warm spring riffle beetle occurs in the Warm Springs area near Moapa. Warm spring riffle beetles occur in shallow water on pebbles, algae-covered rocks, aquatic vegetation, and tree roots. Population trends for these species are unknown.

3.2.7.2.2. Plants

In addition to the sensitive wildlife species, there are 26 plants designated as sensitive species within the planning area (see Table 3.19, "BLM Sensitive Plant Species in the Planning Area" (p. 374)). BLM has little specific information to determine quantitative trends for special status plants in the planning area since the 1998 RMP. The area occupied by rare plant habitats in the planning area is finite. In general, the acreage of rare plant habitats has decreased since the 1998 RMP because of BLM realty actions, congressionally mandated land transfers (land sales, patents, and right-of-way authorizations), mining (see the Lands and Realty (p. 460) and Minerals (p. 427) sections), and fire. This decrease has been predominantly on multiple-use lands within designated disposal boundaries and utility corridors. In general, rare plant habitats are slow to recover following disturbance. The condition of special status plant species habitats has deteriorated due to colonization by non-native invasive species and surface-disturbing activities such as casual recreation use (e.g. motorized recreation) and grazing by livestock, wild horses, and wild burros.

Table 3.19. BLM Sensitive Plant Species in the Planning Area

Common name	Scientific name	State-listed
Alkali mariposa lily	*Calochortus striatus*	No
Beaverdam breadroot	*Pediomelum castoreum*	No
Black whollypod	*Astragalus funereus*	No
Blue Diamond cholla	*Cylindropuntia whipplei var. multigeniculata*	Yes
Clokey buckwheat	*Eriogonum heermannii var. clokeyi*	No
Death Valley beardtongue	*Penstemon fruticiformis ssp. amargosae*	No
Death Valley sage	*Salvia funerea*	No
Gold Butte moss	*Didymodon nevadensis*	No
Halfring milkvetch	*Astragalus mohavensis var. hemigyrus*	No
Las Vegas bearpoppy	*Arctomecon californica*	Yes
Mokiak milkvetch	*Astragalus mokiacensis*	No
Pahrump Valley buckwheat	*Eriogonum bifurcatum*	No
Pahrump silverscale	*Atriplex argentea var. longitrichoma*	No
Parish phacelia	*Phacelia parishii*	No
Rock purpusia	*Ivesia arizonica var. saxosa*	No
Rosy two-toned penstemon	*Penstemon bicolor ssp roseus*	No
Scrub lotus	*Lotus argyraeus var. multicaulis*	No
Silverleaf sunray	*Enceliopsis argophylla*	No
Sticky buckwheat	*Eriogonum viscidulum*	Yes
Sticky ringstem	*Anulocaulis leiosolenus var. leiosolenus*	Yes
Straw milkvetch	*Astragalus lentiginosus var. stramineus*	No

Common name	Scientific name	State-listed
Tecopa bird's beak	*Cordylanthus tecopensis*	Yes
Threecorner milkvetch	*Astragalus geyeri var. triquetrus*	Yes
White bearpoppy	*Arctomecon merriamii*	No
White margin beardtongue	*Penstemon albomarginatus*	No
Yellow two-toned penstemon	*Penstemon bicolor ssp bicolor*	No

3.2.7.2.2.1. Gypsum Endemics

Three of the BLM sensitive species in the planning area are considered gypsum endemic species. Plant species that inhabit gypsum soils exhibit a range of affinities/tolerances for gypsum soils, with some plants demonstrating high affinity (gypsophiles) and others able to grow on both gypsum and non-gypsum soils (gypsovags). In arid environments, gypsum soils are particularly stressful environments because plants generally do not retain water and the chemical properties of gypsum itself causes nutrient deficiencies. Because of these harsh growing conditions, vegetation on gypsum soils is slow to recover from disturbance. Gypsum is a locatable mineral (see Minerals (p. 427) section). In the planning area, gypsum soils are commercially mined to make gypsum products and have been withdrawn within ACECs. Mining remains a threat to gypsum endemic plants outside of ACECs. Because gypsum endemics do not recover quickly from disturbances, OHV activities that crush or remove vegetation are a threat to most populations.

3.2.7.2.2.1.1. Las Vegas Bearpoppy

The Las Vegas bearpoppy is protected by the state of Nevada under NRS 527.260. The Las Vegas bearpoppy is a short-lived perennial in the Papaveraceae family that typically lives four to five years with a reproductive biology that resembles an annual plant. As summarized the Clark County Conservation management strategy for nine low-elevation rare plants (TNC 2007), the species occurs mainly north of Lake Mead and west of the Virgin River and Overton Arm of Lake Mead. There are a few sites south of the reservoir in Arizona and a few locations east of the Overton Arm in the Gold Butte area. In 2005, a substantial population in the upper Las Vegas Wash was documented. The species known occurrences have been grouped into 13 tightly clumped population groups, 10 of which occur in Clark County (central and eastern) (TNC 2007). In the mid-1990s, BLM measured the species population on BLM lands to be 7,480 acres, with the largest population group in Sunrise Valley.

The species is restricted to gypsum soils that form relatively barren, low-competition sites within creosote, saltbush, and rarely blackbrush vegetation communities. Elevation of known species locations average 2,000 feet with a range of 1,100 to 3,300 feet. Approximately 40 percent of the species' historic distribution in Clark County has been lost or is privately owned due to development in the Las Vegas Valley and the Pabco gypsum mine. The species and its habitat are presently threatened by anthropogenic activity. The most significant threat is casual OHV activity and the creation of new trails (TNC 2007). Urban development, utility corridor construction, and gypsum mining are also important threats to the species (TNC 2007). The Las Vegas bearpoppy is dependent on a specialist bee. Disturbances that affect pollinator populations indirectly affect the species by reducing of pollination and seed production.

3.2.7.2.2.1.2. Sticky Ringstem

The sticky ringstem is a BLM special status species belonging to the Nyctaginaceae (four o'clock) family. The distribution of this robust herbaceous perennial includes Nevada, Arizona, New

Mexico, and Mexico. The entire range of the species consists of 17 known population groups. Populations in Nevada and Arizona are separated from other populations in New Mexico and Mexico by approximately 350 miles. The Clark County populations are unique and may be important for contributing genetic and ecotypic variation to the taxon. The Clark County populations are isolated, represent the westernmost part of the species range, and account for more than half of the distribution (8 of 17 known populations). The species occurs in Nevada only in Clark County (eastern half) at Frenchman Mountain, in the Black Mountains, Bitter Springs Valley, Muddy Mountains, and in the Gold Butte area. In the Mojave Desert, the species is restricted to gypsum outcrops, rolling hills, and terraces primarily within creosotes bursage vegetation communities and is associated with the Las Vegas bearpoppy at many locations. Elevation of known species locations in the Mojave Desert average 1,800 feet with a range of 1,200 to 2,400 feet.

The species and its habitat are primarily threatened by gypsum mining and casual OHV activity. Minor threats include wild horses and burros, competition with non-native species, and utility corridor construction/maintenance.

3.2.7.2.2.1.3. Silverleaf Sunray

The silverleaf sunray is a BLM sensitive species in both Nevada and Arizona belonging to the Asteraceae (sunflower) family. Surveys for this species are not complete. This herbaceous perennial with thick silver grey green leaves resprouts each year from a caudex. The center of the distribution of this species is the Lake Mead area. This species is largely confined to Clark County; Washington County, Utah; and Mohave County, Arizona. Habitat for this species is dry, open, relatively barren areas on gypsum badlands, volcanic gravels, and loose sands in the creosote-bursage zone. The silverleaf sunray is typically found at elevations of 1,165 to 2,380 feet. In the planning area, utility corridor construction, gypsum mining, and casual OHV activity threaten the species.

3.2.7.2.2.2. Sand Endemics

3.2.7.2.2.2.1. Beaverdam Breadroot

The beaverdam breadroot is a Nevada and Arizona BLM sensitive plant in the Fabaceae (pea) family. The species is known from 11 occurrences in Clark County, Nevada; San Bernardino County, California; and Mohave County, Arizona. Habitat for this low-growing, single-stemmed, deep-rooted, herbaceous perennial is predominantly sandy soils and well-drained gravels in the creosote-bursage and blackbrush vegetation communities. The beaverdam breadroot is typically found at elevations of 1,280 to 5,000 feet. Based on habitat modeling and known occurrences, there are approximately 30,000 acres of potential habitat within Clark County, 25,000 acres of which are managed by the BLM. In the planning area, beaverdam breadroot is threatened by casual OHV activity, renewable energy development, and competition with non-native species including Sahara mustard.

3.2.7.2.2.2.2. White Margin Beardtongue

The white margin beardtongue is a BLM sensitive species in the Scrophulariaceae (figwort) family. The species is restricted to the southeastern Mojave Desert including Nevada, California, and Arizona, with the largest distribution in Nevada. In Nevada, there are three populations in

Nye County (north of Ash Meadows, Rock Valley, and Specter Range), and four populations in Clark County (Hidden Valley, Jean Lake, Ivanpah Valley, and Roach Lake). In 2001, the Nevada population was estimated to cover 6,437 acres (TNC 2007). All populations in Clark and Nye counties are on multiple-use lands except for a small portion (10 percent) of the Hidden Valley population. In Nevada, this species occurs on loose deposits of aeolian sand or sandy alluvium. These areas are found particularly in or near small dry drainages, wash bottoms, on valley floors, gentle foot-slopes, or alluvial terraces. This specialized habitat is surrounded by creosote-bursage, salt desert scrub, or blackbrush vegetative communities.

Elevation of known species locations average 3,000 feet with a range from 1,200 to 3,500 feet. In the planning area, the species and its habitat are threatened by development, sand and gravel mining, casual OHV activity, and livestock grazing management. These activities have reduced the size and extent of populations and habitats through direct mortality and loss or fragmentation of habitats. Based on habitat modeling and known occurrences, there are approximately 12,000 acres of potential habitat within Clark County, of which the BLM manages more than 11,000 acres. Habitat modeling has not been done for the Nye County populations. Based on surveys from the mid-1990s of Clark County populations, the Ivanpah Valley and Roach Lake population groups exhibit the best long-term viability. The Jean Lake population has more documented individuals than the other four Clark County populations. The Jean Lake population is within the Jean Dry Lake Special Recreation Management Area. This area has experienced an increase in OHV activity since the 1990s. The Ivanpah Valley population is within the planned Ivanpah Valley Airport and will be transferred out of BLM management.

3.2.7.2.2.2.3. Sticky Buckwheat

The sticky buckwheat is an herbaceous winter annual in the Polygonaceae (buckwheat) family. This BLM sensitive species is also protected under Nevada Revised Statute 527.260. The species is endemic to the northeastern Mojave Desert, nearly confined to Clark County, although it does spill into adjacent Lincoln County and Mohave County in Arizona. Known occurrences are grouped into 13 population groups centered on the confluence of the Muddy and Virgin rivers. Clark County represents the vast majority of the species' known global distributions (11 of 13 populations groups). The species' habitat includes typical dune formations, open beach sand at waterline and on the adjacent sandy slopes of Lake Mead, solidified sands of dry wash channels, and sandy soils within creosote bush vegetative communities. The sand on which the species grows is delivered to its habitat primarily by fluvial transport. Elevation of known species' locations average 1,700 feet with a range of 1,200 to 2,500 feet.

The sticky buckwheat is threatened by inundation and shoreline fluctuation, fire, livestock grazing, and wild horse and burro management. These activities have reduced the size and extent of populations and habitats through direct mortality and loss or fragmentation of habitats. They have altered plant community composition by reducing native plant cover and aiding the spread of weeds. Exotic annuals that compete with the sticky buckwheat play a role in altering the fire regime of the plant communities and increase the risk of habitat-type conversion. They have altered conditions of substrates through soil erosion and stabilization and have disrupted maintenance of habitat through loss of fluvial sand deposition. No recent comprehensive status report exists for the species. Based on habitat modeling and known occurrences, there are approximately 27,000 acres of potential habitat in Clark County, of which the BLM manages just under 16,000 acres. The species' annual habit with wildly fluctuating population numbers has been an impediment for understanding long-term population viability.

3.2.7.2.2.2.4. Threecorner Milkvetch

The threecorner milkvetch is an herbaceous winter annual in the Fabaceae (pea) family. The threecorner milkvetch is listed by the state of Nevada under NRS 527.260 as critically endangered and is considered a sensitive species by the BLM. The varietal name "triquetrus" refers to the three-sided inflated seedpod of the variety that is well suited for wind dispersal. The species is restricted to the northeastern Mojave Desert and nearly confined to Clark County. It is centered on the confluence of the Muddy and Virgin rivers. Clark County represents the majority of the species' known global distributions (16 of 17 populations groups) (TNC 2007). The BLM, National Park Service, and the Lake Mead National Recreation Area share management of the species. The species' habitat has been described as stabilized sands that have cemented or surface-hardened cryptogamic crust and frequently with sparse gravel on the surface. The majority of the species' occurrences are within creosote-bursage vegetative communities, and a few are associated with warm desert wash or warm desert bedrock ecological systems. Elevation of known species locations average 1,800 feet with a range of 1,200 to 2,400 feet. Based on habitat modeling and known occurrences, there are approximately 45,000 acres of habitat within Clark County, approximately two-thirds of which are managed by the BLM. Primary threats to the threecorner milkvetch and its habitat on BLM lands include development, casual OHV activity, energy and utility corridor development, invasive plant species, and surface mineral mining.

3.2.7.2.2.3. Other Sensitive Species

3.2.7.2.2.3.1. Alkali Mariposa Lily

The alkali mariposa lily is a herbaceous perennial in the Liliaceae (lily) family. The species distribution encompasses California and Nevada with its center of distribution in California. The Nevada populations are isolated from the core populations in the west Mojave Desert by approximately 160 miles and therefore may be important populations for genetic and ecotypic variations. The species' known occurrences have been grouped into 15 populations. Four population groups occur in Nevada: one in Nye County and three in western Clark County that are managed by the BLM (Calico Hills and Lone Willow Spring in the Red Rock Canyon National Conservation Area and Las Vegas, which is presumed extirpated from urban development and sprawl).

The species is restricted to seasonally moist alkaline soil in association with desert springs, floodplains, and topographic depressions. Elevation of known species' locations average 2,812 feet with a range of 240 to 5,360 feet. The species and its habitat are subject to casual OHV activity, pedestrian trampling, and wild horse and burro activity in the springs that support the species. The Calico Hills population is the largest population group, and about half the sites in this population have heavy disturbance associated with them.

3.2.7.2.2.3.2. Black Whollypod

The black whollypod is in the Fabaceae (pea) family. In Nevada, surveys for this small perennial herb are largely incomplete. The species is known from 12 occurrences in Clark and Nye counties and Inyo County, California. Habitat for the black whollypod includes dry, open scree, talus, or gravelly alluvium derived from light-colored volcanic tuff. It is found on east, south, west (less common), and north (rarely) aspects in the blackbrush and sagebrush communities,

3,200 to 7,680 feet. In the planning area, renewable energy development and casual OHV activity threaten the species.

3.2.7.2.2.3.3. Blue Diamond Cholla

Blue Diamond cholla is a perennial in the Cactaceae (cactus) family. This cactus species occurs in Clark County and possibly Mohave County, Arizona. Recent surveys estimate the overall population of the species to be around 250,000, but extensive surveys have not been performed in all areas where the cactus could occur. Habitat includes rocky slopes with low shrub cover within creosote and blackbrush scrub. In the planning area, the species was originally thought to occur only in the Blue Diamond Hill area, but recent surveys have found populations on La Madre Mountain, the McCullough Range, Gass Peak, and Bonelli Peak (Baker 2005). This species is threatened by development, off-road vehicle use, trampling by wild horses and burros, and mining.

3.2.7.2.2.3.4. Clokey Buckwheat

Clokey buckwheat is a perennial in the Polygonaceae (buckwheat) family. This shrub is endemic to Clark, Nye, and Lincoln counties. Surveys for this species are largely incomplete. Habitat includes carbonate outcrops, talus, scree, and gravelly washes and banks in creosote-bursage, shadscale, and blackbrush from 4,000 to 6,000 feet. In the planning area, the species occurs on BLM lands in the lower elevations of the Spring Mountains and potentially the Specter Range and other ranges near Mercury (Morefield 2001). This species is threatened by off-road vehicle use, trampling by wild horses and burros, and mining.

3.2.7.2.2.3.5. Death Valley Beardtongue

The Death Valley beardtongue is in the Scrophulariaceae (figwort) family. Surveys for this perennial sub-shrub species are not complete. The species is known from 17 occurrences in Clark and Nye counties and Inyo County, California, mostly from the west side of the Spring Mountains, Funeral Mountains, and the Nevada National Security Site. This species occurs within the blackbrush and sagebrush communities at 3,100 to 6,332 feet. In the planning area, the Death Valley beardtongue is threatened by casual recreation activities (e.g. OHV), renewable energy development, and fire.

3.2.7.2.2.3.6. Death Valley Sage

Death Valley sage is a perennial in the Lamiaceae (mint) family. This shrub occurs in southern Nye County and in neighboring portions of California. Surveys for this species are largely incomplete. Habitat includes dry limestone cliffs, crevices, and adjacent wash gravels in deep, sheltered canyons or north-facing exposures in shadscale or creosote bush scrub from 2,600 to 3,500 feet. In the planning area, this species occurs on BLM lands in the hills west of Pahrump. This species is threatened by off-road vehicle use, trampling by wild horses and burros, and mining (Morefield 2001).

3.2.7.2.2.3.7. Gold Butte Moss

Gold Butte moss is a moss in the Pottiaceae (pottia) family. This long-lived species occurs in Clark County but has been found in Texas, British Columbia, and Mexico. Surveys for this species are largely incomplete. Habitat includes gypsiferous deposits and outcrops or limestone

boulders, especially on east- or north- facing slopes in loose, uncompacted soil. Elevation ranges from 1,300 to 2,350 feet (Morefield 2001). In the planning area, it occurs in Gold Butte, Bitter Spring Valley, and near the Muddy Mountains and Valley of Fire State Park. Threats to the species include off-road vehicle use.

3.2.7.2.2.3.8. Halfring Milkvetch

The halfring milkvetch belongs to the Fabaceae (pea) family. This annual or short-lived perennial herb is endemic to Clark, Nye, and Lincoln counties. Surveys for this species are largely incomplete. Habitat for the species includes carbonate gravels and derivative soils on terraced hills and ledges, open slopes, and along washes. Habitat is found in the creosote-bursage, blackbrush, and mixed-shrub zones between 3,000 and 5,600 feet. In the planning area, the species occurs on BLM lands at lower elevations on the west side of the Spring Mountains and outside Indian Springs. The species is threatened by renewable energy development, off-road vehicle use, and trampling by wild horses and burros.

3.2.7.2.2.3.9. Mokiak Milkvetch

The Mokiak milkvetch is a herbaceous perennial in the Fabaceae family. This species occurs in northeast Clark County and in neighboring Mohave County, Arizona, and Washington County, Utah. Habitat for the species includes sandy soils, bluffs, cliff terraces, gullied badlands, and disturbed areas along streams in creosote scrub into the lower edge of pinyon-juniper between 2,460 and 5,020 feet in elevation (Morefield 2001). In the planning area, the species is only known from the Gold Butte region, but surveys are largely incomplete. Threats to the species include off-road vehicle use, trampling by cattle and burros, and wildfire.

3.2.7.2.2.3.10. Pahrump Valley Buckwheat

The Pahrump Valley buckwheat is a winter annual in the Polygonaceae (buckwheat) family. The species is a narrowly distributed species endemic to three adjacent valleys along the California-Nevada border. The species' distribution is roughly 47 miles long and 7 miles at the widest. Known occurrences are grouped into four population groups: one large population in the Stewart Valley, two populations in the Pahrump Valley, and one population group in the Mesquite Valley in the Sandy Valley community. All locations are significant for the long-term viability of the species because its distribution is highly restricted. The total distribution is likely less than 2,000 acres. The Pahrump Valley population group, the largest known, is estimated at 1,104 acres. The Stewart Valley population group is estimated at 412 acres, and the Mesquite Valley population group is estimated to be 113 acres.

The species occurs in substrates that are typically saline, heavy clay, or silty hardpan soils. Elevation of known species locations average 2,553 feet with a narrow range of 2,457 to 2,799 feet. Habitat for the Pahrump Valley buckwheat includes valley bottoms, playa margins, adjacent shore terraces, and stabilized sand dunes. The species habitat is within creosote bursage, salt desert scrub, and mesquite woodland vegetative communities. Major threats to the Pahrump Valley buckwheat include federal land disposal resulting in development, utility corridors, habitat degradation and modification, concentrated recreation activity, and competition with invasive plant species. The USFWS initiated a spotlight species action plan in 2009 that aimed at development of a conservation strategy to preclude the need to federally list the species, in which assistance would be required from federal and local agencies.

3.2.7.2.2.3.11. Pahrump Silverscale

Pahrump silverscale is an annual in the Chenopodiaceae (goosefoot) family. This herbaceous annual occurs in southern Nye County and neighboring Inyo County, California. Surveys for this species are largely incomplete. Habitat includes barren alkaline flats in saltbush scrub. In the planning area, the species is known only from a few locations in the Pahrump Valley. This species is threatened by development and off-road vehicle use.

3.2.7.2.2.3.12. Parish Phacelia

The Parish phacelia is a winter annual in the Hydrophyllaceae (waterleaf) family. The species occurs on alkaline flats, playas, lakebeds and margins, and valley floors. These habitats are typically sparsely vegetated, generally dry, and fill as seasonal pools in years of high rainfall. Elevation of known species locations average 3,445 feet with a range of 1,778 to 5,919 feet. The species distribution is centered in northeastern Mojave Desert in Clark, Lincoln, and Nye counties with isolated populations in California and Arizona. The species known occurrences have been grouped into 16 population groups, with two occurring in Clark County and three in Nye County (TNC 2007). The two population groups in Clark County are managed by the Department of Defense within the Nellis Test and Training Range and are the largest populations documented. In Nye County, two population groups are managed by the BLM, and one is on private land. Populations on BLM lands in the planning area (Pahrump Valley North Pahrump and Stewart Valley) are primarily threatened by development and casual OHV activity.

3.2.7.2.2.3.13. Rock Purpusia

Rock purpusia is in the Rosaceae (rose) family. This perennial herb is endemic to Nye and Lincoln counties. Habitat for the species includes crevices of cliffs and boulders on volcanic and possibly carbonate rocks in the upper mixed-shrub, sagebrush, and pinyon-juniper zones, 4,925 to 6,800 feet. The distribution of this species is largely outside the planning area. However, there is potential for the species to occur on BLM lands adjacent to the Spring Mountains.

3.2.7.2.2.3.14. Rosy Two-Toned Penstemon

Rosy two-toned penstemon is in the Scrophulariaceae (figwort) family. The distribution of the rosy two-toned penstemon is larger than the yellow two-toned penstemon and includes Clark County; San Bernardino County, California; and Mohave County, Arizona. Habitat for the species includes rocky calcareous, granitic, or volcanic soils in washes, roadsides, scree at outcrop bases, rock crevices, or similar places receiving enhanced runoff. This habitat is found in the creosote-bursage, blackbrush, and mixed-shrub zones. This species is distinguished from ssp. *bicolor* by its red to pink flower color. In the planning area, urban development, renewable energy development, and casual OHV activity are the primary threats to the species.

3.2.7.2.2.3.15. Scrub Lotus

Scrub lotus is a perennial in the Fabaceae (pea) family. This shrub occurs in southern Clark County and in the New York Mountains in California. Surveys for this species are largely incomplete. Habitat includes mountain slopes in pinyon-juniper woodland. In California, its elevation range is 3,600 to 4,500 feet (Hickman 1993). In the planning area, this species is known

only in a couple of locations in the south McCullough Range. This species is threatened by off-road vehicle use and trampling by wild horses and burros.

3.2.7.2.2.3.16. Straw Milkvetch

Straw milkvetch is a perennial in the Fabaceae (pea) family. This short-lived perennial herb occurs in northeast Clark County and neighboring portions of Arizona and Utah. Surveys for this species are largely incomplete. Habitat includes sandy and gravelly valley flats, washes, and dunes in creosote scrub from 1,800 to 3,000 feet. In the planning area, this species occurs in the Mesquite area. This species is threatened by development, off-road vehicle use, and competition with non-native species such as Sahara mustard.

3.2.7.2.2.3.17. Tecopa Bird's Beak

The Tecopa bird's beak is endemic to the Ash Meadows Area of Nye County, Fishlake Valley in Esmeralda County, Nevada, and Inyo County, California. The Tecopa bird's beak is an annual herb in the Scrophularaceae (figwort) family. Habitat for the species includes open, moist-to-saturated, alkali-crusted clay soils of seeps, springs, outflow drainages, and meadows. Other plant species that share habitat with Tecopa bird's beak are saltgrass, Baltic rush, spikerush (*Eleocharis* sp.), Ash Meadows lady's tresses (*Spiranthes infernalis*), spring-loving centaury, cattail (*Typha)*, thistle (*Cirsium)*, Ash Meadows ivesia, and whiteflower rabbitbrush (*Chrysothamnus albidus)*. In Nevada, the species is common on the margins of wetlands. This wetland species is vulnerable to threats that affect surface and subsurface hydrology that support the species and habitat alteration by non-native species, such as tamarisk, that directly compete with the species or alter habitat.

3.2.7.2.2.3.18. White Bearpoppy

The white bearpoppy is a herbaceous perennial belonging to the Papaveraceae (poppy) family. The distribution of the white bearpoppy spans California and Nevada and is confined to the northern Mojave Desert. The species' known occurrences are grouped into 33 population groups, with the largest occurring in northwestern Clark County. In 2001, the Nevada population was estimated at 974 acres (Morefield 2001).

The species occurs on a variety of soils (alkaline clay, alkaline sand, gypsum, calcareous alluvial gravels, and carbonate rock outcrops) and is associated with creosote, shadscale, blackbrush, and mixed desert scrub vegetation communities. Elevation of known species locations average 3,766 feet with a range of 1,765 to 8,596 feet. Major threats to the species and its habitat within the planning area include land disposal, casual OHV use and trail development, and wild horse and burro management.

3.2.7.2.2.3.19. Yellow Two-Toned Penstemon

The yellow two-toned penstemon is in the Scrophulariaceae (figwort) family. This perennial herb is endemic to Clark County. The center of the species distribution is the Las Vegas Valley, Red Rock Canyon National Conservation Area, and the McCullough Mountains. A large portion of its historic distribution is assumed to have been lost due to development in the Las Vegas Valley. Habitat for the species includes calcareous or carbonate soils in washes, roadsides, rock crevices, outcrops, or similar places receiving enhanced runoff. This habitat is found in the creosote-bursage and blackbrush vegetation communities. The yellow two-toned penstemon

is distinguished from ssp. *roseus* by its yellow flower color. It is threatened by continued urban development of the Las Vegas Valley, road maintenance activities, and hybridization. Hybridization threats are from Palmer's penstemon (*Penstemon palmeri*), which was introduced into Red Rock Canyon NCA as part of previous Nevada Division of Transportation Highway projects and BLM revegetation efforts.

3.2.8. Wild Horses and Burros

Wild horses and burros are found within five herd management areas (HMAs) throughout the Southern Nevada District (see Map 3.2.6.1 - 2 (p. 2144)). Gold Butte and Wheeler Pass are within the Las Vegas Field Office's boundary; Red Rock is within the Red Rock/Sloan Field Office's boundary; and Johnnie and the Nevada Wild Horse Range are within the Pahrump Field Office's boundary). Red Rock HMA is managed specifically under the 2005 Red Rock Canyon National Conservation Area Resource Management Plan. The Nevada Wild Horse Range is managed specifically under the 2004 Nevada Test and Training Range Resource Management Plan and the 2008 Nevada Wild Horse Range Herd Management Area Plan (NV052-2008-223).

The WFRHBA and 4700 series of the Code of Federal Regulations require the BLM to not only protect wild horses and burros, but also manage them according to certain requirements. These requirements include the following:

- Manage in a manner to maintain a thriving natural ecological balance;
- Ensure that excess animals are removed as necessary to protect the range from deterioration associated with an overpopulation of wild horses and burros;
- Manage wild horses and burros as populations of healthy animals in balance with the other uses and productive capacity of their habitat; and
- Maintain the free-roaming behavior of the herds.

3.2.8.1. Regional Context

Wild horse and burro herds should be managed in a thriving, natural ecological balance according the Wild Free-Roaming Horses and Burros Act. The primary natural resource feature that should guide management of wild horses and burros is rangeland health. Utilizing the guidelines associated with Interpreting Indicators of Rangeland Health, long-term trend, and annual monitoring of forage utilization will provide some of the information necessary to evaluate the effectiveness of herd management in meeting the goals and objectives originally identified in the 1998 RMP.

3.2.8.2. Rangeland Resources

The integrity of soils, hydrologic, and biotic functions are the critical elements necessary to maintain a sustainable environment. A healthy environment will provide adequate forage, water, cover, and space to support a viable, healthy wild horse and burro herd in a thriving natural ecological balance and multiple-use relationship on the public lands.

Technical Reference 1743-6, Interpreting Indicators of Rangeland Health, is a qualitative assessment that provides information to "the degree to which the integrity of the soil, vegetation, water, and air, as well as ecological processes of the rangeland ecosystem, are balanced and sustained" (Pellant et al. 2000). The use of this qualitative assessment combined with quantitative monitoring, such as utilization and trends, allows for the comprehensive evaluation of site indicators throughout HMAs.

3.2.8.3. Herd Health

BLM regulations and policy state that wild horses and burros shall be managed as viable populations of healthy animals in balance with other multiple uses and the productive capacity

of their habitat (CFR 4700.0-6). A wild horse and burro population that is in balance with its rangeland habitat will be healthy and viable even when its habitat has been limited by severe drought, wildfires, and/or other uncontrollable and unforeseeable environmental influences.

Population genetic diversity may become a concern in areas where there are small herds. These populations will be managed and evaluated to preserve and maintain the genetic diversity of the herd.

Several rangeland and herd-health indicators have been evaluated to guide the management of wild horses and burros. Specifically, the appropriate management level (AML) was established in the following HMAs in 2005 (Johnnie, Muddy Mountains and Wheeler Pass Herd Management Areas Establishment of Appropriate Management Levels, EA#NV-052-05-399). The Johnnie HMA was determined to have a carrying capacity of 649 animal unit months (AUMs) that can be supported by the available forage; based on this calculation the AML was set at 54 to 108 wild burros and identified for the management of zero (0) wild horses. The Muddy Mountains HMA was determined to have a carrying capacity of 198 AUMs that can be supported by the available forage; based on this calculation, the Muddy Mountains HMA cannot support a viable herd of wild horses and/or burros because 198 AUMs would only allow for a maximum of 17 animals. That small of a herd would not meet the minimum requirements to maintain the genetic diversity of a herd of wild horses or burros. The Muddy Mountains HMA is no longer managed for wild horses and burros, however it will retain its herd area status.

The Wheeler Pass HMA is part of the Spring Mountains Complex and was determined to have a carrying capacity of 933 AUMs that can be supported by the available forage; based on this calculation, the AML was set at 47 to 66 wild horses and 20 to 35 wild burros. This AML is based on the coordinated management between the BLM and the U.S. Forest Service. The Spring Mountain Complex is a large area comprised of several HMAs and wild horse territories (WHTs) with management of wild horses and burros being coordinated between the BLM and the U.S. Forest Service due to the movement of the animals throughout the complex.

Management of wild burros in the Gold Butte HMA must be coordinated between the BLM and the National Park Service (NPS) due to the movement of the wild burros within the HMA (see Table 3.20, “Wild Horse and Burro Herd Management Areas Within the Las Vegas and Pahrump Field Offices” (p. 385)).

Table 3.20. Wild Horse and Burro Herd Management Areas Within the Las Vegas and Pahrump Field Offices

HMA	BLM AML	Species	2014 Estimated population (adults only)	Approximate BLM acreage	Last gather	Administered by
Gold Butte	22 to 98	Wild burros	211-278	171,000	2007	
Wheeler Pass	47 to 66	Wild horses	335-443	273,000	2007	
Wheeler Pass	20 to 35	Wild burro	109-164	273,000	2007	
Johnnie	54 to 108	Wild burros	166–248	178,000	2007	
Johnnie	0	Wild horses	95–125	178,000	2007	

Ash Meadows Herd Management Area will revert to Ash Meadows Herd Area (see Map 3.2.8.1 - 2 (p. 2144)) due to historical conflicts with private lands and federally listed threatened and endangered species. In the 1998 Las Vegas RMP, the AML was set to 0, but the area should have been reverted to the Ash Meadows Herd Area. Herd areas are geographic areas of the public lands identified as habitat used by wild horses and burros at the time the WFRHBA was enacted (12/15/1971), however these areas have been identified as not being able to sustain a wild horse and burro population for the long term.

Amargosa Herd Management area will revert to Amargosa Herd Area (see Map 3.2.8.1 - 1 (p. 2144)) due to a lack of forage and water available on public lands.

El Dorado Mountains Herd Management Area will revert to El Dorado Mountains Herd Area. The National Park Service recommended that all wild burros be removed from the El Dorado HMA to lessen impacts on the environment and conflicts with developments within the Lake Mead National Recreation Area.

Muddy Mountains Herd Management Area will revert to Muddy Mountains Herd Area. The evaluation of the Muddy Mountains HMA's carrying capacity (Johnnie, Muddy Mountains, and Wheeler Pass Wild Horse and Burro Herd Management Area Establishment of Appropriate Management Levels EA# NV-052-05-399) determined that there was not adequate forage available in the HMA to support a large enough population to meet the minimum requirements of animals necessary to maintain the genetic viability of the herd for either wild horses or burros.

Subsequent wild horse and burro removals will maintain the population at 0 in accordance with these areas' herd area status.

Table 3.21. Wild Horse and Burro Herd Areas

Herd area	Size (BLM-managed acres)
Ash Meadows	115,500
Amargosa	8,900
El Dorado	16,500
Muddy Mountains	78,600

Currently wild horse and burro populations are estimated using a direct count aerial survey. Review of the population inventory and gather data over the years shows that wild horses and burros are missed during population inventory and gathers, and in the case of the Spring Mountains Complex, there is movement of wild horses and burros between the HMAs and WHTs. It would be conservative to estimate that 15 to 20 percent of the wild horses are not observed during population inventory flights. Currently, there is a correction factor (0.5) applied to estimate wild burro populations due to their coloring and the challenges of locating them during population inventory flights. The National Academy of Sciences completed an independent review of BLM's wild horse and burro program, this study "Using Science to Improve the BLM Wild Horse and Burro Program A Way Forward" provides numerous findings and suggestions for managing the wild horses and burros. Specifically, "In the committee's judgment, the reported annual population statistics are probably underestimates of the actual number of equids on the range inasmuch as most of the individual HMA population estimates are based on the assumption that all animals are detected and counted in population surveys.

The U.S. Geological Survey is researching more accurate methods to estimate wild horse and burro populations. Several methods have been evaluated to ensure statistically valid population estimates. These methods include simultaneous double count sightability bias correction

modeling, distance sampling, and mark re-sight. These methods or some combination of these methods may be incorporated in the future based on the direction of the national and state office.

Frequency, utilization, and rangeland health assessments have been completed at key management areas (KMAs) within all HMAs. Key management areas represent the dominant ecological sites found within the HMAs. As more information is collected, more key management areas may be established to include in rangeland assessments. However, trend data has not been collected for an adequate period to determine vegetative trends. As more data is collected and analyzed, it will be included in specific herd management area plans that define short- and long-term goals for the HMAs.

Due to low precipitation values and frequent drought, improvement to rangeland resources is a slow process and will require many years to record statistically valid trend changes. Some vegetation communities have been so degraded in the past that perennial grass species are missing in the understory and may not return.

Wildfires are anticipated to continue, particularly in areas where there is a predominance of red brome grass and other invasive species. In areas of the HMAs not impacted by wildfires, the majority of the plant communities are in a stable state and are not likely to change unless there is a major disturbance. Seed availability and new technology will influence the extent of rehabilitation and possible restoration of the wildfire areas.

Wild horse and burro populations generally increase by 20 percent annually; this increase will be closely monitored to determine when a gather will take place to remove excess animals. Removing excess wild horses and burros helps maintain a healthy population remaining on the rangeland while maintaining or improving the health of the rangeland. Fertility control methods will be evaluated before future removals. The National Academy of Sciences completed an independent review of BLM's wild horse and burro program, this study found that horse populations are growing at 15 to 20 percent a year.

Wild horses and burros in this area originally escaped or were abandoned by settlers, ranchers, prospectors, and/or Native American tribes. Many of today's wild horses were altered by registered animals released by local ranchers to "enhance" the wild herds by introducing new genetic diversity to the local herds. The ranchers would then capture the wild horses for sale or use on their ranch. The varieties of wild horses and burros in this area are directly linked to their diverse background. The colors of wild horses in the district are predominantly bay, brown, and sorrel, however there are palomino, pinto, black, or buckskin wild horses. Wild burros range in color from pink, red, white, gray, or black, with gray being the predominant color.

3.2.9. Cave and Karst Resources

A cave is defined as any naturally occurring void, cavity, recess, or system of interconnected passages occurring beneath the surface of the Earth or within a cliff or ledge large enough to permit an individual to enter, whether the entrance is naturally formed or man-made (FCRPA, Sec. 3(1)). In the planning area, caves are most commonly formed by the weathering of rock through water and wind erosion (erosional caves) or through the solidification of lava over and around a still flowing laval stream that results in a long, hollow channel (lava tube). Caves were often used by Native Americans as temporary living quarters, storage areas, shelter, and game traps.

Karsts are defined as an irregular limestone region with sinkholes, underground streams, and caverns. The planning area does have limestone deposits, but lacks water to develop karsts, so no actual karsts are present.

Cave resources are fragile due to their association with other resources such as groundwater hydrologic systems and biological communities (Moore & Sullivan, 1997). They may also be considered non-renewable due to paleontological and archaeological deposits, speleothems (formations inside caves), and biological resources.

The Federal Cave Resources Protection Act (FCRPA) of 1988 was the first federal legislation to recognize caves and their contents as whole, integrated ecosystems. FCRPA declares significant caves on federal lands as an invaluable and irreplaceable parts of the nation's heritage. Improper use, increased recreational demand, urban spread, and a lack of specific statutory protection threaten caves. The purpose of FCRPA is to secure, protect, and preserve significant caves on federal lands for the perpetual use, enjoyment, and benefit of all people and to foster increased cooperation and exchange of information between governmental authorities and those utilizing caves located on federal lands for scientific, educational, or recreation purposes. DOI implementation regulations for FCRPA require federal lands be managed in a manner that, to the extent practical, protects and maintains significant caves and cave resources (43 CFR Part 37.2).

BLM policy and guidance for managing cave resources is to protect sensitive, fragile, biological, ecological, hydrological, geological, scientific, recreational, cultural, and other cave values from damage and to ensure they are maintained for the use by the public, both now and in the future (BLM Manual 8380).

Indicators of cave condition are dependent on the resources the cave possesses, including:

- **Biota:** The cave serves as seasonal or yearlong habitat for organisms or animals or contains species or subspecies of flora or fauna native to caves; or are sensitive to disruption; or are found on state or federal sensitive, threatened, or endangered species lists.
- **Cultural:** The cave contains historic or archaeological resources included in or eligible for inclusion in the National Register of Historic Places because of its research importance for history or prehistory, its historical association, or other historical or traditional significance.
- **Geological/mineralogic/paleontologic:** The cave possesses one or more of the following features: geologic or mineralogic features that are fragile or exhibit interesting formation processes, or are otherwise useful for study; deposits of sediments or features useful for evaluating past events; or paleontological resources with potential to contribute useful education and scientific information.
- **Hydrologic:** The cave is part of a hydrologic system or contains water important to humans, biota, or development of cave resources.
- **Recreational:** The cave provides or could provide recreational opportunities or scenic values.

- **Educational or Scientific:** The resource offers opportunities for educational or scientific use or is in a virtually pristine state, lacking evidence of contemporary human disturbance or impact, or the length, height, volume, total depth, or similar measurements are notable (43 CFR Part 37).

The planning area has several caves of regional or national importance. The most significant is Gypsum Cave, which is eligible for nomination to the National Register of Historic Places based on the important information on prehistory of the region previously obtained. An archaeological excavation of the cave was conducted by Southwest Museum in the 1930s. The research yielded information concerning continuous prehistoric human occupation and use for approximately 3,000 years. The scientific data that the cave yielded continues to be important in reconstruction the prehistory of the region.

Devil's Throat is an unusual geologic formation located near Gold Butte. Devil's Throat is regarded as a collapsed sink, a type of sinkhole. The sink is approximately 120 feet wide and 130 feet deep.

Adherence to the FCRPA and BLM policy provides for the continued identification and protection of fragile and unique qualities and features of cave resources. Cave resources are identified and inventoried to document the important and relevant values which relate to significance. Currently, the BLM does not have a complete inventory of all cave resources as most surveys are conducted as needed to identify these resources in a project-specific context. Due to the exponential urban growth in southern Nevada over the past two decades, cave resources have been affected by numerous demands placed on public lands. Cave resources have been impacted from development on adjacent, once isolated lands. Resources located in areas once difficult to access are now threatened by the increased demands that recreation places on public lands in addition to impacts from increased visitation. Impacts to cave resources result from both natural forces and human-caused damage. Natural forces include changes in dissolution, groundwater flow, rock collapse, and fire. Destructive human impacts include road network expansion, off-road vehicle use, construction of powerlines and facilities, and contamination. The majority of users visit caves for recreational purposes such as exploring or viewing cultural resources and geology. Use by the public is not limited or confined to specific times or activities. Unregulated access to caves has resulted in the destruction of cave resources. Vandals steal or deface unique cave formations and archaeological and paleontological resources. Human visitations into caves, even by competent, careful cavers, impact these resources to some degree.

Specific indicators may include the presence of indicator species, the amount of ground disturbance, water quality, and the amount and type of recreational use.

3.2.10. Wildland Fire Ecology and Management

3.2.10.1. Wildland Fire Management

The public lands managed by the Las Vegas and Pahrump field offices have numerous rural, urban, and wildland interface areas that can be characterized as lines, areas, or zones where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels. The operational role of the BLM in the wildland urban interface (WUI) is wildland firefighting, hazardous fuels reduction, cooperative prevention and education, and technical assistance. Structural fire suppression is the responsibility of tribal, state, or local governments (BLM 2012(b)). Federal agencies may assist with exterior structural protection activities under formal fire protection agreements that specify the mutual responsibilities of the partners, including funding (BLM 2012(b)). Decisions and actions implemented in the response to wildland fires are based on ecological, social, and legal consequences, the circumstances under which a fire occurs, and the likely consequences on firefighter and public safety and welfare, natural and cultural resources, and values to be protected (BLM 2012(b)).

Wildland fire is a general term describing any non-structure fire that occurs in the wildland. Wildland fires are categorized into two distinct types (BLM 2012(a)):

- Wildfires are an unplanned ignition caused by lightning, volcanoes, unauthorized and accidental human-caused fires, and escaped prescribed fires.
- Prescribed fires are any fire intentionally ignited by management under an approved plan to meet specific objectives identified in a written and approved prescribed fire plan for which requirements (where applicable) have been met prior to ignition.

Wildland fire is generally considered an essential ecological process and natural change agent (BLM 2012(a)). However, fire as an essential ecological process varies across the planning area and depends on the vegetation community and the related fire regime (Chambers, et al., 2013(a), p. 75). Plant communities and fire regimes have been altered where an invasive annual grass fire cycle has been established (Chambers, et al., 2013(a), p. 81). As a result, large, landscape-level fires have become possible when annual grass fuel loading is high and ignition sources are prevalent (Chambers, et al., 2013(a), p. 79). Winter precipitation can generate a sufficiently dense growth of grasses and other annual plants to potentially promote wildfire at the landscape level (Chambers, et al., 2013(a), p. 81). Where the plant communities are not fire dependent or fire adapted, the common fire management response is fire suppression (BLM 2004).

The overriding priority for all wildland fire actions is firefighter and public safety. In addition, wildland fire may be concurrently managed for one or more objectives, and objectives can change across the landscape. Objectives are affected by changes in fuels, weather, topography; varying social understanding and tolerance; and involvement of other governmental jurisdictions having different missions and objectives. The range of wildfires does not follow jurisdictional boundaries. Responses to wildland fire are regularly coordinated across levels of government regardless of the jurisdiction at the ignition source. The use of cooperative agreements promotes the common goals for the agency to manage incidents in a cost-effective manner for the protection of life, property, and natural resources. It is in the interests of city, county, state, tribal, and federal agencies to work toward a common goal concerning an incident.

Wildland fire is managed to achieve effective collaboration among cooperating agencies, often through agreements that identify the jurisdictional interrelationships and define the roles and

responsibilities among local, state, tribal, and federal fire protection entities. Wildland fire management utilizes common standards for all aspects of fire management programs to ensure effective collaboration. The Southern Nevada District Office () fire management program provides comprehensive fire response to areas managed by multiple field offices including the Las Vegas and Pahrump field offices, as well as multiple jurisdictions through agreements with interagency partners (BLM 2004).

A decision support process is utilized to guide and document wildfire management decisions in designated fire management units (FMUs) and is supported by a fire management plan (FMP). A FMU is a specific land management area that is defined by fire management objectives, management constraints, topographic features, access, values to be protected, political boundaries, fuel types, and major fire regime groups (BLM 2012(a)). FMUs encompass about 7 million acres including the planning area (BLM 2004).

The use of certain fire suppression techniques is incorporated into pre-attack scenarios so that fire suppression strategies and tactics are acceptable to protect special environments. These special areas include, but are not limited to, herd management areas, riparian areas, designated natural areas, wilderness, wilderness study areas, wild and scenic rivers, mining districts, cultural resource districts including both prehistoric and historic, desert tortoise habitat areas, airshed management areas, designated research areas, and WUI zones.

There are nine identified resource concerns described below:

1. **Wilderness, wilderness study areas, and wild and scenic rivers:** Fire suppression efforts in these areas strive to maintain the qualities of the existing environment and must be conducted to comply with the respective policy and requirements for each given area. A fire response would be developed following the initial report for wildland fires. The response must ensure the safety of firefighters and the public. The fire response would include a range of specific actions such as monitoring, confinement, initial attack and suppression or wildfire suppression with multiple strategies. It may include use of motor vehicles, mechanized equipment and retardant during emergency operations. Use of motorized equipment would only be used in wilderness if the fire is threatening human life, property or wilderness characteristics. Fire response would be determined utilizing a decision support system for each wildfire. Actions will be consistent with minimum impact suppression tactics. A Resource Advisor would be assigned to all fires occurring in these areas.
2. **Designated natural areas:** Values that constitute a natural area, including unique visual resources, vegetative community uniqueness, and specific biological qualities, are described in those documents that prescribed the designation. Fire suppression strategies are set in those documents. In most situations, a resource advisor is required during implementation of fire suppression field strategies.
3. **Cultural resources and historical properties:** In areas where important cultural resources, including both prehistoric and historic features were identified, a qualified archaeologist or a designated resource advisor is required to assist the incident commander on possible fire suppression equipment restrictions. Historic structures, such as mining fixtures and ranching line cabins, are fragile and should receive maximum protection.
4. **Desert tortoise habitat areas:** Fire suppression tactics focus on protection of tortoise habitat while minimizing impacts to the species. The strategy is to conduct immediate suppression efforts.
5. **Riparian areas:** The strategy in riparian areas is to protect habitats and species. Because protection of species is important, the use of ground and/or aerial retardants and foams is restricted.

6. **Mining districts:** The nature of mining often involves the use of toxic and hazardous chemicals. Special training with fire department and environmental protection agencies is necessary for personnel involved in directing suppression activities. The tactics should be a result of consideration of a "back-off and protect" policy. Providing information to the incident commander on mine hazards will help ensure firefighter safety during a fire response in these areas.
7. **Air shed management:** Fire suppression strategies should emphasize immediate limitation of conflagrations in the Las Vegas Valley "air shed" due to the negative impact on air quality in the urban area.
8. **Special vegetative communities:** To protect the range of special vegetative communities such as desert biomes with mesquite and certain cacti, fire suppression actions should be immediate in these designated areas.
9. **Herd management areas:** Fire suppression tactics focus on protection of herd management areas while minimizing impacts to the to wild horses and burros. The strategy is to conduct immediate suppression efforts.

The use of fire suppression equipment and techniques to the maximum design capabilities will be modified as necessary to ensure impacts from suppression activities are not greater than the effects from the fire. In areas or locations where special resource concerns have been identified, a resource advisor will be requested to assist the incident commander.

3.2.10.2. Hazardous Fuel Management

The Healthy Forests Restoration Act of 2003 (HFRA) serves to aid in the implementation of the goals of the National Fire Plan, the 10-year Comprehensive Strategy Implementation Plan, National Cohesive Wildland Fire Management Strategy, and the Healthy Forests Initiative. HFRA provides improved statutory processes for hazardous fuels reduction projects on certain types of at-risk BLM lands and also provides other authorities and direction to help reduce hazardous fuel and restore healthy forest and rangeland conditions on lands of all ownership (BLM 2012(a), p. 1–5).

Hazardous fuel projects and treatments are carried out annually in the planning area to reduce wildfire risk by protecting and creating fire-adapted communities and to meet resource goals and objectives such as restoring and maintaining resilient landscapes. Fuel treatment projects require activity-level plans and environmental analysis. Goals and objectives are achieved by analyzing and utilizing a full range of tools such as prescribed fire, mechanical, chemical or biological land treatments. Projects are prioritized and coordinated at the local, state, and national levels. A common fuel project objective is to reduce wildfire risk to communities and resources by reducing hazardous fuels. Monitoring and evaluation of project treatments helps determine the effectiveness of the management action implemented. From 2003 to 2012, about 100 high-priority project treatments were successfully completed and resulted in approximately 13,800 acres treated for hazardous fuels (BLM 2013(a)).

The major uses of prescribed fire are to achieve specific fire and resource goals in Southern Nevada. Wildland fire hazard reduction involves decreasing a quantity of accumulated fuel that could, through natural means, become a devastating event. Prescribed burns also facilitate vegetative manipulation to benefit habitat or related restoration efforts. Pile burning or similar techniques can be a cost-effective measure to reduce accumulations of woody debris, plant materials or to treat activity fuels.

3.2.10.2.1. Smoke Management

Smoke from wildfires can impact air quality in the planning area. Fire management activities work to minimize wildfire smoke impacts in coordination with local and state cooperators. Suppressing fires is a common minimization method. Reducing hazardous fuels before a wildfire event can reduce the amount of potential emissions by reducing the amount of available burnable fuel. Short-term impacts to air quality due to prescribed fire activities are possible. Prescribed fire projects are required to comply with federal, state, and local regulations and standards, including air quality and smoke management programs. Smoke management in Clark County is carried out in coordination with the Clark County Department of Air Quality (DAQ). Prescribed fire within Nye County requires an approved variance (open burn permit) from the Nevada Division of Environmental Protection, Smoke Management Program (See the Air Quality (p. 285) section for more information).

3.2.10.2.2. Fire Prevention, Mitigation, and Education

The fire prevention and education program is responsible for wildland fire prevention, prescribed fire education, fire trespass and investigations, and compiling fire statistics. The function of the program is to provide and maintain a viable and effective fire prevention and education program to educate the public on fire prevention concerns, fire management activities, and fire statistics. Special emphasis is given to use of fireworks, abandoned campfires, railroad fires, children playing with fire, and prescribed fire and fire occurrence data. The fire trespass and investigations team of the fire prevention and law enforcement programs are responsible for investigating human-caused fire to determine the origin, ignition source, and the identity of the responsible persons. After the cause is determined, proper documentation and billing will occur.

Human-caused fires have accounted for about 54 percent of all wildfires from 1999 to 2012 for most of the fire response area (BLM 2010, BLM 2013(b)). An active community assistance and education program has been established to create fire-safe communities and prevent catastrophic impacts to sensitive natural resources. Fire prevention strategies are employed to reduce human-caused fires with special emphasis in the wildland urban interface, campgrounds, and transportation corridors. One of the goals of this program is to enhance knowledge and understanding of wildland fire management policies and practices through internal and external communication and education. Key components are analysis of risks, hazards, and values, as well as the development of specific educational, mitigation, enforcement, and administrative actions. Prevention planning is integrated with the fire and resource management planning process, and needs are identified through a risk or hazard analysis that is approved as part of the fire management plan. From 2004 to 2012, about 115 program activities or events were completed in Clark and Nye counties (BLM 2013(a)).

3.2.10.2.3. Emergency Stabilization and Rehabilitation (ESR)

The fire management response following a wildfire can include emergency stabilization, rehabilitation, and restoration measures focused on preserving, protecting, and enhancing resource values where needed. Post-fire emergency stabilization and rehabilitation efforts are designed and implemented to achieve multiple objectives for vegetation, habitats, soil stability, and watersheds. For emergency stabilization, actions fall into several categories: human life and safety; soil/water stabilization; designated critical habitats for federal/state-listed, proposed, or candidate species; critical heritage resources; invasive plants; and monitoring. For burned area

rehabilitation, some of the categories are: lands unlikely to recover naturally; weed treatments; tree planting; repair/replace fire damage to minor facilities; and monitoring. From 2005 to 2011, about 13 fires have been managed under ESR with about 72 post-fire ESR actions and treatments that have resulted in approximately 184,000 acres treated (BLM 2013(a)).

3.2.10.2.4. Wildland Fire Ecology

Vegetation types and fire regimes vary throughout the planning area and across the fire management units (Chambers, et al., 2013, p. 75; BLM 2004). Fire is a natural component of ecosystems but has historically played a minor role in the promotion of plant succession and plant community development in the Mojave Desert. Although native vegetation contributes to fuel loading, invasive annual plants have augmented fuel loading and continuity (Brooks and Minnich 2006). The increased presence of red brome, an invasive annual grass, has promoted fires in areas where fire was previously infrequent due to insufficient fuels (Phillips 1992). Red brome produces a continuous and abundant cover of fine flashy fuels that promote fast-moving "hot" fires (Brooks 1999). In addition, cheat grass expansion has dramatically changed fire regimes and plant communities by creating an environment where fires are easily ignited, spread rapidly, cover large areas, and occur frequently (Young and Evans 1978). Due to the increasing abundance of invasive plants as a fuel in the Mojave Desert, wildfire is now a prevalent agent of disturbance in this ecosystem. This change has resulted in conditions that may sustain large-scale fires when the ignition of vegetation occurs.

In Southern Nevada, ephemeral grass fuels respond to climatic influences:

> During the past century, fire activity in Southern Nevada has been primarily associated with the warm (positive) phase of the multi-decadal Pacific Decadal Oscillation (PDO) cycle during which perennial fuels increase, and secondarily with the El Niño phase of the interannual El Niño-Southern Oscillation (ENSO) cycle during which fine ephemeral fuels increase due to increased precipitation. The El Niño effect alone may not be sufficient to promote large fires and may only kick in during the latter part of or soon after a multi-decadal period of high rainfall associated with the PDO (e.g., after 1993, and especially during 2005 and 2006). Although intentional burning by humans has at times added significantly to acres burned, these fires likely remain small when climatic conditions result in sparse fuels (Chambers et al., 2013(b), p. 28).

3.2.10.2.5. Types of Vegetation Susceptible to Wildfire

3.2.10.2.5.1. Mojave

Mojave is characterized by low-elevation desert shrub communities with low cover of woody shrubs of various heights, primarily creosote bush and white bursage. This cover type is dominated by creosote bush, which has the highest cover and is the most wide-ranging plant species in the Mojave Desert. It is most frequently associated with white bursage, but it also occurs with saltbush, Mormon tea, wild buckwheat, ratany, galleta grass, Indian ricegrass, cholla, prickly pear cacti, Mojave yucca, and Joshua tree. Invasive species such as red brome, cheat grass, Russian thistle, Mediterranean grass, and Sahara mustard can be found either scattered throughout or predominantly within this cover type, which generally has low productivity and

naturally sparse understory vegetation and light fuels. Areas of the Mojave Desert dominated by red brome are more susceptible to fire than areas dominated by native forbs (Simonin 2001).

The recent spread of Sahara mustard is a concern because this invasive plant may introduce a significant new fuel type to the Mojave Desert (Brooks and Minnich 2006). Fire frequency has been estimated at 200-plus years for the Mojave vegetation type and is classified as Fire Regime V (for a description of fire regimes, seeTable 3.23, "Fire Regimes and Acres" (p. 399)). Due to the moderate risk of losing key ecosystem components and moderately altered fire regimes as invasive annual grasses increase, Mojave is typically classified as Condition Class 2 (for a description of condition classes, see Table 3.24, "Fire Regime Condition Classes and Acres" (p. 400)).

A lack of continuous cover (fuels) made fire rare to nonexistent in Mojave communities. Historically, these types did not burn often enough or in patches large enough to support dominance of fire-adapted plants. Most Mojave species do not readily regenerate following fire; this is true of creosote bush, which has limited sprouting ability and is poorly adapted to fire (Brown and Minnich 1986). At present, red brome has invaded large portions of Nevada's Mojave vegetation type and now provides sufficient ephemeral fuel loading to support large, fast-moving fires. With few exceptions, fine fuels drive the characteristics of wildland fires occurring in this cover type. These fine fuels are ephemeral and primarily consist of red brome and other non-native annual grasses, and forbs. Further expansion of invasive species (red brome, Sahara mustard, and Mediterranean grass) following fire is a major threat for Mojave communities (Brooks and Minnich 2006).

3.2.10.2.5.2. Blackbrush

Fires in blackbrush were historically infrequent. Low amounts of fine fuels in the interspaces probably limited fire spread to only extreme fire conditions when high winds, low relative humidity, and low fuel moisture led to high intensity stand-replacing crown fires (Brooks et al. 2003). This ecosystem is at moderate risk of losing key components due to fire. It is characterized by Fire Regime IV and Condition Class 2. Once cheat grass and red brome dominate a blackbrush site, the site would then be Condition Class 3. Historical fire return intervals appear to have been centuries, allowing late seral blackbrush stands to re-establish (Webb et al. 1987).

Blackbrush is an important community generally occurring in the elevation transition zone above the Mojave creosote bush-dominated cover type and below the sagebrush/juniper cover type. Red brome readily invades blackbrush communities susceptible to fire and shows vigorous vegetative growth in blackbrush communities where shrubs have been removed by fire (Simonin 2001). The invasion of red brome appears to have made the fuel complex in blackbrush more prone to stand-replacing wildland fires and more susceptible to recurrent fire that could prevent the recovery of blackbrush communities (Brooks et al. 2003).

3.2.10.2.5.3. Salt Desert Scrub

Salt desert scrub is characterized by salt-tolerant succulent shrubs including greasewood, ephedra, shadscale, four-wing saltbush, and threadleaf rubber rabbitbrush. Common grasses include inland saltgrass, alkali sacaton, bottlebrush squirreltail, and Indian ricegrass. Invasive species such as cheat grass, red brome, and halogeton are strongly associated with prior disturbance but also occur at lesser densities in undisturbed habitats. These species can be found either scattered throughout or predominantly within salt desert scrub, which generally has low productivity and naturally sparse understory vegetation and light fuels. Fire frequency has been estimated at 35-

to 100-plus years for the salt desert scrub vegetation type and is classified as Fire Regime IV. Due to the high risk of losing key ecosystem components and significantly altered fire regimes as invasive annual grasses dominate, salt desert scrub is typically classified as Condition Class 3.

A lack of continuous cover (fuels) made fire rare to nonexistent in salt desert scrub communities (Billings 1949 and Zouhar 2003). Frequent wildland fire is not part of the normal ecology of salt desert scrub and blackbrush, which typically are not dominated by fire-adapted species (Paysen et al. 2000). Historically, these types did not burn often enough or in patches large enough to support dominance of fire-adapted plants. Most salt desert scrub species do not readily regenerate following fire. At present, cheat grass has invaded large portions of Nevada's salt desert scrub types and now provides sufficient ephemeral fuel loading to support large, fast-moving fires. With few exceptions, fine fuels drive the characteristics of wildland fires occurring in this cover type.

These fine fuels are ephemeral and primarily consist of cheat grass and other non-native annual grasses and forbs. Where cheat grass has invaded, native salt desert scrub communities have been permanently lost or are at high risk of loss. Further expansion of invasive species (cheat grass, red brome, and halogeton) following fire is a major concern for salt desert scrub communities.

3.2.10.2.5.4. Pinyon and Juniper Woodland

The pinyon-juniper ecosystem is among the most variable in part because it encompasses a wide elevation range. Shrub species commonly associated with this cover type include sagebrush, rabbitbrush, oak, alder leaf mountain mahogany, bitterbrush, littleleaf mountain mahogany, and cliffrose. In Southern Nevada, juniper occurs commonly with blackbrush (Homer 1997). There are at least two different historic fire regime patterns that were likely present in the pinyon-juniper cover type. Regime I (0 to 35 years, low to mixed severity) is where pinyon-juniper may have expanded in the last century. Regime II (0 to 35 years, high severity, stand replacement) was probably a less common historical pattern of the same frequency with increased severity (Ewell, Boes, and Beckman, in progress). A recent pattern with the presence of native and invasive non-native herb and grass understory species that are more tolerant of frequent fire has been suggested (Ewell, Boes, and Beckman, in progress) as a Fire Regime Ia (0 to 35 years, mixed to high severity, replacement) for this cover type. This regime is similar to the frequency of Fire Regime I but with increased mortality to the overstory and replacement or increase in understory species (Ewell, Boes, and Beckman, in progress). The vast majority of pinyon-juniper can be characterized as Condition Class 3 due to the prevalence and/or potential invasion of alien annual grasses cheat grass and red brome.

3.2.10.2.5.5. Sagebrush

Sagebrush is often composed of large, open, discontinuous stands of big sagebrush and is frequently associated with pinyon pine, mountain mahogany, rabbitbrush, snakeweed, blackbrush, shadscale, spiny hopsage, and bitterbrush. Fire frequency varies for the different sagebrush species and subspecies, but it is considered to be between 10 and 110 years depending on precipitation, elevation, sagebrush species and associated vegetation. Although sagebrush does not re-sprout with fire, it is a prolific seeder, and studies show that burned soil and sagebrush seed have higher germination rates. Pre-European settlement, stand-replacing fire frequencies for low-elevation sagebrush are estimated to vary from 60 to 110 years (Whisenant 1990; Peters and Bunting 1994; and Miller et al. 2001). For mountain big sagebrush, pre-European settlement stand-replacing fire frequencies have been estimated to vary between 10 and 25 years (Houston 1973 and Harniss and Murray 1973). Sagebrush, characterized by Fire Regime II, is considered to

be generally in Condition Class 3 because of the high risk of losing key ecosystem components following fire and significantly altered fire regimes due to red brome and cheat grass invasion.

Most sagebrush species do not sprout after fire, and most plants are killed by low- to high-severity fires. This is true of the two subspecies, mountain big sagebrush and basin big sagebrush. Generally, the herbaceous understory composition does not determine the intensity and severity of wildland fires; sagebrush itself is the primary fire carrier. The high canopy cover associated with late, mature sagebrush stands likely facilitated historic stand-replacing fires. However, the pre-fire understory is an important determinant of post-fire response. A sagebrush stand with a robust understory of native grasses and forbs would generally be replaced after fire with native perennial grassland. Degraded sagebrush stands with poorly evolved native understories are most vulnerable to colonization by invasive species after fire.

Cheat grass and red brome are widely distributed throughout this cover type. Both of these invasive species are strongly associated with prior disturbance/fire occurrence, but also occur at lesser densities in undisturbed habitats. Both of these invasive grasses contribute to fire fuel loadings and behavior. As sagebrush seeds generally are not transported far from the parent plant, unburned areas within large burn areas are often the most important source of seed material for natural recruitment and re-establishment of sagebrush (Tirmenstein 1999 and Johnson 2000).

3.2.10.2.5.6. Desert Riparian Woodland

Desert riparian woodlands occur principally along the Virgin and Muddy rivers and the Meadow Valley Wash, but they can also be found scattered throughout the planning area. Desert riparian woodland areas are characterized by localized vegetation influenced by the presence of abundant water in contrast to the surrounding landscape. Typical plant species include Fremont cottonwood, desert willow, and the noxious invasive tamarisk, or salt cedar. Historically, fire in riparian communities would have been infrequent, low- to moderate-intensity surface fires, with short to moderate fire return intervals to stand-replacing burns likely to have occurred only in extreme drought periods (Brooks and Minnich 2006 and Dudley 2006).

These riparian communities were historically in Fire Regime III, but the invasion of non-native tamarisk has changed these communities to a Fire Regime II. Most of these areas are in Condition Class 2 due to higher incidence and potential of invasive species. After an initial fire, tamarisk quickly recovers and surpasses its pre-fire dominance, promoting increasingly more frequent and intense fires that can eventually displace many native plants (Brooks and Minnich 2006). Monoculture stands of tamarisk may result from repeated high-intensity fires and turn desert riparian areas from barriers to pathways for fire spread (Dudley 2006). Fremont cottonwood communities are characterized by a late seral stage (e.g., all mature to late-mature trees) with little or no representation of younger age-classes and are not typically fire-adapted.

The life history and ecology of cottonwoods are intimately tied with flooding, erosion, and deposition on the flood plains because the seeds only germinate and establish on bare, moist alluvium. Willow species typically sprout vigorously following a fast-moving fire. Slow-moving fires are generally more damaging, presumably due to greater heat transfer to root crowns.

3.2.10.2.5.7. Mesquite Woodland

Honey mesquite occurs in riparian habitats or scattered clumps on sandy hummocks and near desert springs where plants have access to permanent undergroundwater either in pure stands or

mixed with catclaw acacia. These woodlands are composed of honey mesquite and/or catclaw acacia of varying canopy heights and structural arrangements. Honey mesquite may occur in either clumping, shrubby growth-form or in more of a true woodland canopy configuration. The former is typically associated with sites that have received disturbance and setback of the honey mesquite growth stage. When the above-ground portion of honey mesquite is damaged by fire, regeneration occurs by sprouting from lateral roots and establishing from seed. Following top-kill by fire, numerous sprouts arise from the underground buds (Steinberg 2001). In riparian communities where honey mesquite grows with non-native invasive tamarisk, frequent fire will likely lead to a decline of western honey mesquite and increase of tamarisk. Not much is known of the honey mesquite fire history in the Mojave Desert, however, it is assumed that fuels were discontinuous and that fire was infrequent (Steinberg 2001). Mesquite woodland is in Fire Regime I, and Paysen et al. (2000) concluded that the likely historic average fire return interval was 10 years. Mesquite woodlands are generally classified as a Condition Class 2 due to invasive noxious tamarisk and the moderate risk of losing key ecosystem components.

3.2.10.2.5.8. Mixed Conifer

Small forest community enclaves of mixed conifers predominantly found on mesic, north-facing slopes include white fir, ponderosa pine, limber pine, Englemann spruce, bristlecone pine, and pinyon pine. Primary associated shrub species include sagebrush, snowberry, buckbrush, mountain mahogany, and manzanita. The mixed conifer forests of Southern Nevada are most closely associated with the southern Rocky Mountain ponderosa pine woodlands. Fire regimes are probably similar, characterized by frequent low and mixed severity fires (Fire Regime I). This mixed severity fire regime often results in a mosaic pattern of stand structure and fuels. Past stand burn mosaics tend to increase the probability that subsequent fires will also burn in a mixed pattern (Arno 2000). The mixed conifer forests of Southern Nevada are generally considered to be Condition Class 1 due to the fire regimes functioning within historical ranges and the low risk of losing key ecosystem components.

3.2.10.3. Wildland Fire History

According to the *Southern Nevada Agency Partnership Science and Research Synthesis Executive Summary*:

> Between 1972 and 2007, approximately one million acres (404,686 ha) burned in 116 large fires (≥1,000 acres) in Lincoln and Clark counties, primarily within the blackbrush/shadscale and Mojave Desert scrub ecosystems. Most of that burned acreage (90 percent) occurred in areas that had not previously burned during the 36-year study period, 8 percent occurred in areas that had burned once before, and 2 percent occurred in areas that had burned two or three times before. The largest areas burned in the 2005 and 2006 fire seasons and appear to have been unprecedented during the past century. There was a general increase in number of large fires and area burned between 1972 and 2007, largely due to the 2005 and 2006 fires. (Chambers, et al., 2013(b), p. 25)

Fires are widely distributed in terms of frequency and severity. The weather and fuel structure in the planning area provide an opportunity for ignitions from frequent summer thunderstorms. From 1999 to 2012, fire occurrence averaged about 57 fires per year. Lightning accounted for 46 percent of all starts, and most of the acres burned during the 2005 and 2006 fire seasons. Fifty-four percent of fire starts were human-caused due in part to recreational shooting of

steel-core ammunition, fireworks, and burning of copper wire insulation. Equipment use is also responsible for starting some fires. During this period, the achieved about 97 percent initial attack success rate (BLM 2004, BLM 2010, BLM 2013(b)).

Fires are typically categorized on the basis of period of occurrence, size class, regime, and condition class. Wildfires can occur year-round in much of the Mojave region. For the planning area, the general fire season is usually May through October. The most critical fire conditions correspond with the hot summer period characterized by low moisture and midsummer thunderstorms. From 1999 to 2012, the large majority of wildfires in the fire response area have been less than a tenth of an acre in size. About 96 percent of the wildfires that occurred within the fire response area were Size Class A (0.1 to 0.2 acres), B (0.3 to 9.9 acres), C (10 to 99.9 acres), and D (100 to 299.9 acres) incidents (see Table 3.22, "Fire Occurrence 1999 to 2012 " (p. 399)). About 4 percent of fires fall into the other three size classes, primarily from the 2005 to 2006 fire seasons, including the 2005 Southern Nevada Complex (E, 300 to 999.9 acres; F, 1,000 to 4,999.9 acres; G, 5,000+ acres) (BLM 2010, BLM 2013(b)).

Table 3.22. Fire Occurrence 1999 to 2012 [a]

Size class	A (0.1 to 0.2 acres)	B (0.3 to 9.9 acres)	C (10 to 99.9 acres)	D (100 to 299.9 acres)	E (300 to 999.9 acres)	F (1,000 to 4,999.9 acres)	G (5,000+ acres)
Number of fires	490	204	67	15	10	6	7
Number of acres	49.8	383.4	2,044	2,377	5,806	8,173	874,560

[a]Source: BLM 2010 and BLM 2013(b).

The five fire regime classes are representative of the frequency and severity of burns throughout much of the fire response area which includes the planning area (see Table 3.23, "Fire Regimes and Acres" (p. 399)). Historically, the most prolific fire spread events have been wind-driven, especially in the brush plant cover types associated with annual invasive grasses. Plume-dominated fires have occurred particularly during very dry years in the mountain shrub vegetation type and in the older stands of pinyon-juniper. The incursion of invasive annual grasses, such as red brome, is changing the fire environment. Invasive light/flashy fuels that are available to burn through the peak of the fire season are becoming more abundant by way of the species post-disturbance fire adaptations. Examples of a more moderate to frequent return interval would be sage/grasslands and the higher elevation shrub communities.

Table 3.23. Fire Regimes and Acres[a]

Fire regime	Description	Acres	Percent of area
I	0- to 35-year frequency and low to mixed severity-surface fires most common	59,081	1 percent
II	0- to 35-year frequency and high severity-stand replacement fires	1,620,586	27 percent
III	35- to 100+ year frequency and mixed severity	10,862	<1 percent

Fire regime	Description	Acres	Percent of area
IV	35- to 100+ year frequency and high severity-stand replacement fires	1,294,301	21 percent
V	200+ year frequency and high severity-stand replacement fires	2,782,987	46 percent
Unclassified		284,394	5 percent

[a] Source: BLM 2004 and BLM 2010

Table 3.24, "Fire Regime Condition Classes and Acres" (p. 400) shows the acreages for condition classes for much of the fire response area as defined in terms of the relative risk of losing one or more key components that define an ecological system based on five ecosystem attributes: disturbance regimes (patterns and frequency of insect, disease, and fire), disturbance agents, smoke production, hydrologic function (sedimentation and stream flow), and vegetation attributes (composition, structure, and resilience to disturbance agents).

Table 3.24. Fire Regime Condition Classes and Acres[a]

Condition class	Acres	Percent of area	Condition Class description
1	14,532	<1 percent	Fire regimes are within an historical range, and the risk of losing key ecosystem components is low. Vegetation attributes (species composition and structure) are intact and functioning within an historical range.
2	3,879,908	64 percent	Fire regimes have been moderately altered from their historical range. The risk of losing key ecosystem components is moderate. Fire frequencies have departed from historical frequencies by one or more return intervals (either increased or decreased). This results in moderate changes to one or more of the following: fire size, intensity and severity, and landscape patterns. Vegetation attributes have been moderately altered from their historical range.
3	1,873,377	31 percent	Fire regimes have been significantly altered from their historical range. The risk of losing key ecosystem components is high. Fire frequencies have departed from historical frequencies by multiple return intervals. This results in dramatic changes to one or more of the following: fire size, intensity, severity, and landscape patterns. Vegetation attributes have been significantly altered from their historical range.
Unclassified	284,394	5 percent	The unclassified category includes four Southwest Regional Gap Analysis Project (SWReGAP) land cover types that are not conducive to being ranked in a fire regime. Unclassified land cover types include: barren, urban, water, and agricultural.

[a]Source: BLM 2010 and BLM 2004

Most public lands in the planning area are a mixture of Fire Regime Condition Class 1 and 2 with components of Condition Class 3 where exotic, invasive combustible species are present. The fuel structure in the planning area is changing due to the incursion of non-native annual grasses, primarily red brome (*Bromus rubens*) and cheat grass (*Bromus tectorum*). In areas where fuels are continuous, there is the potential for fires to spread readily during the peak of the average fire season. Much of this area is grouped typically in Fire Regimes I and II, but many of the pinyon and juniper stands have much older stand characteristics that often have heavier fuel accumulations and burn with stand replacement fire behavior. Many areas exist where sparse fuels and other natural barriers limit fire spread. Most are dry sites where the vegetation is of a moderate to old age class distribution.

Red brome and cheat grass have significantly increased from historically inhabiting scattered pockets to becoming a dominant fine fuel component intermixed with the Mojave and salt desert

scrub vegetation types and sagebrush and pinyon-juniper stands. Beatley (1966) reported that cheat grass was confined to disturbed sites at higher elevations (5,000 to 7,500 feet) on the Nevada National Security Site in Southern Nevada, where vegetation is dominated by sagebrush or pinyon-juniper, and that red brome was the frequent dominant winter annual species in blackbrush communities at 4,000 to 5,000 feet. Cheat grass has since expanded its range into lower elevation sites (West and Ibrahim 1968; and Brown 1971).

Wherever red brome and cheat grass dominate, the prevailing Condition Class is 3 due to the loss of key ecosystem components such as native species. The fire regime of red brome- and cheat grass-dominated sites is the historical fire regime of that site before it was invaded by these invasive annuals. The establishment of red brome and cheat grass in a wildland community fosters much more frequent fire return intervals by extending the time during which the vegetation community is susceptible to wildfire ignitions. Once established, red brome may increase fire frequency by enhancing the potential for start and spread (Beatley 1966). In the summer, red brome and cheat grass dry out four to six weeks earlier than perennial grasses and form a fine-textured, highly flammable fuel that persists into the fall (Paysen et al. 2000). Once red brome and cheat grass dominate a site, the fire regime is altered to more frequent stand-replacing fires such as the red brome and cheat grass fire regime, or annual grass fire regime. Shortened natural and historical fire rotations adversely impact perennial vegetation, reduce plant species diversity, and result in large areas of exotic annual species and a fire regime that excludes perennial plants (Whisenant 1990).

3.2.11. Cultural Resources

Cultural resources are the tangible remains of past human activities as identified through field inventory, historic documentation, or oral history. These remains may include prehistoric or historic-period sites, architectural properties, and sites or places of traditional cultural or religious importance to Native American tribes or other social or cultural groups. A subset of cultural resources are historic properties, which are legally defined as districts, sites, buildings, structures, or objects that are included in or eligible for inclusion in the National Register of Historic Places.

The BLM is required to identify, protect, and manage cultural resources located on public lands, as well as those located on non-federal lands that may be impacted by BLM undertakings. The BLM manages cultural resources in compliance with various federal laws, regulations, and directives. The principal federal law to address cultural resources is the National Historic Preservation Act of 1966 (NHPA), as amended, and its implementing regulations (36 CFR 800).

The National Historic Preservation Act directs the BLM to ensure that any undertakings initiated or authorized by the BLM do not inadvertently disturb or destroy historic properties. Inventories to identify, evaluate, and mitigate potential effects to historic properties affected by a proposed undertaking are the first step in the Section 106 process. The BLM has entered into a protocol agreement with the Nevada State Historic Preservation Office (SHPO) that governs the manner in which the agency shall meet its responsibilities under the NHPA. The BLM has also developed policies and procedures through its Cultural Resources Manual (Sections 8100-8170) to guide planning, decision-making, and activities. These guidelines provide comprehensive instructions for conducting cultural resource inventories and further implement federal policy to protect cultural resources.

Other important laws and directives applicable to cultural resources management include the Archaeological Resources Protection Act (ARPA); the Native American Graves Protection and Repatriation Act (NAGPRA); the American Indian Religious Freedom Act (AIRFA); Executive Order (EO) 11593, “Protection and Enhancement of the Cultural Environment”; EO 13007, “Indian Sacred Sites”; EO 13175, “Consultation and Coordination with Indian Tribes”; and, EO 13287, “Preserve America.”

Cultural resources are fragile, nonrenewable resources with scientific or historic values. These resources are managed for both conservation and public use depending on their specific values. Impacts to cultural resources result from natural forces and human-caused damage. Natural forces include erosion from wind and water; extreme temperatures (for example, the freeze-thaw cycle, which pits and spalls rock); earthquakes; and fires. Destructive human impacts include driving off-road vehicles over sites; target shooting with bullets; anchoring climbing bolts to canyon walls that are covered with petroglyphs; painted or scratched graffiti; trash dumping; and unauthorized excavation and collecting. Public attention is increasingly focused on protecting cultural resources; long-term preservation and management is best achieved through developing a range of appropriate land-use allocations.

Indicators that reflect good physical condition of cultural resources include the following:

- The amount and distribution of natural ground cover such as plants, plant litter, and biological crusts in the vicinity of cultural resource localities is sufficient to support soil stability.
- Minimal evidence of accelerated erosion at archaeological or historic sites in the form of rills, gullies, erosional pedestals, or terrace sloughing.
- Minimal evidence of impacts to the structural integrity of buildings or structures.

- Absence of vandalism such as graffiti or bullet holes.
- Few, if any, social trails have been developed that bisect the site.
- No evidence of off-road vehicle impacts to sites (for example, there are no tire tracks, ruts, crushed vegetation, or compacted soil).
- Artifacts remain in situ rather than being gathered from the surface and placed in collector's piles.
- Monitoring detects no evidence of illegal or unauthorized damage to cultural resources.

Since 1975, more than 2,600 inventories covering a half-million acres have been conducted to comply with Section 106 of the National Historic Preservation Act. Land sales and leases have provided the impetus for most of the work, while energy projects such as transmission lines and gas pipelines are second in the total number of projects and acres surveyed. Two works of note include efforts in 2003 in support of the Las Vegas Valley Disposal Boundary Environmental Impact Statement in which 46,761 acres were inventoried; and surveys in the Gold Butte region between 2006 and 2008 in which 31,196 aces were inventoried. Roughly 16 percent of the district has been inventoried at a Class III level, which is an intensive pedestrian inventory with transect intervals spaced no more than 100 feet apart. More than 8,000 cultural resources are recorded in the district representing a variety of site types and chronological periods.

3.2.11.1. Cultural History

The earliest evidence of humans in the area has been found at Tule Springs and indicates humans were present approximately 12,000 years ago. Southern Nevada was more moist then, and shallow lakes filled several of the lower valleys. The water attracted animals and provided a lush environment to support early humans. These first people probably moved through the area as few sites are found dating to this time period.

About 10,000 years ago, climatic conditions became drier and people moved frequently to search for food and water. People lived in temporary camps near springs and other water sources. Some of these sites may show thousands of years of use. Gypsum Cave shows evidence of more than 5,000 years of human occupation, as well as earlier use by now extinct animals like the giant ground sloth.

As early as A.D. 100, the Ancestral Puebloans settled along the Muddy and Virgin River valleys building permanent houses and storage structures of stone and adobe. Although the archaeological evidence shows these people came to depend increasingly on horticulture, they still relied on wild foods. By A.D. 1150, the Puebloans began to abandon their settlements, and evidence indicates that the Colorado River peoples, including ancestors of the Mohave and Paiute increasingly moved into the area.

When the first Euro-Americans entered Southern Nevada, they encountered people that they called the Paiutes. Trappers and explorers established a commercial trade route through the Paiute homeland that became known as the Old Spanish Trail. In 2002, the trail was designated as the Old Spanish National Historic Trail (OSNHT). A major stop in Pahrump Valley was Stump Springs, where even John C. Fremont stopped there in 1844.

The remains of early ranches, homesteads, and construction camps are still present in the district, and mining sites are common. In 1868, silver-lead ore was discovered at the Yellow Pine south of Potosi, and the mining camp of Goodsprings soon became a permanent settlement. Gold was discovered in 1892 at the Keystone mine, and lead-zinc deposits were discovered and developed.

Southeast of Las Vegas, mining at Eldorado Canyon and Searchlight became established during the 1860s. In the Pahrump area, the Johnnie Mining District was established on the northwest flank of the Spring Mountains and became the second largest gold producer in Nevada next to Bullfrog Mine to the north. In addition, the largest bentonite mine in Nevada was established in 1918 in the southern Amargosa desert.

Construction of the San Pedro-Los Angles & Salt Lake, Las Vegas Tonopah, Tonopah & Tidewater railroads, beginning in the late 1800s, brought development to Southern Nevada. Bustling construction camps moved southwest with the rails until the last spike was driven connecting the line from Las Vegas with the portion of the line extending from Los Angeles. Rail travel opened previously isolated areas and stimulated the development of towns along the line. In the early 1930s, another boom hit Las Vegas with the construction of Hoover Dam, which set the stage for the development of military installations and the growth of defense industries.

President Truman established the Nevada Test Site in 1950 and in 1951 the first atomic weapon was tested at Frenchman Flat. The Test Site was a major employer through the mid–1980s, and with the development of Test Site, Pahrump become a bedroom community. During the Cold War, the Peace Camp near Mercury was the scene of anti-nuclear protests as early as the 1950s. Despite the Nuclear Testing Ban, to this day the Western Shoshone continue to protest the harm that has been done to their traditional territory.

Due to the exponential urban growth in Southern Nevada over the past two decades, cultural resources have been affected by numerous demands placed on public lands. Cultural resources have been lost through development, and rampant growth has impacted sites located on adjacent, once isolated lands. Resources located in areas once difficult to access are now threatened by the increased demands that recreation places on public lands in addition to cumulative impacts from increased visitation.

Impacts to cultural resources result from both natural forces and human-caused damage. Natural forces include erosion from wind and water; extreme temperatures such as the freeze-thaw cycle that can pit and spall rock; earthquakes; and fires. Destructive human impacts include driving off-road vehicles over sites; target shooting at rock art panels; anchoring climbing bolts to canyon walls that are covered with petroglyphs; painted or scratched graffiti; trash dumping; and unauthorized excavation and collection. Before the passage of the ARPA a long tradition of collecting artifacts as a hobby has left few significant sites free from looting. In particular rockshelters, which preserve valuable organic materials such as basketry and fabrics, have been excavated illegally. Cumulative impacts from an increasing number of visitors have further damaged sites by the development of social trails.

Adherence to Section 106 of the NHPA and BLM policy of avoiding impacts to cultural resources provides for the continued identification and preservation of cultural resource sites. Most surveys take place in compliance with Section 106 of the NHPA, meaning the surveys are conducted as needed to identify cultural resources in a project-specific context and generally are not statistically valid samples of a region.

Exposed sites and their associated artifacts, features, and/or structures are disturbed by wind and water erosion, natural deterioration, animal and human intrusion, and through development. Vandalism of archaeological sites, including collection of cultural artifacts, both unauthorized digging or “pothunting” as well as surface collecting is illegal under the ARPA.

3.2.11.2. Cultural Site Types

The Las Vegas BLM District encompasses a unique region because it is located at the interface of three distinct geographical zones:

- Colorado Plateau.
- Mojave Desert.
- Great Basin.

Each zone shows evidence of the distinctive cultural groups that adapted to the natural resources of the area. All prehistoric Native Americans employed hunting and gathering methods to acquire at least some of their foods; these resource collection practices are reflected in the archeological record. Seeds, nuts and roots were collected from a variety of plants, including cacti, agave, yucca, grasses, mesquite, and pinyon pine. Stone tools such as manos and metates used to grind seeds and nuts; knives; sharpened stone flakes; and chopping tools were found in archeological sites that record these plant procurement and processing activities.

Rabbits, desert tortoises, coyotes, rodents, bighorn sheep, and mule deer were prey for prehistoric hunters. The atlatl, a wooden device used to throw long, stone-tipped darts, was used prior to A.D. 500. After that time, the bow and arrow was introduced and included in the hunting tool kit. Projectile points, associated debris from stone tool making, and hunting blinds mark the locations of these past hunting events.

Hunter-gatherers moved seasonally within a series of environmental zones. Extended family groups collected maturing plant resources and hunted seasonally abundant game. Such hunter-gatherer occupations in Southern Nevada begin about 11,000 BCE, as documented by the prehistoric site of Tule Springs in the northwest Las Vegas Valley. Heaviest use of the region has occurred within the past 5,000 years. Gypsum Cave, located northeast of Las Vegas, has yielded evidence of continual use by different cultural groups from about 3,000 BCE into historic times. Due to the variety of resources, availability of water, and the accessibility of shelter caves, Red Rock Canyon was also extensively used.

Aboriginal peoples commonly used these natural formations as shelters and as storage areas for small quantities of collected resources, tools, and other personal possessions. Evidence of their fires can be found in the blackened staining on the walls and ceilings of such caves. The remnants of food processing equipment and toolmaking activities, as well as seeds, baskets, sandals, and other perishable items, are often preserved within habitation sites.

Other types of prehistoric archeological sites include stone features such as rock rings and rock art locales. Rock art is defined as the modification of a rock face by pecking (petroglyphs) or painting (pictographs) figures or designs. Rock art panels are common in certain areas, generally near water sources, along game trails, or near resource procurement locations. Sandstone with a stained or patinated surface is perhaps the best medium for illustrating this kind of aboriginal visual creativity, but limestone, basalt, and other volcanic materials were also commonly used. Although rock art designs have been attributed to all prehistoric groups, there is presently no positive method for dating these kinds of sites. Keyhole Canyon is one site complex within the Las Vegas Field Office that was fenced for protection and signed for interpretation.

The southern portion of Nevada was occupied by four distinctive groups: Lower Colorado or Yuman peoples, the Virgin Anasazi, the Southern Paiute and the Western Shoshone. Lower Colorado tribes such as the Mojave conducted floodwater farming along the Colorado River. The

Virgin Anasazi were concentrated along the Muddy and Virgin rivers to the north of Las Vegas and lived in isolated hamlets or small villages, with semi-permanent pueblos. Much of their staple food came from corn, beans, and squash grown in the floodplains. When the first Anglo-European explorers reached this area they observed small groups of Southern Paiutes living in temporary brush structures and foraging among the diverse environmental zones of the region. The Southern Paiutes also practiced limited horticulture around spring sources and along river bottoms. They grew a variety of crops, including corn, beans and squash unlike the Western Shoshone, which were highly mobile foragers.

Historic use of Southern Nevada began with the exploration of routes such as the Old Spanish Trail/Mormon Road/(1844 to the early 1900s). other histroic types of sites include mines such as Johnnie District and the Potosi Mine (the first mine in the region), which dates back to 1861. Ranching also was well under way by the late 1800s; completion of railroad construction in 1905 established Las Vegas as a vital Nevada community. The history of the area is rooted in the mines/mineral exploration and production, the defense industry, and other forms of economic development. In the Pahrump area, there are numerous areas of high cultural resource sensitivity and values. Stump Springs is recognized as an ACEC, in the Hidden Hills area there are archaeological sites that may acquired by the Archaeological Conservancy, and Cold War sites associated specifically with the Nevada Test Site are but a few examples.

There are seven sensitive cultural resource areas that have been designated as areas of critical environmental concern (ACECs) in addition to six areas that include cultural resources in combination with other values such as natural resources.

The seven cultural ACECs areas are:

- Arden Historic Sites: Historic railroad construction and mining.
- Bird Spring: Prehistoric habitation and rock art.
- Crescent Townsite: Historic railroad construction and mining.
- Hidden Valley: Prehistoric habitation and rock art.
- Keyhole Canyon: Prehistoric habitation and rock art.
- Sloan Rock Art District: Prehistoric habitation and rock art.
- Stump Spring: Prehistoric camp and historic trail and camp.

The following ACECs include cultural resources as an outstanding value:

- Arrow Canyon: Prehistoric rock art.
- Gold Butte, Part A – Red Rock Spring: Prehistoric habitation and rock art.
- Gold Butte, Part A – Whitney Pocket: Prehistoric habitation and rock art.
- Gold Butte, Part B – Gold Butte Townsite: Historic mining.
- Rainbow Gardens: Gypsum Cave, traditional cultural property.
- Virgin River: Prehistoric habitation and rock art.

3.2.12. Paleontological Resources

Paleontological resources are the remains, traces, or imprints of organisms, preserved in or on the Earth's crust, that are of paleontological interest and provide information about the history of life on Earth. Vertebrate and some plant and invertebrate paleontological resources are unique, non-renewable resources that have scientific value. Paleontological resources are found in specific geological units or formations and may be distributed both vertically and horizontally.

Throughout the district, only a minimal amount of paleontological research has been conducted. However, extensive investigations have occurred recently in the upper Las Vegas Wash in the north Las Vegas Valley. Field surveys of 25,000 acres within the wash located more than 430 paleontological localities that include the remains of extinct mammoths, camels, bison, and horses. The majority of these remains are located in specific horizons of fossiliferous Quaternary spring deposits. These distinctive deposits, which are exposed throughout the Las Vegas Valley, are known as the Las Vegas Formation (Longwell et al. 1965:50). Similar deposits are also exposed in areas of the Pahrump Valley, but these have yet to be mapped accurately (Longwell et al. 1965:52). Due to the large number of fossil localities, locally abundant fossils, and highly diverse vertebrate fossil assemblages, the Las Vegas Formation is considered to contain the most significant assemblage of late Pleistocene invertebrate and vertebrate fossil remains known from the Mojave Desert and Great Basin. In addition to the Las Vegas Formation, other geologic strata in the district that contain vertebrate fossils include the Thumb, Muddy Creek, and Horse Spring formations.

The BLM manages paleontological resources for scientific, educational, and recreational values. However, only permitted paleontologists may collect or excavate vertebrate fossils, trackways, and noteworthy occurrences of fossilized invertebrates or plants. Paleontological resources are managed under the following principal authorities:

- Paleontological Resources Preservation Act of 2009 (Sections 6301-6312 of the Omnibus Public Lands Act of 2009, 16 USC 470aaa) is the primary authority for permitting the collection of paleontological resources. It mandates the management and preservation of paleontological resources on public lands using scientific principles and expertise. Programs to increase public awareness about the significance of paleontological resources are also mandated, and civil and criminal penalties are provided for prohibited acts of vandalism and theft of paleontological resources and other violations of the act.
- The Federal Land Policy and Management Act of 1976 (P.L. 94-579) requires that the public lands be managed in a manner that protects the "quality of scientific" and other values. The act also requires public lands to be inventoried and provides that permits may be required for the use, occupancy, and development of public lands.
- The National Environmental Policy Act of 1969 (P.O. 91-190) requires that "important historic, cultural and natural aspects of our national heritage" be protected, and that "a systematic, interdisciplinary approach which will insure the integrated use of the natural and social sciences … in planning and decision making" be followed.
- Additional regulations address the casual collection of invertebrate and plant fossils (43 CFR 8365.1-5(b)), and the free use collection of petrified wood (43 CFR 3622(a)).

Paleontological resources constitute a fragile and nonrenewable scientific record of the history of life on earth and, therefore, represent an important and critical component of America's natural heritage. Fossils are integrally associated with specific geologic formations and may occur throughout those formations. The potential for locating important paleontological resources can

be predicted by the presence of fossil-bearing geologic formations. For this reason, the condition of paleontological resources is directly linked to soil and landform stability.

Indicators that reflect good physical condition of paleontological resources include the following:

- The amount and distribution of natural ground cover such as plants, plant litter, and biological crusts in the vicinity of fossil localities is sufficient to support soil stability.
- Minimal evidence of accelerated erosion at fossil localities in the form of rills, gullies, erosional pedestals, or terrace sloughing.
- No evidence of off-road vehicle impacts to localities (for example, there are no tire tracks, ruts, crushed vegetation, or compacted soil).
- Few, if any, social trails have been developed that bisect a locality.
- Monitoring detects no evidence of illegal or unauthorized damage to paleontological resources.

Since 2002, more than 30,000 acres have been inventoried for paleontological resources. Land sales and leases have provided the impetus for most of the work, while energy projects such as transmission lines and gas pipelines are second in the total number of projects and acres surveyed. More than 25,000 acres were evaluated in support of the Las Vegas Valley Disposal Boundary Environmental Impact Statement, and supplemental inventory and excavations were conducted subsequently.

Paleontological resources have been less impacted than cultural resources by the exponential urban growth in Southern Nevada during the past two decades. This is probably due to the more limited occurrence of fossils. However, the theft of fossils is apparent in several locations in the district. Thieves have used rock saws to remove the fossilized trackways of birds and mammals (species unknown) west of Moapa. The extent of the damage points to multiple episodes of theft over many years. In addition, trackways on small portable slabs of rock have been removed illegally.

Impacts to paleontological resources result from both natural forces and human-caused damage. Natural forces include erosion from wind and water; extreme temperatures (for example, the freeze-thaw cycle, which pits and spalls rock); earthquakes; and fires. Destructive human impacts include driving off-road vehicles over sites, trash dumping, unauthorized excavation and collecting, and vandalism.

The formal interagency site stewardship program that was developed in 2005 will be expanded to include paleontological resources. To date, the group Protectors of Tule Springs has been active in monitoring paleontological localities in the Las Vegas Wash. As interest grows and publicity about paleontological resources becomes widespread, it is anticipated that localities may be looted or vandalized, resulting in the loss of valuable information. In addition, off-road vehicles have already impacted several localities in the north valley. Motorcycles create trails by riding up and over hills, causing increased erosion and crushing and fragmenting fossil material.

As reported to the BLM by cultural site stewards, the closing and rehabilitation of impromptu roads has drastically diminished the incidences of vandalism and destruction by off-highway vehicles. Forcing visitors to walk some distance to reach paleontological localities would increase the amount of effort and planning it takes to illegally excavate and remove heavy items. Not having a vehicle handy for a quick getaway discourages furtive looters or vandals. In addition, foot travel limits the amount of equipment that can be carried into a remote location to loot a site.

There are two areas that include paleontological resources in combination with other values such as natural resources.

The following ACECs include paleontological resources as an outstanding value:

- Arrow Canyon: Miocene bird tracks.
- Rainbow Gardens: Includes Gypsum Cave, which, prior to excavation, contained the remains of extinct Pleistocene megafauna such as Shasta ground sloth and horse.

3.2.13. Visual Resources

The objective of the visual resources program is to manage and maintain the quality of the visual environment and reduce the visual impact of development activities while maintaining effectiveness in all BLM resource programs. BLM's visual resources program consists of three phases: the visual resource inventory (VRI), establishment of visual resource management (VRM) classes through land-use plans, and analysis of implementation-level management actions to ensure compliance through visual resource contrast rating. VRM classes are assigned to reflect resource value and resource use allocation decisions made in the land-use planning process. The intent of VRM is to minimize the visual impacts of all surface-disturbing activities regardless of the class in which they occur.

The VRI process provides BLM managers with a means for determining visual values. In 2011, the Southern Nevada District Office conducted a visual resource inventory to characterize the visual resources within the planning area (3,116,155 acres) (BLM 2011). The inventory consists of a scenic quality evaluation, sensitivity level analysis, and a delineation of distance zones. Based on these three factors, BLM-administered lands are placed into one of four VRI classes, with each representing the relative value of the visual resources. VRI classes are based on a rating scale of Class I through Class IV, the former being the most valued and the latter being of least value. VRI classes II, III, and IV are assigned based on combinations of scenic quality, sensitivity levels, and distance zones identified during the inventory process. VRI Class I is automatically assigned to all special areas where the current management situation requires maintaining a natural environment essentially unaltered by humans, specifically congressionally designated wilderness and wilderness study areas (including instant study areas). Wilderness study areas (WSAs) are managed to preserve the wilderness characteristics of the area until Congress releases the area from further wilderness consideration. Therefore, because congressional release of a WSA can occur at any time, the VRI class analysis includes the underlying visual value of the existing WSAs. The planning area is characterized as follows:

Scenic quality classification[1]:
- **A (High):** 329,996 acres.
- **B (Medium):** 1,765,863 acres.
- **C (Low):** 832,258 acres.

Scenic sensitivity classification[1]:
- **High:** 1,516,618 acres.
- **Moderate:** 533830 acres.
- **Low:** 877,665 acres.

Visual resource inventory classification:
- **VRI Class I:** 182,858 acres.
- **VRI Class II:** 926,307 acres.
- **VRI Class III:** 861,436 acres.
- **VRI Class IV:** 1,137,995 acres.

The VRI provides the basis for considering visual values in the RMP revision process. While VRM classifications, as designated by the 1998 RMP, are part of the existing management, they

[1] Acreage calculations do not include congressionally designated wilderness areas which, by National BLM policy, are VRI Class I

are not part of the affected environment. The existing environment, and thus the baseline for which impacts will be compared in Chapter 4, is the VRI class.

The topography within the planning area is varied and ranges from valley floor elevations of around 1,150 feet near Laughlin to mesas at around 2,500 feet and mountain elevations of over 7,000 feet. The principal mountain ranges are the Spring Mountains, South Virgin Mountains, Muddy Mountains, Eldorado Mountains, McCullough Range, Newberry Mountains, and Arrow Range. The broad valleys of the Basin and Range landscape trend generally north-south and can extend for more than 30 miles along this axis. With a typical width of 10 miles, these valleys afford panoramic vistas of the adjacent mountain ranges. The Ivanpah Valley, Piute Valley, and the Amargosa Valley are notable examples of large valleys surrounded by mountain ranges. The planning area is in the Mojave Desert with some influence in the transition zone to the Great Basin Desert and vegetation representative of the Sonoran Desert. The planning area is within the Mojave Desert ecoregion of the Basin and Range Physiographic Province and displays a diverse variety of landscapes that can be separated into eight distinct areas: Gold Butte region, Mormon Mesa, Arrow Canyon Range, Muddy Mountains, Las Vegas Valley, Southern Spring Mountains, Southern Clark County, and Amargosa-Pahrump.

Impacts to the landscape within the planning area are being produced by the tremendous increases in residential, commercial, and industrial development, small site-type ROWs (e.g., communication sites, seismic exploration, and substations), and linear ROWs (e.g., transmission, fiber-optic, and gas lines), renewable energy projects, OHV recreation, and the increasing number and length of vehicle routes and trails. Additional impacts are resulting from the development of locatable, fluid, and saleable minerals. The increasing number of OHV routes being utilized by recreationists throughout much of the planning area, is having indirect effects on visual resources. Seldom-seen zones (those areas that are not visible from major travel routes) have decreased, and an increase in the number of vehicles and people on major roads and OHV routes are creating changes in foreground and middleground views, and changes in visual sensitivity. An increasingly utilized network of two-track roads and routes are creating conditions that allow OHV users and campers to expand surface disturbances and impact visual resources.

3.2.13.1. Gold Butte Region

The Gold Butte region is generally defined as south of the Virgin River near Mesquite and east of the Overton Arm of Lake Mead. The southern boundary is the Lake Mead National Recreation Area, while the east is formed by the planning area boundary at the Nevada/Arizona state line. The region is rated as having high to medium scenic quality (approximately 75 percent to 25 percent, respectively). The region is dominated by the Virgin Mountains, a portion of which are within the Virgin Peak Instant Study Area. The Virgin Mountains are a highly variable and complex massive mountain range with areas of deep and rugged erosional forms and characterized by exceptional panoramic desert views. Lower mountain ridges are highly scenic and geologically interesting, offering varying colorations including black and vivid reds.

The region's low rolling hills in a landscape with rough rock formations and incised canyons is highly complex. The northern portion of the area is covered by sparse creosote bushes, grasses, and shrubs. Dense stands of Joshua trees, pinon, and juniper, as well as desert vegetation types, are found at the southern extreme of Gold Butte. There are few water sources and riparian areas. The proximity of the tree-clad Virgin Mountains to sandstone formations and desert vegetation creates a stark visual contrast. Most visitors would view the region from numerous miles of OHV routes and State Route 170.

Approximately 75 percent of the region is rated as having high sensitivity. Whitney Pockets is a highly scenic point of interest with significant historic features. The 62-mile Gold Butte Backcountry Byway is a rugged, highly scenic route requiring four-wheel drive that loops through the region and parallels the Virgin River, which is under review for eligibility as a wild and scenic river. Azure Ridge is a highly scenic and popular hiking destination and includes the Million Hills Wilderness Study Area. Public interest in the Gold Butte Historic Mining District, petroglyphs, and colorful sandstone formations add to the sensitivity of the area. Special areas include Devil's Throat and Red Rock Spring. The viewshed adjacent to Lime Canyon Wilderness is a highly scenic and popular hiking area. The Gold Butte ACEC is highly scenic, contains historic and cultural resources, includes the Jumbo Springs Wilderness, and has highly rated scenic value. The low sensitivity areas comprise approximately a quarter of the region and are infrequently used areas outside of high and moderate rated areas. Adjacent land uses having high sensitivity include Lake Mead National Recreation Area and Grand Canyon-Parashant National Monument.

Cultural modifications include historic mines and Civilian Conservation Corps structures, corrals, agricultural areas, and developed areas of Bunkerville. The distinct river valley is bordered by mesas and bajadas with areas of concentrated retail and residential development. Few site-type ROWs (e.g, communication towers and water tanks) are located primarily in the northern portion of the region, and OHV travel in region is limited to designated routes. The Mesquite Community Pit is in the northeast portion of the region.

3.2.13.2. Mormon Mesa

The Mormon Mesa area is generally triangular in shape and located north of State Routes 168 and 169, bounded on the east by the Virgin River. The area extends to the northern boundary of the planning area and is rated as having mostly medium visual appeal with limited low and high visual appeal. The predominant landscape feature in the area is Mormon Mesa, a large, gradually sloping landscape extending from Moapa Valley to the base of the Mormon Mountains. The mesa landscape displays highly eroded features with low, rolling hills, buttes, sand hills, narrow stream beds, alluvial fans, and a terraced river valley along the Virgin River with extensive riparian and agricultural crops. The Virgin River Valley is well defined to the north by the Mormon Mesa rim in addition to smaller mesas and bajadas.

Most highway travelers will view scenery from Interstate 15, which bisects the area. Travelers can also view scenery from State Routes 168 and 169, which connect major roads, cities, unincorporated towns, or extend to adjacent locations and points of interest, such as Lake Mead National Recreation Area. The primary water sources are the Muddy River, Meadow Valley Wash, and Virgin River. Vegetation consists of creosote bush communities in the lower elevations and pinyon-juniper woodlands on Mormon Mountain. Scenic values are found in the transition between the mesa's floor and Mormon Mountain. Cultural modifications include many private sections, mostly surrounding the Muddy River, above-ground transmission lines, underground pipelines, and a cement plant. Few site-type ROWs (e.g, communication towers) are present, while OHV travel in most of the area is limited to designated routes. The Virgin River Valley contains areas of concentrated retail and residential development and agricultural use. The area along the Virgin River presents a lush, green, narrow landscape that weaves through dry and arid surroundings. The river and valley colors provide a pleasing and harmonious color contrast.

High sensitivity is found within approximately half the area, with little low and moderate sensitivity present. High sensitivity is identified around Meadow Valley Wash due to adjacent private land, Mormon Mesa ACEC, eligibility of Meadow Valley Wash as a wild and scenic river,

Mormon Mountains Wilderness, Meadow Valley Range Wilderness, the Old Spanish Trail, and the Virgin River ACEC. Medium sensitivity areas primarily occur along Interstate 15, which is primarily used as a transportation corridor, although Mormon Mesa offers views of a nice expansive landscape with minimal development.

3.2.13.3. Arrow Canyon Range

The Arrow Canyon Range is north of Interstate 15 and west of the Mormon Mesa area and is confined by the planning area boundary contiguous with the Desert National Wildlife Refuge. This area includes the Coyote Springs Valley west of Meadow Valley Range Wilderness in the north and extends south just beyond Apex. The area is rated as having equally moderate to low visual appeal. Much of the area is characterized by flat and dry valleys with little topographic or vegetative variety. Vegetation is typical of lower-elevation Mojave Desert. Pahranagat Wash is a more highly eroded landscape of mesas and with more complexity compared to the surrounding landscape. Major landscape features include the Arrow Canyon Range, Coyote Spring Valley, Moapa Valley, and Dry Lake Valley. The Arrow Canyon Range, which dominates the area. is composed of low- to medium-height peaks and ridges formed by geologic uplift and made prominent by the flatter surrounding valleys. Dry Lake Valley is flatter than its surroundings with little topographic or vegetative variety. Communities of sparse, scattered shrubs and grasses including creosote bush, white bursage, and big galleta grass occur in basins; Joshua tree, other yucca species, and cacti occur on arid footslopes; woodland and shrubland communities occur on mountain slopes, ridges, and hills (Bryce et al., 2003). A portion of the unit is irrigated private land, the majority of which flanks the Muddy River and appears lush and green.

Most highway travelers will view scenery from Interstate 15 and less so from Highway 95, which trends north to south through the western portion of the area. Highway 168 is primarily a transportation corridor used by local residents and has a considerable amount of private development. Cultural modifications include transmission lines, power plants, a mine, a portion of the Speedway Community Pit, communication towers, substations, a diversion dike, a detention basin, Union Pacific Railroad ROWs, OHV routes, and signs.

The area is primarily moderate and low sensitivity with little rated as high. Meadow Valley Range Wilderness, the Arrow Canyon ACEC (which contains prehistoric resources including rock art and a CCC dam), Desert National Wildlife Refuge, Arrow Canyon Wilderness (which includes Table Mountain), Mormon Mesa ACEC, Coyote Springs ACEC, proximity to private/residential, Moapa Indian Reservation, and the Moapa Valley National Wildlife Refuge contribute to the high sensitivity of the area. The Muddy River is a unique feature and under review for eligibility as a wild and scenic river.

3.2.13.4. Muddy Mountains

The Muddy Mountains area is south of Interstate 15, north of Lake Mead, and east of Las Vegas. The area extends to State Route 169 in the north and is bounded in the south by State Route 564. The area has a diversity of scenic quality with approximately half rated as medium, a moderate amount of low, and few acres rated as high. The region is dominated by the Muddy Mountains, the southern portion of which are within the Muddy Mountains Wilderness. The Muddy Mountains are a prominent range within a relatively flat landscape and include distinct areas of saturated red and tan badlands and complex geology. The Bitter Springs Valley is an area of high scenic quality characterized as a large, open, rolling valley transitioning to alluvium at mountain edges. Another

prominent feature within the area is Frenchman Mountain, a small, bold and blocky mountain range at the eastern edge of Las Vegas. Other portions of the area display a complex landscape containing a variety of forms from low, rolling hills and small angular mountains to massive, uplifted ridges. Lava Butte is a dominant massive pyramidal peak with steep, sloping sides. The western portion of the area is characterized by sparse vegetation and a low mountain range with a rounded and flattened ridge to low rolling hills and flats with sand dunes. A few springs with riparian vegetation intersperse the creosote bush communities of the lower elevation. California Wash is relatively flat and sparsely vegetated compared to its surroundings.

Most highway travelers will view scenery from Interstate 15. State Route 169 is an important area that tourists pass through en route to Valley of Fire State Park and other destinations. State Route 147 is a popular and scenic route passing through portions Rainbow Gardens ACEC. Cultural modifications include communication sites, transmission lines, a portion of the Speedway Community Pit, fences, a landfill, a weigh station, lighting, a high-use OHV area (Nellis Dunes), OHV routes, and the Union Pacific Railroad.

The area is predominantly high sensitivity with minimal moderate sensitivity (less than 5 percent). The Muddy Mountains Wilderness, Hidden Valley ACEC, Moapa Indian Reservation, residential/private/industrial/, Nellis Air Force Base, Valley of Fire State Park, Valley of Fire Road Scenic Byway (state), and Lake Mead National Recreation Area contribute to the area's high sensitivity. The Bitter Springs Backcountry Byway is a popular high-clearance OHV route that passes through desert valley, mountains, unique sandstone rock formations, and springs on its 28-mile course. Visitors' primary purpose to Logandale is to enjoy the scenic values present along the OHV trails. The Old Spanish National Historic Trail is an important remnant of America's history that runs the length of the western boundary of the area.

3.2.13.5. Las Vegas Valley

This unit generally encompasses the Las Vegas Valley and is bounded on the north and west by the Desert National Wildlife Refuge, by a high point just north of Lee Canyon on Interstate 15, and on the west by Red Rock Canyon National Conservation Area; the south and southeast boundary are near Sloan and Railroad Pass, respectively. The area is generally flat with little variation in landform and vegetation type. Most highway travelers will view scenery from Interstate 15, a major travel route with high frequent use. State Route 160 and Highway 93/95 are major transportation routes; the former is the main travel route to Pahrump. Other popular routes include short portions of State Routes 156 and 157 (Mount Charleston Scenic Byway) and 159. Sensitivity levels are nearly equally split between high, medium, and low. Areas of high sensitivity include the open space and scenery of the Conservation Transfer Area, adjacent Nellis Test and Training Range, Nellis Air Force Base, Desert National Wildlife Refuge, private/residential/industrial, Las Vegas Paiute Indian Reservation, Red Rock Canyon National Conservation Area, Mount Charleston Scenic Byway (state), Floyd Lamb Park at Tule Springs, Sloan Canyon National Conservation Area, North McCullough Wilderness, and segments of the Old Spanish Trail. Cultural modifications include roads, OHV routes, transmission lines, drainage facilities, the Lone Mountain Community Pit, small site-type ROWs, Union Pacific Railroad, quarries, and fences.

3.2.13.6. Southern Clark County

This large region is bounded on the north by State Route 564 and extends to the southernmost extent of Clark County. It is bounded on the east by the Lake Mead National Recreation area

and by Interstate 15 on the west. The area has a diverse scenic quality, being predominantly medium and little high and low scenic quality. The landscape in this region is characteristic of the Basin and Range — north-south trending mountains separated by valleys. Major landforms include the unique black basalt and springs in the McCullough Mountains while smaller mountain ranges include the regionally common Sheep Mountain; the Lucy Grey Mountains, which are characterized by incised drainages within rounded boulder fields of igneous rock; the Highland Range, a small, low, rugged mountain range with bold escarpments and massive, tilted colorful rocks that make it distinct, and springs; the unique Newberry Mountains with areas of contrasting quartzite cliffs, diverse vegetation, and year-round presence of water at Hiko Spring; and the compact, mostly rounded east-west trending New York Mountains. Broad open, flat valleys include Ivanpah, with three dry lake features; Eldorado, a comparatively small, slightly bowl-shaped valley with typical Mojave Desert vegetation; and Piute with its rolling hills, washes, and notable expanse of Joshua tree forests.

Most highway travelers will view scenery from Interstate 15, a major travel route with high, frequent use. Highway 95 bisects the region north to south through the Eldorado and Piute valleys, offering expansive views of the adjacent mountains. State Routes 163, 164, and 165 serve cities/unincorporated towns and are utilized by visitors passing through en route to Lake Mead National Recreation Area, California, and Arizona.

Cultural modifications include numerous transmission lines, a solar power project (Silver State North), a wind energy project (Searchlight), a power plant, quarries, mines, gravel pits, the Jean Community Pit, radio and meteorological towers, Loran station, OHV routes, communication sites, and radio towers.

Sensitivity in the region is closely split between high and low with minimal moderate (5 percent). Contributing factors to the region's high sensitivity include popular outdoor recreation area for tourists and hikers; scenic viewing; close proximity to Las Vegas, Henderson, Searchlight, and more remote areas with little access; high use along Interstate 15 and OHV recreation; River Mountains ACEC, Piute/Eldorado ACEC, and Keyhole Canyon ACEC for their distinct geologic landscape and cultural resources; congressionally designated areas including the South McCullough Wilderness, Wee Thump Joshua Tree Wilderness, Eldorado Wilderness, Ireteba Peaks Wilderness, and Spirit Mountain Wilderness; Old Spanish National Historic Trail; historic mining districts in Searchlight and Nelson; cultural, ecological and a piece of Nevada's ranching history at Walking Box Ranch; unique ecology at Hiko Springs, which is under review for eligibility as a wild and scenic river; and a scenic drive through pinyon/juniper forest at Christmas Tree Pass.

Adjacent land uses that contribute to high sensitivity include Red Rock Canyon National Conservation Area, Sloan Canyon National Conservation Area, North McCullough Wilderness with a cultural site listed on the National Register of Historic Places, Lake Mead National Recreation Area, Mojave National Preserve, and Dead Mountains Wilderness on the Nevada/California state line. Moderate sensitivity areas include Interstate 15 as primarily a transportation corridor and major tourist route; highways between Las Vegas, California, and Arizona; a major power transmission corridor along Interstate 15; and adjacent private/residential/industrial land.

3.2.13.7. Southern Spring Mountains

This area is bounded on the north by the southern portion of the Las Vegas Valley and Red Rock Canyon National Conservation Area, and on the south at the Nevada/California state line. The western boundary roughly follows Lovell Wash. The landscape varies from the Ivanpah and Mesquite valleys with broad, flat terrain, panoramic views of nearby mountains and limited diversity in vegetation. The landscape also features the massive and rugged southern Spring Mountains with a variety of landforms, lines, patterns, and vegetation. Goodsprings Valley is characterized by distinctive low, rolling terrain and a good variety in vegetation due to the presence of Joshua trees. Bird Spring Range is complex and highly varied, having a variety of vegetation.

Most highway travelers will view scenery from Interstate 15, a major travel route with high frequent use. Cottonwood Valley Road is an important locally known route that connects the historic mining area of Goodsprings to State Route 160. State Route 161 is a moderately traveled route used by tourists and local residents. Cultural modifications include power lines, transmission lines, OHV routes, numerous quarries and mines, a substation, roads, and rural residential.

Sensitivity in the area is equally split between moderate and low with the remainder rated high (10 percent). The range of well-traveled and highly visible areas along major roads contributes to the moderate rating. The Old Spanish National Historic Trail, historic mining and natural resources around Goodsprings, and adjacent land uses including Humboldt-Toiyabe National Forest, Red Rock Canyon National Conservation Area, and private/residential/industrial lands contribute to the high-sensitivity areas.

3.2.13.8. Pahrump-Amargosa

The Pahrump-Amargosa region is located between the Springs Mountains and the Nevada/California state line; the planning area marks the northern boundary. Scenic quality in the region is classified as nearly equally medium and low. The region is composed of four small mountain ranges that vary from common landforms of foothills, to higher and more complex areas with pyramidal peaks, color contrast in rock banding, bold blocks, and escarpments. The dominant feature in the region is the Amargosa Desert, an overall flat, vast, panoramic landscape with Big Dune, which offers a unique scenic contrast. Pahrump Valley is a broad and expansive valley with vegetation typical of the Mojave Desert and springs that make the valley somewhat unique. Other smaller enclosed valleys are not remarkable, characterized by flat bajada-type desert country with creosote bush communities. An exception is the Stewart Valley, which has a broad band of dense mesquite along an edge of the dry lake.

Cultural modifications include the Gold Ace and Cinder Cone mines, OHV routes, power lines, transmission lines, a railroad, an FAA beacon, fence, weather station, and prisons.

Sensitivity in the area is diverse, having similar amounts of high, medium, and low. High sensitivity is due to the Amargosa River, Amargosa Desert (including the distinct landscape of Big Dune and Ash Meadows), the Old Spanish Trail, and water and recreation at Willow Creek. Adjacent land uses contributing to high sensitivity include Ash Meadows National Wildlife Refuge, Death Valley National Park (Devil's Hole), Carson Slough (under consideration for eligibility as a wild and scenic river), designated wilderness in California and Mt. Charleston Wilderness, Humboldt-Toiyabe National Forest, and private/residential/industrial/agricultural. Moderate sensitivity is attributed to OHV recreation and scenic values, presence of small rural communities, major transportation and infrastructure corridors with infrastructure along the

length, sightseers, private mines, adjacent Nevada National Security Site, and Nellis Air Force Test and Training Range.

3.2.13.9. Special Management Areas

Special management areas generally contain areas of high scenic quality. Special designations with landscape of visual interest within the planning area include:

- Arrow Canyon Wilderness
- Eldorado Wilderness
- Ireteba Peaks Wilderness
- Jumbo Springs Wilderness
- Lime Canyon Wilderness
- Meadow Valley Range Wilderness
- Mormon Mountains Wilderness
- Mt. Charleston Wilderness
- Muddy Mountains Wilderness
- South McCullough Wilderness
- Spirit Mountain Wilderness
- Wee Thump Joshua Tree Wilderness
- Million Hills WSA (northern portion)
- Resting Springs WSA (eastern portion)
- Virgin Peak ISA
- Arrow Canyon ACEC (portions)
- Crescent Townsite ACEC (portions)
- Devils Throat ACEC
- Gold Butte ACEC, Part A
- Gold Butte ACEC, Part B
- Gold Butte ACEC, Part C
- Gold Butte Townsite (portions)
- Hidden Valley ACEC
- Mormon Mesa ACEC (minimally)
- Piute/Eldorado ACEC (portions)
- Rainbow Gardens ACEC
- Stump Spring ACEC
- River Mountains ACEC (approximately half)
- Virgin River ACEC
- Virgin Mountains ACEC
- Whitney Pocket ACEC
- Red Rock Springs ACEC

3.2.14. Lands with Wilderness Characteristics

In accordance with Section 201 of the Federal Land Policy and Management Act (FLPMA), the BLM is required to maintain a current inventory of land under its jurisdiction and identify within that inventory lands with wilderness characteristics that are outside the areas designated wilderness and wilderness study areas (including instant study areas). Through land-use planning, the BLM may manage lands newly found to have wilderness characteristics to affect, protect, or preserve all wilderness characteristics within those lands. A wilderness characteristics inventory is the process of determining the presence or absence of wilderness characteristics based on existing conditions. The inventory evaluates wilderness characteristics as defined in Section 2(c) of the Wilderness Act and incorporated in FLPMA. For an area to qualify as lands with wilderness characteristics, it must possess sufficient size, naturalness, and outstanding opportunities for either solitude or primitive and unconfined recreation. In addition, it may possess supplemental values, but these values need not be present for an area to be identified as lands with wilderness characteristics, but their presence should be documented.

During the 1998 RMP revision public scoping process in early 2010, the BLM received citizens' nominations for lands with the potential to contain wilderness characteristics located within the planning area. The BLM interdisciplinary team identified additional areas for consideration. In the winter of 2010-11, in preparation for revising the 1998 RMP, the BLM conducted an inventory of lands with wilderness characteristics. The inventory was conducted using GIS analysis, route inventory data, field visits with resource specialists, review of previous inventory data, information contained within citizens wilderness proposals, and BLM staff knowledge the areas. A BLM Southern Nevada District Office interdisciplinary team evaluated a total of 53 areas and determined that 21 units (242,214 acres) met lands with wilderness characteristics criteria. Table 3.25, "Lands with Wilderness Characteristics" (p. 418) lists the 21 parcels evaluated in the inventory and which criteria were met by each parcel. Appendix D (p. 1741) provides a detailed description of the wilderness characteristics findings for each of the areas.

Table 3.25. Lands with Wilderness Characteristics

Area name	Subunit	Acres	Size	Naturalness	Solitude	Primitive unconfined recreation
Arrow Canyon Addition	Subunit B	5,773	Y	Y	Y	Y
Billy Goat Peak	NA	30,345	Y	Y	Y	Y
Black Ridge	NA	14,430	Y	Y	Y	Y
Garrett Buttes	NA	11,694	Y	Y	Y	Y
Highland Range	NA	34,606	Y	Y	Y	Y
Ireteba Peaks Addition	NA	5,378	Y	Y	Y	Y
Lime Canyon Addition	Subunit A	9,839	Y	Y	Y	Y
Lime Canyon Addition	Subunit B	2,081	Y	Y	Y	Y
Lime Canyon Addition	Subunit C	233	Y	Y	Y	Y

Area name	Subunit	Acres	Size	Naturalness	Solitude	Primitive unconfined recreation
McCullough Mountains	NA	53,396	Y	Y	Y	Y
Muddy Mountains Addition	Subunit A	16,132	Y	Y	Y	Y
Muddy Mountains Addition	Subunit B	819	Y	Y	Y	Y
Muddy Mountains Addition	Subunit C	1,259	Y	Y	Y	Y
Muddy Mountains Addition	Subunit D	312	Y	Y	Y	Y
Muddy Mountains Addition	Subunit E	14,741	Y	Y	Y	Y
Muddy Mountains Addition	Subunit F	3,408	Y	Y	Y	Y
Resting Springs Addition	NA	9,317	Y	Y	Y	Y
Newberry Mountains	NA	38	Y	Y	Y	Y
South McCullough Addition	Subunit A	13,069	Y	Y	Y	Y
Temple Mesa	Subunit B	220	Y	Y	Y	Y
Whitney Pockets West	NA	15,128	Y	Y	Y	Y

3.3. Resource Uses

3.3.1. Forestry and Woodland Products

Ponderosa pine (*Pinus ponderosa*) conifer forests and woodlands occupy roughly 1,561 acres (0.05 percent) of the planning area and are located at the highest elevations of the Virgin and McCullough mountains. Pinyon juniper woodlands, dominated by pinyon pine (*Pinus monophylla*) and Utah juniper (*Juniperus osteosperma*), occupy roughly 30,820 acres, or approximately 1 percent of the planning area, at lower elevations of the Virgin and McCullough mountains. Currently, the BLM does not issue permits for timber, firewood, or Christmas tree sales because these activities are not sustainable or compatible with general management objectives for the Virgin Mountains ACEC and South McCullough Mountains Wilderness where these vegetation types occur. Casual collection of firewood in conifer forests and pinyon juniper woodlands for a personal campfire is authorized but subject to seasonal restrictions.

Mesquite trees (*Prosopis glandulosa*) produce an aromatic hardwood that is occasionally harvested for firewood. In the planning area, mesquite acacia woodlands occupy roughly 3,332 acres, or 0.11 percent, of the planning area. Mesquite acacia woodlands provide foraging and nesting habitat for BLM sensitive species and migratory birds. Following disturbance, recovery of mesquite stands is slow, and many stands in the planning area lack recruitment of new individuals. Within the planning area, the BLM does not issue firewood sale permits to collect mesquite wood because this activity is not sustainable or compatible with management objectives. Casual collection of dead firewood in mesquite woodlands for a personal campfire is authorized but subject to seasonal restrictions.

Cactus and yucca are regulated under the Nevada BLM forestry program. The sale and transportation of cactus and yucca are regulated by the Nevada Division of Forestry. BLM will follow state policy consistent with BLM policy and resource objectives. Cactus and yucca are an important component of creosote bursage and blackbrush vegetation types that comprise roughly 88 percent of the planning area. Because of the thermal cover and forage they provide, cactus and yucca are important habitat components for the desert tortoise. Cactus and yucca are extremely slow growing and slow to reproduce. Removal of cactus and yucca is not sustainable and is generally incompatible with conservation of desert tortoise habitat. Currently, the BLM only occasionally authorizes permits to remove cactus and yucca. Typically, collection permits are issued as part of salvage events held on lands that are being disposed of or where right-of-way authorizations will result in long-term ground-disturbing activities. In fiscal year 2009, BLM issued sales contracts for salvaged cactus and yucca. In 2003, BLM issued 279 cactus and yucca salvage sale contracts. Under the forestry program, the BLM also authorizes commercial collection of native seed and other plant materials from public lands. Overcollection of seed from native shrubs, grasses, and forbs can diminish the soil seed banks, decrease recruitment, and reduce plant species. In the planning area, BLM has designated eight seed collection zones on multiple-use lands in low-density desert tortoise habitats. Public demand for these materials is variable. BLM issued five sales contracts in 2009, seven contracts in 2008, one in 2007, and one in 2006.

3.3.2. Livestock Grazing

The planning area is divided into 54 grazing allotments comprising approximately 2,867,508 acres of public lands with 689,852 acres of unallotted public lands. Typically BLM decisions to open and close allotments and adjust allocations for livestock and conservation use are made at the resource management plan level. Typically, BLM decisions regarding the number of animals, kind of animals, and season of use and made in allotment management plans. In 1969, all grazing allotments in the planning area were designated as ephemeral in response to the Ephemeral 36 Range Rule of 1968. On ephemeral allotments, set animal unit months (AUMs) were eliminated and season of use is contingent on the availability of ephemeral forage. In the planning area, the need to develop individual allotment plans is reduced and many of the decisions that would be made in allotment management plans are instead included the RMP.

Grazing allotments in the planning area were originally established in 1934. Over the past 80 years, grazing within many allotments is no longer feasible or authorized because of congressional land transfers and designations and compliance with federal laws. Many of these changes include the creation of Lake Mead National Recreation Area and the transfer of BLM lands to the National Park Service; the creation of Valley of Fire State Park and transfer of BLM lands to the state of Nevada; the creation of a reservation for the Moapa Band of Paiutes and Las Vegas Band of Paiutes and transfer of BLM lands to the Bureau of Indian Affairs; designation of the Spring Mountains National Recreation Area and transfer of BLM lands to the U.S. Forest Service; the creation of the Ash Meadows National Wildlife Refuge and transfer of BLM lands to the U.S. Fish and Wildlife Service; designation of the Red Rock Canyon and Sloan Canyon National conservation areas and transfer of BLM lands into the National Landscape Conservation System; designation of Wilderness areas including Wee Thump Joshua Tree, Spirit Mountain, Iretreba, Eldorado, South McCullough, North McCullough, Rainbow Mountain, La Madre Mountain, Mt. Charleston, Arrow Canyon, Muddy Mountains, Jumbo Springs, and Lime Canyon; the disposal of BLM lands in the Las Vegas Valley, Pahrump Valley, Sandy Valley, Amargosa Valley, Mesquite, Glendale, and Moapa; and designation of critical habitat for the desert tortoise and creation of the Coyote Springs, Upper Mormon Mesa, Gold Butte, and Paiute/Eldorado Valley ACECs for desert tortoise recovery.

Under the 1998 RMP forty three allotments and unallotted lands in the planing area were closed to livestock grazing and remain unavailable for livestock grazing, many for the reasons described above. Eleven allotments in the planning area are currently available for grazing (see Map 2.6.2.2 - 1 (p. 2139)). Presently, three allotments, Flat Top Mesa, Lower Mormon Mesa and Hidden Valley, have active 10 year grazing permits. Two allotments, the Muddy River and Wheeler Wash allotments are inactive and do not have permittees. Six allotments, the Roach Lake, White Basin, Mesa Cliff., Arrow Canyon in Battleship Wash and Jean Lake are inactive with the grazing preference currently held by Clark County. From 1998 to 2006 the Clark County Multiple Species Habitat Conservation Plan (MSHCP), in partnership with the Nature Conservancy, purchased the base property with attached grazing preference, water rights, and range improvements from willing sellers a mitigation for desert tortoise and other species covered under the plan. Following the purchase the new owners, (Clark County) agreed to relinquish the grazing permits and preferences associated with the allotments with the understanding BLM, as a signatory to the implementing agreement for the MSHCP, would consider their closure and reallocation of forage for desert tortoise and protection of other MSHCP covered species, under the 1998 RMP management direction LG1–i. Closure of these allotments will be analyzed in this RMP amendment.

Subpart 4180 of the regulations requires BLM state directors, in consultation with the Resource Advisory Councils (RAC), to develop standards for rangeland health and guidelines for grazing administration of BLM lands within a region or state. Standards and guidelines are developed to identify characteristics of healthy ecosystems on public lands and the management actions to promote them. Standards and guidelines for a region or state must be approved by the Secretary of the Interior. On February 12, 1997, the standards and guidelines for three regions in Nevada were approved by the Secretary of the Interior. The standards and guidelines developed through the RAC process for the Mojave-Southern Great Basin area apply to livestock grazing in this planning area. These standards for rangeland health and guidelines for grazing administration are in Appendix L of the 1998 RMP. Grazing allotments were categorized according to their potential to respond to management. The three categories of management priority for allotments include:

- **"I" for improve:** These allotments have the highest need and priority for intensive management.
- **"M" for maintain:** These allotments are where present conditions and management are satisfactory.
- **"C" for custodial:** These allotments, for a variety of reasons, have low management priority.

Table 3.26. Summary of Grazing Allotments in the Planning Area

Allotment name	Acres (as described in 1998 RMP)	Status	Operator	Kind of livestock	Management category	Average annual use Horse/cow-calf pair (2004-2013)
Acton-Farrier	41,465	Closed by 1998 RMP	N/A	N/A	N/A	N/A
Arrow Canyon	75,948	Closed by 1998 RMP	N/A	N/A	N/A	N/A
Arrow Canyon in Battleship Wash	12,160	Open/non-use	Clark County	Cattle	M	0
Azure Ridge	7,295	Administered by BLM AZ	N/A	N/A	N/A	N/A
Billy Goat Peak	48,962	Closed by 1998 RMP	N/A	N/A	N/A	N/A
Bunkerville	118,298	Closed by 1998 RMP	N/A	N/A	N/A	N/A
Dry Lake	43,873	Closed by 1998 RMP	N/A	N/A	N/A	N/A
Flat Top Mesa	5,338	Open/active	H. Wittwer	Horses Cattle	C	5 6
Glendale	23,595	Closed by 1998 RMP	N/A	N/A	N/A	N/A
Gold Butte	172,859	Closed by 1998 RMP	N/A	N/A	N/A	N/A
Hen Springs	21,330	Closed by 1998 RMP	N/A	N/A	N/A	N/A
Jack Rabbit	2,000	Closed by 1998 RMP	N/A	N/A	N/A	N/A
Lime Spring	3,140	Closed by 1998 RMP	N/A	N/A	N/A	N/A
Lower Mormon Mesa	37,048	Open/active	D. Whitney	Cattle	C	34
Mesa Cliff	8,077	Open/non-use	Clark County	Cattle	C	0
Mesquite Community	13,681	Administered By BLM AZ	N/A	N/A	N/A	N/A
Muddy Mountains	8,702	Closed by 1998 RMP	N/A	N/A	N/A	N/A
Muddy River	17,888	Open/inactive	None	Cattle	C	0
Overton Arm	1,822	Closed by 1998 RMP	N/A	N/A	N/A	N/A

Allotment name	Acres (as described in 1998 RMP)	Status	Operator	Kind of livestock	Management category	Average annual use Horse/cow-calf pair (2004-2013)
Pittman Well	34,192	Closed by 1998 RMP	N/A	N/A	N/A	N/A
Pulsipher Wash	3,451	Closed by 1998 RMP	N/A	N/A	N/A	N/A
Rox	18,062	Closed by 1998 RMP	N/A	N/A	N/A	N/A
Sunrise Mountain	34,272	Closed by 1998 RMP	N/A	N/A	N/A	N/A
Toquop Sheep	24,557	Closed by 1998 RMP	N/A	N/A	N/A	N/A
Upper Mormon Mesa	46,325	Closed by 1998 RMP	N/A	N/A	N/A	N/A
Ute	45,231	Closed by 1998 RMP	N/A	N/A	N/A	N/A
White Basin	97,454	Open/non-use	Clark County	Cattle	M	0
Virgin River Bottom	90	Closed by 1998 RMP	N/A	N/A	N/A	N/A
Mt. Stirling	126,888	Closed by 1998 decision	N/A	N/A	N/A	N/A
Iretreba Peaks	201,544	Closed by 1998 RMP	N/A	N/A	N/A	N/A
Hidden Valley	63,621	Open/active	L. Sprouse	Cattle	I	85
McCullough Mountains	169,175	Closed by 1998 RMP	N/A	N/A	N/A	N/A
Christmas Tree Pass	69,233	Closed by 1998 RMP	N/A	N/A	N/A	N/A
Newberry Mountain	31,764	Closed by 1998 RMP	N/A	N/A	N/A	N/A
Jean Lake	141,082	Portion closed by 1998 RMP Remaining portion Open/non-use	Clark County	Cattle	I	0
South Point	16,739	Closed by 1998 RMP	N/A	N/A	N/A	N/A
Crescent Peak	119,320	Closed by 1998 RMP	N/A	N/A	N/A	N/A
Roach Lake	20,752	Open/non-use	Clark County	Cattle	C	0
Kyle Canyon	17,514	Closed by 1998 RMP	N/A	N/A	N/A	N/A
Black Butte	40,861	Closed by 1998 RMP	N/A	N/A	N/A	N/A
Table Mountain	83,102	Closed by 1998 RMP	N/A	N/A	N/A	N/A
Stump Springs	49,557	Closed by 1998 RMP	N/A	N/A	N/A	N/A
Younts Spring	14,502	Closed by 1998 RMP	N/A	N/A	N/A	N/A
Lucky Strike	99,839	Closed by 1998 RMP	N/A	N/A	N/A	N/A
Wheeler Wash	64,701	Open/inactive	P. Bowman	Cattle	I	0
Spring Mountain	237,890	Closed by 1998 RMP	N/A	N/A	N/A	N/A
Wheeler Slope	72,277	Closed by 1998 RMP	N/A	N/A	N/A	N/A
Unallotted	3,732	Closed by 1998 RMP	N/A	N/A	N/A	N/A
Unalloted	6,786	Closed by 1998 RMP	N/A	N/A	N/A	N/A
Unalloted	62,243	Closed by 1998 RMP	N/A	N/A	N/A	N/A
Ash Meadows	120	Closed by 1998 RMP	N/A	N/A	N/A	N/A
Carson Slough	13,842	Closed by 1998 RMP	N/A	N/A	N/A	N/A
County Line	6,720	Closed by 1998 RMP	N/A	N/A	N/A	N/A
Grapevine-Rock	6,844	Closed by 1998 RMP	N/A	N/A	N/A	N/A

3.3.2.1. Livestock/Range Studies

Monitoring and evaluation of the effects of livestock grazing occurred in all authorized grazing allotments (see Table 3.27, "Summary of Livestock-Range Studies" (p. 425)). In 2009, there were three permits authorizing use on these allotments. Stocking numbers on authorized grazing allotments range from as few as two cows and three horses on the Flat Top Mesa allotment to as many as 112 cattle on the Hidden Valley allotment. The season of grazing use (authorized grazing period) is normally designated through land-use planning; however, on ephemeral ranges the season of use depends upon the forage production, which can change from year to year. Therefore, a specific season of use is not designated on the grazing permits associated with ephemeral ranges.

From 2011 to 2013, the BLM completed rangeland health assessments in conjunction with BLM assessment inventory and monitoring of active, inactive, and selected closed allotments in the planning area. The following allotments had more than 60 percent of sampling points in moderate or higher departure from expected conditions for biotic integrity: Flat Top Mesa, Bunkerville, Gold Butte, Hen Springs, Billy Goat Ridge, Upper Mormon Mesa, Muddy River, Wheeler Wash, and Hidden Valley.

The following allotments had more than 60 percent of the sampling points in moderate or higher departure from expected conditions for hydrologic function: Glendale and Acton-Ferrier. The following allotments had more than 60 percent of the sampling points in moderate to higher departure from expected conditions for soil stability: Glendale and Mesa Cliff.

Table 3.27. Summary of Livestock-Range Studies

Allotment name	Status	Livestock type	Dates of studies	Number of years of data	Types of studies[a]
Flat Top Mesa	Open/active	Cattle/horses	2003-2012	9	U, UM, LHA
Hidden Valley	Open/active	Cattle	2008-2012	4	U, LHA
Lower Mormon Mesa	Open/active	Cattle	2007-2012	4	U, UM, LHA
Muddy River	Open/inactive	Cattle	2011-2013	1	LHA
Wheeler Wash	Open/inactive	Cattle	2011-2013	1	LHA
Gold Butte	Closed	Trespass cattle	2011-2013	1	LHA
Bunkerville	Closed	Trespass cattle	2011-2013	1	LHA
Billy Goat Ridge	Closed	Trespass cattle	2011-2013	1	LHA
Hen Springs	Closed	Trespass cattle	2011-2013	1	LHA
Toquop Sheep	Closed	Trespass cattle	2011-2013	1	LHA
Upper Mormon Mesa	Closed	Cattle	2011-2013	1	LHA
Rox	Closed	Cattle	2011-2013	1	LHA
Acton-Farrier	Closed	Cattle	2011-2013	1	LHA
Arrow Canyon	Closed	Cattle	2011-2013	1	LHA
Pittman Well	Closed	Cattle	2011-2013	1	LHA
Muddy Mountains	Closed	Cattle	2011-2013	1	LHA
Lucky Strike	Closed	Cattle	2011-2013	1	LHA
Kyle Canyon	Closed	Cattle	2011-2013	1	LHA
Spring Mountain	Closed	Cattle/herd management area	2011-2013	1	LHA
Jean Lake	Open/inactive	Cattle	2011-2013	1	LHA
McCullough Mountains	Closed	Trespass cattle	2011-2013	1	LHA
Crescent Peak	Closed	Cattle	2011-2013	1	LHA

Allotment name	Status	Livestock type	Dates of studies	Number of years of data	Types of studies[a]
Iretreba Peaks	Closed	Cattle	2011-2013	1	LHA
Christmas Tree Pass	Closed	Cattle	2011-2013	1	LHA
Stump Springs	Closed	Cattle	2011-2013	1	LHA

[a]U: Key area utilization; UM: Use map; LHA: Land health assessment using indicators of rangeland health and assessment and inventory monitoring

3.3.3. Minerals

There are approximately 3,130,157 acres of public lands that are administered by the BLM's Southern Nevada District Office Minerals Management Program. This total does not include the lands associated with the two national conservation areas, Red Rock Canyon and Sloan Canyon, and only accounts for the surface lands managed by the Las Vegas and Pahrump field offices. Since the enactment of the Federal Land Policy and Management Act (FLPMA), the BLM has retained the mineral estate for lands disposed of in Southern Nevada. The BLM refers to lands in which the mineral estate and surface are owned by different entities as split estate lands.

Lands that have been disposed of or transferred to other government entities have created an incalculable split estate issue where the surface is privately/other agency owned and the mineral estate is owned by the federal government. The BLM is mandated by FLPMA to retain the underlying mineral estate with disposals or transfers. The split estate managed by the Mineral Management Program includes but is not limited to the Las Vegas Valley SNPLMA disposal area and Valley of Fire State Park. In these examples, the surface is owned by private individuals, the state, or city. Any future land actions that dispose of the surface estate may continue to fragment the lands into a split estate that the must handle.

The BLM minerals management program permits development activities under three distinct categories: leasable, saleable, and locatable minerals. The historic occurrence, indicators, current condition, potential future trends, forecasts, and key features for each of the three categories are discussed in the following sections. The lands available for use by these programs can be found in Table 3.28, "Approximate Acres Available for Development of Each of the Mineral Programs Based on the 1998 RMP" (p. 427). Lands that are unavailable for development through either closure or withdrawal include congressionally designated or administratively designated lands. These include, but are not limited to, ACECs, wilderness and wilderness study areas, specific disposal boundaries, and solar energy zones, etc., and account for approximately 1.1 million acres that are unavailable for development of mineral resources.

Table 3.28. Approximate Acres Available for Development of Each of the Mineral Programs Based on the 1998 RMP

Total -administered lands:	3,130,157	Total -withdrawn lands:	1,103,714
-administered lands open to locatable and solid leasable development			2,026,443
-administered lands open to saleable mineral development			2,482,981
-administered lands open to oil and gas development:			3,007,244
-administered lands open to geothermal development:			2,969,891

3.3.3.1. Leasable Minerals

The BLM issues leases for leasable minerals, allowing producers to access the mineral. Leases are issued through a competitive and non-competitive processes of nominated parcels. Each leasable commodity has a royalty based on its associated law(s) and supporting regulatory authority. Over the years, leasable minerals have been split into two subdivisions, fluid and solid. Fluid leasable minerals consist of oil, oil sands and shales, gas, and geothermal resources. Solid leasable minerals consist of energy and non-energy commodities of coal, phosphate, and sodium varieties.

The has no recorded production of solid or fluid leasable minerals and one active leases. Some portions of the , such as the Muddy Mountains, have similar geologic settings to the oil and

gas fields in eastern Nevada and Utah, which could spur future exploration for fluid minerals. According to the Nevada Division of Minerals, oil production in Nye County accounts for about 90 percent of the oil production in the state, based on a three-year average from 2007 to 2009 (Nevada Division of Minerals 2009).

Hydraulic fracturing is a potential method for developing fluid leasable resources and involves injecting pressurized fluid into rock formations to propagate fractures in the rock layers and allow the release of oil and natural gas. First used in 1947, it is a well completion practice used to tap into previously unrecoverable reserves, or to stimulate increased production from existing oil or gas wells in the United States.

3.3.3.1.1. Geothermal Resources

Geothermal resources are handled under the Minerals and Lands programs, with each having different roles in managing the resource. Leasing of geothermal nominated parcels is managed under the fluid leasable mineral program and would include the permitting of Geothermal Drill Permits (GDPs). In addition to GDPs, Operations Plan for exploration drilling activities and Utilization Plans for development of geothermal resources undergo future NEPA action. Once initial drilling and resource development have been completed, geothermal energy production is an authorization handled by the Lands program with an issuance of site-type rights-of-way. Geothermal resources tend to be developed in known geothermal resource areas (KGRAs). These regions have been mapped throughout Nevada (Garside 1974, Shevenell et al. 2000, Zehner et al. 2009, Penfield et al. 2010) and are areas with the right conditions for geothermal development. Based on the mapped data, there is low to moderate geothermal resource potential in the (Map 3.3.3.1 - 1 (p. 2144)). Penfield et al (2010) identified areas within the planning area that have warm and hot waters that may be feasible for geothermal use, see Table 3.29, “Geothermal areas in the planning area that may have developable uses ” (p. 428). These waters, as technology improves could be used for power generation or direct use applications.

Table 3.29. Geothermal areas in the planning area that may have developable uses[a]

Zone	Hot spring	Warm spring	Hot well	Warm well	Hot heat-flow well	Warm heat-flow well	Permitted geother-mal well
Amargosa Desert			X	X		X	
Ash Meadows	X	X		X			
Beatty	X	X		X		X	
Black Canyon[b]	X	X					
Coyote Springs Valley			X	X			
Crater Flats		X		X			
Dry Lake Valley		X		X			
Frenchman Flat[c]			X			X	
Indian Springs Valley		X		X			
Las Vegas Valley		X		X		X	X
Laughlin				X			
Mercury Valley				X	X		
Moapa Valley				X			
Pahrump Valley		X		X			
Searchlight				X			
West Lake Mead				X			

Zone	Hot spring	Warm spring	Hot well	Warm well	Hot heat-flow well	Warm heat-flow well	Permitted geother-mal well
Valley of Fire		X					
Virgin Valley		X		X			X
Yucca Mountain[d]			X	X		X	

[a]Based on Penfield et al (2010)
[b]NPS (Lake Mead)
[c]DOD
[d]DOE

3.3.3.1.1.1. Historic Occurrences

Sixteen geothermal wells have been permitted by the state (Tingley 1989), see Table 3.30, "Regional Locations of Historical Geothermal Drilling Activity" (p. 429). Half the geothermal sites were located within vicinity of the towns of Glendale and Moapa in Moapa Valley. The Mesquite and Bunkerville and the Logandale and Overton areas (southern Moapa Valley) account for all of the known historic geothermal exploration. The highest documented temperature from these wells was 32˚C (89.6˚F), and the deepest was 300 feet (Tingley 1989).

Table 3.30. Regional Locations of Historical Geothermal Drilling Activity

Location	Drilled	Percentage of the total
Logandale / Overton	2	12.50 percent
Glendale / Moapa	8	50 percent
Mesquite / Bunkerville	6	37.50 percent
Total	**16**	

3.3.3.1.1.2. Indicators

Geothermal resources need to have the right water temperature for energy production, and a resource large enough for development. Based on historic drilling, the water temperature at depth was marginally favorable for resource development.

3.3.3.1.1.3. Current Condition

Geothermal leases can be permitted on nearly 2.97 million acres, which is slightly less than the acres available to oil and gas development (see the Section 3.3.3.1.2, "Oil and Gas" (p. 431) subsection). This is due to the sensitive aquatic habitat of the Ash Meadows ACEC, which was designated to protect federally listed fish. The potential of impacting the hydrological condition of the ACEC makes these lands are unavailable for geothermal development. Recent interest in geothermal development has been extremely low. Over the life of the existing RMP there have been ten proposed lease parcels identified for geothermal development. These proposed lease parcels for geothermal competitive sales in Southern Nevada totaled 40 thousand acres (see Table 3.31, "Proposed Geothermal Lease Parcels and Their Resource Acreage for Southern Nevada Between 2004 and 2013" (p. 430)). All but one of the parcels, one was located near Lake Mead, occur in Nye County. The majority (five) of the Nye County parcels are on split estate lands where the surface is managed by Department of Energy and the BLM retains the underlying mineral estate while the remaining four are in the Crater Flats area. There are approximately 2.97 million acres are available for geothermal leasing.

Table 3.31. Proposed Geothermal Lease Parcels and Their Resource Acreage for Southern Nevada Between 2004 and 2013

Case File[a]	Acres
NVN 086510	5,120
NVN 086511	5,120
NVN 086753	320
NVN 086953	5,120
NVN 086954	1,920
NVN 086955	5,120
NVN 086956	5,120
NVN 086957	5,120
NVN 086958	2,560
NVN 087140	4,480
Total acreage	**40,000**

[a]These are currently deferred pending this RMP update

3.3.3.1.1.4. Potential Future Trend and Forecast

Geothermal energy development has a negligible impact to fluid leasable mineral resources in the planning area. The two forms of geothermal energy development, power generation through power plants and direct-use. These developments tend to have small footprints, generally range from 35 to 70 acres in size, although their associated leases would be much larger. There has been interest in the Crater Flats area in the district presumably for power generation purposes. Direct-use geothermal energy are small scale and site specific developments to provide energy for single structures. The impacts associated with geothermal can be addressed during scoping.

Areas that have been drilled show water temperature that is marginally favorable based on Coolbaugh *et al* (2005). Until technology improves to make these locations feasible, there is a low potential for development in the coming years. In addition, until the issues of occupancy are addressed from the existing RMP, geothermal resource development will continue to stagnate. Interest in geothermal development continues to be extremely low (BLM 2010).

It is possible to see all ten parcels will be leased, equating to 40 thousand acres, after the new RMP is signed. As this is a new potential resource available for development, it is currently unknown as to how many exploration or development would actually occur. As noted earlier Coolbaugh *et al* (2005) identified the planning area as marginally favorable while Penfield *et al* (2010) identified areas that have warm and hot waters that may be feasible for geothermal use that could be developed. It is possible to see a few gradient wells, probably less than a dozen, drilled leading to an exploration well or two. An estimate of 500 acres (approximately 1% of the lease acreage) could be developed for geothermal uses during the life of the RMP.

3.3.3.1.1.5. Key Features

Economically exploitable geothermal resources generally have higher temperatures (Tingley 1989) than those seen within the jurisdictional boundaries of the . Geothermal resources tend to be located in known geothermal resource areas.

3.3.3.1.2. Oil and Gas

3.3.3.1.2.1. Historic Occurrences

From 1929 to 1989, 76 oil and gas wells were permitted on public lands administered by the BLM in Clark County (Garside 1974, Garside *et al.* 1988, Hess *et al*. 2004). 63 of these were drilled. Approximately half of the drill sites had "shows" of oil, but none were production capable at the time, see Map 3.3.3.1 - 5 (p. 2144). The majority of the permitted wells were located within the Las Vegas Valley (including Henderson) and the Jean-Goodsprings areas. The majority of these wells were drilled between 1940 and 1960. At 19,562 feet, the Virgin River U.S.A. No. 1-A drilled by Mobil Oil Corporation in 1980 was the deepest well that has been drilled in Clark County.

The Muddy Mountains area had five total oil and gas permits issued from 1929 to 1989, of which only three were drilled. This region has had renewed interest in oil and gas exploration as the surficial geology of the range resembles that seen in the oil producing Railroad Valley region of Nevada.

There are no known oil shale resources within the jurisdictional boundaries of the Southern Nevada District. Unless a deposit is discovered, there are no indicators, potential future trends and forecasts, or key features.

3.3.3.1.2.2. Indicators

The indicators for oil and gas development are having the right geology to generate and trap the resource, the fields need to contain enough volume to warrant development, and that there are enough lands available for exploration and development. The Muddy Mountains/Bitter Springs region may have the right geologic conditions to warrant recommencing oil and gas exploration in the area. Additionally, as technology improves or develops new exploration activities could also occur within the planning area.

3.3.3.1.2.3. Current Condition

Approximately 3 million acres of public lands are available for fluid leasable mineral (oil and gas) development. The 1998 RMP does not address split estate mineral development and identifies lands having "special status plant and animal habitat" as no surface occupancy (NSO). The majority of Southern Nevada has been identified as special status plant and animal habitat. Lands that are designated as NSO prevent surface location of facilities or equipment, but NSO does not close the mineral resource that underlies the region of protection. Access to the resource must come from outside of the lands designated as NSO through directional drilling and exploratory work.

Since 2004, there have been 115 proposed parcels for oil and gas lease in Southern Nevada totaling just over 226.5 thousand acres (see Table 3.32, "Proposed Fluid Mineral Lease Parcels and Their Resource Acreage for Southern Nevada Between 2004 and 2013" (p. 432)). The majority of the proposed fluid leasable mineral lease parcels (Map 3.3.3.1 - 4 (p. 2144) and 3.3.3.1 - 5 (p. 2144)) have been located in areas designated as NSO.

The Muddy Mountains have a geologic structure similar to the oil fields located in Railroad Valley, Nevada that may allow for trapping of fluid minerals. The NSO designation prevented further exploration of the area to validate that structure. Three drill holes had oil "shows" that where not

production capable at the time of drilling, decades ago. There has been renewed interest in oil and gas development in the Muddy Mountains since 2004. Of the 115 proposed leases, 41 parcels have been specifically located in the range (27 in the southern portion and 14 in the northern portion of the range). Seven parcels in the region also impact split estate lands in Valley of Fire State Park.

Onshore Oil and Gas Order Number 1 requires federal oil and gas operators to conduct operations to minimize impacts to surface and subsurface resources, prevent unnecessary surface disturbance, and conform to currently available technology and practice. Drilling and abandonment activities must adhere to the provisions and standards of Onshore Oil and Gas Order Number 2 to protect subsurface resources. Onshore Oil and Gas Order Number 7 provides the methods and approvals necessary to dispose of produced water associated with oil and gas operations.

The BLM is currently in the process of revising the rules that regulate hydraulic fracturing for oil and gas on public and Indian trust lands. The revised proposed rule modernizes BLM's management of hydraulic fracturing operations and help to establish baseline environmental safeguards for these operations across all public and Indian lands. In addition, measures to avoid, minimize, or mitigate impacts, in addition to those identified in the Onshore Oil and Gas Orders and the regulations in 43 CFR 3160 are incorporated in the RMP as Standard Operating Procedures and Best Management Practices.

Table 3.32. Proposed Fluid Mineral Lease Parcels and Their Resource Acreage for Southern Nevada Between 2004 and 2013[a]

Parcel number	Acres		Parcel number	Acres		Parcel number	Acres
NV-04-03-252	1,261.63		NV-09-12-238	2,240.00		NV-09-12-284	1,919.56
NV-04-03-253	1,591.03		NV-09-12-239	1,440.00		NV-09-12-285	1,920.00
NV-04-03-254	1,280.00		NV-09-12-240	1,600.00		NV-09-12-286	2,240.00
NV-05¥	2,547.82		NV-09-12-241	1,920.00		NV-09-12-287	2,239.76
NV-05¥	640.00		NV-09-12-242	2,560.00		NV-09-12-288	2,560.00
NV-05-09-106	640.00		NV-09-12-243	1,960.00		NV-09-12-289	1,920.00
NV-05-09-108	1,543.93		NV-09-12-244	2,080.82		NV-09-12-290	639.33
NV-05-09-112	2,527.96		NV-09-12-245	1,923.00		NV-09-12-291	2,398.48
NV-05-09-113	1,914.00		NV-09-12-246	1,560.00		NV-09-12-292	1,995.26
NV-05-10¥	640.00		NV-09-12-247	1,280.00		NV-09-12-293	2,560.00
NV-06-06-247	2,550.00		NV-09-12-248	2,555.18		NV-09-12-294	800.00
NV-06-06-248	2,240.00		NV-09-12-249	2,554.20		NV-09-12-295	1,924.08
NV-06-06-249	2,000.00		NV-09-12-250	2,537.00		NV-09-12-296	960.00
NV-06-06-250	480.00		NV-09-12-251	2,560.00		NV-09-12-297	1,878.02
NV-06-06-253*	2,537.00		NV-09-12-252	2,560.00		NV-09-12-298	1,802.16
NV-06-06-256	2,549.00		NV-09-12-253	1,915.00		NV-09-12-299	960.49
NV-09-12-216	2,560.00		NV-09-12-254	1,280.00		NV-14-03-113	2,437.89
NV-09-12-217	1,903.24		NV-09-12-255	2,560.00		NV-14-03-146	1,814.00
NV-09-12-218	1,910.92		NV-09-12-256	1,276.00		NV-14-03-147	1,920.00
NV-09-12-219	1,929.90		NV-09-12-259	1,517.57		NV-14-03-148	1,800.00
NV-09-12-220	2,400.00		NV-09-12-260	2,240.00		NV-14-03-149	2,240.00
NV-09-12-221	2,559.64		NV-09-12-261	2,239.20		NV-14-03-150	2,310.00
NV-09-12-222	2,320.80		NV-09-12-262	2,560.00		NV-14-03-151	960.00
NV-09-12-223	1,881.50		NV-09-12-263	2,560.00		NV-14-03-152	2,200.00
NV-09-12-224	1,680.00		NV-09-12-264	1,918.40		NV-14-03-153	1,750.36
NV-09-12-225	1,840.00		NV-09-12-265	1,920.00		NV-14-03-187	2,550.00
NV-09-12-226	1,202.35		NV-09-12-266	2,557.36		NV-14-03-188	2,521.00
NV-09-12-227	2,240.00		NV-09-12-267	1,679.02		NV-14-03-189	2,548.00
NV-09-12-228	1,920.66		NV-09-12-268	2,240.00		NV-14-03-190	1,741.00

Parcel number	Acres		Parcel number	Acres		Parcel number	Acres
NV-09-12-229	1,920.00		NV-09-12-275	2,560.00		NV-14-03-209	2,240.00
NV-09-12-230	1,920.00		NV-09-12-276	1,920.00		NV-14-03-210	2,240.00
NV-09-12-231	1,261.00		NV-09-12-277	2,559.68		NV-14-03-211	1,919.40
NV-09-12-232	2,240.88		NV-09-12-278	2,560.00		NV-14-03-212	1,919.00
NV-09-12-233	2,240.00		NV-09-12-279	2,560.00			
NV-09-12-234	2,240.00		NV-09-12-280	1,920.65		**Total number of parcels**	**115**
NV-09-12-235	2,240.00		NV-09-12-281	1,920.00			
NV-09-12-236	2,401.90		NV-09-12-282	1,921.08		**Total lease acreage**	**226,505.19**
NV-09-12-237	2,240.00		NV-09-12-283	1,921.56			

[a] Between 2009 and 2012, all proposed parcels were put asiged due to RMP conflicts with no surface occupancy and are not included in this list.

[¥]Proposed lease parcels only listed a partial parcel number on form.

[*] Oil and gas location that was proposed a second time as parcel # NV-09-12-250.

3.3.3.1.2.4. Potential Future Trend and Forecast

Garside and Hess (2011) show a region of moderate oil and gas potential in the planning area as a corridor that follows Interstate 15 from Sloan through Mesquite. East of the Apex industrial area, this zone of potential expands greatly north and south. The expansion to the south covers all of the Muddy Mountains region into western Gold Butte and is currently the planning area's major areas of exploration interest. The northern expansion continues into Lincoln County outside of the planning area.

Development is driven by increased consumer demand. There may be a need to locate new resources of fluid leasable minerals domestically to maintain the public's demand for fuel or energy without depending so heavily on foreign sources. The cost of oil and gas both crude oil and fuel have continued to rise (see Figure 3.2, "Monthly Averages of Crude Oil " (p. 434) and Figure 3.3, "Monthly Averages of Gasoline and Diesel Fuels " (p. 434)). As technology continues to improve, there may be a need to allow access to these resources in the coming years. Steam injection, horizontal drilling and hydraulic fracturing are examples of technologies that can increase the feasibility of an oil and gas deposit. Therefore, the moderate potential resources in the planning area may prove to be economically feasible.

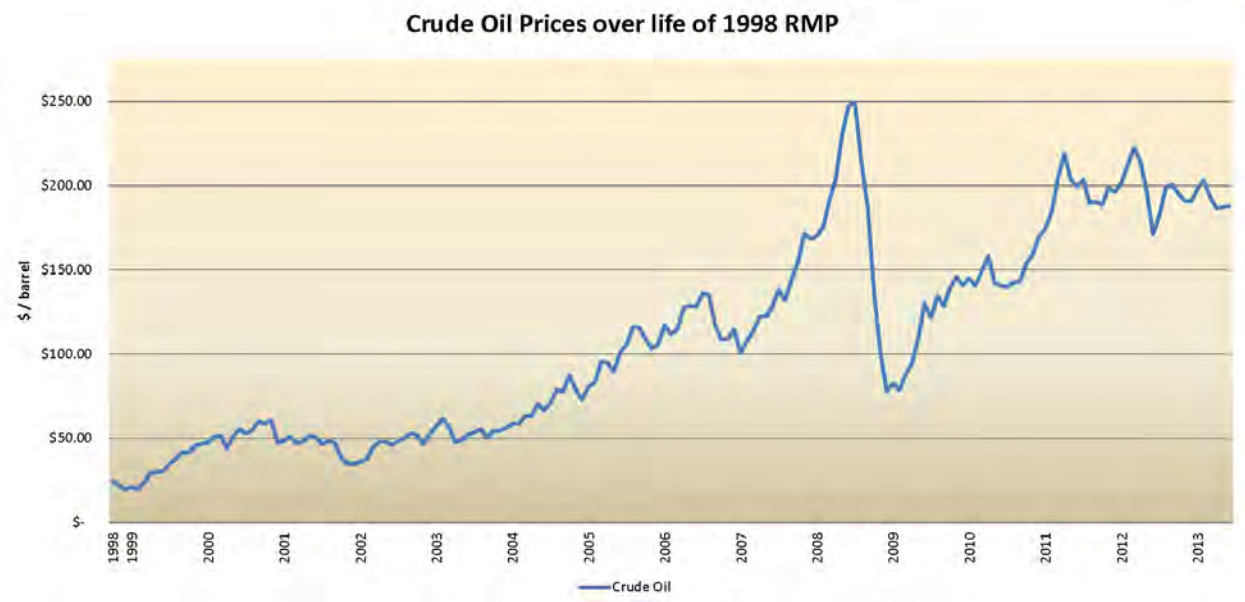

Figure 3.2. Monthly Averages of Crude Oil [2]

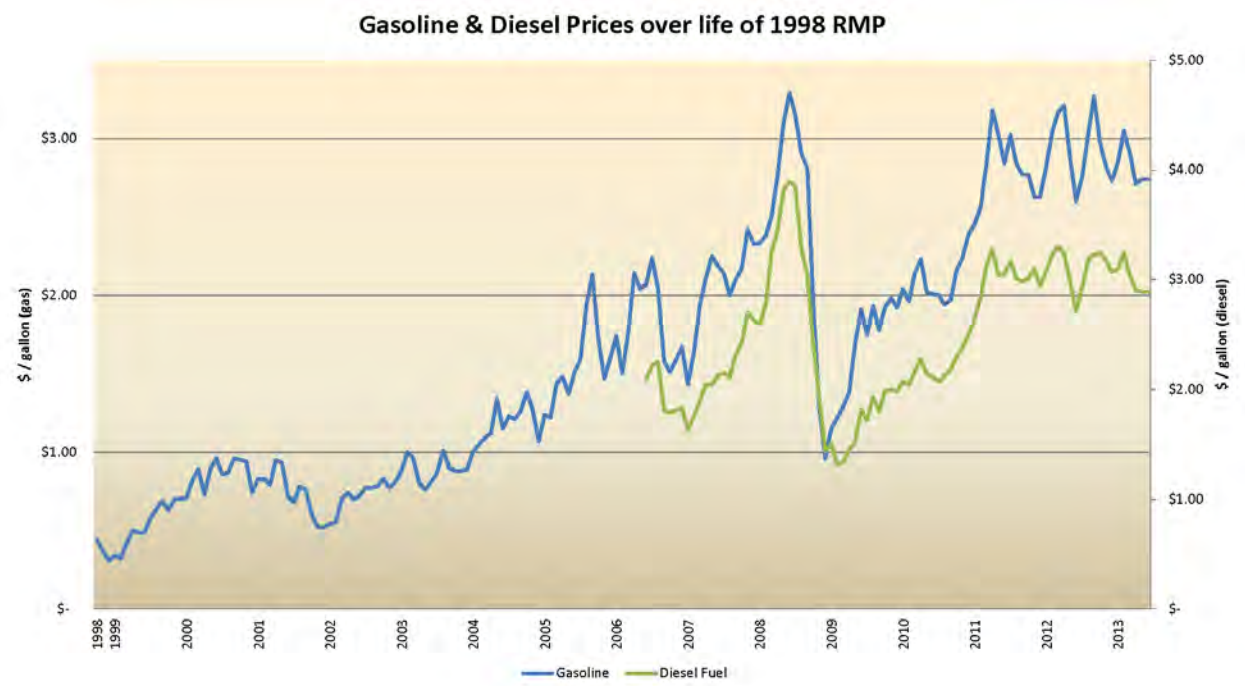

Figure 3.3. Monthly Averages of Gasoline and Diesel Fuels[3]

Reasonable foreseeable development for oil and gas development is difficult to identify as the majority of the planning area has been classified as NSO. Over the life of the RMP, there have been over 100 proposed lease parcels that have not been processed due to the NSO classification. If one of the three action alternatives is selected ,many of the lands currently managed as open to

[2] Based on average of three spot prices. Source: Index Mundi (www.indexmundi.com)
[3] Based on NY Harbor regular spot price. Source: Index Mundi (www.indexmundi.com)

oil and gas leasing with an NSO would be open to oil and gas leasing without NSO constraints. This could lead to exploration and development. It is possible to have over 100 thousand acres of active leases in the planning area. Exploration and development of those lands will encompass significantly less lands possibly 1% of the total authorized lease acreages maybe equating to a dozen or two permitted drilling operations.

3.3.3.1.2.5. Key Features

Key features include the right geology to trap the oil and gas resource, accessibility, and available lands. The Muddy Mountains/Bitter Springs region may contain the right geologic conditions to develop oil and gas resources. Maintaining access to those lands is essential.

3.3.3.1.3. Solid Leasable Minerals

Solid leasable minerals are split into energy and non-energy minerals. Coal is the predominant energy solid leasable mineral. Non-energy solid leasable minerals such as phosphates, potassium, and sodium salts tend to be used in agricultural industries.

3.3.3.1.3.1. Non-Energy Minerals

3.3.3.1.3.1.1. Historical Occurrences

There are potentially three historically known solid leasable mineral resources areas within the : Ash Meadows, St. Thomas, and White Basin (McCaskey 1917, Stoddard 1932, Vanderburg 1937, Scheid 1964). Rock salt was mined in the St. Thomas area before Lake Mead was formed and flooded the area. Native Americans mined the region over a thousand years ago, while in the 1860s, it was mined for use in Arizona (Scheid 1964). The potential for valley brines containing potassium or sodium salts is unknown although Scheid (1964) noted that the St. Thomas deposit may have been considered for use as a brine for the Henderson industrial complex. There was no recorded development for sodium deposits in the White Basin area (Scheid 1964). Various sources have stated there is potential for potash in the Ash Meadows area (McCaskey 1917, Stoddard 1932), but this has not been substantiated by other authors (Ludington 2006).

3.3.3.1.3.1.2. Indicators

There seems to be no clear understanding of the resource volume for the solid leasable mineral deposits that may occur in the district. The few previously mentioned locations represent a limited region of deposition. Development in those areas appears to be sparse at best.

3.3.3.1.3.1.3. Current Conditions

There has been no known development or prospecting of the solid leasable minerals in the district in recent times.

3.3.3.1.3.1.4. Potential Future Trends and Forecast

This assessment doesn't eliminate future interest or changes in technology but is based on recent history. Although 2.03 million acres are available for solid leasable exploration, these locations may be minimally economic deposits of solid leasable minerals, as there are no current active

leases, nor proposed locations for development. Thus, the potential for development of a solid leasable mineral resource within the ’s jurisdictional area is low.

3.3.3.1.3.1.5. Key Features

Key features include geographic location, volume, and proximity to appropriate markets.

3.3.3.1.3.2. Coal

There are no known coal resources within the jurisdictional boundaries of the Southern Nevada District Office. Unless a deposit is discovered, there are no indicators, potential future trends and forecasts, or key features.

3.3.3.2. Saleable Minerals

Saleable minerals (also referred to as mineral materials and common variety minerals) are among the most basic natural resources. These materials are used in everyday construction, agriculture, and decorative applications. Highways, bridges, power plants, dams, high-rise buildings, railroad beds, and airport runways, along with their foundations and sidewalks, all use saleable minerals. In agriculture, saleable minerals are used as soil conditioners and in decorative applications such as xeriscaping. Separating naturally occurring mineral materials from the earth is neither easy nor inexpensive. The sheer weight of these materials makes their transportation costs high. Therefore, adequate local supplies of these basic resources are vital to the economic life of every community. It is the BLM’s policy to make these materials available to the public and governmental agencies whenever possible and wherever it is environmentally acceptable.

Saleable minerals consist of, but are not limited to, common varieties of sand, stone, gravel, cinders, clay, pumice, and pumicite. The BLM’s authority to dispose of saleable minerals not subject to mineral leasing or location under the mining laws comes from the Act of July 31, 1947, as amended, commonly referred to as the Materials Act. Saleable minerals are disposed of in two ways: through free-use permits (FUP) and sales contracts. FUPs allow government entities and nonprofit organizations to use saleable minerals free of charge, provided the government entity and nonprofit do not use the mineral materials for commercial or industrial purposes. Sales contracts are an agreement between a purchaser and the BLM in which the BLM sells mineral materials, at fair market value, to the purchaser. The fair market value of mineral materials is determined through an appraisal-like process. FUPs and sales contracts give the permittee/purchaser a location to extract, process, stockpile, and dispose of the mineral materials, specify the volume or weight of mineral materials to be disposed of, specify the amount of time the permittee/purchaser has to dispose of the mineral materials, and include the terms and conditions of the permit/contract.

FUPs and sales contracts can be administered for an individual parcel of land anywhere on BLM lands open to mineral material sales or on split estate lands where the BLM has retained the saleable minerals. The has established a number of community pits around population centers throughout the district to service the needs of those communities. Community pits provide convenient and economic access to saleable minerals while concentrating and reducing the amount of surface disturbance in areas known to have a public demand for saleable minerals.

The sells more mineral materials than any other district in the BLM. The potential for future FUPs and sales contracts in the is very high as the large population in Southern Nevada requires

constant improvement and maintenance of infrastructure. The growth in urban development will increase demand for saleable minerals.

3.3.3.2.1. Historic Occurrences

Lands administered by the BLM provide a significant portion of the mineral materials used in Southern Nevada. In 2006, one of the peak production years in the , sales of mineral materials from BLM-administered lands totaled 11,730,334 tons (BLM 2010). This represented approximately 20 to 25 percent of all the mineral materials sold on private and public lands in Southern Nevada.

Demand for mineral materials generally rises and falls with urban development trends. From 2000 to 2006, urban development grew rapidly during Southern Nevada's boom years, resulting in increases in new construction, infrastructure development, and a growing population. From 2007 to 2012, urban development declined during the economic downturn, resulting in a decrease in new construction. Demand for saleable minerals increased and declined with these trends (see Figure 3.4, "Saleable Resources Sold Since 2000" (p. 438)). In 2013, construction in Southern Nevada began to increase, followed by an increase in demand for saleable minerals. The increase in construction activity in 2013 has resulted in a leveling off of the declining mineral material sales trend. Sales in 2013 were approximately equal to the 2012 sales.

Despite the economic downturn, approximately 80 percent of the total historic production of mineral materials in the has occurred in the past decade (BLM 2010). This means that of the 52 million cubic yards of mineral materials historically sold from BLM lands within the , approximately 40 million cubic yards has been sold in the past decade. This demand required the to evaluate the need for a new source of mineral materials to meet the needs of Las Vegas. An environmental impact statement on the Sloan Hills competitive sales was done between 2007 and 2013 to address that demand. In 2013, a final decision on Sloan Hills was made, denying the authorization of those sales.

The demand for mineral materials declined significantly from 2008 to 2012 due to economic conditions and a slowdown in construction. However, recovering economic conditions and recent increases in construction have and will continue to increase the current and future demands for mineral materials in Southern Nevada.

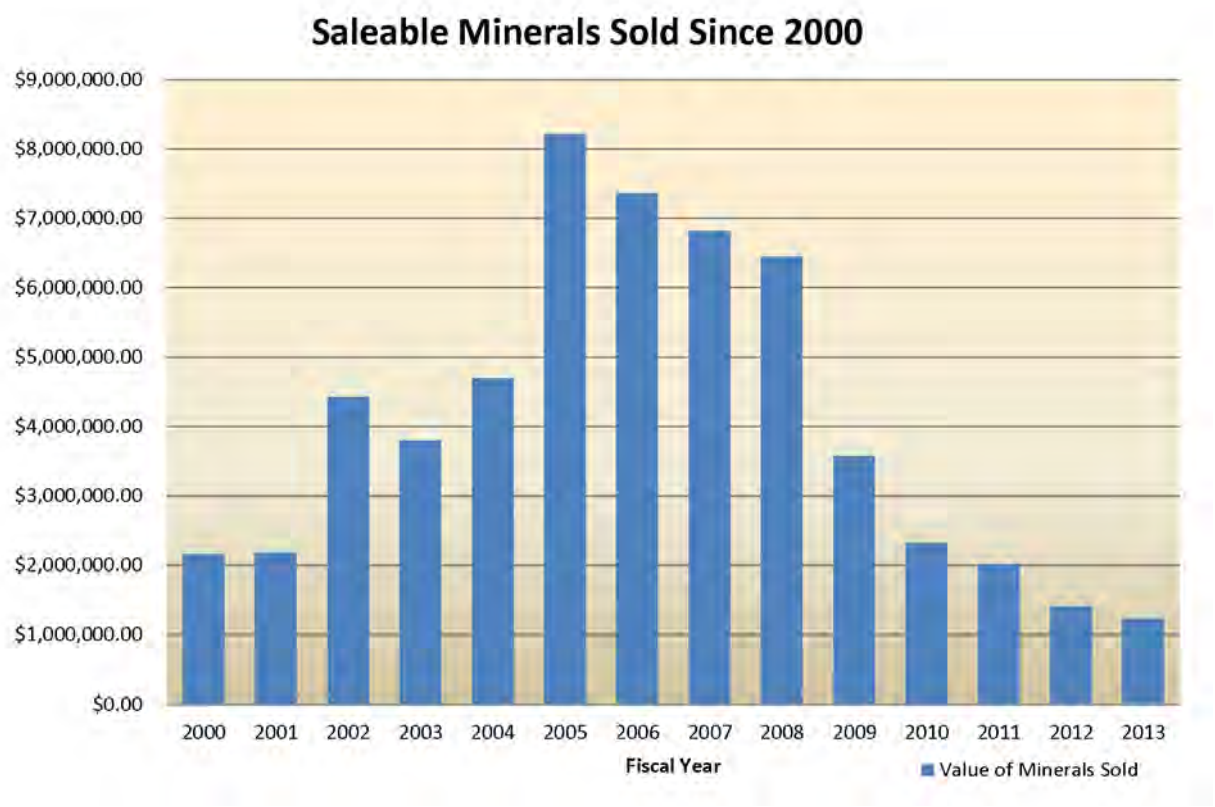

Figure 3.4. Saleable Resources Sold Since 2000[4]

3.3.3.2.2. Indicators

Saleable minerals have three primary factors that can affect the value and viability of a deposit: quality, quantity, and distance from the deposit to the consumer. Quality refers to the arrangement of particle sizes (e.g. clay, silt, sand, gravel, cobble, and boulders) and the composition of the clasts (e.g. sandstone, granite, and limestone) within the deposit. The quality of the deposit will impact the amount of crushing, screening, and blending that is required to make a product that meets the specifications of the job it is to be used on. Deposits with a large proportion of cobbles and boulders generally require much more crushing than a deposit composed primarily of gravel and sand. Deposits with a large fraction of silt, mud, or clay require more screening, and in some cases, washing. Deposits with horizons of caliche (a cement-like layer of calcium carbonate that forms several feet below the Earth's surface) require large, heavy equipment to break and move the caliche. In addition, deposits must be composed of material that meets certain water absorption, abrasion resistance, soundness, and friability tests. Any one or combination of the above mentioned impacts can decrease the value of the deposit and have major impacts to its viability.

The quantity or volume of mineral materials within a deposit will impact the viability of a deposit. There are certain costs associated with capitalizing equipment, mobilizing equipment, and setting up equipment for crushing, screening, and blending before a permittee can begin producing and selling mineral materials. At the end of the mine-life, when the deposit has been mined, processed, and sold, the permittee must reclaim the mine site, which often involves disassembling

[4] NOTE: The 2013 data only spans from October 2012 through August 2013. Source: LR2000 Reports

all the processing equipment, demobilizing the equipment, final earthwork, and revegetation. The deposit must be of sufficient volume to spread the startup and reclamation costs over the deposit on a per-unit basis (usually ton or cubic yard) so that the price per unit of mineral materials does not exceed what the consumer is willing to pay. If the volume of the deposit is too low, the startup and reclamation costs will cause the price per unit to be too high, making the deposit unviable. On the other hand, for large deposits, the startup and reclamation costs will be spread over a large volume of mineral materials. This lowers the unit cost to the permittee, thereby increasing the viability of the deposit and the amount the permittee will pay for the mineral materials within.

The distance from a minable deposit to the consumer can add significant costs. Hauling costs can vary depending on fuel prices, type of truck being utilized, whether the loaded truck is primarily traveling uphill or downhill, and prevailing wages for truck drivers. According to CostMine (InfoMine USA, Inc. 2012 p. TR A2), hauling rates in 2012 were approximately $0.10 per ton-mile. This means that if the source of the mineral materials is 15 miles from where it will be used, the cost to transport the material will be $240 [5]. This equates to $3 per ton. If the source is 20 miles from the location, it will cost $320 or $4 per ton to transport the mineral materials.

In an industry where margins are low and the effects of low-quality, low-quantity and increased hauling distances can quickly add costs to the producer and ultimately the consumer, maintaining large, quality deposits of mineral materials close to the consumer is of upmost importance.

3.3.3.2.3. Current Condition

There was a significant decrease in mineral material sales in response to the decline in urban development between 2008 and 2012. During the 2013 fiscal year, the downward trend in mineral material sales bottomed out. Mineral material sales for the 2012 and 2013 fiscal year are approximately equal (see Figure 3.4, “Saleable Resources Sold Since 2000” (p. 438)). During the 2014 fiscal year, mineral material sales are expected to remain equal to or increase from the 2013 sales.

The decision to not authorize mineral material sales at Sloan Hills does not prevent future need for materials associated with urban development. Operators may look elsewhere for potential aggregate deposits and submit proposals for the needed volume of materials. The immediate, temporary impact of the decision may push the limits of transportation of needed construction aggregate to support local development and growth. Other sand and gravel quarries at existing community pits may be expanded as needed to meet near-term demand. New decorative rock quarries may be proposed to supply increased demand or customer preferences for landscaping materials.

3.3.3.2.4. Potential Future Trend and Forecast

There will be an increased demand for mineral materials from public lands as Southern Nevada begins to recover from the economic downturn and as urban development increases. Until the need for a new community pit arises, mining activity will continue only in existing community pits. In the future, as the demand for saleable minerals increase, resources in existing community pits will be depleted as communities expand beyond the reach of the existing community pits. Future need may still require the development of new sources of aggregate to provide the materials for urban

[5] 15 miles × 2 [round trip] × 80 tons [double bottom dump truck; 40 cubic yard capacity] × $0.10 per ton-mile

development, at which point there may be active exploration for suitable locations. The need for new community pits may be warranted to support that demand (Map 3.3.3.2 - 1 (p. 2144)).

3.3.3.2.5. Key Features

Saleable minerals are used in everyday construction, agriculture, and decorative applications. It is the BLM's policy to make mineral materials available to the public and governmental agencies whenever possible and wherever it is environmentally acceptable. To make a mineral material deposit viable, the quality of the mineral materials must meet or exceed the specifications for the market area, the quantity available must be of sufficient volume to spread startup and reclamation costs thinly enough across the volume to be sold, and the haul from the source of the mineral materials to the consumer must be within an economically feasible distance. In an industry where margins are low and the effects of low-quality, low-quantity and increased hauling distances can quickly add costs to the producer and ultimately the consumer, maintaining large, quality deposits of mineral materials close to the consumer is of upmost importance.

Lands administered by the BLM provide for a significant portion of the mineral materials used in Southern Nevada. Demand for mineral materials generally rises and falls with urban development trends. From 2000 through 2006, urban development grew rapidly, resulting in increases in demand for mineral materials. From 2007 through 2012, urban development declined, resulting in a drastic decrease in demand for mineral materials. In 2013, construction in Southern Nevada began to increase, followed by an increase in demand for saleable minerals. The increase in construction activity in 2013 has resulted in a leveling off of the declining mineral material sales trend. Sales for 2013 are approximately equal to the 2012 sales. During the 2014 fiscal year, mineral material sales are expected to remain equal to or increase from the 2013 sales.

3.3.3.3. Locatable Minerals

The remaining mineral commodities fall under locatable minerals and include minerals such as gold, silver, molybdenum, uranium, gypsum, silica, and specialized clays. Miners locate mining claims to acquire the right to develop mineral values on lands open to mineral entry, under the provisions of the General Mining Law of 1872, as amended. Locatable minerals can be subdivided into metallic minerals (precious and base metals) and non-metallic minerals (gemstones and industrial minerals).

As the name suggests, these minerals are location specific with unique occurrences of mineralized material. Although decorative rock, a saleable mineral, is location specific, it is not classified as a locatable mineral unless it can be determined to be an uncommon variety of mineral. It tends to be common varieties of sedimentary, igneous, or metamorphic rock.

Mining operations must be approved by the local jurisdictional office. Under surface management regulations, 43 CFR 3809, there are two kinds of mining operations allowed for locatable minerals: Notice level and Plan of Operations (Plan) level. Table 3.33, "Brief Comparison of Notices and Plans" (p. 441) summarizes the difference between the two classifications.

Notice level operations are exploration-directed endeavors to locate and identify the extent of a mineral resource and are limited to a maximum of five acres. Notices are a two-year permit that can be extended before the end of the two-year cycle. Since the regulations were changed in 2001, all Notice level activity is restricted to be exploratory in nature with minimal disturbances such as drilling and trenching programs. Notice level operations are not federal actions and do not

undergo a NEPA review. However, Notices are subject to all existing laws and regulations, BLM specialist reviews, surveys, and bonding before beginning operations. Due to the presence of several federally listed threatened or endangered species in the district, all Notices must have a pre-site inspection to comply with 43 CFR 3809.11(c)(6) to determine whether there are listed species in the immediate area that would be impacted by the activity. If a federally listed species would be impacted under a Notice level activity, a Plan would be required.

A Plan has no limit to acreage that is proposed and can range from small (less than five acres) to large (hundreds of acres) operations. Plans are reviewed for environmental, cultural, and safety concerns and go through complete NEPA review. Most Plans are evaluated under an environmental assessment as long as their impacts are not significant or do not exceed 640 acres. If the operation exceeds 640 acres or has significant unmitigatable impacts, it can be evaluated under an environmental impact statement in accordance with NEPA.

Table 3.33. Brief Comparison of Notices and Plans

	Notice level operation	Plan of operations
Level of activity	Exploration only (trenching, drilling, bulk sampling, etc.)	Exploration through mining (open pit /underground)
Disturbance size	Less than 5 acres	Typically greater than 5 acres.*
Time limit	Two years, extendable for additional two years	Up to hundreds of years
Bonded and frequency	Yes, upon acknowledgement and each two-year extension	Yes, three-year mandatory bond review**
NEPA	No, not a federal action	Yes

* In cases when a Plan is required when a Notice does not meet 43 CFR 3809.11(c)(6) requirements.
** Phased plans are reviewed yearly.

Each authorized operation is required to obtain all of the necessary state and local permits before final authorization from the . Regardless of the level of activity, all operations are bonded for what is to occur on the site. These bonds are reviewed within specific time frames and reflect the current costs to reclaim these sites. Costs include current labor, equipment, supply, and administrative costs so the BLM can contract, via a third party, to reclaim a site should it become abandoned. In Nevada, most bonds are calculated using a spreadsheet reclamation cost estimator called the Standardized Reclamation Cost Estimator, or SRCE. SRCE was created as a joint venture between the federal (BLM), state (Nevada Division of Environmental Protection's Bureau of Mining Regulation and Reclamation [BMRR]), and the Nevada Mining Association (NMA). Costs are updated yearly by BMRR to adjust all mining-related costs.

Based on LR2000 data prior to August 2013, there have been a total of 220 Plans (for 4,551.29 acres) and 898 Notices (for 882.37 acres) processed in the district's administrative history. Over the life of the 1998 RMP, 51 Plans (for 1,913 acres) and 159 Notices (for 607 acres) have been submitted (see Table 3.34, "Comparison of Number of Plans and Notices Submitted to the District" (p. 442)). Currently, there are 20 active and two pending Plans with 10 active and one pending Notices. The minerals in these active and pending Plans include clays, gold, gypsum, limestone, magnesium, perlite, silicon, dimensional stone, and zeolites. The minerals included in these active and pending Notices are calcium (limestone), gold, silicon, and specialty stone.

Table 3.34. Comparison of Number of Plans and Notices Submitted to the District[a]

	Plan of operations		Notice level operations	
	Number of operations	**Acres**	**Number of operations**	**Acres**
history (pre-August 2013)	220	4,551.29	898	882.37
During 1998 RMP (Oct. 1998 to Aug. 2013)	51	1,913	159	607
Active and pending operations (During 1998 RMP)	22		11	
Percent processed during 1998 RMP (Oct. 1998 to Aug. 2013):	23.18 percent	42.03 percent	17.7 percent	68.79 percent

[a] All data is taken from LR2000 reports.

3.3.3.3.1. Indicators

Regardless of the locatable mineral commodity, the primary condition of the resource is location. These operations are location specific and immovable and develop where the right economic deposit resides.

Metallic deposits can range from small to very large operations and are driven by the grade of the material being mined. All of the mineable metals are openly traded as commodities on world markets. The higher the value of the metal correlates to the lower-grade deposit that could be mined. These resources have global uses with many metals having select uses. Metallic mines can have a wide range of mine lives from a few years to centuries with periods of inactivity followed by reactivated periods based on fluctuations of mineral value.

Non-metallic deposits tend to be large to very large with potentially long mine lives (centuries) to support the market area that the material would be used in. For example, gypsum mined regionally for the wallboard market easily covers the markets and needs of the southwestern United States but may extend beyond the boundaries of the nation. That same deposit may serve the Portland Cement industry as far away as southern California. Whereas, rare earth minerals are used globally in very specific applications and come from only a handful of locations around the world.

3.3.3.3.2. Metallic Resources

3.3.3.3.2.1. Historic Occurrences

As the name suggests, metallic locatable minerals consist of all of the metals ranging from base metals to precious metals, including strategic metals. Historically, many of the mining districts within the have mined metallic resources (Longwell et. al. 1965; Nevada Bureau of Mines and Geology 1994–2011) (Map 3.3.3.3 - 3 (p. 2144)). The Goodsprings and Sandy Valley areas have primarily produced base metals (copper, lead, and zinc) with minor accessories of gold and silver. The Bare Mountains, Copper King District (Bunkerville area and Virgin Mountains), Crescent Peak, Gold Butte, Johnnie District, Nelson, and Searchlight areas have primarily produced precious metals (gold and silver) with base metal accessories. The Copper King and Gold Butte mining districts may have some platinum group metals (PGMs, platinum, and palladium) in addition to the previously mentioned minerals.

3.3.3.3.2.2. Current Condition

Currently, only the Bare Mountain (southern Nye County) region of the district has two authorized Plans to extract metallic resources. One is underground and open pit, whereas the other is an open pit mine. Both use a heap leach processing facility. Historically, there has been Notice level exploration in the Johnnie, Searchlight, Nelson, Goodsprings, and Crescent Peak areas, although there are no authorized large-scale metallic mining operations (BLM 2010).

Since 2010, there has been renewed exploratory activity around the district. Precious metal exploration in the Bare Mountain and Johnnie areas are managed by the Pahrump Field Office. In the Las Vegas Field Office, there has been more base metal exploration in the Goodsprings and Sandy Valley areas with some renewed precious metal interest in the Nelson and Searchlight areas.

3.3.3.3.2.3. Potential Future Trend and Forecast

Metallic mining is dependent on market prices for the commodity. The market trend since the 1998 RMP shows metal commodity prices continuing to rise to unseen values across the globe. For example, gold began its climb in 2007 when its approximate value was $600/oz. to its historic high in September 2011 when its value was approximately $1,900/oz (see Figure 3.5, "Historic Monthly High and Low Averages of Gold Over the Life of the 1998 RMP " (p. 444)). Metals other than gold have climbed, too, although most metals have not climbed as dramatically (see Figure 3.6, "Historic Monthly High and Low Averages of Silver Over the Life of the 1998 RMP" (p. 444) and Figure 3.7, "Historic Monthly High and Low Averages of Base Metals Over the Life of the 1998 RMP" (p. 445)). As metal prices continue to climb, future mining actions in lower-grade deposits may occur within the district. With historically known areas of metal production, there is a moderate to high potential for future mining actions to extract those resources as technology advances or as the price of the commodity increases, which would make it more economical to mine a lower-grade resource (Map 3.3.3.3 - 3 (p. 2139)).

Due to its dependency on market value for each metallic commodity, it is difficult to discern a forecastable trend. That historic increase has created an increase in exploration in the district and could create the potential for future mining operations for these resources. Over the past year, there has been some contraction in the value of those commodities as the world's economies recover. This contraction has slowed some projects from developing as quickly. If commodity values plunge drastically, then it is very likely that fewer operations will conduct exploratory activities or develop large mining operations for these resources.

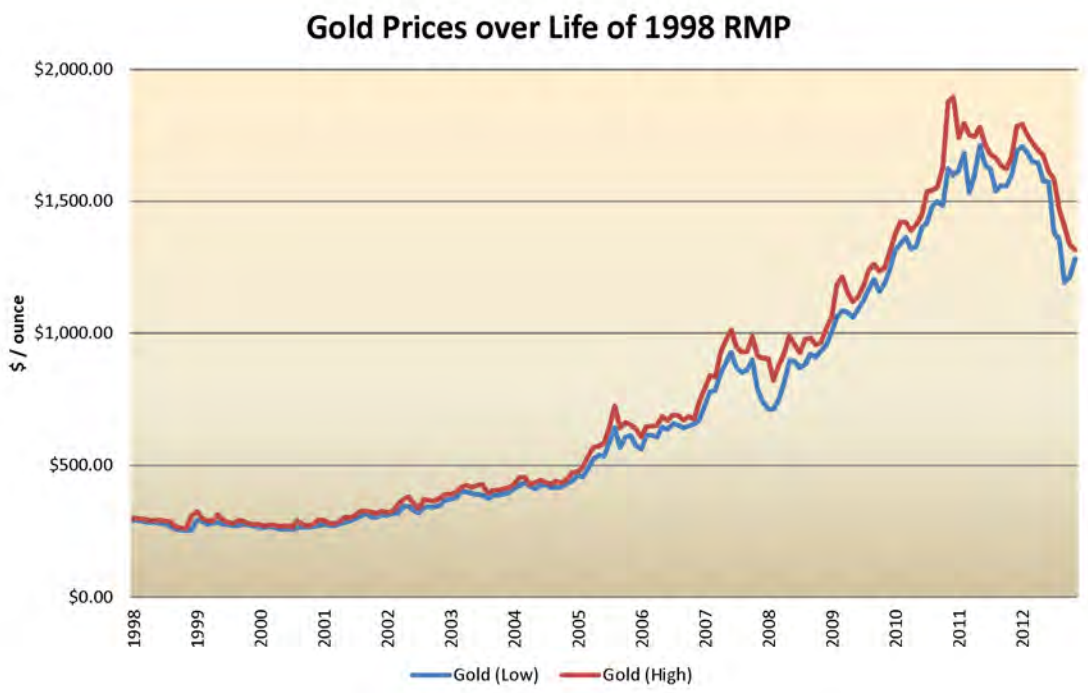

Figure 3.5. Historic Monthly High and Low Averages of Gold Over the Life of the 1998 RMP [6]

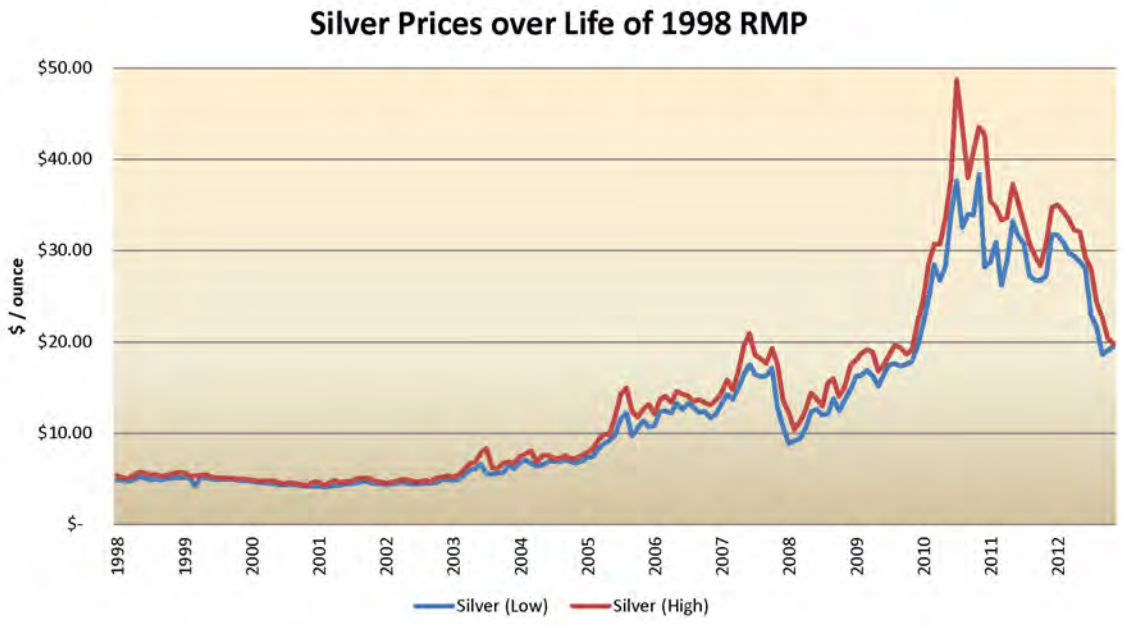

Figure 3.6. Historic Monthly High and Low Averages of Silver Over the Life of the 1998 RMP[7]

[6]Source: Kitco (http://www.kitco.com/charts/)
[7]Source: Kitco (http://www.kitco.com/charts/)

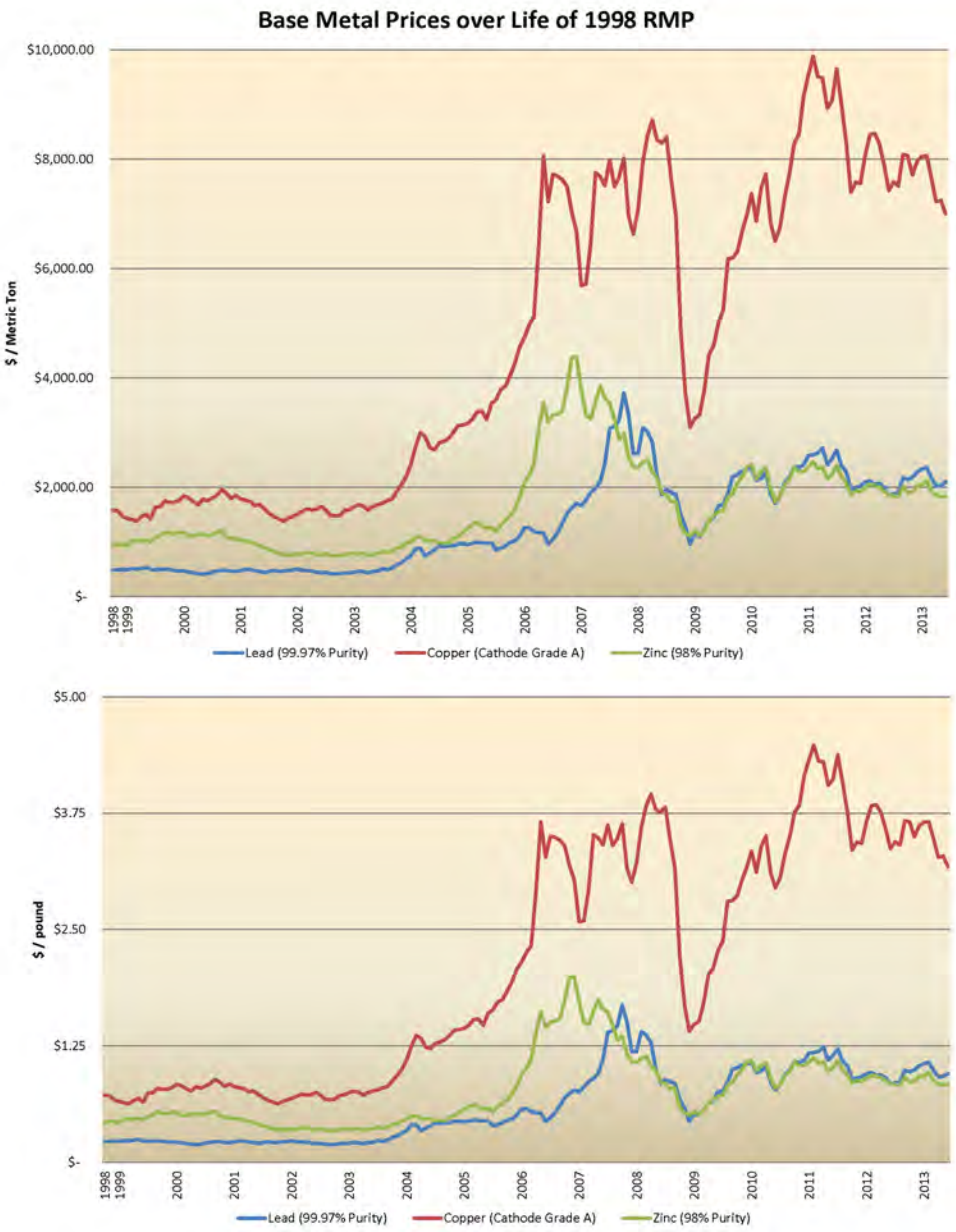

Figure 3.7. Historic Monthly High and Low Averages of Base Metals Over the Life of the 1998 RMP[8]

3.3.3.3.2.3.1. Key Features

These deposits are location specific. Development of mineral resources has a positive effect on the economy and the livelihood of people. The only way to access and develop these resources is to keep public lands open for locatable development. If more lands are withdrawn from mineral entry, the nation would need to import these commodities, which would result in increased costs.

[8]Source: Index Mundi (www.indexmundi.com)

3.3.3.3.3. Non-Metallic Resources

Non-metallic minerals are the primary forms of locatable minerals found within the jurisdictional boundary of the and can be further subdivided as gemstones and industrial minerals. Industrial minerals comprise the largest groups of mineral resource as they can be "any rock, mineral, or other naturally occurring substance of economic value, exclusive of metallic ores, mineral fuels, and gemstones, and are non-metallic" (Bates 1994). Gemstones are minerals that tend to be used for jewelry or commerce.

3.3.3.3.3.1. Historic Occurrences

The potential for gemstone mineral development is extremely low as these resources tend to be small and are primarily in withdrawn areas (BLM 2010). The presence of gemstones is extremely limited within the district (Castor and LaPointe 2001). Turquoise may be found in the Crescent Peak area and near Boulder City. The Crescent Peak area also may have some fluorite and jade. Lapidary grade agates and chalcedony are located in isolated portions of the Muddy Mountain Wilderness Area, and chalcedony is found near Henderson. There is no recorded gemstone production in the district.

Industrial minerals form the bulk of locatable minerals found within the jurisdictional boundary of the and provide resources to numerous industries (Tingley 1998, Castor 1993). Extensive gypsum deposits occur within the Blue Diamond (Arden), Bunkerville, Lake Mead, and Muddy Mountains areas. These deposits are used for wallboard production, additives for concrete and cement, and agricultural needs. Borates are found in the Amargosa, eastern Lake Mead, and the Muddy Mountains areas. Rare magnesium clays are currently produced in the Amargosa Valley for specialized uses in the drilling industry as binding agents, thickeners, gels, and in certain filtering applications. Silica sand for glass and foundry use is located near the Goodsprings, Mercury, and Overton areas. High-grade limestone can be located in the Apex, Overton, and Sloan areas for use as lime and Portland Cement. Perlite is located in the Bare Mountains, Jean, southeastern Sandy Valley, and Searchlight areas for lightweight concrete, Portland Cement (as a silica additive), and agricultural uses. Saline brines and evaporites can be located in Amargosa and the Overton areas. Zeolites are mined in Amargosa and in California. The zeolites mined in California are milled, processed, and sold from a facility in Sandy Valley for use in filtration systems, kitty litter, and animal feed.

3.3.3.3.3.2. Current Condition

Since 2010, there has been active exploration for rare earth elements in the geologic district, primarily due to the similarity with the world class Mountain Pass Mine in the Ivanpah Mining District in California just south of Primm. There has been renewed exploration for Portland Cement-grade limestone around the Muddy Mountains and Moapa area that could serve the region into southern Utah, northern Arizona, and possibly California.

Unlike metallic operations that are tied more to the commodity markets, non-metallic operations are closely tied to the local, regional or global economy. These resources provide the necessary raw materials to numerous diverse industries. The recent recession and associated construction slowdown has significantly curtailed production of gypsum, silica, and specialized clay products. Industrial mineral production has been heavily impacted by the current economic recession, but

not as severely as saleable mineral resources. However, production is ongoing, and increased production and exploration is anticipated once the building industry rebounds.

3.3.3.3.3.3. Potential Future Trend and Forecast

As the economy recovers, production from the active industrial mineral operations will improve. There are several large mineral resource areas within the planning area that may promote future growth as the commercial market improves. The push for high technology and the need for more energy resources will drive additional development. Interest in rare earth and silica sands is beginning to develop in the district. The potential for future mining activity of non-metallic industrial minerals remains high within the district's jurisdictional area. Below are just a few examples of some of the recent driving forces of mineral exploration and potential future development in the district that may not be found elsewhere in the nation.

Rare earths have numerous uses including high-tech electronics, high-end magnetics, and ceramics. They are becoming highly sought. The value of specific rare earths can range from less than $10/kg for the concentrates to $1,000s/kg for refined metals such as scanduim metal (99.99 percent purity), valued at $6,000/kg (Harben 2002). Since 2004, the market trend has been climbing at unprecedented rates with some valued at more than $15,000/kg (scanduim metal 99.9 percent purity) (see Figure 3.8, "Historic Prices for Rare Earth Elements Between 2004 and 2010" (p. 448) and Figure 3.9, "Prices for Rare Earth Elements Between 2012 and 2013" (p. 449)). Currently, China owns more than 95 percent of the rare earth market. There is one rare earth mine in North America located just south of the district in Mountain Pass, California, which provides the only national source for the minerals. Exploration in the region, particularly Southern Nevada, is looking to expand the known resource with a high potential for future development.

The drive for oil and gas development to meet the public's need for fuel by developing the oil shales is creating a market for silica sands. Many of these new operations are developing in the western states. Until recently, all of the silica sand was mined east of the Mississippi River. This national driving force has pushed for exploration in the west, particularly in Southern Nevada, to find sources of this mineral closer to the western oil fields.

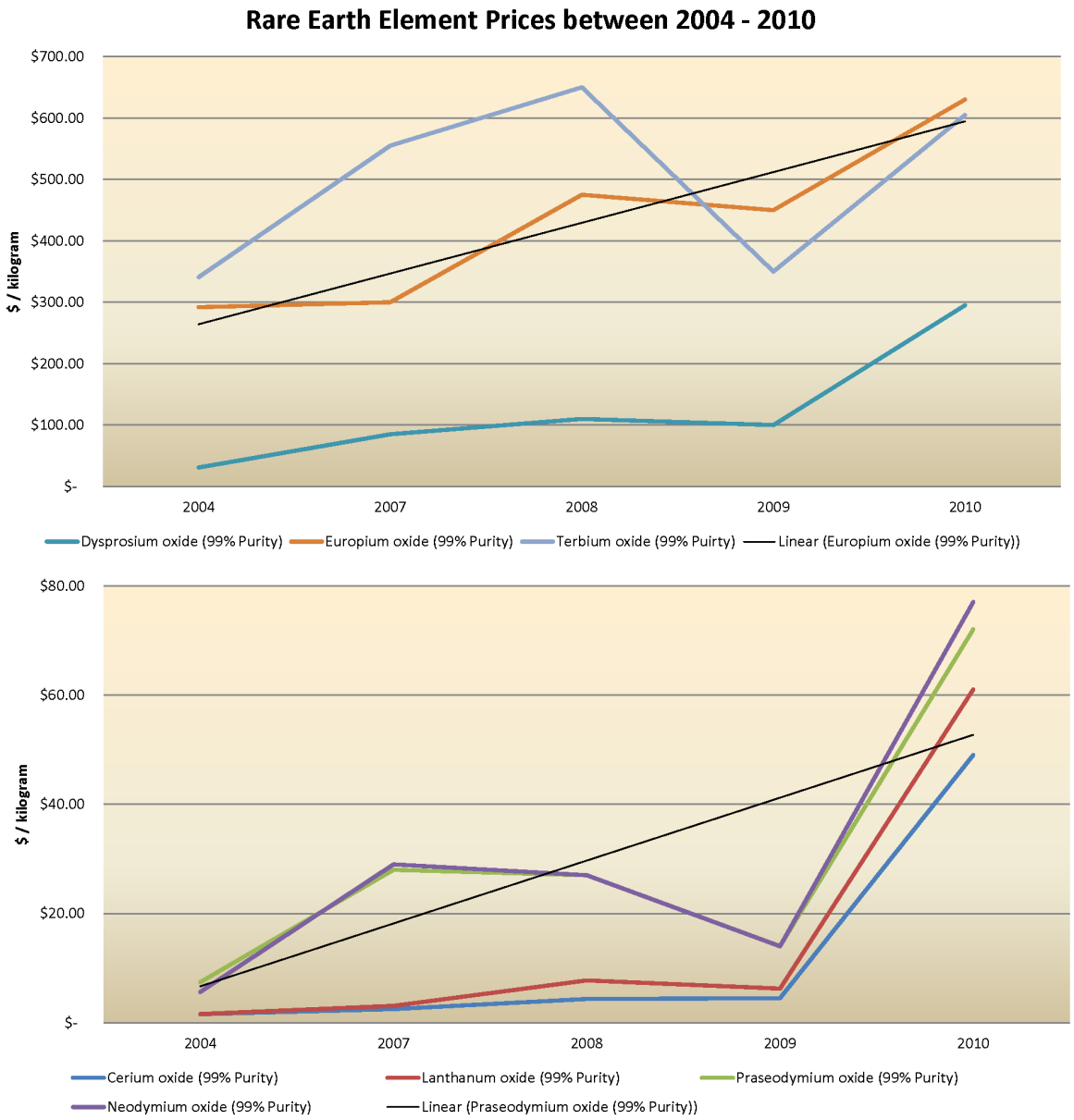

Figure 3.8. Historic Prices for Rare Earth Elements Between 2004 and 2010[9]

[9]Source: REE-Investor (http://www.ree-investor.com)

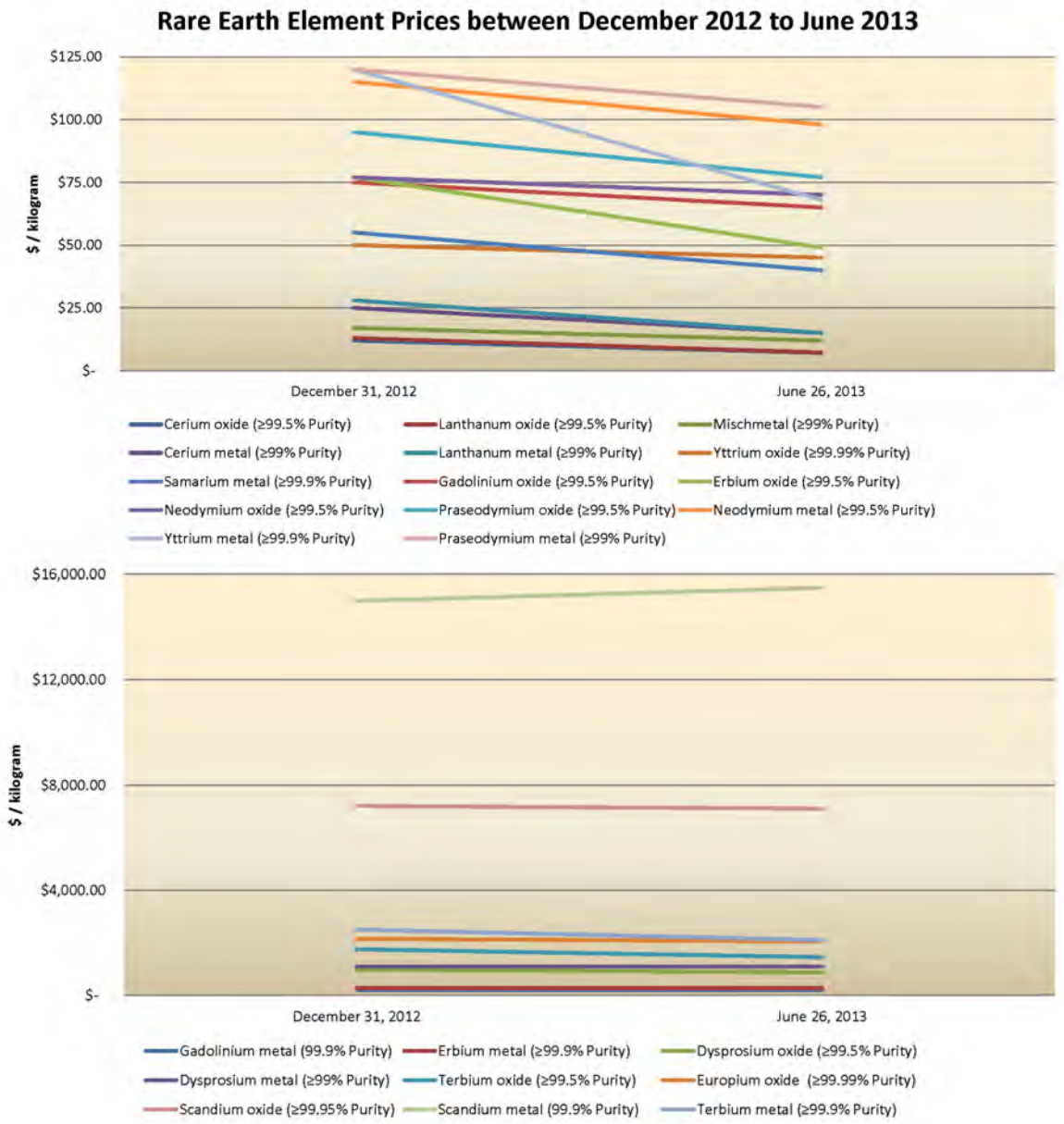

Figure 3.9. Prices for Rare Earth Elements Between 2012 and 2013[10]

3.3.3.3.3.4. Key Features

These deposits are location specific. Development of mineral resources has a positive effect on the economy and the livelihood of people. The only way to access and develop these resources is to keep public lands open for locatable development. If more lands are withdrawn from mineral entry, the nation would need to import these commodities, which would result in increased costs.

[10]Source: HEFA Rare Earth (http://www.mineralprices.com)

3.3.4. Recreation

Changes have occurred within the planning area in regards to recreational use since the completion of the 1998 RMP. Increased visitor use in the planning area affects vegetation, visual, and cultural resources. As communities continue to grow in Clark and southern Nye counties, and many visitors to the Red Rock Canyon National Conservation Area are being displaced by overcrowding in the conservation area, there is more demand for places to walk, bicycle, and ride horses in the planning area. Many trails are being created from this casual use. Local communities have been developing trailheads that access adjacent public lands. This trend is expected to continue. Speed-based events continue to be popular in both the Las Vegas and Pahrump field offices. Solar and wind energy developments are being proposed in areas of high recreation demand, including OHV racing areas.

BLM public lands are an important component of the outdoor recreation in Southern Nevada, and BLM public lands figure prominently in local and regional plans for interconnected trails. Many local cities, particularly in the Las Vegas Valley, are planning connectivity to BLM lands. Such plans are also under way in the Moapa area, Logandale, and Searchlight. The socioeconomic significance of BLM's place in development of a regional trails system is that by helping increase connectivity, BLM lands contribute to greater accessibility to recreation resources with attendant quality-of-life benefits and contribute to the overall appeal of Southern Nevada as an outdoor recreation area, thereby generating new trips to the region or leading to extended trips made for other purposes, which increases the influx of non-local dollars to the regional economy.

All recreation activities provide socioeconomic value. The value may be as simple as increased quality of life for the participants. In addition, recreationists often spend money to recreate. Local recreationists pay for gas to reach a site and may buy equipment, food and drink, and other purchases locally. Non-local recreationists represent new income in the region as they may also pay for lodging, restaurants, guides and outfitters, etc. In addition to the value of recreational expenditures in the local economy, recreation provides economic benefits in the form of nonmarket values enjoyed by the recreationists themselves.

BLM accounts for different types of annual recreation use through the Recreation Management Information System (RMIS). RMIS measures recreation participation in 65 types of recreation activities, including visitation. RMIS data sources for most of these activities depend entirely upon observations and professional judgment. In fiscal year 2012, the Las Vegas Field Office had approximately 2,004,450 visitors. The Pahrump Field Office had approximately 620,678 visitors for a total of approximately 131,377 visitor days within the Big Dune Special Recreation Management Area.

Currently, development proposals are competing with recreation use in Southern Nevada and threaten to cut off large portions of public lands within the Jean/Roach Dry Lakes Special Recreation Management Area. These developments include the high-speed train corridor, the Southern Nevada alternative airport, and renewable energy developments. As more areas are developed and therefore by default closed to OHV use due to competing resources, demand for those remaining areas will increase. The majority of the planning area is limited to existing roads, trails, and dry washes, while some areas, including ACECs and wilderness study areas, are limited to designated roads and trails.

3.3.4.1. Special Recreation Management Areas

3.3.4.1.1. Existing Guidance at the time of the 1998 RMP

Recreation management areas are the BLM's primary means of managing recreational use of public lands. Public lands are designated as a special recreation management area (SRMA) or extensive recreation management area (ERMA). SRMAs require a recreation investment where more intensive recreation management is needed and where recreation is a principal management objective. These areas often have high levels of recreation activity, contain valuable natural resources, or require recreational settings that need special management. ERMAs constitute all public lands outside SRMAs and are areas where recreation is non-specialized, dispersed, and does not require intensive management. Recreation may not be the primary management objective in these areas, and recreational activities are subject to few restrictions. Eight SRMAs (seven in Clark County and one in Nye County) are identified in the 1998 RMP.

The eight SRMAs include:

1. **Muddy Mountains (Las Vegas Field Office):** 123,400 acres, established for recreational and off-road vehicle values.
2. **Nellis Dunes (LVFO):** 10,860 acres, established for OHV high-speed and open play opportunities.
3. **Sunrise Mountain (LVFO):** 37,620 acres, established for recreation opportunities, sensitive plants, scenic, cultural, and geologic values (ACEC).
4. **Las Vegas Valley (LVFO):** 197,300 acres, established for open space and trail connectivity with the local community.
5. **Nelson Hills/Eldorado (LVFO):** 81,600 acres, established for competitive OHV events.
6. **Jean/Roach Dry Lakes (LVFO):** 216,300 acres, established for competitive OHV events, dry lakes, open OHV play areas.
7. **Laughlin (LVFO):** 25,600 acres, established for permitted OHV events.
8. **Big Dune (Pahrump Field Office):** 11,600 acres, recreational and off-road vehicle values.

3.3.4.1.2. New Guidance Received in 2011

Recreation management areas: Recreation management areas (RMA) are classified as either special recreation management areas or extensive recreation management areas. RMAs are land units where recreation and visitor services (R&VS) objectives are recognized as a primary resource management consideration and specific management is required to protect the recreation opportunities. The recreation management area designation is based on recreation demand and issues, recreation-setting characteristics, resolving use/user conflicts, compatibility with other resource uses, and resource protection needs.

Designation of special recreation management areas (SRMA):

- **Definition:** SRMAs are administrative units where the existing or proposed recreation opportunities and recreation-setting characteristics are recognized for their unique value, importance, and/or distinctiveness, especially compared to other areas used for recreation.
- **Management focus:** SRMAs are managed to protect and enhance a targeted set of activities, experiences, benefits, and desired recreation setting characteristics. The SRMAs may be subdivided into recreation management zones to further delineate specific recreation opportunities. Within SRMAs, recreation and visitor services management is recognized as the

predominant land-use plan focus, where specific recreation opportunities and recreation setting characteristics are managed and protected on a long-term basis.

Designation of extensive recreation management areas (ERMA):

- **Definition:** ERMAs are administrative units that require specific management consideration in order to address recreation use, demand, or R&VS program investments.
- **Management focus:** ERMAs are managed to support and sustain the principal recreation activities and the associated qualities and conditions of the ERMA. Management of ERMA areas is commensurate with the management of other resources and resource uses.

Public lands not designated as recreation management areas:

- **Definition:** All lands not designated as an SRMA or ERMA.
- **Management focus:** Public lands that are not designated as RMAs are managed to meet basic R&VS and resource stewardship needs. Recreation is not emphasized, however, recreation activities may occur. The R&VS are managed to allow recreation uses that are not in conflict with the primary uses of these lands.

3.3.4.1.3. Dispersed Recreation

OHV use is the major dispersed recreation use across the entire planning area. Because of its relationship to transportation and access issues, further discussion of OHV use can be found in the Transportation and Access (p. 456) section of this document. Other popular uses include hunting, hiking, bicycling, photography, automobile touring, backpacking, bird watching, target shooting, model rocket launching, camping, rock hounding, and visiting archaeological sites. The Gold Butte and Logandale areas have become popular for OHV activities, cultural site visits, and camping. Both areas have had an increase in new vegetative disturbance and unauthorized new routes.

The BLM has noticed a trend during the past six years of continued increase in the number of people recreating on public land. Table 3.35, "Visitor Use Trends for Las Vegas Field Office" (p. 452) shows this trend. These numbers do not include people who watched or participated in a permitted event.

Table 3.35. Visitor Use Trends for Las Vegas Field Office

Year	Annual visitors
2007	1,201,792
2008	1,346,005
2009	1,418,537
2010	1,447,061
2011	1,797,122
2012*	2,004,450

* In 2012, the BLM began utilizing electronic vehicle counters to collect visitor use data in addition to field observations.

The projected average population increase of approximately 4.5 percent annually in Clark and southern Nye counties is expected to substantially increase recreation use, especially OHV use, in the planning area.

The escalating population of the Las Vegas Valley and Pahrump Valley, coupled with the growth of other communities in the region, will continue to increase recreation use on public lands. The BLM is expecting that visits to public lands will continue to grow at an average of 11 percent annually based on the trends identified in the table above, whether or not BLM provides more opportunities, facilities, or management presence.

Areas near Big Dune, Gold Butte, and Logandale have become increasingly popular destination sites over the past five years. BLM staff has observed noticeable increases in OHV use and reported resource impacts related to the creation of unauthorized new routes. Jean/Roach, Nellis Dunes, Laughlin, Logandale, Gold Butte, and Big Dune continue to be popular for OHV activities.

Data on BLM recreational user characteristics is available from the National Visitor Use Monitoring (NVUM) survey (Southern Nevada Agency Partnership 2009). NVUM has standardized measures of visitor use to ensure comparability across different agencies and geographic units throughout the country. In Southern Nevada, NVUM surveys have been completed for national forest units and BLM lands. For BLM, recreationists were surveyed at Red Rock Canyon National Conservation Area and other BLM lands in federal fiscal year 2006. A total of 955 complete surveys representing 2,229 individuals were obtained for Red Rock Canyon, and surveys representing 86 individuals were obtained for other BLM lands.

Given the differences in sample size, the data for Red Rock Canyon is more accurate than the data for other BLM lands. Red Rock Canyon is located outside the planning area, and therefore the BLM will not use NVUM data in this section.

3.3.4.1.4. Developed Recreation Sites

Developed recreation sites incorporate visitor use infrastructure such as roads, parking areas, and facilities to protect the resource and support recreational users in their pursuit of activities, experiences, and benefits. Visitor use infrastructure is a management tool that can minimize resource impacts, concentrate use, and reduce visitor conflicts. Logandale Trails is the only developed non-fee site within the planning area. The site includes several parking areas, interpretive kiosks and panels, restrooms, picnic tables, and protective fence structures. It does not have potable water. In 2012, based on electronic vehicle counter data, the area received 168,248 visitors.

3.3.4.1.5. Special Recreation Permits

Five types of uses requiring special recreation permits (SRPs) are authorized by the Federal Lands 30 Recreation Enhancement Act of 2004: commercial, competitive, vending, individual or group use in special areas, and organized group activity and event use. SRPs may be issued for 10 years or less with annual renewal and are issued to manage visitor use, protect natural and cultural resources, and accommodate commercial recreational uses. Commercial SRPs are issued to outfitters, guides, vendors, recreation clubs, and commercial competitive event organizers providing recreational opportunities or services without employing permanent facilities. SRPs for competitive and organized group events are also included in this category.

The Las Vegas Field Office receives on average 40 special recreation permit applications annually. In fiscal year 2012, the Las Vegas Field Office had 54 SRP applications. The Pahrump Field Office authorized three special recreation permits for 2009 and 2010. With the exception of select ACECs, the 1998 RMP for the planning area does not address special recreation permits

for commercial tours, vending, or organized groups on public lands. These permits are issued in accordance with BLM SRP Policy Manual 2930.

During the past six years, there has been an increase in the number of participants and spectators at permitted events. Table 3.36, "Numbers of Public Served by Special Recreation Permits" (p. 454) shows that although the number of permitted events and participants at these events has increased, it has not increased at the same rate that the spectators/observers has grown.

Table 3.36. Numbers of Public Served by Special Recreation Permits

Year	Applications received	Event participants	Spectators/ observers	Total number served
2007	27	8,498	3,550	12,048
2008	40	9,027	13,230	22,257
2009	36	8,922	31,290	40,212
2010	36	17,577	47,267	64,844
2011	43	20,626	66,500	87,126
2012	54	25,450	90,902	116,352

3.3.4.1.6. Fees

Recreation fees are used to provide public services while protecting and enhancing public lands and recreation opportunities. Fees should be balanced and affordable for all members of the public, should not be an impediment to visiting public lands, and should not be used as a means to affect the allocation of recreation opportunities. However, those who actively use recreation opportunities should make a greater, but reasonable, contribution to protect and enhance those opportunities than those who do not use these opportunities.

The BLM collects recreation fees at all recreation sites that meet fee collection guidelines as provided for in REA. The collection of recreation fees supports the Department of the Interior's 2007-2012 Strategic Plan Performance Goal "To Provide for and Receive Fair Value in Recreation" and conforms to the BLM's "Priorities for Recreation and Visitor Services" strategic plan. Fee programs should support protection of natural resources, provide for public health and safety, and facilitate access to public lands.

Recreation fees are one part of a comprehensive funding strategy to support recreation sites and services. Other elements of the funding strategy include appropriated funding (as a primary funding source), volunteer assistance, interagency cooperation, grants, partnerships with the private sector, commercial operations, and leveraged funding. Fees are not used to maximize revenue.

The BLM, in concert with the U.S. Forest Service, automatically adjusts the minimum commercial, competitive, and organized group SRP fees, as well as the minimum assigned site fee, every three years. The automatic three-year fee adjustment policies and fee calculation methodologies were published in the Federal Register on October 19, 1989, (54 FR 42998) and July 29, 1999 (64 FR 41133). Individual state directors also have the authority to impose application fees and/or to establish higher minimum fees for special recreation permits.

No fees are associated with dispersed recreation in the Southern Nevada District Office, and the district has no fee sites for developed recreation. Fees are required for all special recreation permits.

The fee schedule shown in Table 3.37, "National Special Recreation Permit Fee Schedule" (p. 455) went into effect on March 1, 2011, and will remain in effect until March 1, 2014.

Table 3.37. National Special Recreation Permit Fee Schedule

Permit type	Type of recreation fee		
	Minimum	**Use**	**Cost recovery**
Commercial or vending	$100, adjusted every three (3) years based on the Implicit Price Deflator Index (IPDI)	Three (3) percent of gross revenue	
Commercial assignment of a non-exclusive site	$200, adjusted every three (3) years based on the IPDI		
Commercial assignment of an exclusive site	$200, adjusted every three (3) years based on the IPDI		
Commercial, competitive, or organized group activities or events			If more than 50 hours of staff time is required to process and administer the permit, cost recovery charges begin with the first hour.
Competitive	$100, adjusted every three (3) years based on the IPDI	Three (3) percent of gross revenue or $5 per participant per day, whichever is greater	
Organized group or event	$100 or $5 per person per day, whichever is greater		

3.3.5. Transportation and Access

Transportation involves access to public lands and infrastructure management. Within the planning area, local dependence on public lands to meet transportation needs occurs mostly in terms of access to public and private lands, in contrast to town-to-town or city-to-city destination-type travel. Development of the existing transportation system in the planning area has been associated with providing access for resource uses such as rights-of-ways and recreation.

Increased demand for access to public lands, combined with research on the impacts of roads and trails to resources and resource uses, requires a well-designed and managed transportation system.

Passage through and access to public lands via the transportation system is essential to economic activity and quality of life. For instance, access to rights-of-ways, communication sites, mining sites, and other commercial sites may impact the commercial viability of the operations at these sites and thereby effect the contributions of these sites to the local economy. Recreational use of OHVs also contributes to the local economy when OHV users make local expenditures for goods and services.

The transportation system includes county and BLM system roads, some of which receive regular maintenance. Various government entities and individuals acquire rights-of-ways from BLM for portions of the transportation system roads that cross BLM-administered lands. Issuance of rights-of-ways is based on access needs and resource considerations. County roads are usually constructed and maintained to higher standards than BLM roads and provide local road systems with access to and through BLM lands, supporting a higher volume of traffic than other roads in the planning area. These roads are maintained by the local highway districts.

In addition to these collector and local routes, numerous smaller routes are laced throughout the planning area to connect more remote locations to larger roads. These resource roads are used for administrative access, recreational purposes, access to in-holdings, and access to mining or ROW infrastructure. Some of these routes are maintained as needed and are of native surface (dirt, gravel, or sand).

Public concern over management of these non-collector and non-local routes has increased in the past decade. One issue concerns potential ROWs and management responsibility. Revised Statute 2477 (R.S. 2477), contained in the Mining Law of 1866, was intended to facilitate settlement of the west by granting the ability for state and local governments to assert a “right-of- way for the construction of highways over public lands.” Congress repealed R.S. 2477 when the Federal Land Policy and Management Act of 1976 (FLPMA) was enacted in 1976. Since then, determining which routes were developed under the R.S. 2477 authority and are the responsibility of the counties has been an ongoing issue between the federal government and western states and counties. In 1997, Congress directed the Department of the Interior not to issue any new regulations on R.S. 2477. In Southern Utah Wilderness Alliance v. Bureau of Land Management (2005), the Tenth Circuit Court of Appeals determined that only a court of law could make a binding determination on the validity of an R.S. 2477 right-of-way.

3.3.5.1. Off-Highway Vehicles

For many years, the term “off-highway vehicle” (OHV) has been used by the public, industry, and the BLM interchangeably with the term “off-road vehicle” (ORV). The term “off-road vehicle” has a legally established definition in Presidential Executive Order 11644 (1972) and BLM

regulations. BLM has chosen to use OHV, not only because it is a more popular term, but also because the regulations address vehicles that use roads and trails on BLM-administered lands, and are therefore not just "off-road."

The national BLM objectives for OHV management are to protect the resources of public lands, promote the safety of all users of those lands, and minimize conflicts among the various uses of those lands (BLM 2001). OHVs are defined as "any motorized vehicle capable of or designated for travel on or immediately over land, water, or other natural terrain, excluding (1) any non-amphibious registered motorboat; (2) any military, fire, emergency, or law enforcement vehicle when being used for emergency purposes; (3) any vehicle whose use is expressly authorized by the authorized officer or otherwise officially approved; (4) vehicle in official use; and (5) any combat or combat support vehicle when used in times of national defense emergencies" (43 CFR 8340.0-5).

Areas and routes are designated during the planning process in accordance with BLM regulations and include the following three management categories:

- **Open: (26,563 acres)** An area where all types of vehicle use are permitted at all times, anywhere within the designated "open" area. This refers to cross-country travel both on and off roads.
- **Limited:(2,76,756 acres)** Areas where vehicle use is restricted at certain times, in certain areas, and/or to certain vehicular use to meet specific resource management objectives. These limitations may include limiting the number or types of vehicles; limiting the time or season of use; permitted, administrative, or licensed use only; use on existing roads and trails; and limiting use to designated roads and trails.
- **Closed: (319,673 acres)** Motorized vehicles are permanently or temporarily prohibited. The use of motorized vehicles in closed areas may be allowed for certain reasons; such use shall be made only with the approval of the BLM-authorized officer. (319673 acres)

All designations shall be based on the protection of the resources, promotion of the safety of all users, the minimization of conflicts among various uses of the public lands; and in accordance with criteria established in 43 CFR 8342.1.

3.3.5.2. Roads/Trails

Between 1992 and 1994, the BLM limited vehicle use to designated routes in portions of Piute Valley, Eldorado Valley, and Nelson Hills. In 1998, with completion of the RMP, the BLM finalized the previously interim designation of approximately 550 miles of roads within the Piute/Eldorado ACEC.

The 1998 RMP closed the Las Vegas Valley SRMA. A short time later, the BLM closed the area around the Las Vegas Valley, including the Las Vegas Valley SRMA, the Sunrise Mountain SRMA, and portions of the Jean Roach SRMA and Muddy Mountains SRMA to motorized vehicles. These areas are currently being managed as closed to motorized vehicles. The Sunrise Mountain SRMA overlaps with an ACEC and is being managed to limit motorized vehicles to designated routes. These closures were in place to assist local government efforts in meeting Environmental Protection Agency Air Quality Standards and reducing dust production from unpaved roads within the Las Vegas Valley Non-Attainment Area. Exceptions have been made for those with valid hunting permits and other valid uses such as accessing a right-of-way or private property within the non-attainment area.

In 1999, BLM designated approximately 36 miles of roads as open within the Rainbow Gardens ACEC in the Sunrise Management Area Interim Management Plan (EA NV-055-99-21). In 2008, BLM designated 807 miles of roads as open and 94 miles of roads as closed across 11 ACECs comprising 555,554 acres of the planning area (EA NV-052–2006–433):

- Coyote Springs ACEC and Arrow Canyon ACEC: Approximately 52,000 acres with approximately 128 miles of designated routes.
- Mormon Mesa ACEC: Approximately 148,000 acres with approximately 185 miles of designated routes.
- Gold Butte area ACECs (Gold Butte Parts A, B and C, Virgin River ACEC, and all small ACECs within the Gold Butte area): Approximately 344,000 acres with approximately 494 miles of designated routes.
- More than 9,000 miles of routes were inventoried on BLM lands in Clark County outside of ACECs.

Transportation in Nye County

The current resource management plan governing travel in the area was developed in early 1990 with a signed record of decision in October 1998. The 1998 RMP established OHV designations as limited to designated roads and trails on the east side of U.S. Highway 160, limited to roads, trails, and dry washes on the west side of U.S. Highway 160, open within 1,720 acres of the 11,500 acres at the Big Dune Special Recreation Management Area, and closed approximately 200 acres to vehicle use within the 1,920 acre Big Dune Area of Critical Environmental Concern.

Motorized vehicle travel is the dominant form of transportation throughout the area. The principal highways used to reach public lands in the area include U.S. Highway 95, State Route 160, State Route 372, and State Route 373. The Town of Pahrump has experienced moderate growth since then and has seen considerable expansion of arterial and local street infrastructure. From the perspective of public lands surface transportation, population growth has pushed road infrastructure into previously undeveloped areas.

The main transportation trend affecting the area is an expected continued increase in demand. The introduction of off-highway vehicles and other vehicles with the capability to travel into more remote areas has led to increased use of public lands for recreational vehicle use in the Pahrump Valley. New routes and the extension of existing ones have emerged in the area as vehicles with more technical capability (such as rock crawlers and high-speed off-road vehicles) become common. These trends are likely to continue into the future.

Transportation network changes on and around public lands include upgrades to existing roads traversing the area; new rights-of-ways for streets, communication sites, and transmission corridors. Access elimination has occurred in some areas and access expansion has occurred in others due to new roads, increasing demand for motorized vehicle access to public lands as the population grows.

A systematic inventory or roads, primitive roads, and trails, was conducted between 2006 and 2013, and routes are currently being inventoried. The inventory of routes will allow the BLM to develop a network of designated routes that is sustainable, as well as meet the increasingly diverse transportation, access, and recreational needs of the public. Currently, 1,349 miles of roads and trails have been systematically mapped in the area, but route inventory of the Amargosa and Pahrump Valley is not complete.

3.3.5.3. Regional Travel Management Efforts

In making road and trail management decisions and designations, BLM strives to cooperate with adjoining land-use plans. Several travel management plans from regional and local entities have been considered in the route designation process. Local plans considered throughout implementation of the 1998 RMP road designations include the following:

- Integrated Resource and Recreation Area Management Plan of the Logandale Trail System (BLM 1 2007c).
- Goodsprings Trail Feasibility Study (Clark County 2009a).
- Moapa Valley Trails Study (Clark County 2009b).
- Searchlight Trails Study (Clark County 2009c).

3.3.6. Lands and Realty

The goals of the lands and realty program are to manage the public lands to support the goals and objectives of resource programs and to provide for multiple uses of public lands in accordance with applicable laws and regulations, while protecting sensitive resources and improving management of public lands through land tenure adjustments. The primary responsibilities of the lands and realty program include land tenure adjustments (disposals and acquisitions) and withdrawal actions; land-use authorizations (i.e., rights-of-way, permits, leases, and easements), and other land-use authorities. The lands and realty program responds to requests from other programs and outside entities. The frequency of such requests is anticipated to increase as neighboring communities grow and the demand for use of public lands and the need for renewable energy increase. As a result, future management of the lands and realty program may become more intense, complex, and costly.

There are approximately 9.6 million acres within the Las Vegas and Pahrump field offices, of which 3.1 million acres (or 32 percent) are BLM-administered public lands. Table 3.38, "Las Vegas Field Office (Clark County)" (p. 460) and Table 3.39, "Pahrump Field Office (Nye County)" (p. 460) provide a breakdown of all the lands (including non-BLM lands) within the Southern Nevada District Office. Non-BLM lands are managed under their respective land-use plans by local, state, or other federal government agencies, therefore, those lands are outside the scope of the planning area.

Table 3.38. Las Vegas Field Office (Clark County)[a]

Administering entity	Acres	Percent of area
Bureau of Land Management	2,414,061	50.7 percent
Bureau of Indian Affairs	80,686	1.7 percent
Bureau of Reclamation	43,212	0.9 percent
Department of Defense	26,704	0.6 percent
Department of Energy	4,313	0.1 percent
U.S. Fish and Wildlife Service	751,322	15.8 percent
U.S. Forest Service	280,142	5.9 percent
National Park Service	563,349	11.8 percent
State of Nevada	50,717	1.1 percent
Private	546,105	11.47 percent
Total acres in Clark County	**4,760,611**	**100 percent**

[a]Source: GIS, Aug. 2013

Table 3.39. Pahrump Field Office (Nye County)[a]

Administering entity	Acres	Percent of area
Bureau of Land Management	702,094	14.4 percent
Department of Defense	2,978,516	61.0 percent
Department of Energy	877,169	18.0 percent
U.S. Fish and Wildlife Service	58,125	1.2 percent
U.S. Forest Service	37,326	0.8 percent
National Park Service	110,210	2.3 percent
State of Nevada	80	<0.1 percent
Private	116,608	2.4 percent
Total acres in Nye County	**4,880,128**	**100 percent**

[a]Source: GIS, Aug. 2013

The major components of federal lands within the planning area are listed below by agency in order of total land acreage (largest to smallest):

- BLM Southern Nevada District: Las Vegas and Pahrump field offices.
- Department of Defense (DOD): Nellis Air Force Base and Nevada Test and Training Range.
- Department of Energy (DOE): Nevada National Security Site.
- U.S. Fish and Wildlife Service (USFWS): Ash Meadows National Wildlife Refuge, Desert National Wildlife Refuge, and Moapa Valley National Wildlife Refuge.
- National Park Service (NPS): Portions of Death Valley National Park and Lake Mead National Recreation Area.
- U.S. Forest Service (USFS): Humboldt-Toiyabe National Forest.
- Bureau of Reclamation ("Reclamation"): Las Vegas Valley Water District, Virgin River Property, and other protected properties.

Tribal lands are represented in the federal category; however, it should be noted that tribes exercise inherent sovereign powers over their members and territory. There are three Indian reservations and one Indian colony within the LVFO planning area: Snow Mountain Indian Reservation, Moapa River Indian Reservation, and Fort Mojave Indian Reservation; and the Las Vegas Indian Colony (in downtown Las Vegas). Together, the Indian reservations and colony comprise more than 81,266 acres.

The BLM administers the leasing of the mineral estate underlying U.S. Forest Service-, National Park Service-, and Bureau of Reclamation-withdrawn lands, although mineral management decisions on these lands are coordinated with the appropriate surface agency. The mineral estate of many private land parcels was reserved to the U.S. government at the time they were patented. In these cases, the mineral estate is administered by the BLM, and the surface estate is administered by private landowners.

3.3.6.1. Land Tenure

Land tenure adjustments are often associated with accommodating public and private needs; community expansion; consolidating public land; acquiring access to public lands and protecting important resources; providing life and property protection; or serving a national priority. Land tenure adjustments must be in conformance with applicable land-use plans and be subject to valid and existing rights. BLM utilizes several authorities to make land tenure adjustments through acquisition, disposals, exchanges, and conveyances under the Recreation and Public Purposes Act of 1926 (R&PP) [44 Stat. 741], as amended, or through other federal legislation.

The Federal Land Policy and Management Act

BLM's authority for administration of public land is the Federal Land Policy and Management Act of 1976 (FLPMA) [P.L. 94-579)], as amended. Public land is any land and interest in land (i.e., water rights, mineral estate) owned by the United States and administered by the BLM. Pursuant to FLPMA, Congress declared that it is the policy of the United States that public lands shall be retained in federal ownership unless, as a result of land-use planning, it is determined that disposal of a particular parcel will serve the national interest. Lands to be considered for disposal, at a minimum, must meet the disposal criteria outlined in Section 203 of the FLPMA, such as: 1) They are difficult and uneconomical to manage, and are not suitable for management by another federal agency; or 2) Disposal would serve important public objectives, including but not limited to community expansion or economic development that could not be achieved prudently or feasibly on land other than public lands and which outweigh other public objectives

or values; or 3) Such tract was acquired for a specific purpose, and the tract is no longer required for that purpose or any other federal purpose.

Land Disposals

Federally owned lands within the planning area can be disposed of through various disposal authorities such as FLPMA; R&PP; the Southern Nevada Public Lands Management Act of 1998 (SNPLMA) [P.L. 105-263], as amended; the Santini-Burton Act of 1980 [P.L. 96-586]; the Airport and Airway Improvement Act of 1982 [49 U.S.C. 2215], as amended; or through other targeted federal legislation. Land disposal actions must be consistent with the appropriate regulation subparts 2710, 2740, or 2640 under Title 43, Code of Federal Regulations, and BLM policy and guidance.

Public lands have potential for disposal when they are isolated and/or difficult to manage or are in the public interest. Disposal actions are usually in response to public requests, such as community expansion or individual needs, and are coordinated with local governments and current land users. Disposals result in a title transfer wherein public lands leave federal ownership. Environmental Site Assessments (ESA) are required for all land disposals according to BLM H-2000–02 and in accordance with section 120(h) of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA).

Disposal actions also require an environmental analysis in accordance with the National Environmental Policy Act (NEPA). This NEPA analysis may reveal resource conditions that could not be mitigated to the satisfaction of the authorized officer and may therefore preclude disposal. Public lands determined suitable for sale may be offered by the BLM, unless the disposal was specifically directed by federal legislation. Public lands are not sold at less than fair market value, unless otherwise provided for by law (such as SNPLMA affordable housing disposals). Specific lands suitable for sale must be identified by legal description, such as by township, range, section, and aliquot part, and be consistent with the applicable FLPMA 203(a) disposal criteria and a current land-use plan. Any lands to be disposed of through sale that were not identified in the land-use plan would require a plan amendment before a sale could occur.

The 1998 RMP/FEIS, as amended by the 2004 Las Vegas Valley Disposal Boundary FEIS, identified approximately 197,314 acres of public lands available for disposal. Since October 1998, BLM has conveyed approximately 82,000 acres of public land (Source: LR2000, Sept. 2013) to other parties through various land disposal authorities and land exchanges. All the disposals are considered to have taken place under the authority of FLPMA, but in some cases, additional specific legislative authorities were utilized such as the SNPLMA, Santini-Burton Act, and R&PP Act.

Table 3.40, “Current Disposal Areas Within the Las Vegas Field Office” (p. 462) and Table 3.41, “Current Disposal Areas Within the Pahrump Field Office” (p. 463) provides a list of the current disposal areas within the Las Vegas Field Office (Clark County) and Pahrump Field Office (Nye County) that total approximately 176,420 acres (Source: GIS, Aug. 2013).

Table 3.40. Current Disposal Areas Within the Las Vegas Field Office

LVFO disposal areas	Acres
Apex	16,434
Goodsprings	950
Indian Springs	378

LVFO disposal areas	Acres
Indian Springs Prison	1,302
Laughlin	4,944
Mesquite-Bunkerville	6,854
Moapa-Glendale	40,492
Nelson	799
Sandy Valley	3,996
Searchlight	2,042
SNPLMA *	41,851
Ivanpah **	14,394
Valley West	968
Total	**135,404**

*Includes Santini-Burton and McCarran Airport CMA.

**Includes lands formerly identified as Jean and Primm disposal areas.

Table 3.41. Current Disposal Areas Within the Pahrump Field Office

PFO disposal areas	Acres
Amargosa Valley	27,697
Lathrop Wells	5,615
Pahrump	9,036
Total	**42,348**

3.3.6.1.1. Public Lands Not Identified for Disposal

Certain lands within the planning area have been excluded from disposal through the planning process or congressional action. Lands that have been withdrawn from appropriation under the public land laws are also excluded from disposal. Furthermore, lands within a designated wilderness or wilderness study area are required to be retained in federal ownership.

3.3.6.1.1.1. The Southern Nevada Public Land Management Act

SNPLMA became law in October 1998. This special legislation allows the BLM to sell public land within a specific area around the Las Vegas Valley known as the SNPLMA disposal boundary. A key provision of the SNPLMA is that revenue generated from such land sales remain in Nevada for a variety of land management activities. Revenue derived from SNPLMA land sales goes to the State of Nevada General Education Fund (5 percent), the Southern Nevada Water Authority (10 percent), and a special account (85 percent) available to the Secretary of Interior for purposes such as, but not limited to, items relevant to the planning area listed below:

- Acquisitions of lands and interests in lands (acquisitions).
- Capital improvements.
- Multi-Species Habitat Conservation Plan (MSHCP).
- Conservation initiatives (CI).
- Hazardous fuels reduction.
- Eastern Nevada Landscape Restoration Project.
- Parks, trails, and natural areas (PTNA).
- Reimbursement of costs incurred by BLM in arranging sales or exchanges.
- Reimbursement of any costs incurred by BLM to clear debris from and protect public lands that are located in the disposal boundary and reserved for affordable housing purposes.

In addition to the above, SNPLMA allowable expenditure types, certain revenues deposited into the SNPLMA special account are designated and set aside for specific purposes such as:

- Acquisition of in-holdings within the Mojave National Preserve in California and for the protection and management of petroglyph resources in Clark County; utilizing revenues from the disposal of lands in the Ivanpah Valley for an airport. These revenues are not available until the lands are transferred to Clark County and a final Record of Decision pursuant to NEPA has been issued that permits development of the airport at the Ivanpah site.
- Acquisition of environmentally sensitive land in the Lake Tahoe Basin pursuant to the Santini-Burton Act; utilizing revenue deposited in the SNPLMA special account from the conveyance (e.g., sale, lease, etc.) of parcels within the SNPLMA disposal boundary that are also within the disposal boundary established by the Santini-Burton Act, and the McCarran Airport Cooperative Management Area boundary.
- Development of a Multi-Species Habitat Conservation Plan for the Virgin River and associated groundwater monitoring utilizing revenue from the sale of certain lands to the city of Mesquite.

3.3.6.1.1.1.1. SNPLMA Affordable Housing Land Disposals

BLM has a unique land sales program pursuant to SNPLMA that provides for the conveyance of public land for affordable housing purposes at a discounted rate based on a fair market value as determined by a federally approved appraisal. Under the authority of FLPMA and Section 7(b) of SNPLMA, the BLM, in consultation with the Department of Housing and Urban Development, may make land available in the state of Nevada at less than fair market value for affordable housing purposes. Such lands may be made available only to state or local government entities, including local public housing authorities. Housing will be considered to be affordable housing if the housing serves “low-income families.” Such income cannot exceed 80 percent of the median income for the area as further defined in Section 104 of the Cranston-Gonzalez Act and under the authority of SNPLMA and its policy outlined in the SNPLMA Section 7(b) — Nevada Guidance Policy and Procedures for Affordable Housing Disposals (Nevada Guidance) issued April 8, 2006.

BLM maintains a SNPLMA Sec. 7(b) reservation file (N-77376) that identifies lands reserved by the state or local government entities for affordable housing purposes. The governing entities identified approximately 1,195 acres of land for affordable housing purposes. Since this program was implemented, three affordable housing land sales have been completed totaling 20 acres: 1) Harmon Pines Senior Housing Project (N-81870) – five acres patented in February 2007; Arby Family Housing Project (N-82856) — 10 acres patented in November 2007; and Agate Senior Housing Project (N-91073) — 5 acres patented in November 2013. These projects will have resulted in the construction of 465 units of affordable housing in southern Nevada. These parcels were sold at 95 percent discount of the fair market value pursuant to the Nevada Guidance. There are over 1,000 acres of BLM lands reserved for affordable housing purposes.

3.3.6.1.1.2. R&PP Disposals

R&PP authorizes the direct sale (or lease to conveyance) of public lands for recreation and public purposes to state and local governing entities and to qualified nonprofit organizations. Examples of R&PP qualified uses are historic monument sites, campgrounds, schools, school bus yards, fire houses, law enforcement facilities, municipal facilities, hospitals, parks, fairgrounds, and churches. While most R&PP land disposals are executed through a lease to conveyance process, it is possible under extenuating circumstances to go directly to sale (patent). An example of this would be the potential for release of hazardous materials, such as a public sanitary landfill.

Patents issued under R&PP convey a restricted title because they contain certain provisions or clauses that, if not complied with, may result in reversion of the title to the United States, except where hazardous materials may be generated by the proposed use.

SNPLMA specifically authorizes acquisition or use of public lands by state or local governing entities for recreational purposes pursuant to R&PP. Such lands are reserved by the state or local governing entities for R&PP conveyances. The state and local governing entities periodically provide BLM with a list of public land parcels located within the SNPLMA disposal boundary and their respective jurisdiction to be reserved for R&PP purposes. These SNPLMA R&PP reservations are available only for disposal for purposes consistent with R&PP. BLM maintains SNPLMA R&PP reservation files for each governing entity (as information is received) and notes the public record to reflect the reservation and its assigned case file, as depicted in Table 3.42, "SNPLMA R&PP Reservation Files" (p. 465).

Table 3.42. SNPLMA R&PP Reservation Files[a]

SNPLMA R&PP reservation files		Acreage	As of date
N-77372	City of Las Vegas	174	May 2011
N-77373	City of North Las Vegas	762	July 2011
N-77378	Clark County	2,110	May 2013
N-77379	State of Nevada	755	June 2013

[a]Source: LR2000, Sept. 2013

3.3.6.1.1.3. Santini-Burton Disposal Boundary

The Santini-Burton Act of 1980 provides for the disposal of small parcels of public land interspersed adjacent to private lands in urban areas of Clark County. These small public land parcels are located in the Santini-Burton boundary, which lies within the SNPLMA disposal area. No more than 700 acres per calendar year may be offered by BLM under the Santini-Burton provision. At the time of the Santini-Burton enactment, there was in excess of 9,300 acres of public lands identified for disposal. There are approximately 1,200 acres of public lands that remain available for sale within the Santini-Burton disposal area. SNPLMA provides that 85 percent of annual revenues be used to acquire environmentally sensitive lands in the Lake Tahoe Basin pursuant to Section 3 of the Santini-Burton Act. Such lands are acquired and managed by the U.S. Forest Service.

3.3.6.1.1.4. McCarran Airport Cooperative Management Area

The McCarran Airport Cooperative Management Area (CMA) overlaps a substantial part, but not all, of the Santini-Burton disposal area. Pursuant to SNPLMA, the federally owned lands within the CMA were conveyed to Clark County in March 1999; if Clark County disposes of those lands, 85 percent of the revenue from the lands that are both within the Santini-Burton boundary and the CMA boundary is deposited into the SNPLMA special account and set aside for purchase of environmentally sensitive lands in the Lake Tahoe Basin. Revenue from disposal of lands within the Santini-Burton boundary, but not within the CMA boundary, do not go to the SNPLMA special account. Those revenues are deposited into the United States Treasury for distribution as specified in the Santini-Burton Act. Revenue from disposal of lands within the CMA boundary and the SNPLMA disposal boundary, but not within the Santini-Burton boundary, are deposited in the SNPLMA special account for uses specified pursuant to SNPLMA.

3.3.6.1.1.5. Ivanpah Disposal Area

In October 2000, Congress passed the Ivanpah Valley Airport Public Lands Transfer Act [P.L. 106-362] for the conveyance of certain BLM-administered lands located approximately 25 miles south of the Las Vegas Valley to be conveyed to Clark County for an airport facility and related infrastructure. This facility is known as the Ivanpah Valley Airport. In June 2004, BLM conveyed to Clark County approximately 5,800 acres by Patent No. 27-2004-0104. This conveyance is serialized under BLM casefile number N-73950. Revenue from the conveyance was deposited in the SNPLMA special account and made available for specific purposes as identified in the Ivanpah Valley Airport Public Lands Transfer Act. The funds may not be expended until an environmental analysis and a final Record of Decision pursuant to NEPA has been issued to permit development of an airport at the Ivanpah site. Before construction of an airport facility on the subject conveyed lands, all actions required under NEPA with respect to initial planning and construction shall be completed by the Secretary of Transportation and the Secretary of the Interior as joint lead agencies. Pursuant to the Ivanpah Valley Airport Public Lands Transfer Act, if the Federal Aviation Administration and the county determine that an airport should not be constructed on the conveyed lands, BLM shall refund to the county all payments made to the United States for such lands, and upon such payment, all right, title, and interest in the lands conveyed to the county under this act shall revert to the United States.

Furthermore, pursuant to the Clark County Conservation of Public Land and Natural Resources Act of 2002 (Clark County Act), BLM shall transfer to the county, without consideration, all right, title, and interest of the United States in and to the land identified as the Ivanpah Airport Noise Compatibility Area, which encompasses approximately 15,000 acres. If any portion of the transferred land is sold, leased, or otherwise conveyed by the county, such lands shall be subject to the same limitations as the original transfer that requires that any use of the transferred land be consistent with the Interim Cooperative Management Agreement between the BLM and Clark County dated November 4, 1992, and Section 47504 of Title 49 United States Code. Any gross proceeds received by the county, the county shall contribute 85 percent to the SNPLMA special account, 5 percent to the state of Nevada, and reserve 10 percent for use by the Clark County Department of Aviation for airport development and noise compatibility programs.

3.3.6.1.1.5.1. Airport and Airway Improvement Act

Section 516 of the Airport and Airway Improvement Act of 1982 (49 U.S.C. 2215) provides for the conveyance of BLM-administered lands to public agencies for use as airports and airways. A conveyance may be made only on the condition that, at the option of the Secretary of Transportation, the property shall revert to the United States in the event that the lands in question are not developed for airport purposes or used in a manner consistent with the terms of the conveyance. If only a part of the property interest conveyed is not developed for airport purposes or used in a manner consistent with the terms of the conveyance, only that particular part shall, at the option of the Secretary, revert to the United States.

3.3.6.1.2. Land Exchanges

Land exchanges are initiated in direct response to public demand or by BLM to acquire sensitive resources and/or improve management of the public lands. Exchanges are considered on a case-by-case basis where the exchange is in the public interest and where acquisition of the

non-federal lands will contain higher resource or public values, than the public lands being disposed of.

Since October 1998, BLM has disposed of approximately 13,265 acres of public land within May 1999 and February 2005; and acquired approximately 1,944 acres between May 1999 and May 2003 (Source: LR2000, Sept-2013). Land exchanges are a land tenure adjustment tool that may be utilized as part of BLM's strategic goal to serve the both current and future public interests.

3.3.6.1.3. Acquisitions of Lands and Interests in Lands

Consistent with Sec. 205 of FLPMA and the applicable land-use plan, acquisition of lands and/or interests in lands (i.e., water rights, mineral rights, access easements) may be pursued to facilitate various resource management objectives. Acquisitions can be completed by negotiated purchase, exchange, and donation including transfer from other federal agencies. Funding sources for acquisitions may be provided through special legislation (i.e. the Land and Water Conservation Fund or SNPLMA), as well as the benefitting resource program. The Land and Water Conservation Fund specifically provides land acquisition funding for recreation and conservation purposes. Such land acquisitions must be within or contiguous to a unit of the National Landscape Conservation System (with the exception of wilderness study areas), an area of critical environmental concern, or other special management areas. SNPLMA provides funding for environmentally sensitive purposes to acquire land and protect important resources, including but not limited to, lands and interests in lands used by threatened or endangered species and historic and prehistoric cultural sites. Acquisitions completed for specific purposes require special management considerations to protect the resource values on the acquired lands.

Although no acquisition transactions under the Land and Water Conservation Fund have occurred in the areas covered under this RMP, the BLM has acquired 3,549 acres and 200 acre-feet of annual water rights pursuant to SNPLMA. Such acquisitions are identified in Table 3.43, "Acquisition Transactions Under SNPLMA" (p. 467).

Table 3.43. Acquisition Transactions Under SNPLMA[a]

Serial No.	Project name	Acres	Water rights (AFA)	County	General location
N-73979	Virgin River 1	160		Clark	Overton Wildlife Management Area
N-75456	Perkins Ranch	391		Clark	Muddy River near Moapa
N-76050	Bunker Property	9		Clark	Virgin River northwest of Bunkerville
N-76054	Hughes Property	40		Clark	Virgin River northwest of Bunkerville
N-76501	Rainbow Gardens	525		Clark	Rainbow Garden ACEC
N-77499	Delavan Properties	861		Clark	Gold Butte ACEC and Lime Canyon Wilderness Area

Serial No.	Project name	Acres	Water rights (AFA)	County	General location
N-77502	Walking Box Ranch	160	13	Clark	Piute/Eldorado ACEC, west of Searchlight
N-80545	White Basin	1,103		Clark	Muddy Mountains Wilderness Area
N-82256	Stuart Ranch	262	145	Clark	Morman Mesa ACEC
N-85375	Grapevine Springs	38	41	Nye	Johnnie HMA
Total		**3,549**	**199**		

[a]Source: LR2000, Sept. 2013

3.3.6.1.4. Withdrawal Actions

Withdrawals are formal actions that set aside, withhold, or reserve federal lands by administrative order or statute for federal purposes. The effect of a withdrawal is to segregate and close federal land to the operation of all or some of the public land laws and/or one or more mineral laws; transfer total or potential jurisdiction of federal land between federal agencies; or dedicate federal land for a specific federal purpose.

The three major categories of formal withdrawals are congressional, administrative, and Federal Power Act or Federal Energy Regulatory Commission withdrawals. Congressional withdrawals are those made by Congress in the form of public laws (acts of Congress). Administrative withdrawals are made by the president, Secretary of the Interior, or other authorized officers of the executive branch of the federal government. Federal Power Act or Federal Energy Regulatory Commission withdrawals are power project withdrawals established under the authority of the Federal Power Act of 1920.

Withdrawal actions are used to protect national interests in facilities or other improvements, reserve lands for specific purposes and use, support national security, protect resources, and provide for public health and safety. Section 204(l) of FLPMA requires the review of existing withdrawals to determine whether they are still serving the purposes for which they were made. If the withdrawals are no longer serving their intended purpose, they are to be revoked and the lands opened or partially opened to the uses that were previously prohibited. If withdrawals are determined to still meet the purposes for which they were made, they are recommended for an extension for a specific term. While BLM can make recommendations to designate, revoke, or extend withdrawals, only the Secretary has the authority to actually take these actions.

3.3.6.1.4.1. Military Withdrawals

Public lands may be withdrawn and reserved for military training and testing in support of national defense requirements. Such withdrawals and reservations are authorized by an act of Congress or by order of the Secretary of the Interior. Lands so designated are usually withdrawn from all forms of appropriation under public land laws, including the mining laws, but not the mineral and geothermal leasing laws and the Minerals Act of 1947. Lands withdrawn for military purposes are outside the scope of this resource management plan.

Table 3.44, “Non-Military and Military Withdrawals Actions” (p. 469) shows non-military and military withdrawal actions by estimated total acreage in the planning area.

Table 3.44. Non-Military and Military Withdrawals Actions[a]

Withdrawal type	Number of cases	Acres
Non-military	45	2.4 million
Military	4	6 million
Total	**49**	**8.5 million**

[a]Source: LR2000, Sept. 2013

3.3.6.2. Land-Use Authorizations

Land-use authorizations focus on requests for rights-of-way (ROW), permits, leases, and easements. A ROW is typically authorized through a grant, although sometimes a permit or lease may be issued. Permits are generally short-term authorizations (not to exceed three years) that have a negligible impact on the land. Leases are usually long-term authorizations requiring a significant capital investment.

3.3.6.2.1. Permits, Leases, and Easements

Section 302 of FLPMA and other applicable laws and regulations pursuant to 43 CFR 2900 provide the BLM the authority to issue leases and permits for the use, occupancy, and development of public lands. Leases and permits are issued for purposes such as commercial or noncommercial croplands, apiaries, commercial filming, harvesting of native or introduced species, temporary or permanent facilities for commercial purposes (does not include mining claims), construction equipment storage sites, assembly yards, oil rig stacking sites, and water pipelines and well pumps related to irrigation and non-irrigation facilities. Issuance of leases and permits are a discretionary action. One important use in the planning area is a land-use permit for the motion picture industry. The western deserts, dry lake beds, sand dunes, and mountain terrain are strong attractions to national and international photography, television, and film production companies. Many major motion pictures and television commercials have been filmed on public lands within the planning area.

3.3.6.2.1.1. R&PP Leases

R&PP is a commonly used authority for leases. It authorizes the lease (for future conveyance) of public lands for recreational or public purposes to state and local governments and to qualified nonprofit organizations. Most common R&PP leases issued by BLM within the planning area include schools, fire houses, law enforcement facilities, municipal facilities, hospitals, parks, and churches. R&PP leases are issued for a specific time allowing the lease holder adequate time to substantially build and follow the approved plan of development. During the lease period, the holder pays an annual rental to the United States based on appraised value at a reduced rate depending upon the proposed-for use. Rental paid during the time of the lease is not applied toward the purchase price of the land when substantial development warrants sale and conveyance of the land. Patents issued under R&PP convey a restricted title because they contain certain provisions or clauses that, if not complied with, may result in reversion of the title to the United States, except where hazardous materials may be generated by the proposed use. Currently, there are 123 R&PP leases totaling approximately 8,235 acres within the planning area (LR2000, Sept. 2013).

3.3.6.2.1.2. Airport Leases

Federal regulations (43 CFR 2911) provide the authority for the Secretary of the Interior to lease federal lands for public airports. Public airport means an airport open to use by all persons without prior permission of the airport lessee or operator and without restrictions within the physical capacity of its available facilities. There are approximately 134 acres of BLM land leased for airport purposes.

3.3.6.2.2. Rights-of-Way

A ROW grant is an authorization to use a specific piece of public land for specific projects, such as roads, pipelines, power transmission lines, renewable energy (e.g., solar, wind), and communications lines (i.e., telephone or cable). A ROW grant authorizes rights and privileges for a specific use of the land for a specific period of time. Generally, a BLM ROW is granted for a term appropriate for the life of the project. The vast majority of ROWs granted are authorized by Title V of FLPMA and Section 28 of the Mineral Leasing Act of 1920, as amended (43 U.S.C. 185). The BLM also grants ROWs to the Nevada Department of Transportation for material sites.

Many ROWs within the planning area authorize construction, operation and maintenance of power lines, telephone lines and fiber optic cables, water facilities and pipelines, material sites, solar energy development, communication sites, ditches and canals, pipelines for mineral resources, roads, highways, and other similar uses. These ROWs may be granted to various government agencies and private entities. Whenever feasible, BLM encourages joint use and placement of new facilities in existing use areas that have already been disturbed, such as existing communication sites, roads, and highways. It is BLM policy to authorize ROW applications at the discretion of the authorized officer in the most efficient and economical manner possible. As a general policy, BLM does not issue exclusive use rights-of-way; therefore, more than one grant may be issued for the same area. In such instances, the actual acreage impacted will appear inflated. Table 3.45, “Numbers and Acres of ROWs in the Planning Area” (p. 470) below shows the number and acres of ROWs within the planning area.

Table 3.45. Numbers and Acres of ROWs in the Planning Area[a]

ROW type	Number of cases	Acres
Roads and highways	389	13,651
Power transmission lines	488	34,261
Renewable energy (solar)	1	619
Renewable energy (wind)	2	25,426
Water facilities and pipelines	367	2,766
Oil and gas pipelines	107	1,951
Communication site uses	150	1,332
Miscellaneous	46	72,633
Total	**1,550**	**152,638**

[a]Source: LR2000, Sept. 2013

3.3.6.2.2.1. Renewable Energy

The Southern Nevada District Office has been involved in renewable energy development on public lands since fiscal year 2000, with initial applications for wind energy in 2000 and solar energy in 2007. In an effort to promote the development of renewable energy across public lands, BLM opened Renewable Energy Coordination Offices (RECO). In Southern Nevada, a RECO

office was established within the Pahrump Field Office in 2009. In 2014, RECO was reassigned to the Southern Nevada District Office.

Table 3.46, "Approved Renewable Energy Projects" (p. 471) identifies renewable energy projects that received priority processing approval through April 30, 2014. In the table, the "case disposition" column provides the status of the project specifically regarding issuance of a ROW grant (i.e., pending, authorized):

Table 3.46. Approved Renewable Energy Projects[a]

Case file No.	Project name	Project location	Case disposition	Project type		Acres
N-84626	Searchlight Wind Energy	Searchlight	Pending	200 MW	Wind energy development	Pending
N-85077	Silver State Solar - North	Primm	Authorized	50 MW	Solar energy development	618.63
N-85801	Silver State Solar - South	Primm	Authorized	250 MW	Solar energy development	2,393
N-88313	Fotowatio Nevada Solar	Apex	Authorized	N/A	Transmission line	1.5
N-89176	KRoad Moapa Solar	Moapa Reservation	Authorized	N/A	Transmission line	17.17
N-89219	Pioneer Green	Apex	Authorized	N/A	Wind testing	20,336.78
N-89424 and N-91137	Copper Mountain 3	Boulder City	Authorized	N/A	Transmission line	98
N-89751	Table Mountain Project (Renewal)	Jean	Authorized	N/A	Wind testing	7,003.98
N-90395	Techren Solar	Boulder City	Authorized	N/A	Transmission line	98
N-90989	Mountain View Solar	Apex	Authorized	N/A	Transmission line	10.29
N-91253	Boulder Solar	Boulder City	Authorized	N/A	Transmission line	73.62

[a]Source: LR2000, April 2014.

In summation, the Southern Nevada District Office has authorized 300 megawatts (MW) of renewable energy facilities on BLM-administered public lands in the planning area. The transmission projects identified in the table above support an additional 1,320 MWs of renewable energy facilities sited on land not under the jurisdiction of the BLM. The current national average of homes that can be powered by a MW of solar is 164 (Solar Energy Industries Association, 2014). According to the American Wind Energy Association, 1 megawatt of wind energy can generate enough electricity for 225 to 300 households per year (American Wind Energy Association, 2010).

Renewable energy development on public lands is closely tied to land availability, power line access, and reasonable access to utility markets. Potential for development varies with the type of renewable energy development. For example, solar energy requires relatively flat lands with less than 5 percent slope, and wind development is typically sited in hilly areas. Not all public lands within the planning area are open to renewable energy development. Public lands can be closed to site-type ROWs under the discretionary authority of the authorized officer through a public land-use planning process.

Access to power lines is a key to renewable energy development. Renewable energy developers are challenged with the need to upgrade existing power lines to support their planned power output. As local governments, such as Boulder City, set aside lands for renewable energy development that are adjacent to BLM lands, there may be increased pressure for BLM to make additional public land available. Currently, there are approximately 146,542 acres of pending solar applications in the planning area, and one pending wind energy testing application. The BLM will process the pending solar applications consistent with the Resource Management Plan Record of Decision (ROD) for the Supplement to the Draft Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States (Solar PEIS). More than 50 percent of the pending projects identified in the Solar PEIS have been withdrawn or closed. The acreages in the pending applications include lands within a project study area, not solely the area needed for project development. This additional acreage allows for project layout modifications that may be necessary to avoid sensitive resources. Upon project approval, ROW grants are issued only for the land needed for project development.

3.3.6.2.2.1.1. Solar

The Record of Decision for the Solar PEIS signed in October 2012 amended 89 BLM land-use plans in the six-state study area (Arizona, California, Colorado, Nevada, New Mexico, and Utah), including the 1998 RMP. The land-use plan amendments include the identification of exclusion areas for utility-scale solar energy ROWs, priority areas for utility-scale solar energy ROWs (i.e., solar energy zones or SEZs), and areas potentially available for utility-scale solar energy development outside of exclusion areas and SEZs (i.e., variance areas). Currently in the planning area, approximately 2,135,596 acres are excluded from solar development based on 32 categories of exclusion identified in the Solar PEIS; an additional 966,435 acres, more or less, will be subject to a variance process; and approximately 14,118 acres are included in two SEZs. Per the Solar PEIS ROD, the BLM will assess the need for new or expanded SEZs at least once every five years in each of the six states covered by the Solar PEIS. Assuming new SEZs identified in Alternative 3 are approved and that 75 percent of the SEZs could be developed, it is expected that the acres utilized for renewable solar energy would grow to approximately 28,787 acres to meet the Renewable Energy Portfolio standard in multiple states, including California.

3.3.6.2.2.1.2. Wind

The Record of Decision (ROD) for the Final Programmatic Environmental Impact Statement on Wind Energy Development on BLM-Administered Lands in the Western United States (Wind PEIS) signed in December 2005 amended 52 BLM land-use plans in nine of the states in the study area (Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming), including the 1998 RMP. The land-use plan amendments include the adoption of Wind Energy Development Program policies and best management practices, and in a few instances, the identification of specific areas where wind energy development will be excluded. Currently in the planning area, there are approximately 1,102,261 acres that are excluded from wind development based on seven categories of exclusion identified in the Wind PEIS ROD, and approximately 2,013,887 acres that are open for wind energy development. Additional areas may be excluded from wind energy development on the basis of findings of resource impacts that cannot be mitigated and/or conflict with existing and planned multiple-use activities or land-use plans.

The Wind PEIS established the policy that all areas of critical environmental concern would be excluded from wind development. It also identified specific lands to be excluded from wind

energy development. BLM Instruction Memorandum (IM) 2009–043 Wind Energy Development Policy changes the ACEC exclusion policy to ensure consideration of the purpose and specific consideration and environmental sensitivities for which the ACEC was designated. All new, revised, or amended land-use planning efforts will address and analyze ACEC land-use restrictions individually, including restrictions to wind energy development. For future land-use planning efforts, ACECs will not universally be excluded from wind energy site testing and monitoring or wind energy development, but will be managed consistent with the management prescriptions for the individual ACEC. Existing land-use plans and planning efforts may be amended as necessary, with appropriate level of NEPA analysis and decision, to address this change in wind energy and ACEC policy consistent with the procedures of 43 CFR 1610.5.5. A site-specific land-use plan amendment to address this change in policy will continue to provide protection of sensitive resource values in ACECs consistent with the management prescriptions for the individual ACEC. The IM also advises all BLM offices that all new, revised, or amended land-use planning efforts will address and analyze ACEC land-use restrictions individually, including restrictions to wind energy development. Therefore, one or some of the ACECs within the planning area may become available for wind energy. If, as a result of the RMP revision, ACECs become open to site-type ROWs, there is potential for approximately 866,067 additional acres of BLM-administered land to become available not only for renewable energy, but for other lands uses as well.

3.3.6.2.2.2. Communication Sites

Communication sites host communication equipment and facilities for various uses, such as television, radio, microwave, seismograph, cellular, and internet. Table 3.47, "Communication Sites in the Planning Area" (p. 473) depicts the number of communication sites, users, uses, and acres authorized within the planning area. In some instances, these authorizations include ancillary facilities, such as buildings, towers, roads, power lines, and fuel storage facilities, needed to sustain the operation of the site, These are factored into the total acreage granted to the site. Communication site authorizations are issued under a communications use lease, unless the use involves a third party that wants to co-locate in a federally owned facility. In that case, the authorization is a right-of-way (ROW) grant. Both authorizations are administered under the ROW regulations and are referred to as a ROW grant (or authorization). Source: LR2000 (2013).

Table 3.47. Communication Sites in the Planning Area

Field office	Named sites	Number of users	Number of uses	Acres
LVFO	57	360	460	1,290
PFO	8	18	20	18.92
Total	**65**	**378**	**480**	**1,308.92**

In November 1995, the BLM issued final regulations establishing a rental schedule for communication uses on public lands. The rent schedule is adjusted annually based on changes in the Consumer Price Index for Urban Consumers (or CPI-U Index). The schedule establishes a rental amount based upon the population of the area served and the type of communication use. Currently, there are 10 categories of use and nine population strata areas represented by the schedule.

Facility owners and facility managers are required to have authorizations. Tenants and customers who do not own their own building, equipment shelter, tower, or other improvements do not need a separate authorization. Total rent assessed a facility owner or facility manager is based on 100 percent of the highest valued use in the building, plus 25 percent of scheduled rent for all other communication uses subject to rent. Tenants and customers who are co-located within a federal

agency-owned facility or a rental-exempt agency facility must have their own authorization for any and all facilities or equipment located on public land.

3.3.6.2.2.2.1. Unauthorized Land Uses

Unauthorized uses are activities that do not substantially alter the physical character of public lands and resources. Unauthorized occupancies are activities resulting in full or part time human occupancy or use. Unauthorized development issues arise from activities which disturb the earth's surface or physically alter the character of the land or vegetation. Collectively, the above activities are termed trespass situations.

BLM's regulations and policies are to prevent trespass; investigate suspected trespass; terminate trespass; recover full compensation; and report criminal action, where applicable. Should conveyance by direct sale be appropriate to resolve trespass it would require approval by the State Director, and may require a land use plan amendment. Each situation is handled on a case-by-case basis.

3.3.6.2.2.3. ROW Summary

With the large number of varying ROW authorizations, it is important that all environmental resources and concerns be taken into consideration. Loss of resources or environmental damages could be prevented if compatible uses are analyzed and, where possible, consolidated. The BLM typically uses avoidance and exclusion areas to protect resources and to prevent unnecessary or undue environmental damages. Such avoidance and exclusion areas are identified under the no action alternative in Chapter 2.

According to current BLM guidance and the President's National Energy Policy, the BLM's objective is to continue to make BLM-administered public lands available for needed ROWs where consistent with national, state, and local plans, and to use ROWs in common to minimize environmental impacts and proliferation of separate ROWs. This guidance and policy also pertains to ROWs for alternative, renewable energy resources, such as solar, wind, geothermal, and biomass.

3.3.6.2.3. Utility Corridors

Designation of utility corridors provides an opportunity to minimize adverse environmental impacts and the proliferation of separate use authorizations, while providing an orderly system for transportation and utility purposes and reducing the need for land use plan amendments in support of the authorization of transmission rights-of-way. The designation of energy corridors can provide for more efficient siting, permitting and review processes for projects within such corridors, as well as improve the predictability and transparency of these processes. Section 503 of FLPMA directs the Secretary of the Interior to designate rights-of-way corridors to minimize adverse environmental impacts and the proliferation of separate rights-of-way, promote rights-of-way in common, and reserve to the secretary the right to grant additional rights-of-way for compatible uses.

3.3.6.2.3.1. West-Wide Energy Corridor (WEC)

On August 8, 2005, the president signed into law the Energy Policy Act of 2005 (EPAct). In the EPAct, Congress set forth provisions that would change the way certain federal agencies coordinated to authorize the use of public land for a variety of energy-related purposes. The EPAct requires, among other things, the designation of energy corridors (also referred to as utility corridors) on federal lands in 11 western states (i.e., Nevada), the establishment of procedures to ensure that additional corridors are identified and designated as necessary, and to expedite applications to construct or modify oil, gas, and hydrogen pipelines and electricity transmission and distribution facilities.

The BLM analyzed corridors in a 2008 final programmatic environmental impact statement, Designation of Energy Corridors on Federal Land in the 11 Western States (DOE/EIS-0386), and subsequently designated corridors in a January 2009 BLM Resource Management Plan Amendment/Record of Decision. Conservation groups challenged the BLM's corridor designation decisions.

In July 2012, a court-approved settlement agreement was issued for the *Wilderness Society v. United States Department of Interior*, No. 3:09-cv-03048-JW (D.N.D. Cal.) (hereinafter referred to as the "settlement"). Per the settlement, the BLM, U.S. Forest Service, and the Department of Energy developed an interagency work group and entered into a Memorandum of Understanding (MOU) that was approved on July 8, 2013. The MOU and corresponding work plans provide the framework for future corridor studies and periodic regional reviews of corridors. Furthermore, the settlement specified a variety of environmental, cultural, and other concerns ("corridor of concern" or COC), as well as a process for the ongoing use and modification of corridors, including revisions to, deletions from, and additions of designated corridors taking into consideration certain principles such as location of corridors in favorable landscapes; facilitation of renewable energy projects where feasible; avoidance of environmentally sensitive areas to the maximum extent practicable; minimize the proliferation of dispersed rights-of-way crossing the landscape; and improvement of the long-term benefits of reliable and safe energy transmission.

With the signing of the Record of Decision for the West-wide Energy Corridor, and consistent with the EPAct, the settlement, and the presidential memorandum, BLM's existing corridors within the planning area are amended, as appropriate, with changes to widths, as well as creating new corridors (including COCs). The current corridors within the planning area, as amended by the WEC and legislation, are more specifically identified on utility corridor Map 2.6.2.6 - 13 (p. 2139). Table 3.48, "LVFO and PFO Utility Corridors" (p. 476) provides brief descriptions of the existing corridors.

Table 3.48. LVFO and PFO Utility Corridors

LVFO and PFO Utility Corridors					
No.	**Corridor name**	**Width (feet)**	**Approximate starting point**	**Approximate ending point**	**General location/information**
1	Amargosa to Roach	2,640	T. 15 S., R. 49 E., sec. 35	T. 26 S., R. 60 E., sec. 5	NW of Pahrump, south of U.S. 95 and SW of Highway 373; terminating in Ivanpah Valley, east of I-15.
2	Apex	2,000	T. 17 S., R. 63 E., sec. 32; T. 18 S., R. 63 E., sec. 13	T. 19 S., R. 63 E., secs. 2, 6, 7	This corridor encompasses multiple corridors with the Apex area.
3	Apex Connector	2,000	T. 19 S., R. 63 E., T. 19 S., R. 63 E., sec. 1	T. 19 S., R. 64 E., sec. 8	Southeast of Apex area
4	Arrow Canyon to Apex	2,000	T. 13 S., R. 63 E., secs. 5 and 6	T. 16 S., R. 63 E., sec. 9	South from the Clark/Lincoln county boundary line, extends parallel with U.S. 93, east of DNWR, and south through Coyote Springs Valley toward Apex.
5	Black Mountain-Crystal	2,000	T. 17 S., R. 64 E., sec. 10	T. 20 S., R. 63 E., secs. 11 and 12	South of Moapa Indian Reservation, running along north side of I-15, ending NE of Apex.
6	Boulder-McCullough Pass	2,000	T. 23 S., R. 63 E., sec. 26	T. 24 S., R. 62 E., sec. 36	This federally reserved Eldorado Valley Corridor (EVC) runs through private land patented in 1995 under the authority of the Eldorado Valley Transfer Act, P.L. 85-339, as amended. Location is south of Henderson and Boulder City and east of the McCullough Mountains. The corridor runs along the pathway of BLM rights-of-way N-2795 and N-4790. A Cadastral administrative survey on the exterior boundaries of the EVC was completed on Sept. 17, 2013.
7	Boulder-Primm South	3,000	T. 23 S., R. 64 E., secs. 31 and 32.	T. 27 S., R. 59 E., sec. 7	This federally reserved Eldorado Valley Corridor runs through private land patented in 1995 under the authority of the Eldorado Valley Transfer Act, P.L. 85-339, as amended. Location is south of Henderson and Boulder City and east of the McCullough Mountains. South of WAPA withdrawn lands through private lands within the Eldorado Valley, terminating at the Nevada/California state line near Primm. The corridor runs along the pathway of BLM right-of-way CC-18367. Refer to Cadastral survey completed Sept. 17, 2013.

LVFO and PFO Utility Corridors					
No.	**Corridor name**	**Width (feet)**	**Approximate starting point**	**Approximate ending point**	**General location/information**
8	Boulder-Searchlight	3,000	T. 23 S., R. 64 E., sec. 33	T. 26 S., R. 63 E., sec. 16	This federally reserved Eldorado Valley Corridor runs through private land patented in 1995 under the authority of the Eldorado Valley Transfer Act, P.L. 85-339, as amended. Location is south of Henderson and Boulder City and east of the McCullough Mountains. The corridor extends south of WAPA withdrawn lands, ending south of Highway 164 in the Paiute Valley near Primm. The corridor runs along the pathway of BLM right-of-way CC-18307. A Cadastral administrative survey on the exterior boundaries of the EVC was completed on Sept. 17, 2013.
9	Dry Lake	2,000	T. 16 S., R. 63 E., sec. 10	T. 18 S., R. 64 E., sec. 3	SW of Moapa Indian Reservation, SE of I-15, and NE of Apex.
10	Dry Lake Valley	3,000	T. 17 S., R. 64 E., sec. 9	T. 18 S., R. 63 E., sec. 13	South of Moapa Indian Reservation, continues south along north side of I-15, ending NE of Apex.
11	Eldorado-Aztec	3,000	T. 25 S., R. 62 E., sec. 1	T. 25 S., R. 62 E., sec. 33 and 34	This federally reserved Eldorado Valley Corridor runs through private land patented in 1995 under the authority of the Eldorado Valley Transfer Act, P.L. 85-339, as amended. Location is south of Henderson and Boulder City and east of the McCullough Mountains. A Cadastral administrative survey on the exterior boundaries of the EVC was completed on Sept. 17, 2013.
12	Fort Mojave	2,000	T. 32 S., R. 64 E., sec. 12	T. 33 S., R. 65 E., sec. 15	This corridor extends south of the Searchlight to Laughlin corridor, terminating NW of the Fort Mojave Indian Reservation at the Nevada/California state line.
13	Interstate 15 South	2,640	T. 23 S., R. 61 E., sec. 29 and 30	T. 27 S., R. 59 E., sec. 6	This corridor extends along I-15 south of the Las Vegas Valley to state line borders of Nevada and California. This corridor is referred to as the Interstate 15 South Corridor (or Ivanpah Valley Corridor). Pursuant to the 2002 Clark County Conservation of Public Land and Natural Resources Act (Clark County Act) [P.L. 107–82], this corridor is legislatively restricted to a width of 2,640 feet between the Las Vegas Valley and the proposed Ivanpah Airport for the placement, on a non-exclusive basis, of utilities and transportation.
14	Ireteba	2,000	T. 26 S., R. 63 E., secs. 9 and 10	T. 28 S., R. 64 E., sec. 36	Southwest of the Ireteba Peaks Wilderness, terminates at NPS Lake Mead NRA boundary.
15	McCullough Pass to Primm	3,000	T. 25 S., R. 61 E., sec. 24	T. 26 S., R. 59 E., sec. 34	NW of the South McCullough Wilderness

LVFO and PFO Utility Corridors					
No.	**Corridor name**	**Width (feet)**	**Approximate starting point**	**Approximate ending point**	**General location/information**
16	Moapa Indian Reservation	3,000	T. 15 S., R. 65 E., secs. 12 and 13	T. 16 S., R. 64 E., secs. 32, 3, and 34	This corridor is legislatively designated by P.L. 96–491. Rights-of-way rental revenue/fees collected for use of this BLM administered corridor shall be transferred to the Moapa Paiute Indians consistent with P.L. 96–491. This corridor is generally located in the northeastern part of the Moapa River Indian Reservation, extending southwest through the reservation, terminating just north of Crystal substation.
17	Mormon Mesa	2,640	T. 13 S., R. 68 E., sec. 1	T. 15 S., R. 66 E., secs. 7 and 18	NE at Lincoln/Clark county line, extends SW through Mormon Mesa ACEC, north of I-15, terminating SW of Highway 168, NE of Moapa Indian Reservation.
18	Paiute Valley	2,000	T. 29 S., R. 63 E., sec. 16	T. 31 S., R. 63 E., sec. 16	Extends south of Searchlight through the Paiute/Eldorado ACEC, terminating at the Nevada/California state line.
19	Rainbow Garden to Eldorado	2,000	T. 20 S., R. 63 E., sec. 13 and 14; T. 20 S., R. 63 E., sec. 23	T. 23 S., R. 62 E., sec. 13; T. 23 S., R. 63 E., sec. 18	Extends south through private land and through the Rainbow Gardens ACEC (500 feet wide, legislatively restricted), ending in the Eldorado Valley.
20	Eldorado Valley Corridors	2,000	T. 23 S., R. 63 E., sec. 19, and T. 23 S., R. 62 E., sec. 24	T. 24 S., R. 62 E., secs. 35 and 36.	This federally reserved corridor includes multiple corridors that traverse through the Eldorado Valley through private land patented in 1995 under the authority of the Eldorado Valley Transfer Ac, P.L. 85-339, as amended. Location is south of Henderson and Boulder City, and east of the McCullough Mountains. The corridor runs along the pathway of BLM rights-of-way N-33006 and CC-20959. A Cadastral administrative survey on the exterior boundaries of the EVC was completed on Sept. 17, 2013.
21	Searchlight to Laughlin	2,000	T. 29 S., R. 63 E., sec. 16	T. 32 S., R. 6 5 E., sec. 12	Extends south of Searchlight toward Laughlin, turning east along the north side of Highway 163, ending SE of NPS Lake Mead NRA.
22	U.S. 95/Crater Flat	2,640	T. 13 S., R. 48 E., sec. 8	T. 16 S., R. 57 E., sec. 34	NW Nye County (~5 miles south of Beatty) in PFO planning area, extending north of Red Rock Canyon NCA.
23	U.S. 95/Crater Flat-Red Rock	2,640	T. 16 S., R. 57 E., sec. 34	T. 18 S., R. 59 E., sec. 22	North of Red Rock Canyon NCA, continues parallel with U.S. 95 to NW of Snow Mountain Indian Reservation.

LVFO and PFO Utility Corridors					
No.	**Corridor name**	**Width (feet)**	**Approximate starting point**	**Approximate ending point**	**General location/information**
24	WEC 18-224	3,500	T. 13 S., R. 47.5 E., sec. 12; T. 13 S., R. 48 E., sec. 7	T. 16 S., R. 52 E., sec. 13	This Section 368 corridor amended the 1998 land-use plan. Extends south from the NW part of planning area in Nye County (~ 5 miles south of Beatty), continues south and parallel of U.S. 95, ending just past junction Highway 160. Width is constrained by proximity to Red Rock Canyon NCA and military training requirements. This corridor connects with the Tonopah Field Office Section 368 utility corridor at the NW part of the planning area.
25	WEC 224-225	3,500	T. 16 S., R. 52 E., sec. 13	T. 25 S., R. 61 E., sec. 31	This Section 368 corridor amended the 1998 land-use plan. This corridor extends south from U.S. 95 through the Johnnie Herd Management Area; terminating south of Jean Dry Lake.
26	WEC 225-231	3,500	T. 25 S., R. 61 E., sec. 24	T. 25 S., R. 61 E., sec. 31	This Section 368 corridor amended the 1998 land-use plan. NW of the South McCullough Wilderness.
27	WEC 27-225	3,500	T. 25 S., R. 61 E., sec. 31	T. 27 S., R. 59 E., sec. 8	This Section 368 corridor amended the 1998 land-use plan. Extends SW from Eldorado Valley through McCullough Pass; connecting at the Nevada/California state line and connecting with the Barstow Field Office Section 368 utility corridor.
28	WEC 37-223(N)	3,500	T. 18 S., R. 63 E., sec. 19	T. 18 S., R. 62 E., sec. 31	This Section 368 corridor amended the 1998 land-use plan. West of Apex. This corridor is constrained by the DNWR and NE of portion of DOD (Nellis Air Force Base).
29	WEC 37-223(S)	2,400	T. 18 S., R. 63 E., sec. 19	T. 18 S., R. 62 E., sec. 32	This Section 368 corridor amended the 1998 land-use plan. West of Apex. Use of this corridor is restricted to underground purposes only and is constrained by military training requirements such as the DOD (Nellis Air Force Base).
30	WEC 37-232	2,640	T. 13 S., R. 63 E., secs. 5, 6	T. 18 S., R. 63 E., sec. 18	This Section 368 corridor amended the 1998 land-use plan. North of planning area at Lincoln/Clark county line, extending south along east side of DNWR, and south through Coyote Springs Valley, to west side of Apex. Reduced width is consistent with the 1998 land-use plan.
31	WEC 37-39	3,500	T. 19 S., R. 64 E., sec. 5	T. 19 S., R. 63 E., sec. 1	This Section 368 corridor amended the 1998 land-use plan. This is a Corridor of Concern (COC). This corridor extends north/south and east/west, connecting the Black Mountain-Crystal Corridor to Apex corridors. Reduced width follows existing pathway.

LVFO and PFO Utility Corridors					
No.	**Corridor name**	**Width (feet)**	**Approximate starting point**	**Approximate ending point**	**General location/information**
32	COC 223-224	2,050 to 3,500	T. 16 S., R. 52 E., sec. 13	T. 18 S., R. 62 E., sec. 31	This Section 368 corridor amended the 1998 land-use plan. This is a Corridor of Concern (COC). Junction U.S. 95/U.S. 160, extending east along north side of U.S. 95/Snow Mountain Indian Reservation/Clark County Shooting Park; continues east along south line of DNWR. Width is constrained by proximity to Red Rock Canyon NCA and military training requirements.
33	COC 39-113	3,500	T. 13 S., R. 68 E., sec. 1; T. 13 S., R. 69 E., sec. 16	T. 19 S., R. 64 E., secs. 4 and 5	This Section 368 corridor amended the 1998 land-use plan. This is a Corridor of Concern (COC). NE at Clark/Lincoln county line, extends SW through Mormon Mesa, south of I-15, passing the National Historic Old Spanish Trail, continues SW ending north of Valley of Fire State Park; starts again on west side of private land located along west boundary of Valley of Fire State Park, continuing SW and ending north of private land.
34	COC 39-231	500 to 3,500	T. 20 S., R. 63 E., sec. 13 and 14; T. 20 S., R. 63 E., sec. 23	T. 24 S., R. 62 E., sec. 13	This Section 368 corridor amended the 1998 land-use plan. This is a Corridor of Concern (COC). This corridor extends south of private land toward Rainbow Gardens ACEC. A segment of this corridor was legislatively restricted pursuant to P.L. 107–282, which narrowed the 1998 RMP corridor width from 1,400 feet to 500 feet and limited use of the corridor for a specific purpose (Centennial Project). In January 2014, Congress released the ISA from further wilderness consideration and study. There remains a 500 ft. wide corridor within the former Sunrise ISA, however, BLM may accommodate multiple applicants within a particular ROW. The 500 ft. wide corridor through the former ISA will be managed in accordance with the 1998 RMP, as amended by the WEC PEIS and legislation.
35	COC 47-231	2,000	T. 26 S., R. 62 E., secs. 3 and 3	T. 26 S., R. 64 E., sec. 25	Width is reduced to minimize potential impacts to Piute/Eldorado Valley ACEC, consistent with 1998 land-use plan. This corridor runs parallel with BLM granted right-of-way N-869.

3.4. Special Designations

3.4.1. Areas of Critical Environmental Concern

An area of critical environmental concern (ACEC) is defined in the Federal Land Policy and Management Act (Public Law 94-579, Section 103(a)) as an area within the public lands where special management attention is required to protect and prevent irreparable damage to important historic, cultural, or scenic values; fish and wildlife resources or other natural systems or processes; or to protect life and safety from natural hazards. BLM prepared regulations for implementing the ACEC provisions of FLPMA. These regulations are found at 43 CFR 1610.7-2(b).

To be eligible for designation as an ACEC, an area must meet the relevance and importance criteria described in 43 Code of Federal Regulations (CFR) 1610.7-2 and BLM Manual 1613, Areas of Critical Environmental Concern. An analysis of the existing ACECs and ACECs nominated through the scoping process for the RMP revision can be found in Appendix B.

Restrictions that arise from an ACEC designation are determined when the designation is made and are designed to protect the values or serve the purposes for which the designation was made. In addition, ACECs are protected by the provisions of 43 CFR 3809.1-4(b) (3), which requires an approved plan of operations for activities (except casual use) under mining laws.

3.4.1.1. Existing ACECs

There are currently 23 ACECs within the planning area, totaling 1,002,007 acres (Map 2.6.3.1 - 1 (p. 2142)). The size of each area and the values it is designed to protect are listed in Table 3.49, "Existing Areas of Critical Environmental Concern" (p. 482).

Table 3.49. Existing Areas of Critical Environmental Concern

ACEC	Area (acres)[a]	R&I values
Clark County (Las Vegas Field Office)		
Arden Historic Townsites	1,442 acres	Historic railroad construction and mining sites
Arrow Canyon	2,070 acres	Paleontological resources (Miocene bird tracks); geological (candidate for the mid-Carboniferous boundary stratotype section); and cultural resources (prehistoric rock art)
Coyote Springs	51,528 acres	Mojave Desert tortoise
Crescent Townsite	435 acres	Historic railroad construction and mining sites
Devil's Throat	639 acres	Natural hazard area — sinkhole
Gold Butte ACEC (Part A)	185,128 acres	Mojave Desert tortoise
Gold Butte ACEC (Part B)	122,540 acres	Scenic values, cultural/historic values, desert tortoise, relict leopard frog, desert bighorn sheep, Las Vegas buckwheat, and Las Vegas bearpoppy
Gold Butte ACEC (Part C) (Virgin Mountain)	35,706 acres	Scenic values, relict forest stands, and desert bighorn sheep
Gold Butte Townsites	159 acres	Historic mining sites
Hidden Valley	3,356 acres	Cultural/historic values
Ivanpah Valley	31,857 acres	Mojave Desert tortoise
Keyhole Canyon	240 acres	Cultural/historic values
Mormon Mesa	149,254 acres	Mojave Desert tortoise
Piute/Eldorado	328,235 acres	Mojave Desert tortoise
Rainbow Gardens	38,766 acres	Cultural/historic values, scenic values, Las Vegas buckwheat, Las Vegas bearpoppy, paleontological resources (Pleistocene megafauna), and a geologic feature (Great Unconformity)

ACEC	Area (acres)[a]	R&I values
Red Rock Spring	638 acres	Cultural/historic values
River Mountains	11,029 acres	Scenic values and desert bighorn sheep
Stump Spring	646 acres	Cultural/historic values
Virgin River	6,186 acres	Cultural/historic values, Virgin River chub, woundfin, southwestern willow flycatcher, and riparian habitat
Whitney Pocket	160 acres	Cultural/historic values
Nye County (Pahrump Field Office)		
Amargosa Mesquite	6,785 acres	Neotropical migratory bird habitat
Ash Meadows	27,673 acres	Devil's Hole pupfish, Ash Meadows Amargosa pupfish, Warm Springs pupfish, Ash Meadows speckled dace, Ash Meadows naucorid, Amargosa niterwort, Ash Meadows milkvetch, spring-loving centaury plant, Ash Meadows sunray, Ash Meadows ivesia, and Ash Meadows blazing star
Big Dune	1,916 acres	Giuliani's Big Dune scarab; Big Dune aphodius scarab; large aegialian scarab; and Rulien's miloderes weevil

[a]Areas reflects the current parcels within the designated ACEC that are managed by the BLM Las Vegas and Pahrump field offices. Lands withdrawn to other agencies or privately owned are not included. These areas may reflect a smaller size than included in the 1998 RMP due to changes in land ownership.

3.4.1.1.1. Amargosa Mesquite ACEC

This ACEC is located in Nye County, south of State Route 95, and west of Lathrop Wells. This ACEC was designated to protect approximately 1,700 acres of mesquite woodlands important for neotropical bird species. In a landscape dominated by desert shrublands, these patches of woodlands serve as important breeding, foraging, and resting places for many avian species. This mesquite woodland occurs in association with a sand dune system, offering protection from weather and predators, and provides a location where birds can find shelter to help them conserve energy in an extreme environment. Desert woodlands comprise a small percentage of the total vegetation in the Southwest but support greater densities of birds than surrounding desert habitats. Woodland patches scattered throughout the desert may play an important role in the successful migration of birds attempting to cross large ecological barriers such as deserts, as they provide important stopover sites.

Desert woodlands add structural complexity to the landscape, providing nesting sites and food resources for breeding birds. Several species of desert breeding birds are strongly associated with mesquite and/or acacia woodlands, including phainopeplas (*Phainopepla nitens),* Vermilion flycatchers (*Pyrocephalus rubinus*), Lucy's warblers (*Vermivora luciae*), and verdins (*Auriparus flaviceps*). Among these species, phainopeplas are the most dependent on these woodlands; their diet consists almost exclusively of the berries of desert mistletoe (*Phoradendron californiucum*), which in Nevada grows only on mesquites, acacias, and smoke trees. Several other avian species, including summer tanagers (*Piranga rubra*), Arizona Bell's vireos (*Vireo bellii*), and yellow-billed cuckoos (*Coccyzus americanus*), use them during the breeding season (Crampton, 2006).

3.4.1.1.2. Arden Historic Townsites

This ACEC is located in the southwestern corner of the Las Vegas Valley south of Mountain's Edge Parkway. It was designated to protect historic railroad construction and mining sites. The town of Arden included the mill for the Arden Plaster Company, which was almost destroyed by fire in the spring of 1912 and later rebuilt.

3.4.1.1.3. Arrow Canyon ACEC

Arrow Canyon ACEC is located at the northern end of the Arrow Canyon Mountains northwest of Moapa and south of Pahranagat Wash within the Arrow Canyon Wilderness. The ACEC features a canyon measuring 20 feet across at its narrowest, 200 to 400 feet deep, and several miles long with sheer walls that host prehistoric rock art. These and other cultural resources found within the canyon contribute to its eligibility to the National Register of Historic Places. The canyon is also significant for paleontological resources, including Miocene-aged fossilized bird tracks, coral, brachiopods, and fossilized mollusks in limestone sediment. Vegetation consists predominantly of creosote-bursage scrub with mesquite and acacia in the washes.

3.4.1.1.4. Ash Meadows ACEC

The Ash Meadows ACEC is located in the Amargosa Valley in southern Nye County between Death Valley National Park and the town of Pahrump. Ash Meadows is a desert wetland ecosystem containing spring-fed wetlands and alkaline desert uplands that provide habitat for at least 25 species found nowhere else in the world. Thirteen species are endangered or threatened, and most depend on the isolated springs and wetlands found there. This concentration of native species is considered to be the greatest of any local area in the United States. The 36,910-acre Ash Meadows ACEC surrounds the 23,000-acre Ash Meadows National Wildlife Refuge, including all lands identified in the Recovery Plan for the Endangered and Threatened Species of Ash Meadows, Nevada, as essential habitat for the recovery of the listed species. Species receiving protection through the special designation include:

Endangered fish species:
1. Devil's Hole pupfish
2. Ash Meadows Amargosa pupfish
3. Warm Springs pupfish
4. Ash Meadows speckled dace

Endangered plant species: Amargosa niterwort

Threatened plant species:
1. Ash Meadows milkvetch
2. Spring-loving centaury plant
3. Ash Meadows sunray
4. Ash Meadows ivesia
5. Ash Meadows gumplant
6. Ash Meadows blazing star

Threatened aquatic beetle species: Ash Meadows naucorid

Mesquite and ash groves flourish near wetlands and stream channels. Saltbush dominates dry areas adjacent to wetlands and creosote-bursage scrub habitat occurs in the drier elevated areas. The area around Ash Meadows was intensively farmed before the establishment of the national wildlife refuge. During the 1960s and early 1970s in particular, irrigated row crops, grazing, and development took a heavy toll on the area's natural resources. Plants, fish, and wildlife declined as pumping and diversion of spring channels, development of roads, large-scale earth moving, and introduction of more than 100 non-native plants and animals. The Carson Slough, a portion

of which is located in the northern portion of the ACEC, was historically the largest wetland in Southern Nevada. The slough was drained and mined for its peat in the 1960s.

3.4.1.1.5. Big Dune ACEC

Big Dune ACEC is located in the Amargosa Valley of Nye County off Valley View Road, south of State Route 95. It is a 1.5-square-mile complex star sand dune that reaches 2,731 feet above sea level. It is managed to protect habitat for four sensitive beetle species, three of which are endemic to this single dune complex and are found nowhere else in the world. Big Dune is one of only three dune systems in the planning area. Giuliani's big dune scarab beetle (*Pseudocotalpa giulianii*) was proposed for listing as a threatened species under the Endangered Species Act in August 1978 with the entire Big Dune Complex proposed as critical habitat for the species. Off-road vehicle use and mining were identified as the largest threats to the species at the time. Three other sensitive beetle species can also be found at Big Dune:

- Large Aegialian scarab beetle (*Aegialia magnifica*)
- Rulien's miloderes weevil (*Miloderes rulieni*)
- Big Dune aphodius scarab beetle (*Aphodius sp.*)

Vegetation around and on the dunes includes creosote bush (*Larrea tridentata*), sandpaper plant (*Petalonyx thurberi*), prickly poppy (*Argemone corybosa*), and astragalus (*Astragalus lentiginosus var. variabilis*). These plants and the dune itself are very important for survival of these rare beetle species. All four Big Dune beetle species rely on dune plants for survival. The plants provide food and mating sites and, when covered with sand, shelter and food for their larvae. The beetles also burrow into the harder layers of sand below the loose, wind-blown dune surface when they are inactive.

3.4.1.1.6. Crescent Townsite ACEC

This ACEC is located east of the town of Nipton on Crescent Pass. It was designated to protect historic railroad construction and mining sites.

3.4.1.1.7. Devil's Throat ACEC

This ACEC, located 7.25 miles south of Whitney Pockets off the Gold Butte Backcountry Byway, protects a natural hazard area within Gold Butte, a 100-foot-wide by 100-foot-deep sinkhole. This is an active geologic feature that enlarges regularly from erosion. Its formation is poorly understood but is believed to have been caused by dissolution in the subsurface or erosion by groundwater flow (piping). Some visitors have stated that Devil's Throat reminds them of the Gypsum Sinkhole of Cathedral Valley in Capitol Reef National Park.

3.4.1.1.8. Desert Tortoise Critical Habitat ACECs

The Desert Tortoise Recovery Plan (USFWS 1994) directs land management agencies to protect reserves for the desert tortoises measuring 1,000 square miles (640,000 acres) each. When undeveloped habitat of that size does not exist, multiple smaller, more intensively managed reserves should be established with a combined total of at least 1,000 square miles. The Las Vegas Field Office has protected 1,097 square miles (702,160 acres) of desert tortoise critical habitat in desert tortoise ACEC reserves. The majority of this habitat is within the Northeastern Mojave Recovery Unit (NEMO RU), with 190,000 acres in the Eastern Mojave Recovery Unit

(EMO RU). The ACEC boundaries were established to match the boundaries of desert tortoise critical habitat where the habitat was largely intact and where tortoise populations were highest. Boundaries differed in some locations to exclude degraded habitat and to add habitat outside critical habitat designated areas to make up for the degraded areas.

3.4.1.1.8.1. Piute/Eldorado ACEC

The Piute/Eldorado ACEC is located in the Piute and Eldorado valleys between Boulder City and the Nevada-Californa state line and surrounds the communities of Searchlight and Cal Nev Ari. It measures approximately 328,242 acres and contains 286,541 acres of the 343,040 acres of designated desert tortoise critical habitat on BLM-managed lands in the Piute/Eldorado Critical Habitat Unit in Nevada. The ACEC represents the largest area of high-density desert tortoise habitat known in Nevada. This population is contiguous with a large, high-density area in California. It spans the boundary between the NEMO RU and the EMO RU. Approximately 190,000 acres of the ACEC beginning just north of Searchlight and extending south through Piute Valley are located with the EMO RU. The desert tortoises in this portion of the ACEC share genetic markers with those in California to the south. The remaining ACEC (approximately 138,000 acres) is located in Eldorado Valley within the NEMO RU to the north with desert tortoises sharing genetic markers with those found in the Las Vegas Valley and areas to the northeast.

The area consists primarily of rolling valleys and bajadas with creosote-bursage scrub, shadscale scrub, blackbrush and pinyon-juniper woodland. It marks the transition between Mojave and Sonoran desert vegetation. Habitat quality ranges from fair to good across low to moderate elevation flats and slopes. The ACEC is bisected into four parts by U.S. Highway 95 and State Route 164.

The diverse topography and vegetation may offer opportunities for desert tortoise populations to survive should climate changes occur. Approximately 828 miles of roads are designated within this ACEC, in addition to the highways. Human uses affecting habitat quality include unauthorized cross country OHV use, highways, mining, utility corridors, and historic grazing activities. Invasive weeds and grasses are becoming an increasing concern.

3.4.1.1.8.2. Mormon Mesa ACEC

The 149,000-acre Mormon Mesa ACEC is located along the Clark and Lincoln county line. The ACEC is composed primarily of creosote-bursage scrub and mixed Mojave shrub communities. Mormon Mesa has expansive bajadas considered to be prime tortoise habitat. It also has steep mountain ranges located in the Mormon Mountains and Meadow Valley Mountain wilderness areas. The ACEC connects with three ACECs totaling 203,670 acres of habitat in the Ely Field District: Mormon Mesa, Kane Springs, and Beaver Dam Slope ACECs. It is separated from the Coyote Springs ACEC by U.S. Highway 93, State Route 168, and the Coyote Springs development.

There are approximately 212 miles of open roads in the ACEC, which limit public access. Human uses affecting habitat quality include unauthorized cross-country OHV use, utility corridors, and historic grazing. Invasive weeds and grasses are becoming an increasing concern.

3.4.1.1.8.3. Coyote Springs ACEC

Coyote Springs ACEC is located north of Las Vegas along State Route 93. The ACEC is composed of a broad alluvial valley that lies between the Sheep Range to the west and the Arrow Canyon and Meadow Valley Ranges to the east. The northern boundary is Lincoln County and State Route 168, and the southern boundary is the Apex Industrial Park. The ACEC's configuration is intended to provide functional corridors of habitat between tortoise recovery units to enhance long-term persistence of the species. It consists of the western portion of the Mormon Mesa Critical Habitat Unit, protecting moderate to high densities of desert tortoises between the Desert National Wildlife Refuge, the Arrow Canyon Wilderness, and the Mormon Mesa ACEC.

This area supports three vegetative communities, creosote-bursage scrub, Mojave mixed scrub, and blackbrush. These plant communities provide diverse habitats for many species including desert bighorn sheep.

Along its northern boundary, a large residential and resort development has the potential to impact conservation efforts. Human uses affecting habitat quality include unauthorized cross-country OHV use, highways, utility corridors, shooting, and sand and gravel mining. Invasive weeds and grasses are becoming an increasing concern. The ACEC contains approximately 150 miles of open roads in addition to the highways.

3.4.1.1.8.4. Gold Butte ACECs

The Gold Butte ACEC is south of Mesquite along the Arizona border between Grand Canyon-Parashant National Monument and Lake Mead National Recreation Area. It is characterized by isolated, rugged terrain and an extensive network of braided shallow washes. In addition, it has several well-developed springs.

Gold Butte ACEC is managed as three separate ACECs. Gold Butte, Part A covers the portion that is designated as critical habitat for the desert tortoise. Gold Butte, Part B lies to the south and is managed to protect a number of biological resources including habitats for sensitive plants, desert bighorn sheep, and desert tortoise. Gold Butte, Part C is located near the peak of the Virgin Mountains, protecting unique high-elevation habitats including relict forest stands and habitat for desert bighorn sheep. Part C is also classified as a Clark County Natural Area.

There are approximately 657 miles of designated roads in the ACEC, which limits public access. OHV use is expected to increase in the future but should be compatible with conservation efforts if restricted to designated roads and trails. Invasive weeds and grasses are becoming an increasing concern.

3.4.1.1.9. Gold Butte Townsites ACEC

The Gold Butte Townsites ACEC is located on the Gold Butte Backcountry Byway north of Cedar Basin in the Gold Butte Part B ACEC. This is the location of the historic mining town of Gold Butte.

3.4.1.1.10. Hidden Valley ACEC

Hidden Valley is located within the Muddy Mountains Wilderness. The valley contains prehistoric habitation and rock art.

3.4.1.1.11. Ivanpah Valley ACEC

This ACEC is located in the Ivanpah Valley on the east side of I-15 from the Nevada-Californa state line north to just south of Jean. This ACEC was created in 2014 as part of the Record of Decision for the Silver State South solar project. The ACEC was designated to protect habitat for desert tortoise connectivity between tortoise critical habitat in California and tortoise critical habitat in the Piute/Eldorado ACEC in Nevada.

3.4.1.1.12. Keyhole Canyon ACEC

Keyhole Canyon is located on the east side of the Eldorado Valley in the Nelson Hills. The canyon contains prehistoric habitation and rock art.

3.4.1.1.13. Rainbow Gardens ACEC

This ACEC is located on the east side of the Las Vegas Valley next to the Sunrise Mountain Township. The ACEC is managed to protect the geologic, scientific, scenic, and cultural resources and sensitive plants. It contains the Great Unconformity, a location where there are missing intervals of the geologic record. In this case, a surface of rock was exposed and then covered with a much younger layer of rock so there is approximately 1.2 billion years of geologic time missing in the local geologic record.

Rainbow Gardens ACEC contains a scenic mountain and canyon landscape similar to those found in more remote locations of Southern Nevada, but it is unique in its close proximity to the city, allowing people a wilderness experience within a few miles of their homes.

Unique cultural resources can be found in Rainbow Gardens. Gypsum Cave has been nominated to the National Register of Historic Places based on its traditional importance to Southern Piute and Chemehuevi tribes, its importance to the early history of North American archaeology through the work done at the cave in the 1930s by archeologist Mark Harrington, and the information it has provided and will continue to provide concerning the archaeological and natural history of the region. The limestone cave contains five rooms. Tribal representatives indicate that the cave is culturally important to their people, and that it has been a sacred place for untold generations of their ancestors. It relates to traditional Southern Paiute and Chemehuevi practices involving shamans and how they gain their power for healing, and it is associated with traditional practices involving singers and how they gain their songs. Research by Harrington at Gypsum Cave had profound influence on and contributions to Great Basin archaeology. It was pivotal in early interpretations of when man first occupied the Desert West, and in demonstrating to the public the magnitude of environmental changes between the end of the Ice Age and current times. The cave contained rich evidence of Pleistocene paleontological and Holocene archaeological specimens including evidence of sloths dating on the order of 20,000 to 33,000 years BCE and a fragment of a 9,280-year-old basket found in a crevice. The cave still boasts an invaluable research collection.

Rainbow Gardens ACEC contains deposits of gypsum and sandy soils that support sensitive plant species including the Las Vegas bearpoppy. Commonly referred to as “badlands” by locals, these areas have historically been used as OHV play areas throughout the planning area. These soils are very friable when disturbed, and the cyptobiotic surface is easily damaged. The ACEC protects a portion of this habitat.

3.4.1.1.14. Red Rock Spring

Red Rock Spring is located in Gold Butte Part A in a drainage north of the Gold Butte Backcountry Byway. This location contains prehistoric habitation sites and rock art.

3.4.1.1.15. River Mountains ACEC

The River Mountains ACEC is located on the east side of the Las Vegas Valley, east of the city of Henderson. The ACEC is managed to protect habitat for the River Mountains desert bighorn sheep herd and to protect the scenic viewshed for Henderson and Boulder City. This ACEC contains rough, rocky and steep terrain, broken up by canyons and washes that provide steep slopes where the bighorn sheep can escape from predators. This ACEC shares an eastern boundary with lands managed for the herd in Lake Mead National Recreation Area. This herd has suffered from loss of habitat due to increasing urban development in its range from expansion of Boulder City and Henderson and widening of State Route 95. Increases in OHV, shooting, and illegal dumping have continued to fragment and damage the habitat in this ACEC.

3.4.1.1.16. Stump Spring ACEC

Stump Spring is located in Pahrump Valley just east of the Nye County line. This spring site is the location of a prehistoric camp and historic trail and camp.

3.4.1.1.17. Virgin River ACEC

The Virgin River ACEC is located in northeast Clark County, just south of the city of Mesquite. It protects the river's wild and scenic character and riparian habitat. The Virgin River flows within the tri-state area of Utah, Arizona, and Nevada. Portions upstream have been inventoried and determined to have wild and scenic character. The ACEC designation protects those characteristics present within the planning area. In addition to wild and scenic character, the ACEC contains portions of designated critical habitat for two endangered fish species, the Virgin River chub and woundfin, and one endangered bird species, the southwestern willow flycatcher. The ACEC also supports habitat the listed Yuma clapper rail and the yellow-billed cuckoo, a candidate for listing. The riparian habitat type is extremely limited in this eco-region, making this habitat important to maintain species diversity and to support bird migration.

3.4.1.1.18. Whitney Pocket ACEC

Whitney Pocket is located in Gold Butte Part A ACEC at the intersection of the Gold Butte Backcountry Byway and the Whitney Pass Road. It is a cluster of sandstone outcrops with cultural resource sites including prehistoric habitation and rock art.

3.4.1.2. Potential ACECs Considered for ACEC Designation

A total of 33 ACEC nominations were made during the scoping process, including nominations made internally by the BLM. Additions to 11 existing ACECs were also proposed during the scoping process.

Nominations were evaluated in accordance with BLM Manual 1613, Areas of Critical Environmental Concern. Many of the areas and resources nominated overlapped; some

nominations were for a resource in a specific location, and others included many resources over a broad landscape. Following initial evaluation, 23 new areas and 10 ACEC additions that met the relevance and importance criteria were carried forward for consideration as potential ACECs. The boundaries were refined to develop the range of alternatives that are proposed in the draft RMP/EIS. A full analysis of all the nominated ACECs can be found in Appendix N.

Table 3.50, "Potential ACECs" (p. 490) shows all areas nominated for ACEC designation within the Las Vegas and Pahrump field offices, the size of the area evaluated, and the county where they are located.

Table 3.50. Potential ACECs

Nominated area	Area (acres)	R&I Values
Clark County (Las Vegas Field Office)		
Bird Spring Valley	78,959	Desert tortoise, western burrowing owl, and yellow two-tone beardtongue
Bitter Springs	61,733	Scenic values, Las Vegas bearpoppy, sticky ringstem, Las Vegas buckwheat, and desert bighorn sheep
California Wash	11,998	Cultural/historic values and threecorner milkvetch
Gale Hills	3,865	Cultural/historic values, scenic values, Las Vegas bearpoppy, and Las Vegas buckwheat
Hiko Wash	139	Cultural/historic values, scenic values, neotropical migratory bird habitat, and riparian habitat
Jean Lake	11,606	White-margined penstemon
Logandale	6,073	Cultural/historic values, scenic values, and threecorner milkvetch
Lower Mormon Mesa	50,156	Rare geologic feature
Mesa Milkvetch	9,183	Cultural/historic values and threecorner milkvetch
Moapa Mesquite	1,214	Cultural/historic values and riparian woodland
Muddy Mountains	36,189	Desert bighorn sheep
Old Spanish Trail	51,449	Cultural/historic values
Perkins Ranch	408	Cultural/historic values, southwestern willow flycatcher, Moapa dace, Muddy River population of the Virgin River chub, neotropical migratory bird habitat, and riparian resources
Sandy Valley (nominated as part of Stump Spring 2)	210	Pahrump Valley buckwheat
Spirit Mountain	9,488	Cultural/historic values
Stuart Ranch	278	Cultural/historic values, relict leopard frog, southwestern willow flycatcher, Meadow Valley desert sucker, Meadow Valley Wash speckled dace, desert tortoise, and riparian habitat
Upper Las Vegas Wash	12,296	Cultural/historic values, paleontological (Pleistocene megafauna localities), and Le Conte's thrasher
Nye County (Pahrump Field Office)		
Grapevine Springs Watershed	85	Spring Mountains pyrg and Southeast Nevada pyrg
Lava Dune	437	Giuliani's Big Dune scarab, Big Dune aphodius scarab, large aegialian scarab, and Rulien's miloderes weevil
Mt. Schrader	283	Cultural/historic values
Pahrump Valley Mesquite	49,829	Mesquite acacia woodlands, neotropical migratory bird habitat, and Pahrump Valley buckwheat
Specter Hills	5,420	White-margined penstemon
Stewart Valley	5,204	Cultural/historic values, mesquite woodlands, and Pahrump Valley buckwheat

Table 3.51, "Potential Additions to Existing ACECs" (p. 491) lists nominated changes to existing ACECs that were proposed by BLM due to land acquisitions, new information about location of relevant and important values, and changes to the importance of values since 1998.

Table 3.51. Potential Additions to Existing ACECs

Nominated areas	Area (acres)	R&I Values
Clark County (Las Vegas Field Office)		
Gold Butte, Part A	2,500	Scenic values, cultural/historic values, desert tortoise, relict leopard frog
Gold Butte, Part B	862	Scenic values, cultural/historic values, desert tortoise, relict leopard frog, desert bighorn sheep, Las Vegas buckwheat, and Las Vegas bearpoppy
Keyhole Canyon	339	Cultural/historic values, scenic values, and desert tortoise
Mormon Mesa	1) 7,712 2) 10,628	Desert tortoise
Piute/Eldorado	1) 14,093 2) 826 3) 8,844 4) 160	Desert tortoise, desert bighorn sheep, and scenic
Rainbow Gardens	600	Cultural/historic values, scenic values, Las Vegas buckwheat, Las Vegas bearpoppy, paleontological resources (Pleistocene megafauna), and a geologic feature (Great Unconformity)
Virgin River	2,314	Cultural/historic values, Virgin River chub, woundfin, southwestern willow flycatcher, and riparian habitat
Nye County (Pahrump Field Office)		
Amargosa Mesquite	2,865	Neotropical migratory bird habitat, relic plant community (mesquite), and cultural/historic values
Ash Meadows	529	Devil's Hole pupfish, Ash Meadows Amargosa pupfish, Warm Springs pupfish, Ash Meadows speckled dace, Ash Meadows naucorid, Amargosa niterwort, Ash Meadows milkvetch, spring-loving centaury plant, Ash Meadows sunray, Ash Meadows ivesia, and Ash Meadows blazing star
Big Dune	540	Giuliani's Big Dune scarab; Big Dune aphodius scarab; large aegialian scarab; and Rulien's miloderes weevil

3.4.2. Back Country Byways

The BLM Byways program was developed as a component of the National Scenic Byway Program. These byways highlight the spectacular nature of western landscapes. BLM byways vary from narrow, graded roads, passable during only a few months of the year, to two-lane, paved highways providing year-round access. BLM's scenic byways complement the National Scenic Byway Program by focusing on scenic corridors along major primary and secondary highways. A scenic byway has roadside corridors of special aesthetic, cultural, or historic value.

BLM back country byways focus primarily on corridors along backcountry roads with high scenic, historic, archaeological, or other public interest values. The road may vary from a single-track bike trail to a low-speed, paved road that traverses backcountry areas.

To designate a BLM byway, routes must go through a nomination and designation process. During the nomination process, proposals for BLM byway designations should be encouraged from all sources including citizen organizations, state and local governments, and private individuals. Only those nominations consistent with BLM, state, local, and other agency land-use plans should be forwarded to the BLM state director for approval. The designation of byways is normally done through an RMP or RMP amendment. A site-specific environmental assessment must be completed for each byway proposal not done as part of an RMP or RMP amendment. Byways should be approved through state-coordinating organizations before designation. Ideally, the state and BLM would designate byways jointly and concurrently.

Two nationally designated back country byways have been authorized in the planning area (Map 3.4.2.1 - 1 (p. 2144)). The two byways have entrance, interpretive, and directional signs and are regularly patrolled.

3.4.2.1. Gold Butte Back Country Byway

The Gold Butte Back Country Byway includes approximately 24 miles of narrow, paved road, 19 miles of graded dirt road, and 19 miles of high-clearance dirt roads within an area of highly scenic desert landscapes. Recreational opportunities include bicycling, driving for pleasure, OHV touring, hiking, rock climbing, camping, photography, and nature study.

3.4.2.2. Bitter Springs Back Country Byway

The Bitter Springs Back Country Byway includes 28 miles of high clearance/four-wheel drive road located in highly scenic geologic formations and abandoned historic mining sites. Recreational opportunities include exploring, hiking, bicycling, camping, hunting, nature study, OHV touring, and driving for pleasure.

3.4.3. National Trails

A national historic trail is a congressionally designated trail that is an extended, long-distance trail, not necessarily managed as continuous, that follows as closely as possible and practicable the original trails or routes of travel of national historic significance. The purpose of a national historic trail is the identification and protection of the historic route and the historic remnants and artifacts for public use and enjoyment. A national historic trail is managed in a manner to protect the nationally significant resources, qualities, values, and associated settings of the areas through which such trails may pass, including the primary use or uses of the trail.

The National Trails System Act of 1968 provides for the establishment of a system that includes recreational, scenic, and historic trails. A national historic trail must meet three criteria identified within the National Trails System Act. In sum, to qualify as a NHT, the trail must be a trail or route established by historic use and must be historically significant as a result of that use, the trail must be of national significance with respect to any of several broad facets of American history, and the trail must have significant potential for public recreational use or historical interest based on historic interpretation and appreciation.

3.4.3.1. Old Spanish Trail

The only national historic trail in Southern Nevada is the Old Spanish Trail, which was designated on December 4, 2002, by the Old Spanish Trail Recognition Act (Map 3.4.3.1 - 1 (p. 2144)). Prior to designation the National Park Service conducted the Old Spanish Trail NHT feasibility Study. The trail and its variants make up a 2,700-mile route that extends from Santa Fe, New Mexico, to Los Angeles, California. The trail passes through New Mexico, Colorado, Utah, Arizona, Nevada, and California.

The trail extends 160 miles through the planning area. Following the Virgin River, the trail enters Nevada near Mesquite, which is close to the Arizona border. From the river corridor, the route continues southwest along the Virgin River corridor to the springs of the Muddy River, near the present day town of Moapa. The route then stretches 50 miles to the southwest across a vast, waterless expanse between the springs at the Muddy River to Las Vegas. From here, the Spanish Trail heads southwest over Mountain Springs Pass in the Spring Mountains, through the Pahrump Valley, and into California.

At least four segments of the historic trail in Southern Nevada are relatively pristine and are listed on the National Register of Historic Places. Those segments of the trail that no longer retain integrity still have the potential for recreational and interpretive uses such as walking trails, primitive camping, and interpretive displays.

On June 5, 2003, the Secretary of the Interior directed that administrative responsibility for the Old Spanish National Historic Trail be assigned jointly to the BLM and the National Park Service. Co-administration of the trail recognizes the complementary skills of the two agencies.

A trailwide comprehensive plan is being prepared by the co-administering agencies. The trailwide comprehensive plan is a statutorily required plan providing strategic direction and guidance for the future administration and management of a congressionally designated national historic trail. The plan includes identification of the nature and purposes, goals and objectives, high potential sites and high potential segments, and the selection of the national trail rights-of-way. The trailwide comprehensive plan does not make land use allocations and does not direct the actions

of national trail managers. The national trail administering agency encourages and assists, but does not direct, agencies and willing landowners to achieve the strategic direction outlined within the trailwide comprehensive plan.

3.4.4. Wild and Scenic Rivers

Section 5(d)(1) of the Wild and Scenic Rivers Act directs federal agencies to consider the potential for national wild, scenic, and recreational river areas in all planning for the use and development of water and related resources. Although there are currently no designated wild and scenic rivers in the planning area, an eligibility review has been conducted for the Southern Nevada District Office as part of this RMP revision (Appendix K, Southern Nevada Eligibility Report (p. 1929)). Seven river segments within the planning area have been deemed eligible. River segments are deemed eligible if they are free-flowing and possess one or more outstandingly remarkable values, including scenic, recreational, geological, fish and wildlife, historical, cultural, or other river-related values. The seven eligible segments will be further reviewed as to their suitability for congressional designation into the national system.

During the eligibility review, streams were grouped by drainage within each hydrologic unit code and evaluated to see whether they were free-flowing. The next step was to analyze free-flowing drainages for significant river-related resource values or features. These values were compared with values present in similar streams within the ecological subregion/sections. Streams or portions of streams with the most significant values, and those with multiple significant values, rated the highest for outstandingly remarkable values (ORVs). Free-flowing streams with outstandingly remarkable values were given a tentative classification based on the criteria listed on the Classification Table from Illustration 2, page 43 of BLM Manual 8351. A tentative classification of wild, scenic, or recreational is determined for all eligible rivers/segments. Tentative classifications are based on the type and degree of human development associated with the river and adjacent land as they exist at the time of the evaluation.

Table 3.52, " Wild and Scenic Rivers Eligibility Determination" (p. 495) provides summary information about the river(s)/segments found to be eligible for inclusion in the national system.

Table 3.52. Wild and Scenic Rivers Eligibility Determination

River/segment name	Segment description and approximate length in free-flowing BLM river miles (BLM RM) and total river miles (TRM)	Outstandingly remarkable value(s)	Tentative classification
Virgin River Segments 1-3 are equal to 30 TRM (Las Vegas Field Office)	(1) Arizona/Nevada state line (Mile 0) to the bridge at Riverside (Mile 14) **(BLM RM 10) (TRM 14)**	Scenery, cultural, fish, wildlife	Recreational
	(2) Riverside Bridge (Mile 14) to the Overton State Wildlife Management Area (Mile 24) **(BLM RM 5) (TRM 10)**	Scenery, cultural, fish, wildlife	Recreational
	(3) Overton State Wildlife Management Area (Mile 24) to Lake Mead National Recreation Area (Mile 30) **(BLM RM 3) (TRM 6)**	Scenery, cultural, fish, wildlife	Recreational
Muddy River (LVFO)	(1) All portions of the Muddy River that are adjacent to BLM-managed lands **(BLM RM 1.5) (TRM 11)**	Wildlife, cultural, fish	Recreational
Meadow Valley Wash (LVFO)	(1) Stewart Ranch to Glendale **(BLM RM 6) (TRM 11)**	Wildlife, cultural, fish	Scenic

River/segment name	Segment description and approximate length in free-flowing BLM river miles (BLM RM) and total river miles (TRM)	Outstandingly remarkable value(s)	Tentative classification
Hiko Spring (LVFO)	(1) Segment begins where Highway 163 curves north in Section 12, to a quarter mile downstream from lower waterfall **(BLM RM 2) (TRM 2)**	Wildlife, geology, cultural, scenery, recreation	Wild
Carson Slough (Pahrump Field Office)	(1) Ash Meadows boundary to approximately 1 mile downstream **(BLM RM 1) (TRM 1)**	Wildlife, cultural	Wild

3.4.5. Wilderness

The U.S. Congress established the National Wilderness Preservation System to ensure that an increasing population, accompanied by expanding settlement and growing mechanization, does not occupy and modify all areas within the United States. Wilderness designation is intended to preserve and protect certain lands in their natural state. Only Congress, with presidential approval, may designate areas as wilderness. The Wilderness Act of 1964 defines wilderness characteristics, the uses of wilderness, and the activities prohibited within its boundaries.

Wilderness areas provide a contrast to lands where human activities dominate the landscape. No buffer zones are created around wilderness to protect them from the influence of activities on adjacent land. Wilderness areas are managed for use and enjoyment in a manner that will leave them unimpaired for future use and enjoyment as wilderness, for their protection, preservation of their wilderness character, and for the gathering and dissemination of information regarding their use and enjoyment as wilderness. The Clark County Conservation of Public Land and Natural Resources Act of 2002 and Lincoln County Conservation, Recreation, and Development Act of 2004 designated wilderness within the planning area. The designated wilderness areas are managed according to the Wilderness Act of 1964, FLPMA of 1976, and the BLM Wilderness Regulations published in 43 CFR 6300. BLM implements these laws through its wilderness management regulations, which was also published as a final rule in 43 CFR 6300 and 8560.

Table 3.53, "Las Vegas/Pahrump Wilderness Areas" (p. 497) contains a list of the designated wilderness areas within the planning area, their acreages, and a brief description of the location and adjacent wilderness managed by other entities.

Table 3.53. Las Vegas/Pahrump Wilderness Areas

Name	BLM acreage	Description
Arrow Canyon	27,502	Eastern portion of the planning area near the border of Lincoln County
Eldorado	5,766	Southeast portion of the planning area within BLM Las Vegas Field Office. The National Park Service administers more acres of wilderness in the adjacent Lake Mead National Recreation Area.
Ireteba Peaks	10,332	Southeast portion of the planning area within the BLM Las Vegas Field Office. The NPS administers more acres of wilderness in the adjacent Lake Mead National Recreation Area.
Jumbo Springs	4,759	Eastern portion of the planning area near the Arizona border and adjacent to Lake Mead National Recreation Area.
Lime Canyon	23,709	Eastern portion of the planning area and adjacent to the northern boundary of Lake Mead National Recreation Area.
Mt. Charleston	2,178	Central portion of the planning area within the BLM Las Vegas Field Office. The U.S. Forest Service administers more acres of wilderness in the adjacent Humboldt-Toiyabe National Forest, Spring Mountains National Recreation Area.
Muddy Mountains	44,633	Eastern portion of the planning area within the BLM Las Vegas Field Office. The NPS administers more acres of wilderness in the adjacent Lake Mead National Recreation Area.
South McCullough	43,996	Southern portion of the planning area near the California state boundary and northeast of nearby Wee Thump Joshua Tree Wilderness.
Spirit Mountain	553	Southeast portion of the planning area within the BLM Las Vegas Field Office. The NPS administers more acres of wilderness in the adjacent Lake Mead National Recreation Area.
Wee Thump Joshua Tree	6,489	Southern portion of the planning area near the California state boundary and southeast of the nearby South McCullough Wilderness.

Name	BLM acreage	Description
Meadow Valley Range	1,817	Eastern portion of the planning area within the BLM Las Vegas Field Office. The Ely District Office administers more acres of wilderness on adjacent BLM lands.
Mormon Mountains	11,244	Eastern portion of the planning area within the BLM Las Vegas Field Office. The Ely District Office administers more acres of wilderness on adjacent BLM lands.
Total	**182,978**	

National BLM policy directs that wilderness management plans be developed with specific prescriptions to manage individual wilderness areas. Planning documents that have been approved or are in progress include:

- South McCullough Wilderness and Wee Thump Joshua Tree Wilderness Final Wilderness Management Plan and Environmental Assessment (BLM 2005).
- Muddy Mountain Wilderness Final Wilderness Management Plan and Environmental Assessment (BLM 2007a).
- Delamar Mountains, Meadow Valley Range and Mormon Mountains Wilderness Final Wilderness Management Plan and Environmental Assessment (BLM 2009).
- Arrow Canyon Wilderness Final Wilderness Management Plan and Environmental Assessment (BLM 2013).
- Jumbo Springs Wilderness and Lime Canyon Wilderness Final Wilderness Management Plan and Environmental Assessment (BLM 2013).
- Mt. Charleston Wilderness Wilderness Management Plan and Environmental Assessment. The USFS Spring Mountains National Recreation Area is the lead agency in preparation of this joint plan (decision expected in 2014).
- The NPS Lake Mead National Recreation Area is the lead agency in preparation of a joint Wilderness Management Plan and Environmental Impact Statement to include BLM Las Vegas Field Office-administered portions of Spirit Mountain Wilderness, Eldorado Wilderness, and Ireteba Peaks Wilderness (decision expected in 2014).

3.4.6. Wilderness Study Areas

With the passage of the Federal Land Policy and Management Act in 1976, Congress directed the BLM to inventory, study, and recommend which public lands under its administration should be designated wilderness. Between 1978 and 1980, the BLM inventoried all its lands within the present day RMP revision planning area boundary. BLM lands were inventoried for wilderness characteristics through evaluation of an area's size, naturalness, outstanding opportunities for solitude, or primitive and unconfined recreation. The criteria used to identify these characteristics were based on the Wilderness Inventory and Study Procedures Handbook (BLM 1978). As a result of that inventory, a number of wilderness study areas (WSAs) were designated in the planning area. Natural areas existing at the passage of FLPMA became "instant" wilderness study areas (ISAs) as per the wilderness review of existing natural areas requirement contained in Section 603(a). BLM's recommendations to Congress regarding which WSAs or portions of WSAs should be designated as wilderness are described in the Nevada Wilderness Study Report (USDOI BLM 1991).

Legislation enacted in 2002 and 2004 designated some WSAs as wilderness while other areas were released for other purposes. The existing four WSAs (38,049 acres) within the planning area are being managed to preserve their wilderness values and will continue to be managed in that manner until Congress acts on the recommendations. The acreages provided in the table have been calculated in GIS and therefore differ from the acres provided in the Wilderness Report to Congress. Detailed descriptions of the characteristics and other resource values and uses found in each of the WSAs are included in the Nevada BLM Statewide Wilderness Report (USDOI BLM 1991). Table 3.54, "Wilderness Study Areas in the Planning Area" (p. 499) contains a brief description of each WSA gathered from these publications.

Table 3.54. Wilderness Study Areas in the Planning Area

Name	Acreage	Description
Million Hills WSA	22,604	Eastern portion of the planning area in close proximity to Lake Mead National Recreation Area to the south; the Arizona-Nevada border is the eastern boundary of the WSA. The area is approximately 45 miles from Las Vegas in an area known as Gold Butte.
Mount Stirling WSA	5,202	Located centrally within the planning unit and within the BLM Las Vegas Field Office (4,107 acres), BLM Pahrump Field Office (1,095 acres), and adjacent lands managed by the Humboldt-Toiyabe National Forest Spring Mountains National Recreation Area. This study area encompasses the northernmost portion of the Spring Mountains, approximately 30 miles west of Las Vegas.
Resting Springs WSA	4,393	Western portion of the planning area within the Pahrump Field Office. This WSA is located approximately 10 miles west of Pahrump and nearly 60 miles west of Las Vegas, along the California-Nevada border. The unit's western boundary is contiguous with the 76,309–acre Resting Spring Range Wilderness within the BLM California Desert District.
Virgin Mountain ISA	5,850	Eastern portion of the planning area within the BLM Las Vegas Field Office. It is located approximately 4 miles north of Mesquite in a portion of the Virgin Mountains.

Under FLPMA, wilderness preservation is part of the BLM's multiple-use mandate; wilderness values are recognized as part of the spectrum of resource values considered in the land-use planning process. WSAs are managed to not impair the suitability of the WSA for preservation as wilderness. Land uses and facilities must meet this non-impairment standard — the use or facility is temporary and will not create new surface disturbance. BLM Manual 6330 "Management of

Wilderness Study Areas" (BLM 2012) provides specific policy and guidance for management of most resource values and uses in WSAs. VRM management decisions, travel and transportation management (e.g., OHV route designations) are made during land-use planning.

3.5. Social and Economic Conditions

3.5.1. Tribal Interests

The United States has a unique legal relationship with Indian tribal governments as set forth in the Constitution of the United States, treaties, statutes, executive orders, and court decisions. The United States recognizes the right of Indian tribes to self-government and supports tribal sovereignty and self- determination. As domestic nations, Indian tribes exercise inherent sovereign powers over their members and territory. All federally recognized tribes have off-reservation interests in public lands as traditional tribal territories, and many retain pre-existing rights reserved in treaties, executive orders, agreements, and federal statutes. The United States continues to work with Indian tribes on a government-to-government basis to address issues concerning Indian tribal self-government, tribal trust resources, and Indian tribal treaty and other rights.

The relationship between federal agencies and sovereign tribes is defined by numerous laws and regulations addressing the requirement of federal agencies to notify or consult with Native American tribes, or otherwise consider their rights and interests when planning and implementing federal undertakings. Pertinent laws, regulations, executive orders, and policy statements are listed in the planning criteria section of this report.

Within the current planning area are reservations that are home to two culturally and linguistically related groups: the Las Vegas Paiute Tribe and the Moapa Band of Paiutes. The Las Vegas Paiute Tribe owns 10 acres in downtown Las Vegas and 3,800 acres at the Snow Mountain Reservation northwest of town, where the tribe operates the Las Vegas Paiute Golf Resort. The Moapa Band of Paiutes reservation is 30 miles northeast of Las Vegas and consists of 71,954 acres. In addition, more than 15 groups consider portions of Southern Nevada as their traditional tribal territory. These include the Colorado River Indian Tribes, the Quechan, the Hualapai, the Ft. Mojave, the Western Shoshone, the Timbisha Shoshone, the Chemehuevi, and various Southern Paiute bands in Utah and Arizona.

Consultation with the 15 groups and tribes through the years indicates that a wide range of tribal interests are present in the planning area. These include potential impacts to resources associated with practices like gathering medicinal plants, food, and other natural products; hunting; the availability of water and healthy plant and animal populations; and potential impacts to Native American archaeological sites, sacred sites, and traditional cultural properties.

The disposal of land is of great interest to many of the groups and tribes, specifically the natural and cultural resources associated with a particular parcel of public land. The 1998 RMP did not make management decisions that addressed tribal rights or interests in the planning area.

Decisions and actions, tiered to the 1998 RMP that might affect tribal rights or interests, are implemented in consultation with tribal governments.

Current management direction requires consultation with affected tribes during planning and subsequent plan implementation to ensure that the rights and interests of the tribes are addressed. Consultation is particularly important when considering decisions regarding the allocation of lands for special designations such as areas of critical environmental concern (ACECs) for land disposal, and for decisions affecting access, travel management, cultural resources, or other use allocations.

Native American tribes have special recognition from the federal government concerning their land, cultural, religious, and economic resources. The Las Vegas and Moapa Paiute Indian governments and tribal members both have reservation lands within the planning area, and they have a history of using public lands for a variety of uses. There are portions of the planning area that are important to Native American tribes for traditional and religious purposes. This includes some areas that provide habitat for vegetation used traditionally for food and medicine, as well as landmarks and landscapes that have cultural importance based on traditional and/or religious uses. For example, the Spirit Mountain area, within the Newberry Mountain Range approximately 15 miles south of Searchlight, Nevada, is important to the Mojave Paiute (situated on the Colorado River in the vicinity of Northern Arizona, Southern Nevada, and California borders) based on their traditional and historic cultural relationship with the mountain. Portions of the Gold Butte area also have significance to local tribes. Many areas of importance are related to historically important resources or areas, such as springs or other sources of water, traditional corridors of movement, or other areas that provided life-saving resources needed for survival in the Mojave Desert ecosystems. The tribes have notified the BLM of several of these areas within the planning area, and it is likely that others have not been brought to the attention of the BLM or the public due to no conflicts with historic or existing land uses. These types of areas could continue to be identified on a project-by-project basis. Because of the cultural, traditional, and religious nature of these areas, public disclosure of these sites is not required by law.

3.5.2. Public Safety

3.5.2.1. Abandoned Mines

Nevada has a long history of mining due to its unique geology that provides ideal conditions for a variety of valuable minerals. Those that have exploited this mineral wealth, however, have left behind various mine-related features, such as shafts, adits, glory holes, stopes, and mill sites that have proven dangerous to animals and the general public; 200,000 to 300,000 of these features continue to exist across the state. The Nevada Abandoned Mine Lands Program (NAMLP) of the Nevada Division of Minerals (NDOM) maintains a growing inventory of recognized abandoned mine lands (AML) hazards, see Table 3.55, "Known Mine Hazards in the District" (p. 503). Each AML hazard site may include multiple features.

Table 3.55. Known Mine Hazards in the District[a]

County	Number of inventoried sites	Number of secured sites	Percent of sites secured
Clark	2,277	1,551	68.1 percent
Nye*	2,122	1,662	78.3 percent

[a]Data taken from 2012 NAMLP Report.
*Values cover the entire county which is managed by two separate field offices.

All AML closures in the district are handled as a multi-agency endevour consisting of four agencies. The BLM handles the NEPA evaluation and acquires the funding to permanently close the most hazardous sites. The Army Corps of Engineers designs the parameters for these closures. NDOM locates and ranks the AMLs. Bureau of Reclamation does the installation and fieldwork. For low-ranking hazards based on the AML evaluations, NDOM will fence these hazards through numerous public outreach programs particularly, with the Boy Scouts.

3.5.2.1.1. Public Awareness

The "Stay Out, Stay Alive" program run by NDOM and adopted by the BLM does public outreach by talking with the public at a variety of events about mine hazards and the AML program.

3.5.2.2. Debris Flows

Information in this section is primarily drawn from the January 2010 Draft Supplemental EIS for the Upper Las Vegas Wash Conservation Transfer Area. The Upper Las Vegas Wash (ULVW) watershed is drained by the ULVW and several tributaries. The ULVW is an ephemeral wash that flows intermittently during and immediately after significant storm events. The upper subbasins flowing into the ULVW are classified geomorphologically as alluvial fans and consist of material ranging in size from boulders to silts. An alluvial fan is a fan-shaped collection of loose or unconsolidated sediments that have been deposited by stream flow or debris flows at the base of a mountain front or valley side (National Research Council 1996). A bajada is formed when neighboring fans converge into a single apron at the base of the slope. Flooding on alluvial fans can occur quickly. Flow paths on fans typically form a braided network of channels, both active and inactive. Near the mouth of the fan, where the slope is greater, channels tend to be more incised, with coarser-grained alluvium. Farther down the fan, as the slope decreases, flows spread out laterally into other channels and sheet flow with more fine-grained sediments.

The Federal Emergency Management Agency (FEMA) has developed special guidelines for computing regulatory floodplains for alluvial fans (FEMA 2003). In addition, dramatic changes to a dry wash can occur with adjacent development and related infrastructure. Increased urban development, including channelization of stream courses, installation of storm drains, expanded areas of impervious land cover, and construction of stream crossings, has been occurring in the ULVW watershed and has gradually altered the hydrology of the ULVW.

There are a number of smaller, mostly unnamed ephemeral washes located throughout the ULVW watershed. Along with the ULVW, smaller washes that naturally convey storm flows to the ULVW and ultimately into Lake Mead may be considered waters of the United States (WUS), as defined under 33 CFR 328. The U.S. Army Corps of Engineers (USACE) regulates WUS pursuant to Section 404 of the CWA [33 USC 1251 *et seq.*]. The USACE has permitting authority for the placement of fill into WUS on federal, state, and private lands. The majority of the tributary ephemeral washes have remained intact. However, the slope draining into the north side of the ULVW shows evidence of an active alluvial surface in several locations. That conclusion is based on visual interpretation of aerial images, available geological mapping (Bell et al. 1998), and criteria established for differentiating between active and inactive surfaces (House 2005).

Because complete urbanization has not yet occurred within areas that drain to the ULVW, the majority of the ULVW length has not yet been significantly impacted by increased flow rates and channel erosion. However, the ULVW can experience radical changes in shape, alignment, depth, and flood-carrying capacity during major storm events. As a result of these characteristics, specialized hydraulic analyses are usually required to adequately assess flooding impacts for both natural and altered conditions (CCRFCD 1999; House 2005).

Runoff from storm events in the ULVW watershed and surrounding mountains can result in flows ranging from a few dozen cubic feet per second (cfs) to several thousand cfs. Because of the lack of development in the upper basin, very few significant floods have been observed or recorded. Under future ultimate build-out conditions, however, 100-year flood flows are estimated to exceed 14,000 cfs upstream of the ULVW detention basin near Decatur Boulevard. That flow rate would cover a football field 1 foot deep in about 3.5 seconds. Peak flows of that magnitude (and even significantly smaller flows) would erode the banks and degrade the channel of the ULVW, which in turn would cause sedimentation in online detention facilities, Las Vegas Bay, and Lake Mead. In addition, development in the ULVW would impact the quantity of fine sediment that is conveyed during storm events via overland sheet flow into the ULVW and to those facilities.

3.5.2.2.1. Floodplains

The Las Vegas Valley Disposal Boundary Final EIS described the 100-year flood conditions within the LVV watershed. The majority of information presented in that document is still considered applicable in the January 2010 Draft Supplemental EIS for the Upper Las Vegas Wash Conservation Transfer Area, with the exception that the upper range of 100-year flood flows would be around 14,000 cfs based on an ultimate projected build-out condition for all available land. FEMA and the Clark County Regional Flood Control District (CCRFCD) have published maps that show the 100-year floodplain and floodway for the ULVW, based on computerized hydraulic models. The Regional Flood Control Master Plan map shows that any development that happens north of the wash on the fans would require flood control structures. Without any further development, the wash has sufficient natural flood control capacity.

While the CCRFCD and the cities of Las Vegas and North Las Vegas allow development within the floodplain fringe, it is generally discouraged. Proposed development adjacent to and within drainage ways with established floodplains must be evaluated by a licensed engineer to confirm compliance with various criteria and to demonstrate that no adverse impacts to adjacent properties would result. Under no circumstances is proposed development permitted in the floodway. The CCRFCD and the cities of Las Vegas and North Las Vegas currently have no formal erosion setback criteria in place. Plans for development adjacent to the ULVW are reviewed by the appropriate jurisdiction on a case-by-case basis and are approved or rejected on the basis of supporting engineering analyses and compliance with appropriate regulations (CCRFCD 2007; personal communication, Raul Cruz, City of Las Vegas Flood Control Division 2008).

3.5.2.3. Hazardous Materials and Waste

Petroleum Waste and Hazardous Substances

Unauthorized disposal of petroleum waste and releases of hazardous substances continually occurs on public land throughout the planning area. The term "petroleum wastes" denotes those substances included within the meaning of the petroleum exclusion to the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA, 42 USC 9601). This is petroleum which is not specifically listed or designated as a hazardous substance. The term "hazardous substance" is defined by CERCLA. There are thousands of hazardous substances, but they can generally be categorized as ignitable, corrosive, reactive, or toxic materials. "Release" as defined by CERCLA means any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing (including abandonment) of a hazardous substance.

In the planning area, releases of hazardous substances, and dumping of petroleum products usually occur as a result of unauthorized dumping (also known as midnight dumping) or in association with active or abandoned mining or mill site claims. The Southern Nevada District Office follows the National Contingency Plan (40CFR 300) in dealing with releases of hazardous substances which generally involves the timely removal of the hazardous substance. Removal of petroleum waste is performed in accordance with state and local laws and regulations that also generally involve the timely removal of petroleum waste. A release could require a "removal" action for one drum of liquids which could cost a few hundred dollars up to a "remedial" action that could involve extensive studying and cost thousands (or millions) of dollars.

Because releases are not authorized on public land and are generally removed upon discovery, an inventory of sites where hazardous substances and petroleum waste have been released is not maintained in the land-use plan. If a parcel of land is to be disposed of, an evaluation pursuant to section 120(h) of CERCLA is prepared. If a parcel of land is to be acquired, an evaluation is conducted to comply with the standards and practices for "all appropriate inquiry" pursuant to sections 101(35) (B) (i) (I) and 101(35) (B) (ii) of CERCLA is prepared.

Solid Waste

Unauthorized disposal of solid waste continually occurs on public lands throughout the planning area. The term "solid waste" is defined by the Resource Conservation and Recovery Act (42 USC 6901) and includes any solid, liquid, semi-solid, or contained gaseous material that is deemed to be a waste. Solid waste is further defined as abandoned piles of household garbage, bags of yard waste, discarded appliances, old barrels, used tires, and demolition debris that can threaten the

health of humans, wildlife, and the environment. A few commonly found illegally dumped items such as vehicles, boats, trailers, and motorhomes can fit into either solid waste or hazardous waste dependent on the timeliness of the item being found, reported, and subsequently cleaned up.

For example, an intact fiberglass boat found in the desert doesn't pose much of a threat as a solid waste, but once that boat has been set on fire and burned, it becomes a hazardous waste. The number of solid waste illegal dump sites has not been quantified across the planning area. Due to the illegal nature of solid waste dumping and the close proximity of public land to urban areas, illegal solid waste dump sites are regularly observed on public lands within the Las Vegas Valley and in the mesquite woodlands around Pahrump and can occur throughout the planning area.

3.5.2.4. Potential Hazards from Munitions, Small Arms, and Unexploded Ordnance

3.5.2.4.1. Nellis Air Force Base Range, Area of Interest E

Site History: The former Nellis Air Force Base, Area E, is located approximately 2.5 miles of Indian Springs in Clark County (See Map 3.5.2.3–1) (p. 2139). The BLM manages 6,814 acres of this former range area. Area of Interest E is the eastern portion (3,613 acres) of this former range area that appears to have been used for Air Force training exercises in the 1980s and early 1990s.

From 1951-1976, Area E was used as a safety buffer zone for the active bombing and gunnery ranges at Nellis AFB. In 1976, the Air Force decontaminated Area E, in accordance with Department of Defense regulations, and returned it to the Department of the Interior. Between 1981 and at least 1993, Silver Flag Alpha demonstration and performance training exercises were assumed to have been conducted off-base on the eastern part of Area E because of the presence of munitions debris that was typically used in those training exercises. The southwest boundary of this area is roughly delineated by U.S. Highway 95.

As a result of the site inspection completed by the Formerly Used Defense Site (FUDS) Program in 2010, Area of Interest E was determined to be contaminated with munitions debris and munitions and explosives of concern most likely from the Silver Flag Alpha training exercises. Munitions debris found as part of the 1995 ASR investigation and the 2010 site inspection included expended small arms (5.56mm and 7.62mm), expended smoke grenades, expended M127 series slap flares, and empty 20mm and 40mm casings. In addition to the munitions debris, live M49 series trip flares were found during both investigations. These flares are considered munitions and explosives of concern, which represent an explosive hazard. These items were removed and disposed of by the Explosives and Ordnance Unit at Nellis Air Force Base. Other evidence of former training activities conducted in Area of Interest E observed during the 2010 site inspection included tank tracks, communication wire, and dugout pits.

Area of Interest E was determined to be ineligible for the FUDS Program because Silver Flag Alpha training exercises were conducted after the eligibility date for the program. Area of Interest E was referred to the Department of Defense.

3.5.2.4.2. Nellis Small Arms Range (AX)

Site History: The Nellis Small Arms Range (AX) is located approximately 6 miles northeast of Las Vegas and approximately 2 miles north of Nellis Air Force Base at the base of the Las Vegas

Mountain Range. Through the Department of the Interior, the U.S. Fish and Wildlife Service manages approximately 24,000 acres for the Desert Wildlife Refuge. The remaining 12,000 acres are administered by the BLM for the primary purpose of public access and recreational activities. An active U.S. Air Force small arms range abuts the property on the southeast corner, but it is not considered part of the FUDS site (See Map 3.5.2.3–1). (p. 2139)

The property was initially used to train flexible aerial gunners during World War II. After the war, Air Force, Marine Corps and Navy personnel stationed at Nellis Air Force Base and Lake Mead Base used the Nellis Small Arms Range for small weapons training. The site was also used as an emergency drop zone for hung bombs, wing-tip tanks, and pylons. One portion of the site was used as an explosive ordnance disposal (EOD) area. A burial area is also located at the site, and portions of the property are used today by civilians for target practice.

The U.S. Army Corps of Engineers approved a Munitions Response Prioritization Protocol Score score of 4 for the site. A site inspection was completed in 2007. Future Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) phases (RI/FS, RD, RA-C & LTM) are currently scheduled after 2021.

3.5.2.4.3. Lake Mead Base

Site History: Lake Mead Base (Nellis AFB, Area II), located approximately 10 miles northeast of Las Vegas, consisted of 15,014 acres of federal land managed by the Department of the Interior. On Jan. 1, 1953, the Lake Mead Base was acquired by the U.S. Army Corps of Engineers and was used by the Defense Atomic Support Agency. Between 1954 and 1956, a portion of the base (6,999 acres) was returned to the Department of the Interior. On July 15, 1969, the BLM declared the area north of the Lake Mead Base as an open public area for off-road vehicle recreation. This area is commonly referred to as Nellis Dunes, and the area is managed today as a special recreation management area.

From 1953-56, the Lake Mead Base was used by the U.S. government as a firing range and mortar buffer area. In 1994, the base was identified as formerly used defense site-eligible, and project number J09NV044201 was assigned. There are two munitions response sites consisting of 320 acres each within the larger Lake Mead Base property. These have been identified by the Formerly Used Defense Site Management Information System as MRS01 - Mortar Buffer Zone and MRS02 - Emergency Jettison Area, which are shown on Map 3.5.2.3–1 (p. 2139). The coordinates below are in meters (Universal Transverse Mercator [UTM] Zone 11 North American Datum [NAD] 83).

Table 3.56. Lake Mead Base Munitions Response Site Coordinates

Munitions response site	X-Coordinate (meters)	Y-Coordinate (meters)	Total range acreage
MRS01 - Mortar Buffer Zone	685137.00	4016113.00	320
MRS02 - Emergency Jettison Area	681357.00	4016062.00	320

Mortar Buffer Zone Munitions Response Site: The Mortar Buffer Zone is located about 800 feet north of a former mortar impact area. The former mortar impact area remains within the current boundary of Nellis Air Force Base and is used as a demolition range. Currently, the Mortar Buffer Zone is managed as part of the larger Nellis Dunes Special Recreation Management Area, which is used primarily for driving off-road vehicles.

Inspections of the Mortar Buffer Zone completed by the U.S. Army Corps of Engineers in 1996 and 2008 identified the following munitions debris at the site: 60mm mortar fragments from a M302 white phosphorus round, the a nose from a 3.5-inch practice rocket, M1 Garand clips, 20mm HE projectile casings, and expended .30-caliber cartridge cases and clips. No munitions and explosives were encountered, and there are no known incidents of employees or the public encountering munitions and explosives of concern at the site.

Emergency Jettison Area Munitions Response Site: This area did not have any designed use as a range as part of the military training activities, but it was identified based on the discovery of two M38A2 practice bombs and a illumination flare identified as part of the 1996 Archive Search investigation. This site is also within the Nellis Dunes Special Recreation Management Area.

In the Archive Search Report, it was surmised that the bombs found in the area were jettisoned from a plane just prior to landing as the crew returned from a training exercise circa World War II because M38A2 bombs have not been used since the end of the war. Similarly, the presence of the flare was attributed to an isolated incident, potentially blown across the base boundary as the result of a night training exercise. During the 2008 site inspection, munitions debris from two M38A2 100-pound practice bombs were found in addition to munitions debris from 20mm HE projectiles. No munitions and explosives were encountered, and there are no known incidents of employees or the public encountering munitions and explosives at the site.

Due to the detection of munitions debris at both munitions response sites, these sites have been programmed for further investigation for munitions and explosives under the FUDS Program. Both sites have a Munitions Response Prioritization Protocol Score of 4, indicating they are a medium priority site among the thousands of sites that are eligible for further investigation. Based on the current project sequencing, it is unlikely that the U.S. Army Corps of Engineers will address these sites before 2025.

3.5.3. Social and Economic Conditions

Socioeconomics is not a BLM management decision; rather, it is a contextual element for planning. This section addresses social, cultural, and economic conditions and trends within the socioeconomic study area defined below. These conditions and trends affect current and future uses of BLM public land resources. Conversely, decisions made by BLM in the current planning process may have social, cultural, and economic impacts. These impacts may be positive or negative, depending on conditions and on the point of view of stakeholders to BLM public land resources. This section provides socioeconomic background information to assist in the planning process.

Within the social/cultural and economics sections, most data is presented for each county within the socioeconomic study area. Nevada and U.S. data are often presented for comparison. The Socioeconomic Baseline Report provides additional data and discussion of socioeconomics for this planning action.

3.5.3.1. Demographic Overview

These baseline data are primarily focused on the SE study area. In many cases, the socioeconomic study area for a BLM planning action is different from the planning area. This occurs because decisions made by BLM can impact socioeconomic conditions in proximate lands and communities, based on where monies flow and how and where services and goods are obtained. A socioeconomic study area may also be larger than the planning area because key socioeconomic data are only available for geographies (e.g. counties) that extend beyond the planning area. The term “SE study area” in this section refers to geographies that slightly differ from the planning area being evaluated in other sections of the document.

Spanning almost 17 million acres, the SE study area is composed of 5.2 million acres in Clark County and 11.6 million acres in Nye County (BLM 2007). Of the total land in the study area, BLM manages the largest portion (55 percent), followed by the U.S. Forest Service (13 percent), Department of Defense (13 percent), Department of Energy (5 percent), private land owners (5 percent), National Park Service (4 percent), U.S. Fish and Wildlife Service (3 percent), Bureau of Indian Affairs (1 percent), State of Nevada (0.4 percent), and Bureau of Reclamation (0.2 percent). The large majority of land in the SE study area is federally managed, including 98 percent of the land in Nye County and 88 percent in Clark County (BLM 2009).

The total population of the SE study area was estimated to be just over 2 million in 2012, with Clark County accounting for slightly less than 2 million and Nye County accounting for 43,000 people (U.S. Census Bureau 2014). The SE study area has several urban areas, but the majority of the area is rural and sparsely populated. In 2012, the overall density of the SE study area was 77.6 people per square mile, with 248.3 people per square mile in Clark County and 2.4 people per square mile in Nye County. Clark County is much more densely populated than the rest of the state or the nation, and Nye County is far less densely populated than either the state or nation. Table 3.57, “Population Area and Density for 2012” (p. 510) displays the population area and density for 2012.

Table 3.57. Population Area and Density for 2012[a]

Area	Total population (2012)	Land area (million acres)	Land area (square miles)	Persons per square mile
Clark County	1,997,659	5.1	8,046	248.3
Nye County	42,914	11.6	18,175	2.4
Study area	2,040,573	16.8	26,220	77.8
Nevada	2,754,354	70.3	109,826	25.1
United States	313,873,685	2,264.0	3,537,438	88.7

[a] Source: Population – U.S. Census Bureau 2014 U.S. Census Bureau; QuickFacts for Nevada, Clark County, and Nye County; accessed by Julie A. Suhr Pierce; <http://quickfacts.census.gov/qfd/>; (June 2014).; Land Area – BLM 2007 (for counties) and U.S. Census Bureau 2000 (for state and nation land).

The most urbanized and populous portion of the SE study area is the Las Vegas metropolitan area, located in central Clark County and encompassing the cities of Las Vegas, North Las Vegas, and Henderson, along with several unincorporated communities. Other communities with small but expanding populations lay in proximity to the metropolitan area, including Pahrump to the west and Mesquite and Boulder City to the east, with the latter two situated along or near the Colorado River and Lake Mead. Large amounts of land in Clark County and the large majority of Nye County remain remote and rural, with smaller communities scattered across the area. Both Clark and Nye counties are accessible by road, train, and air travel, and from the north, south, east, and west. Major highways include Interstates 15, 215, and 515; U.S. Routes 93 and 95; State Routes 157, 159, and 160; and County Route 215. The primary interstate to and from the area is I-15, running between Salt Lake City, Las Vegas, and Los Angeles. The Union Pacific Railroad (a class one railroad) provides freight service to the area. McCarran International Airport offers domestic and international flights to and from the area. Within the SE study area, RTC Transit is a bus system that services the Las Vegas metropolitan area of Clark County. The Southern Nevada Transit Coalition provides bus services to and from some of Clark County's outlying areas, including Mesquite and Laughlin.

Native Americans have a long history in the Southern Nevada region (NPA 2010a, Nation Master Encyclopedia 2010, and Wikipedia 2010). In prehistoric times, as early as 350 B.C., the valley was inhabited by the Ancestral Puebloan people. Sometime around 1000 A.D. the Southern Paiutes, who were a hunter-gatherer society, moved into the area and coexisted with the Anasazi, who left the area around 1150. The Southern Paiutes continued to occupy the Moapa Desert and the Colorado River region, living near water sources and hunting, gathering, and farming. White settlers began moving to the area in the mid-1800s as a result of the creation of the Old Spanish Trail (linking Santa Fe, New Mexico, with Los Angeles, California), the establishment of the rail system, and the discovery of gold and silver in the mountains of Southern Nevada. With western expansion, the population of Mormon settlers and other pioneers of European descent continued to increase, and the land that the Paiutes used was eventually taken by white settlers for their crops, livestock, and settlements. The Paiute population declined as a result of the unfamiliar traditions and diseases brought by the new settlers. In 1869, the Moapa Band of Paiute Indians was moved to the Moapa River Indian Reservation. The size of the reservation has changed over time, and today the reservation covers 71,954 acres of land in Clark County (Moapa Paiutes 2010), although it does not include the watershed and lands along the Colorado River that Native Americans once occupied. The Las Vegas Paiute Tribe today has 3,810 acres of land at the Snow Mountain Reservation (Las Vegas Paiute Tribe 2010) and 12.5 acres in downtown Las Vegas. The Fort Mojave Indian Tribe has more than 5,500 acres in the SE study area at the southern tip of Nevada.

3.5.3.2. Social and Cultural Conditions

Communities

Clark County spans 8,046 square miles in the southernmost part of Nevada within the Mojave Desert (BLM 2007). The county had a population of slightly fewer than 2 million in 2012, accounting for over 72 percent of the population of the state of Nevada (U.S. Census Bureau 2014). The county was established in 1909. Today, it is a major tourist destination, with close to 151,000 hotel and motel rooms in 2013 (LVCVA 2014). As in the rest of the state, gambling is legal in Clark County. The economy of Clark County is primarily based on tourism, gambling, and conventions, attracting over 37 million visitors most years based on visitation statistics from 2004 to 2013, and bringing in more than $8 billion per year during the same period (LVCVA 2014). Revenues from gaming-related tourism far exceed the revenues from natural attractions (Gregory, et al. 2010). The county houses Southern Nevada's higher education organizations, including the University of Nevada-Las Vegas, University of Nevada School of Medicine; University of Nevada School of Dental Medicine, College of Southern Nevada, and several others. Within Clark County, the primary communities that appear in the U.S. Census Bureau data and the Nevada State Demographer's data include the incorporated cities of Las Vegas, North Las Vegas, Boulder City, Henderson, and Mesquite (each is described below); there are a number of unincorporated towns and communities, as well.

Nye County is located in Southern Nevada directly west of Clark County, extending north to central Nevada and covering 18,175 square miles (BLM 2007). The county had an estimated population of 42,914 in 2012 (U.S. Census Bureau 2014). The population of the county has varied over time. The late 1800s and early 1900s marked the first population boom, resulting from mining. The first half of the 20th century showed a reduced population and population began to increase and stabilize in the 1950s when a nuclear test site was developed in the county. The population grew significantly toward the end of the 20th century as Pahrump became a bedroom community for Las Vegas. In recent years, the population has fluctuated up and down with changes in economic conditions. Today, the bulk of the population lives in the southern part of the county in and around Pahrump. The economy of Nye County is based primarily on service sector industries, comprising more than 73 percent of employment in the county in 2011 (EPS 2014). Traditional industries such as construction, farming, and mining constitute a smaller portion of the county's economy, estimated at just fewer than 15 percent in 2011, but the culture related to these industries remains influential in the county. Government employment in 2011 was 12.7 percent of all employment in Nye County. Government operations in the county include the Nevada National Security Site, on which the U.S. Department of Energy tests nuclear devices, the Yucca Mountain nuclear waste repository study site, which is currently inactive and has no associated employment in the SE study area but which could possibly be reactivated at some point in the future (General Accounting Office 2011), and several environmentally sensitive areas, including a wildlife refuge, national forests, and a national park. Nye County is one of 11 counties in Nevada where prostitution in brothels is legal. The primary communities that appear in the U.S. Census Bureau's data and the Nevada State Demographer's data include the unincorporated towns of Pahrump, Tonopah, Beatty, and Amargosa Valley, along with the less populated unincorporated towns of Gabbs, Manhattan, and Round Mountain. There are no incorporated cities in Nye County.

Population

The population of the SE study area, including all of Clark and Nye counties, was estimated to be just under 2 million in 2012 (U.S. Census Bureau 2014). In the same year, Clark County was

estimated to have 1.997 million people, accounting for nearly 98 percent of the population of the SE study area. Nye County was estimated to have close to 43,000 people in 2012, accounting for 1.6 percent of the population of the SE study area (U.S. Census Bureau 2014). The population of the SE study area has increased almost continuously since the 1970s, with the exception of a few, specific years (NV State Demographer 2014 and U.S. Census Bureau 2014). The populations of Nevada and the U.S. have increased steadily during the same period (U.S. Census Bureau 2014). Projections of the future population of the SE study area show expected growth in each county and the state. Table 3.58, "Population of the Study Area, 1970 to 2020" (p. 512)depicts population estimates and projections for the SE study area, state, and nation from 1970 through 2020.

Table 3.58. Population of the Study Area, 1970 to 2020[a]

Area	1970	1980	1990	2000	2005	2010	2015	2020
Clark County	273,288	463,087	770,280	1,394,440	1,796,380	1,968,831	2,091,895	2,209,526
Nye County	5,599	9,048	18,190	32,978	41,302	45,459	49,328	51,163
Study area	278,887	472,135	788,470	1,427,418	1,837,682	2,014,290	2,141,223	2,260,689
Nevada	488,738	800,508	1,236,130	2,023,378	2,518,869	2,724,634	2,901,522	3,069,268

[a]Sources: 1970 – U.S. Census Bureau 1970; 1980 – U.S. Census Bureau 1980; 1990 to 2005 – Nevada Department of Taxation 2009a; 2010 to 2020 – Nevada Department of Taxation 2011. Census counts 1970 – 2010, projections 2015 and 2020.

Since at least 1970, the populations of both Clark County and Nye County have grown at a faster rate than the population of Nevada, which has in turn grown at a faster rate than the population of the U.S. (EPS 2014, based on U.S. Census Bureau 2000 and 2012).

Table 3.59, "Absolute Population Increase in the Study Area by Decade, 1970 to 2020" (p. 512) shows absolute population growth by decade since 1970, including projected population growth to 2020. From 1970 to 2010, the population of Clark County grew by 620 percent, and Nye County grew by 712 percent, both exceeding the population growth of Nevada (457 percent) and the U.S. (52 percent) in the same time period (U.S. Census Bureau 2014). During the 1990s in particular, population in the SE study area expanded at an extremely rapid pace. That growth rate slowed during the 2000s due to the heavy local impact of a collapse in the housing industry, which spread through the U.S. and world economics, leading to decreased housing construction as well as decreased tourism and related employment. These decreases, in turn, also led to lower desirability of the SE study area as a place of permanent residence, resulting in a net decrease in population in 2008 and 2011 in Clark County, and in 2011 and 2012 in Nye County. In spite of those years of decline, population growth is expected to continue into the future. Growth rates are expected to be lower in the future in comparison with rates since 1970, which is typical of an increasing population because the growth rate is relative to total population.

Table 3.59. Absolute Population Increase in the Study Area by Decade, 1970 to 2020[a]

Absolute Growth	1970 to 1980	1980 to 1990	1990 to 2000	2000 to 2010	2010 to 2020
Clark County	189,799	307,193	624,160	574,391	240,695
Nye County	3,449	9,142	14,788	12,481	5,704
Study area	193,248	316,335	638,948	586,872	246,399

[a]Sources: 1970 – U.S. Census Bureau 1970; 1980 – U.S. Census Bureau 1980; 1990 to 2005 – Nevada Department of Taxation 2009a; 2010 to 2020 – Nevada Department of Taxation 2011. Census counts 1970 – 2010, projections 2015 and 2020.

Population growth of the cities and towns within Clark County and Nye County is shown in Table 3.60, "Study Area Population, 1990 to 2009 " (p. 513). According to the Nevada Department of Taxation, the city with the largest population in Clark County in 2013 was Las Vegas with approximately 30 percent of the population of the county followed by Henderson with 14 percent, North Las Vegas with 11 percent, and Mesquite and Boulder City, each with less than 1 percent (Nevada Department of Taxation and Nevada State Demographer 2014). In Nye County in the same year, the largest was Pahrump with an estimated 83 percent of the total population of the county followed by Tonopah with 6 percent, Amargosa with 3 percent, Beatty with 2 percent, Round Mountain with less than 2 percent, and Gabbs and Manhattan, each with less than 1 percent (Nevada Department of Taxation and Nevada State Demographer 2014). The ranking of cities in terms of population has remained relatively consistent from 1990 to 2013. Since 1990, the population of all Clark County cities and towns has increased significantly. In Nye County during the same period, the population of Pahrump has steadily increased, whereas the populations of some cities and towns have decreased, either temporarily or persistently.

Table 3.60. Study Area Population, 1990 to 2009 [a]

County	City / Town	1990	1995	2000	2003	2006	2009
Clark	**—**	**770,280**	**1,055,435**	**1,394,440**	**1,796,380**	**1,968,831**	**2,031,723**
	Boulder City	12,760	14,090	14,906	15,203	15,359	15,635
	Henderson	69,390	115,412	179,144	241,134	267,270	274,270
	Las Vegas	268,330	367,375	482,389	569,838	586,536	598,520
	Mesquite	1,960	5,166	10,101	16,423	20,440	17,477
	North Las Vegas	50,030	78,310	117,650	180,219	217,482	226,199
Nye	**—**	**18,190**	**23,882**	**32,978**	**41,302**	**43,946**	**44,749**
	Amargosa	N/A	N/A	1,167	1,383	1,442	1,342
	Beatty	N/A	N/A	1,152	1,032	893	966
	Gabbs	670	373	330	312	294	259
	Manhattan	N/A	N/A	124	124	129	124
	Pahrump	N/A	N/A	24,235	33,241	36,538	37,030
	Round Mountain	N/A	N/A	1,039	744	779	822
	Tonopah	N/A	N/A	2,833	2,607	2,405	2,593
Study area		**788,470**	**1,079,317**	**1,427,418**	**2,901,947**	**3,164,354**	**3,253,722**

[a]Source: Nevada Department of Taxation and Nevada State Demographer; accessed by Julie A. Suhr Pierce; < http://tax.nv.gov/>; (June 2014). City/Town populations do not total 100 percent of county populations because there are populations that are outside of the cities and towns. Data are not available for areas and years noted with "N/A", which stands for "not available".

Just over 37 percent of the population growth in the SE study area from 2010-2012 was due to positive net migration into the area, from both domestic and international sources. More people moved out of Nye County than in, but migration into Clark County more than offset the decrease in Nye County's population. Natural change accounted for over 63 percent of all population increase with positive growth in Clark County and negative growth in Nye County where there were more deaths than births during the period reported.[11]

A comparison of several demographic characteristics of Clark County, Nye County, the state of Nevada, and the U.S. is shown in Table 3.61, "Demographics Overview of SE Study Area

[11] U.S. Census Bureau 2014 U.S. Census Bureau; PEPTCOMP, Estimates of the Components of Resident Population Change: April 1, 2010 to July 1, 2012, Population Estimates; generated by Julie A. Suhr Pierce; using American FactFinder; <http://factfinder2.census.gov>; (June 2014).

Compared to State and Nation ” (p. 514), depicting various elements of the socioeconomic makeup of the SE study area. The male-to-female ratio is similar for all geographies, with slightly more males than females in both Nevada and the SE study area (U.S. Census Bureau 2014). The median age and percentage of the population over 65 years for Clark County is similar to the state and nation.

Table 3.61. Demographics Overview of SE Study Area Compared to State and Nation [a]

Area	Sex		Age (years)		Average family size	Education (degrees)		Language other than English*
	Male	Female	Median	Over 65		Sec-ondary	Post-sec-ondary	
Clark County	50.3 percent	49.7 percent	35.3	12.3 percent	3.41	83.9	22.0	33.3
Nye County	50.7 percent	49.3 percent	48.1	25.7 percent	2.72	83.2	13.9	12.5
Nevada	50.4 percent	49.6 percent	36.3	13.1 percent	3.33	84.5	22.2	29.4
U.S.	49.2 percent	50.8 percent	37.0	13.7 percent	3.24	85.9	28.6	20.8

[a]Sources: U.S. Census Bureau; QuickFacts for Nevada, Clark County, and Nye County; accessed by Julie A. Suhr Pierce; <http://quickfacts.census.gov/qfd/>; (June 2014). U.S. Census Bureau; American Community Survey, 2010-2012 American Community Survey 3-Year Estimates, Table DP02, Selected Social Characteristics in the United States; generated by Julie A. Suhr Pierce; using American FactFinder; <http://factfinder2.census.gov>; (June 2014). Economic Profile System; Clark County and Nye County Profile of Demographics; generated by Julie A. Suhr Pierce; (May 2014).
*Indicates that a non-English language is spoken at home. Nye County language data obtained from EPS.

As depicted in Table 3.62, “Population by Race in the SE Study Area ” (p. 514), the majority of the population in the SE study area (67.1 percent) self-identifies as White, with Nye County having a higher percentage of Whites (88.6 percent of the population of the county) and Clark County having a lower percentage (66.6 percent), comparatively speaking (U.S. Census Bureau 2010-2012). The proportional population of each minority group, including Hispanics, is much lower in Nye County than in Clark County. Clark County has a considerably higher Hispanic population, on a percentage basis, than does the U.S. as a whole.

Table 3.62. Population by Race in the SE Study Area [a]

Area	Clark County		Nye County		Study area		Nevada		U.S.	
	Popula-tion	Percent	Popula-tion	Percent	Popula-tion	Percent	Popula-tion	Percent	Popula-tion	Percent
White	1,314,966	66.6 percent	38,442	88.6 percent	1,353,408	67.1 percent	1,946,942	71.4 percent	230,706,254	74 percent
Black / African Ameri-can	208,180	10.5 percent	999	2.3 percent	209,179	10.4 percent	222,937	8.2 percent	39,200,957	12.6 percent
Ameri-can In-dian / Alaska Native	11,291	0.6 percent	1,030	2.4 percent	12,321	0.6 percent	29,776	1.1 percent	2,555,284	0.8 percent
Asian alone	173,152	8.8 percent	619	1.4 percent	173,771	8.6 percent	200,412	7.3 percent	15,157,542	4.9 percent

Area	Clark County		Nye County		Study area		Nevada		U.S.	
	Population	Percent	Population	Percent	Population	Percent	Population	Percent	Population	Percent
Native Hawaiian / Pacific Islander	13,754	0.7 percent	209	0.5 percent	13,963	0.7 percent	17,227	0.6 percent	526,513	0.2 percent
Some other race	166,513	8.4 percent	1,452	3.3 percent	167,965	8.3 percent	201,396	7.4 percent	14,728,936	4.7 percent
Two or more races	86,180	4.4 percent	646	1.5 percent	86,826	4.3 percent	108,881	4.0 percent	8,733,883	2.8 percent
Hispanic[b]	582,618	29.5 percent	6,007	13.8 percent	588,625	29.2 percent	734,645	26.9 percent	51,866,988	16.6 percent

[a]Source: U.S. Census Bureau; American Community Survey, 2010-2012 American Community Survey 3-Year Estimates, Table DP05; generated by Julie A. Suhr Pierce; using American FactFinder; <http://factfinder2.census.gov>; (June 2014).
[b]Hispanic population is an additional designation, not a race designation; the Hispanic population includes multiple races.

According to the U.S. Census Bureau (2014), the median income of Nye County is considerably lower than that of Clark County, the state of Nevada, and the U.S. The median family income and the per capita income of Clark County are very close to that of the state, which is not surprising given the Clark County makes up a very high proportion of the total population of Nevada. Nye County values are significantly lower than those for Clark County, the state, or the U.S. The percentage of families and individuals below the poverty line is higher for Nye County than for Clark County, the state of Nevada, or the U.S., while poverty levels in Clark County are similar to those in the state of Nevada and slightly less than the nation. Table 3.63, "Income Levels in the SE Study Area " (p. 515) shows these numbers as averages for the most recent U.S. Census reporting period.

Table 3.63. Income Levels in the SE Study Area [a] [b]

Income level	Clark County	Nye County	Nevada	U.S.
Median family income	$50,943	$40,022	$50,949	$51,771
Per capita income	$25,380	$22,307	$25,815	$27,385
Families below poverty level	12.3 percent	14.4 percent	11.9 percent	11.6 percent
Individuals below poverty level	16.1 percent	19.5 percent	15.8 percent	15.7 percent

[a]All dollar values are in 2012 inflation-adjusted dollars; percentages are percent families/individuals whose income was below the poverty level in the past 12 months from the time of measurement.
[b]Source: U.S. Census Bureau 2006-2008.

Housing

U.S. Census Bureau data (2014) show that housing types in Clark County are similar to the state and U.S., with the majority of houses being single-unit detached, and small percentages of single-unit attached and mobile home units (Table 3.64, "Housing in the SE Study Area" (p. 516)). Nye County has a considerably lower percentage of single-unit detached houses and a remarkably higher percentage (nearly half) of mobile homes when compared to Clark County. This relatively high percentage of mobile homes in Nye County is reflective of the fact that land is less expensive and it is relatively fast and inexpensive to install mobile homes (Osborne, et al. 2010). The

median value of homes in Clark County is around $5,000 lower than the median home value for Nevada and around $18,000 lower than the median home value for the U.S. as a whole.

Table 3.64. Housing in the SE Study Area[ab]

Housing Unit Types	Clark County		Nye County		Nevada		U.S.
	Estimate	Percent	Estimate	Percent	Estimate	Percent	Percent or $
Total housing units	845,485	N/A	22,197	N/A	1,179,007	N/A	132,114,283
1-unit, detached	487,841	57.7 percent	11,408	51.4 percent	690,818	58.6 percent	61.6 percent
1-unit, attached	40,811	4.8 percent	267	1.2 percent	56,809	4.8 percent	5.8 percent
Mobile home	29,067	3.4 percent	8,987	40.5 percent	72,119	6.1 percent	6.5 percent
Median value (dollars)	$156,500	N/A	$97,600	N/A	$161,300	N/A	$174,600

[a]All dollar values are in 2012 inflation-adjusted dollars. Percentages are percent of total housing units; not all housing unit types are shown.

[b]Source: U.S. Census Bureau; American Community Survey, 2010-2012 American Community Survey 3-Year Estimates, Table DP04, Selected Housing Characteristics; generated by Julie A. Suhr Pierce; using American FactFinder; <http://factfinder2.census.gov>; (June 2014).

Social Organization and Institutions

There are various government entities, institutions, social organizations, and interest groups that are stakeholders in the management processes and decisions associated with the development and implementation of this RMP. The social organizations and institutions that have been identified in initial phases of the RMP revision process are listed in the Socioeconomic Baseline Report.

Attitudes and Beliefs

The Socioeconomic Baseline Report identified many organizations that are stakeholders to the use and management of BLM public lands. Stakeholder organizations and individuals have widely varying interests in the use and management of these lands. It is possible and useful to identify different categories of stakeholders that reflect different linkages people have to public lands. Different types of stakeholders can also be characterized by distinct sets of attitudes, beliefs, values, opinions, and perceptions about public resources and the effects of various management policies and actions.

The social impact analysis that will be conducted later in the planning process will use categories of stakeholders as one means of identifying impacts of management actions under each alternative. The analysis will be written in terms of impacts to the interests and values associated with a particular stakeholder category.

Based on comments made during the public scoping period, the broad categories of stakeholders listed within this section have been identified. Categorization of stakeholders is not meant to imply that all individuals and social groups fit neatly into a single category; many specific individuals or organizations may have multiple interests and would see themselves reflected in more than one stakeholder category.

Land Development Stakeholders

Land development stakeholders are proponents for additional development of public lands to accommodate growing communities, utility corridors, renewable energy development, and other uses. Some members of this group feel that no new areas of critical environmental concern (ACECs) should be designated because an ACEC restricts uses. This group of stakeholders would like to see BLM analyze impacts to land owners and growing communities as part of the decision-making process.

Recreational Land Use Stakeholders

There are many types of recreational activities in the planning area. The primary concern of recreational land use stakeholders is the potential loss of tracts of land that could otherwise be used for recreational use. Recreational land use stakeholders believe there should be more and improved trails, including hiking, equestrian, and single-track motor vehicle trails, and that more access should be created for off highway vehicles (OHV). A large group within this stakeholder category is concerned with OHVs, including area and route designations, and other matters affecting OHV use. OHV activity is highly valued by many in the community, as depicted through one stakeholder's request of BLM to "Protect the off-roading cultural tradition in Nevada" (BLM 2010b, Cox).

These stakeholders perceive conflict between recreation and solar and wind energy development, particularly in areas with OHV use, and some people would like to see restrictions on land disposal and energy development so that recreation activity can occur and potentially grow. This group of stakeholders also tends to believe that certain habitat areas that are under protection do not need to be protected, particularly areas that might otherwise be used for OHV use. A number of people believe that recreation activities contribute positively to the economy and would like BLM to consider the economic impacts of all recreation uses.

Motorized Land Access Stakeholders

Motorized land access stakeholders are interested in having admittance to routes (roads, trails, and rights-of-way) that provide access to and within the planning area. Specifically, these stakeholders are interested in motorized access to recreational resources, wildlife, scenic viewing, and proposed renewable energy sites, as well as access for people of all ages and people with handicaps. Some members of this group believe that additional routes, motorized access, road and trail systems, and/or additional signage and maps are necessary for effective transportation management.

Renewable Energy Stakeholders

Renewable energy proponents support use of BLM public lands for solar and wind energy development. This group of stakeholders sees renewable energy as an important part of the development of the area. Supporters of renewable energy development believe that criteria can be developed to determine appropriate locations for solar and wind projects, which would advance renewable energy production while minimizing negative impacts.

Resource Conservation Stakeholders

Resource conservation stakeholders have concerns over land, water, air, and soil resources, and many have concerns about fish and wildlife. In general, these stakeholders would like to see BLM public lands preserved for existing uses rather than being disturbed for uses such as increased motorized access and renewable energy. People in this stakeholder group tend to be

against additional disposal of public lands, believing among other things that disposal of land and attendant development will create too great a demand on already limited water resources. These stakeholders believe that existing ACECs should be maintained and that new ACECs should be considered to protect the habitats of desert tortoises, other sensitive species, and rare plants. They would like to see increased protection and management of wilderness lands and consideration of certain river segments for wild and scenic river designation.

Regarding motorized access, this group of stakeholders believes that the existing roads and trails are too invasive and should be reduced and/or restricted, particularly in areas with sensitive resources. They believe that OHV access should be limited or removed entirely in some areas. To alleviate resource damage and user conflicts, this group of stakeholders would like to see BLM improve recreation management by improving user education, increasing law enforcement, improving signage and maps, and implementing increased route designations.

Rural Community Stakeholders

These stakeholders are concerned with preservation of the custom and culture associated with small, rural communities. There are many such communities within the planning area. For example, in northeast Clark County, the collective population of the rural communities of the Moapa Valley (Logandale-Overton), Moapa-Glendale, and Bunkerville totals approximately 9,000 people. Rural communities have experienced both population attrition and rapid growth at different times in recent decades. Though employment opportunities in these locations are largely retail and small businesses, the residents of these communities strongly identify with the historic rural lifestyle of mining, ranching, and farming. Many of the residents are fourth- and fifth-generation descendants of the first settlers of European origin in the region. The vision of many of these stakeholders is for the federal government to play a minor role in the management of public lands and for few restrictions in accessing public lands. Some believe that all public land in the planning area should be either state- or privately owned. This viewpoint is not shared by all residents of the rural communities in the planning area; some are more comfortable with federal ownership and management of public lands. Among rural community stakeholders, some have strong concerns about wildlife and sensitive resources. Others are more concerned about issues related to access to public lands for human-centered uses. Impacts from bursts of rapid urbanization in the region, including both environmental and social changes, are of concern to a broad cross-section of rural community members within the planning area; attitudes regarding how best to address those concerns are varied and sometimes controversial.

Cultural Resource Protection Stakeholders

Cultural resources of interest to this stakeholder group include items and areas of cultural and historic value, such as archaeological sites, old mines, cabins, settlements, and other features used by early pioneers of the area. Stakeholders concerned with cultural resource protection suggest taking an inventory of the archeological and cultural resources in the area and request that historic sites be protected from damage and preserved for educational, scientific, and traditional purposes.

Tribal Stakeholders

Within the planning area, there are multiple tribal entities with which the U.S. federal government maintains a special legal relationship. Each local tribe has its own interests in the lands included in Southern Nevada. Tribes in the area include the Southern Paiutes, the Mohaves, the Las Vegas Paiute Tribe, the Moapa Band of Paiutes, and the Ft. Mojave Indian Tribe. Additional tribal groups with an interest in the planning area include the Colorado River Indian Tribes,

the Quechan, the Hualapai, the Western Shoshone, the Timbisha Shoshone, the Chemehuevi, and multiple Southern Paiute bands in the region. Indigenous uses of plant materials, hunting, ceremonial activities, and so on are just a few of the Native American uses of public lands within the region in and around the planning area.

3.5.3.3. Employment Trends

As of early 2014, variations in economic conditions have affected the economies of Clark and Nye counties in similar ways. An initial downturn in multiple economic variables was followed by stabilization and some recovery. Employment has followed this same pattern. A decline in total employment in the initial phases of the 2007 to 2009 recession was followed by stabilization and a modest increase in subsequent years.

From 2001 to 2011, total employment in Clark and Nye counties increased by approximately 22 percent. During the same period, multiple natural resource-related employment sectors saw declines in overall employment numbers, with percent changes ranging from -3.2 percent for forestry, fishing, and related activities to -38 percent for construction. Forestry, fishing, and related activities comprise a very small number of workers within the study area (estimated at 378 in 2011). In contrast, construction makes up a much larger portion of overall employment in the same region. In 2011, there were approximately 48,750 jobs in the construction industry in Clark and Nye counties combined. Although construction is not directly related to BLM land management decisions, raw and processed materials for construction are extracted from BLM lands and so are connected to BLM land management. Because of the importance of construction to the Las Vegas area's economy, alternatives in which closure of community sources of sand, gravel, decorative and structural rock, and other construction-related minerals were dismissed from further consideration in this analysis. In contrast with declining employment sectors, mining within the counties that contain the study area saw an increase in employment of 47.7 percent from 2001 to 2011.

3.5.3.4. Economic Restructuring and Change

During recent years, there have been changes in the makeup of overall economic activity within Clark and Nye counties. Increases in activity in the education and business management sectors of the economy have not been matched by other sectors such as wholesale and retail trade, tourism-related businesses, and information technology. In spite of slower growth, the accommodation and food services, retail trade, and government sectors remained central to the area's economy, comprising the three sectors with the largest number of workers in the two-county area.

3.5.3.5. Economic Well-Being

In general, economic well-being within the study area as measured by employment and income has mostly stabilized since the recession. When examined by individual employment sectors, the area is characterized by contrasts between the large numbers of lower-wage workers in the Las Vegas entertainment and tourism industries and the much smaller numbers of workers in other industries. In 2011, for example, the average annual personal income per job in the management sector was more than $115,000. In contrast, the average annual personal income per job in the combined accommodation and food services and arts, entertainment, and recreation industries was approximately $36,650. Given that in 2011 there were almost 268,000 more accommodation and

entertainment industry workers in Clark and Nye counties combined than managers of companies and enterprises, the difference in income per job implies that there would be a proportional difference in the economic well-being of workers in these sectors, respectively.

Although overall employment and income have stopped declining and have recovered to some degree since the recession, one aspect of economic well-being that continues to lag behind is home values. When the housing industry bubble burst, Las Vegas was hit much harder than most other areas of the U.S. A higher percentage of homes in the Las Vegas area were suddenly "under water" than in the majority of other communities. A home that is under water is a home that is worth less than is owed on it. Homes that are worth less than their mortgages represent a loss of wealth as well as corresponding with an increased probability of the owner either choosing to or being unable to make scheduled payments on the home's mortgage. In 2009 and 2010, out of all cities in the U.S., Las Vegas had the highest percentage of home mortgages foreclosed with 1 out of 9 properties entering foreclosure. As of the end of 2013, Nevada remained one of the top states for foreclosures, indicating that distressed properties continue to create shifts in economic well-being among residents.

3.5.3.6. Direct BLM Contributions to Area Economic Activity

BLM lands in the region provide a source of income to the state of Nevada through payment in lieu of taxes (PILT) payments, and BLM-permitted activities provide incomes as well as sources of economic activities through various activities in natural resource-related industries. Another way in which BLM contributes to the economy of the study area is through employee salaries and their personal expenditures within the Southern Nevada region.

The key industries sections below give an overview of the relationship between these economic sectors and BLM lands within the study area.

3.5.3.7. Key Industries in the Planning Area Affected by BLM Management

3.5.3.7.1. Agriculture and Livestock Production

Although agriculture was once a predominant economic force within the study area, especially within Nye County, in recent years most agricultural operations have been discontinued and the associated water rights and land have been sold for housing, commercial, or industrial development. Since 1969, all grazing allotments in Clark County have been managed as ephemeral grazing allotments, meaning that forage is not available every year. Of the 52 grazing allotments within the planning area, grazing has been authorized on only three during the past decade. Stocking rates have varied on an annual basis as forage conditions have fluctuated over time. The average value of production per animal unit month (AUM) from 2005 to 2009 is estimated as $47.42 in 2013 dollars. The average total nominal annual value for the authorized 353 AUMs on the permitted allotments has been $15,600 in recent years.

3.5.3.7.2. Forest and Woodland Products

Forests of any type comprise only a small portion of the total land included in the study area. Due to the presence of sensitive species and the fragility of the arid forest ecosystems in the region, there is only minimal authorized harvesting and use of forest products within the study area. These are generally limited to personal uses with seasonal restrictions. Although there

is increasing demand for cactus and yucca plants in the area, BLM allows collecting of these plants only under salvage circumstances where lands are being disposed of or where disturbance activities are planned within rights-of-way. Contracts for cactus and yucca sales declined during the past decade. Commercial collection of native seed and plant materials from public lands is an authorized use within BLM-designated collection zones where collection activities are compatible with other resource uses and designations.

3.5.3.7.3. Minerals

Minerals found on BLM-managed lands or that are under BLM management fall within three categories: Leasable minerals, locatable minerals, and saleable minerals (also referred to as mineral materials). Leasable minerals are divided into fluid and solid. Fluid leasables include oil, gas, and geothermal resources. Solid leasables include coal, phosphate, potash, and sodium. Locatable minerals include hard-rock minerals such as gold, silver, and other minerals found in specific deposit locations. Saleable minerals include materials commonly used in building and construction projects. These include sand, gravel, stone, clay, and so on.

BLM manages surface minerals as well as managing subsurface rights to minerals that are found under lands owned by someone other than BLM but where the subsurface mineral estate has remained under BLM management. Mineral exploration and production provide revenue for an array of entities ranging from individuals up to large, multi-national corporations. Although there has been some degree of exploration for various minerals within the study area, minimal extraction has resulted. One reason for this is the past application of no surface occupancy rules in desert tortoise habitat areas. As those rules are refined and revised, there may be increasing opportunities for accessing and extracting liquid leasable minerals.

The majority of oil production in the state of Nevada occurs within Nye County, but it falls outside the planning area. Liquid leasables are known to exist within the study area, but few of the parcels proposed for new leases have been advanced to bidding or leasing to date. At the present time, there are no known economically viable solid mineral leasables within the study area. There are multiple active and pending locatable mineral plans of operation and notices within the study area. Because locatable minerals do not generate payments to the federal government, it is difficult to estimate the value of existing and proposed mining operations. Saleable minerals are sold to the public by BLM at fair market value but are made available to states, counties, and other government entities, as well as to nonprofit organizations on occasion, free of charge. The study area is the leading source of saleable minerals in all of BLM nationwide, generating more than 50 percent of all BLM revenue from the sale of mineral materials. In 2006, BLM within the planning area realized sales of materials valued at more than $7 million. The demand for these materials fluctuates with the construction industry. Accordingly, demand has fallen as construction activity in the Las Vegas area has decreased. It is expected that the demand for these materials will eventually recover and will continue to grow over time. Because of the importance of saleable minerals to the Las Vegas economy, proposed RMP alternatives that would have included closing the Lone Mountain community pit on the northwest edge of the Las Vegas Valley were dismissed from further consideration.

A current Reasonably Foreseeable Development report does not exist for minerals within the study area.

3.5.3.7.4. Lands and Realty

BLM is responsible for disposal of agency-owned land that is either isolated, difficult to manage, or important to a local community or its citizens for expansion or economic activities. BLM also makes determinations and designations regarding special land management categories, such as ACECs, which constitute non-military withdrawals from general multiple use. When categorized under a special designation, a land unit is no longer available for settlement, sale, location, or entry, including actions under the general mining and mineral leasing laws. In addition, BLM authorizes rights-of-way for utilities and transportation corridors of various types. Power lines, telephone lines, water facilities and pipelines, oil and gas pipelines, communication sites, and roads and highways, along with other types of corridors and sites, often require authorization to cross BLM-managed public lands. Although multiple rights-of-way already exist on BLM lands within the planning area, the expected development of new transmission facilities to meet increasing demand for electricity and other types of utilities necessitates the establishment of new utility corridors through BLM lands in Southern Nevada. The siting of these new corridors is included in this planning process. BLM also leases lands to individuals and corporations for a variety of commercial uses such as commercial filming, installation of billboards, construction staging areas, etc.

3.5.3.7.5. Public Finance

Activities on BLM lands and BLM land management decisions affect local, county, state, and federal government finances. Various types of taxes, royalty payments, fees, payments in lieu of taxes, and other revenues can increase or decrease depending on changes in uses of BLM lands. Mineral extraction, energy and utility development, recreational use, and tourism all play roles in the overall generation of government tax and fee revenues. Conversely, public lands are associated with demand for government services such as emergency medical services, law enforcement, search and rescue, road maintenance, firefighting, and special service district activities such as weed control and water resource development, and so on.

3.5.3.7.6. Renewable Energy

Within the study area, numerous applications for solar, wind, and geothermal energy production projects are either pending or have been approved. As these projects become economically viable over time, the number of jobs and other economic activity that they may generate is expected to increase. Multiple studies have been conducted to determine the prospects for commercial generation of power through the use of renewable energy sources, but only a handful of projects have been pursued beyond the initial study phase.

3.5.3.7.7. Special Status Species

The presence of the desert tortoise, and efforts to protect and conserve the species, has had an extensive impact on land management decisions and economic values within the study area in the past. As efforts to refine and improve land-use management within tortoise habitat move forward, there may be increased opportunities for economic development and the pursuit of possible minerals-related enterprises on BLM land in the region. BLM management decisions will be informed by the habitat requirements of the tortoise and other special status species, which will impact available activities.

3.5.3.7.8. Special Designations

BLM classifies certain land areas under special designations such as visual resource management (VRM class) areas, areas of critical environmental concern (ACECs), special recreation management areas (SRMAs), wilderness study areas, wild and scenic rRivers, and so on. Designation under one or more of these categories can affect the degree of restrictions on economic activities within that area. On the other hand, some designations will increase interest in and use of a specific area, especially if the designation calls attention to specific attractive features of that location that are valuable for recreation, tourism, or other activities.

3.5.3.7.9. Travel and Transportation

Many miles of freeways, highways, local paved roads, dirt roads, and recreational trails cross BLM lands within the study area. Most relevant to BLM land management decisions are OHV areas and the management of travel within those areas. OHV areas are classified as open, limited to existing, limited to designated, or closed. The classification of a specific area within one of these categories will play a role in what types of users frequent the area. Designations of travel management areas place restrictions on use and can potentially affect its attractiveness to various types of visitors and users.

3.5.3.7.10. Wild Horses and Burros

Although there is a limited population of wild horses and burros within the study area, management decisions regarding them are important to many people, even some who will never see them on the range in person: by extension, high interest in wild horses and burros and their management is an indication of their value to society.

3.5.3.7.11. Nonmarket Values

In addition to generating economic activity in specific, well-defined markets with prices and definable dollar values, activities on BLM public lands also generate benefits and impacts that are not direction connected with market transactions, are not measured in dollars, and are not obviously connected with existing markets or economic structures. Although nonmarket values are usually more difficult to measure than market-based values, they constitute an important component of the overall value of BLM lands to society. Examples of nonmarket values include the enjoyment of a scenic view, non-fee use of lands for active recreation purposes, happiness generated by knowing that there are areas in existence where there has been minimal disturbance by human beings, and so on are not directly traded in any market, yet they contribute to socioeconomic well-being.

While they themselves are not bought or sold in any specific market, the existence of certain natural features, such as open space and views judged as being particularly beautiful, can and do contribute to other values that are traded in markets. Examples include higher values for real estate properties with adjacent open public lands or beautiful scenery, higher fees for touring companies that take visitors to national parks or other lands with special designations as opposed to simple bus transportation, and so on. Money expended to access public lands can be used as a proxy for the value of the nonmarket benefits obtained by visitors. Using this method of valuation, estimates for the value of multiple recreational experiences have been developed by researchers and can be used to estimate a portion of the nonmarket benefits of access to public lands, in dollar terms.

3.5.3.7.12. Tribal Interests

As mentioned above, multiple tribes have a presence in or near the study area and have an interest in aspects of the management decisions that will be made. Among the issues of particular interest to tribal groups are: Access to BLM lands for traditional food, fiber, cultural, and religious purposes, including medicinal plants, native food sources, and other plant and animal resources; and potential impacts to sites of special value to Native American culture such as archaeological sites, sacred sites, and traditional cultural properties. Tribal interests in land units are not limited to reservation lands and extend into off-reservation areas within the region.

3.5.3.7.13. Recreation

There are three main categories of permitted recreation activities on BLM-managed public lands within the planning area: Dispersed recreation, developed recreation, and special recreation permitting. In the entire planning area, OHV use is the major dispersed use of public lands. Additional uses include hunting, hiking, mountain biking, photography, automobile touring, backpacking, bird watching, target shooting, model rocket launching, camping, rock hounding, and visiting archaeological sites. Developed sites provide a more structured recreational experience for visitors and serve to concentrate and manage impacts from visitation. Uses requiring special recreation permits include various types of individual and organized group activities and events. Public lands accommodate commercial uses that can be permitted for up to 10 years with the opportunity for annual renewal. Outfitters, guides, vendors, recreation clubs, and commercial competitive events are some of the types of users that BLM permits to use public lands in a manner that generates economic activity within a structured use system.

Socioeconomic contributions of recreation to residents of the study area as well as to visitors from outside include enhanced quality of life and enjoyment of time spent in outdoor activities. Recreation-related economic activity is generated in the local area through daily expenditures on recreation and tourism-related fuel, food, and lodging, hiring guides or outfitters, spending on equipment and machines, as well as spending on fees and other individual activity and event-related costs.

Management of BLM lands with the objective of maintaining and enhancing the experience for current and future visitors leads to increased value of public lands over time. High-quality outdoor experiences depend on access to lands that are compatible with and managed for specific uses, and the socioeconomic contribution of those lands to the surrounding region depends, in turn, on visitors' ongoing, continued desire to visit those same public lands. Over time, the number of visitors to specific sites fluctuates, as does the number of participants in specific outdoor recreation activities. The number of participants in some activities has dwindled in recent years while participants in other activities have increased many times over. Day users of BLM lands around (but not including) Red Rock Canyon National Conservation Area are estimated to have made approximately $4.5 million in recreation-related expenditures during fiscal year 2006. These types of spending not only generate additional local economic activity through secondary spending, they also serve as an indication of the value to visitors of the outdoor recreation experience they obtain through use of BLM-managed public lands.

3.5.3.8. Environmental Justice

The concept of environmental justice (EJ) first became a required consideration for federal agencies with the publication of Executive Order (EO) 12898 on February 11, 1994. The EO requires each federal agency to "make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations" (EO 12898, §59 *Federal Register* 7629, 1994).

In order to address EJ considerations in the BLM planning context, a screening analysis of the appropriate socioeconomic study area for the planning action is required to identify if any "EJ populations" are present. If present, attention is needed in the planning process to determine whether there are any disproportionately high and adverse impacts to those populations, and if so, to take measures to avoid or mitigate those impacts.

The Socioeconomic Baseline Report discusses the technical definitions used in identifying EJ populations, and the definition of "disproportionately high and adverse" effects. It also provides detailed tables with the results of the screening analysis.

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Chapter 4. Environmental Consequences

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4.1. How to Read This Chapter

Chapter 4 presents the direct, indirect, and cumulative impacts on the human and natural environment in terms of environmental, social, and economic consequences that are projected to occur from implementing the alternatives presented in Chapter 2.

Impact analyses and conclusions are based on interdisciplinary team knowledge of the resources and planning area, information provided by experts in the BLM or other agencies, and information contained in pertinent literature. The baseline used for the impact analysis is the current condition or situation, as described in Chapter 3, Affected Environment. Analysis assumptions have also been developed to help guide the determination of effects (Section 4.1.1, "Analytical Assumptions" (p. 529)). Because the proposed RMP/EIS provides a broad management framework, the analysis in this chapter represents best estimates of impacts because exact locations of development or management are often unknown. Impacts are quantified to the extent practical with available data. In the absence of quantitative data, best professional judgment provides the basis for the impact analysis.

The land-use planning-level decisions that the BLM will make regarding this RMP are programmatic decisions based on analysis that can be conducted only on a broad scale. Because of the broad scope, the impact analysis of planning-level decisions is speculative with respect to projecting specific activities. Subsequent documents tiered to this RMP would generally contain a greater level of detail and would be subject to NEPA analysis and compliance. Subsequent tiered activity- and project-level plans are more definitive than plans found in an RMP. An activity-level plan typically describes in detail projects that will lead to on-the-ground action and are traditionally focused on single-resource programs. A project-specific plan is typically prepared for an individual project or several related projects. Activity plans (such as travel management plans) are generally more site specific and less speculative than the RMP analyses. Project-level plans (such as stream restoration) contain specific proposed actions, and a site- or area-specific analysis is conducted. Activity plans may contain information that is as detailed or specific at a project level.

4.1.1. Analytical Assumptions

Several assumptions were made to facilitate the estimation of the effects of the alternatives. These assumptions are made only for the purpose of analysis and do not represent potential RMP decisions. The assumptions provide reasonably foreseeable projected levels of development that could occur within the planning area. These assumptions should not be interpreted as constraining or redefining the management objectives and actions proposed for each alternative described in Chapter 2. Following are the general assumptions applicable to all resource categories. Any specific resource assumptions are provided in the Methods of Analysis subheading for that resource.

- Sufficient funding and BLM personnel would be available for implementing the final decision.
- Implementing actions from any of the RMP alternatives would comply with all valid existing rights, federal regulations, BLM policies, and other requirements.
- Local climate patterns of historic record and related conditions for plant growth would continue.
- The functional capability of all developments would be maintained.
- The discussion of impacts is based on the best available data. Knowledge of the planning area and professional judgment, based on observation and analysis of conditions and responses in similar areas, are used to infer environmental impacts where data are limited.

- Acreage figures and other numbers used in the analyses are approximate projections for comparative and analytic purposes only. Readers should not infer that they reflect exact measurements or precise calculations.
- Acreages were calculated using GIS technology, and there may be slight variations in total acres between resources. These variations are negligible and will not affect analysis.

4.1.2. Types of Effects

Direct, indirect, and cumulative impacts are considered in this effects analysis, consistent with direction provided in 40 CFR 1502.16. Direct impacts are caused by an action or implementation of an alternative and occur at the same time and place. Indirect impacts result from implementing an action or alternative but are usually later in time or removed in distance and are reasonably certain to occur. Cumulative effects are defined below in Section 4.1.3, "Cumulative Impacts" (p. 530).

Effects are quantified where possible, primarily by using GIS applications. In the absence of quantitative data, best professional judgment prevailed; impacts are sometimes described using ranges of potential impacts or in qualitative terms. The standard definitions for terms referring to impact duration that are used in the effects analysis are as follows, unless otherwise stated:

- **Short-Term Effect:** The effect occurs only during or immediately after implementation of the alternative. For the purposes of this RMP, short-term effects would occur during the first five years.
- **Long-Term Effect:** The effect could occur for an extended period after implementing the alternative. The effect could last several years or more and could be beneficial or adverse. For the purposes of this RMP, long-term effects would occur beyond the first five years and perhaps over the life of the RMP.

4.1.3. Cumulative Impacts

Cumulative effects are defined as the direct and indirect effects of a proposed project alternative's incremental impacts when they are added to other past, present, and reasonably foreseeable actions, regardless of who carries out the action (40 CFR Part 1508.7). Guidance for implementing NEPA (Public Law 91-190, 1970) requires that federal agencies identify the timeframe and geographic boundaries within which they will evaluate potential cumulative effects of an action and the specific past, present, and reasonably foreseeable projects that will be analyzed. Effects of past actions and activities on resources are manifested in the current condition of the resource, which is described in Chapter 3, Affected Environment, for resources on BLM-administered lands.

For this EIS, the cumulative impact assessment timeframe is from approximately 1998 to 2025, with some exceptions where additional past data are available. This encompasses a range within which data are generally available and forecasts can be reasonably made. This analysis is provided for each resource. It is general because decisions about other actions in the planning area would be made by many public and private entities, and the location, timing, and magnitude of these actions are not well known.

Public documents and data prepared by federal, state, and local government agencies are the primary information sources for past, present, and reasonably foreseeable future actions and for identifying reasonable trends in resource conditions and land uses. Actions undertaken by private persons and entities are assumed to be captured in the information made available by such

agencies. Actions included in the cumulative impact analysis do not affect all resources equally; some resources would be affected by several or all of the described activities, while others would be affected very little or not at all. The actions that make up the cumulative impact scenario were analyzed in conjunction with the impacts of each alternative to determine if they would have any additive or interactive effects on a particular resource.

Actions and trends with the potential to cumulatively affect the resources evaluated (e.g., water resources, vegetation) are identified below:

- **Noxious weeds:** Noxious and/or invasive weeds have invaded the planning area, carried by wind, humans, machinery, and animals (pets, livestock, and wildlife). Cooperative weed management activities exist among the counties, private landowners, and government agencies. Weed invasions in the planning area have increased significantly since the 1998 RMP ROD was signed. Weed invasions are expected to continue increasing, and in response, levels of planning and treatment are also expected to increase. Levels of planning and treatment of weeds fluctuate from year to year based on existing weed populations, threats, and available funding. However, an overall increase in weed treatment can be seen in the planning area in response to an increase in levels of weed invasion.
- **Fish and Wildlife:** Populations of some fish and wildlife species are declining in Nevada. Declining wildlife and fish species will likely receive increased federal and state agency restoration and conservation efforts (e.g., bighorn sheep, golden eagle, burrowing owl, chuckwalla, and gila monster).
- **Listings under the Endangered Species Act (ESA):** Some flora and fauna species have declined to the level where listing under the ESA became necessary. Currently listed within the planning area are the desert tortoise, three bird species, eight plants, and 10 fish species. Potential listings under the ESA may occur in the foreseeable future if populations of sensitive species continue to decline; species that may have more potential for listing than other species may include federally listed candidate species and BLM sensitive species. There is habitat within the planning area that will support the relict leopard frog, which is a candidate for listing under the ESA.
- **Wildland fires:** Wildland fires have occurred and will continue to occur over time given drought conditions, altered fire regimes, and an increase in cheat grass and other invasive weeds, the frequency of fires could be greater than historical averages and could burn larger areas. Fires will be managed as a resource tool and suppressed as appropriate.
- **Archaeological:**Archaeological investigations, illegal activities (e.g., cultural resource site vandalism or collecting), and development and maintenance activities (e.g. grazing, mining, recreation use, OHV use) that adversely affect sites have occurred and will likely continue to occur on public and private lands.
- **Livestock grazing:** Domestic livestock have grazed and will continue to graze on designated allotments within the planning area.
- **Mineral development:** Mineral development and mining has occurred continuously in the region for years and will continue to occur on BLM-administered lands, private lands, and state of Nevada lands.
- **Recreation:** The following are expected trends:
  - Recreation-related visits to Nevada are estimated to continue to increase.
  - Recreational activities, specifically motorized recreational activities, will continue to increase in popularity and use.
  - An increase in the use of developed recreation sites and campgrounds is likely as the population increases.

- **Land tenure actions:** Land tenure actions of various sizes are occurring and will continue to occur to consolidate BLM-administered lands and facilitate management.

4.1.4. Incomplete or Unavailable Information

The Council on Environmental Quality established implementing regulations for NEPA requiring that a federal agency identify relevant information that may be incomplete or unavailable for an evaluation of reasonably foreseeable significant adverse effects in an environmental impact statement (40 CFR 1502.22). If the information is essential to a reasoned choice among alternatives, it must be included or addressed in an environmental impact statement. Knowledge and information is and will always be incomplete, particularly with infinitely complex ecosystems considered at various scales.

The best available information pertinent to the decisions to be made was used in developing the RMP. Considerable effort has been taken to acquire and convert resource data into digital format for use in the plan – both from BLM sources and from outside sources.

Certain site-specific information was unavailable for use in developing this plan, usually because inventories have either not been conducted or are not complete. Some of the major types of data that are incomplete include cultural resources, paleontological resources, vegetation, wildlife, riparian inventories, and noxious weeds. The BLM has information to support planning-level decisions, although the data is incomplete for specific areas. Ongoing data collection and analysis provide a general understanding of the resources trends that were used in developing the alternatives and assessing impacts. The BLM will continue monitoring and taking inventory, as needed, and this information will be used to assess the effectiveness of management measures.

The resource management plan sets objectives for broad level management of the planning area, while implementation-level planning requires subsequent site-specific analysis. During the implementation phase, additional surveys and data could be required to analyze site-specific decisions made in implementation-level planning, such as in the ACEC management plans and the travel management plan.

This RMP is also based on the concept of adaptive management, so it is dynamic enough to account for changes in resource conditions (such as large-scale wildfire), new information and science, and changes in regulation and policies. The RMP may be amended to respond to these factors. No incomplete or unavailable information was deemed essential to a reasoned choice among the alternatives portrayed in this EIS.

4.2. Resources

4.2.1. Air Quality

Air quality resources in the planning area would not be affected as the current analysis, RMP 1998-2018 management conditions, still apply. There are no anticipated changes to the Clean Air Act, as amended in 1990, or subsequent state and local air quality regulations, implementing the CAA, in the state of Nevada.

The local air quality compliance oversight agencies, Clark County Department of Air Quality, as designated by the governor of Nevada, and the Nevada Department of Environmental Protection, Pahrump, NV, continue to manage air quality in accordance with federal CAA requirements.

4.2.2. Geologic Resources

Impacts to the geologic resources in the district are addressed under Section 4.3.3, “Minerals” (p. 1009).

4.2.3. Soil Resources

4.2.3.1. Summary

This section presents potential impacts of the alternatives on soil resources in the planning area. (See Chapter 3 for a more detailed discussion of soil resources in the planning area.) Soil resources would be managed to maintain the natural habitat of the area and to minimize the potential for accelerated (human-caused) wind and water erosion. In order to maintain soil processes, a healthy, productive, and diverse plant community is necessary. Improved ecological condition would increase productivity, litter, biological soil crusts, soil fertility, infiltration, and nutrient cycling.

In Southern Nevada, the expected increase in population will result in an increase in recreation on and development of public lands. This could cause increased impacts on soil resources. These impacts would occur on existing roads and trails, which will have accelerated erosion with increased use, and in adjacent areas due to cross-country travel. ROWs for energy transmission lines and for utility-scale solar energy generation facilities will also have negative impacts on thousands of acres in the planning area. Impacts on soils are varied based on the extent of disturbance. Wildfires have exposed large areas where vegetation has been consumed, increasing wind and water erosion potential for soils. Generally, habitat improvement projects improve or protect soils. Areas experiencing concentrated wild horse and burro grazing have been prioritized for gathering of wild horses and burros, if above appropriate management levels (AML), to maintain a thriving natural ecological balance. Using of BMPs and SOPs, project-specific mitigation measures, permit stipulations, post fire emergency stabilization and rehabilitation treatments, and wild horse and burro gathers can reduce impacts on soils by protecting or re-establishing vegetation communities and biological soil communities.

Land-Use Planning, Including Development of Solar Energy Generation Facilities and Connected Corridors

Population growth is likely to cause increased demand for roads, power lines, highways, and other developments that would increase surface disturbance and runoff from public lands. Disturbance and storm runoff are likely to increase erosion and sedimentation. Blading of desert pavements and biological soil crusts will increase dust emissions, reduce carbon and dust sequestration, soil fertility, nutrient cycling, and infiltration.

Minerals

Mineral exploration and development is probable in the Mesquite, Jean, and Lone Mountain areas and in other parts of the planning area totaling between 1 million and 3 million acres, depending on the alternative and type of mineral development. New sand and gravel exploitations, which are the most common type of mineral development in Southern Nevada, are usually sources of dust and sediment and increase the risk of erosion.

Recreation

Total miles of new roads and acres of new disturbance due to the increase in recreation areas will vary from 150 to 300 acres annually, based on the increase from the 1998 RMP to present. These disturbances will increase the probability of wind and water erosion. Quantities of soil loss will vary depending on the location and timing of new disturbance and the level of maintenance.

Impacts on Soil Resources

The analysis of how Alternatives 1, 2, 3, and 4 would likely affect soil resources emphasizes management actions that could alter soil productivity and erosion rates and the effects on sensitive soils. Impacts on soil resources are from management actions related to land use, grazing, fire management, recreation use, OHV travel, and other resources. Management actions for the other resources would vary the amount of land available for surface-disturbing activities and those that could impact the soil resources. Changing activities that would increase erosion would be mitigated by implementing BMPs and through mitigation or environmental enhancement activities to stabilize or maintain soil processes or by providing funding for various scientific studies or other related programs. Effects are quantified where possible; in the absence of quantitative data, best professional judgment is used.

4.2.3.2. Methods of Analysis

General soil types, erosion potential, structure, and function were discussed and impacts were analyzed. The analysis was based on reference information, site investigations, soil mechanics and engineering criteria, anticipated effects of management actions by alternative, and professional interpretation and judgment. Impacts are sometimes described using ranges of potential impacts or in qualitative terms if appropriate. As noted in Chapter 3, detailed, site-specific soil information is lacking for much of the planning area. General impacts on sensitive soils are discussed by resource. Site-specific analysis would be conducted before on-the-ground project implementation.

Indicators

Indicators used to assess impacts on soil resources in this analysis are sufficiently quantitative to compare the future impacts of this plan with the existing conditions of the planning area. Indicators include the following:

- Bare ground (acres or proportion of a given area.
- Vegetative cover (acres or proportion of a given area).
- Developments or other activities causing surface disturbance on soils with high wind or water erosion hazards (number of developments or other surface disturbances).
- Disturbances from management activities that damage the surface cover provided by desert pavement or cryptogamic biological crusts (acres).

Assumptions

- The application of vegetation treatments and establishment of a desired plant community would improve infiltration and aeration, fertility, and microbial populations.
- Soil and vegetation resources would be managed to meet the BLM standards and guidelines.
- Substantial surface disturbance to soil, including exposure of bare ground, loss of vegetative cover, or rutting on unsurfaced roads, would increase water runoff and downstream sediment loads and lower soil productivity, thereby degrading water quality, altering channel structure, and affecting overall watershed health.
- The degree of impact attributed to any one disturbance or series of disturbances would be influenced by several factors, including the disturbance's location within the watershed, the time and degree of disturbance, the existing vegetation, and levels of precipitation at the time of the disturbance.
- New access roads would be properly designed.
- When special management designations, such as ACECs or special recreation management areas (SRMAs), are proposed and management actions for resource protection are properly implemented, their impacts on soil resources would be positive. These positive impacts

would exceed any negative impacts that could accrue from increased visitation caused by the designation itself.
- When a proposed management action includes a use restriction that requires monitoring and enforcement to be effective, such as routes designated as closed for travel management, resources would be available to ensure that the necessary monitoring and enforcement occurs.

Program Areas with No Impacts on Soil Resources

There would be no impacts on soils from actions proposed under the following resource management programs:
- Air quality
- Cave and karst resources
- Cultural resources
- Paleontological and geological resources
- Visual resource management

4.2.3.3. Qualitative Intensity Scale

The intensities of impacts are described, where possible, using the following terms:
- **Negligible:** The amount of soil loss or erosion, or changes in soil characteristics, would be at or below the level of detection. Changes in the area of bare soil, to the desired plant or crust community, or in extent of surface disturbance are below the level of detection.
- **Minor:** The amount of soil, biological soil crust, or desert pavement lost; or increases in erosion and indicators of soil loss; or the degree of changes in soil characteristics would be small, as would be the area affected. If mitigation is needed to offset adverse effects, it would be relatively simple to implement and likely would be successful.
- **Moderate:** The amount of soil, biological soil crust, or desert pavement lost; or increases in erosion and indicators of soil loss; or the degree of changes in soil characteristics would be readily apparent and would result in changes over a relatively wide area. Mitigating measures probably would be necessary to offset adverse effects and likely would be successful.
- **Major:** The amount of soil, biological soil crust, or desert pavement lost; or increases in erosion and indicators of soil loss; or the degree of changes in soil characteristics would be readily apparent and long term and would substantially change the indicators over a large area. Extensive mitigation measures to offset adverse effects would be needed, and their success could not be guaranteed.

Common to All Alternatives

Natural disturbance from fluvial processes are essential to the long-term maintenance of desert washes and hydrology. Management actions that involve surface-disturbing activities may impact soil and water resources by changing the rates of erosion or deposition, spatial patterns of erosion and deposition, and runoff conditions, potentially affecting air quality, water quality, and watershed health. Physical soil properties such as density, strength, infiltration and water-holding capacity, soil aggregate stability, and productivity may be affected from site-specific to landscape-sized scales.

Accelerated erosion, compaction, displacement, puddling, and rutting of soils can affect soil productivity. Erosion affects soil productivity by carrying away soil particles and nutrients normally held in the soil, such as phosphorous, magnesium, and potassium. The ability of the soil to recover productivity is affected by loss or degradation of the upper layers or horizons. These

horizons have the highest water holding and nutrient storage capacity. Given the low precipitation and limited vegetation levels in the planning area, soil productivity would be slow to recover once it had been reduced by erosion or anthropogenic activities.

4.2.3.4. Resources

4.2.3.4.1. Air Quality Impacts on Soil Resources

4.2.3.4.1.1. Impacts Common to All Alternatives

There likely would be only beneficial impacts on soil resources resulting from air quality management objectives for actions under any of the alternatives. Air quality mitigation measures, including dust suppression requirements, would reduce the potential for blowing dust and wind erosion of soils.

4.2.3.4.1.2. Alternatives 1 through 4

There are no additional impacts to soil resources.

4.2.3.4.2. Soil Resources Impacts on Soil Resources

4.2.3.4.2.1. Impacts Common to All Alternatives

Under all alternatives, erosion would be reduced. These areas are expected to be maintained and improved.

4.2.3.4.2.2. Alternative 1

Alternative 1 relies on a basic set of measures included in all of the alternatives to conserve soil, but it does not specify some measures included in the other alternatives that might provide additional protection against erosion.

4.2.3.4.2.3. Alternatives 2 through 4

Alternatives 2 through 4 call for avoidance or fully mitigating surface disturbances to biological crusts, desert pavements, and other sensitive or fragile soils and require restoration of most surface-disturbing activities. Further, Alternatives 2 through 4 call for improving soils within areas with high potential for biological crusts, desert pavements and other sensitive or fragile soils. These measures would be expected to provide greater direct benefits to soil resources than Alternative 1.

4.2.3.4.3. Water Resources Impacts on Soil Resources

4.2.3.4.3.1. Impacts Common to All Alternatives

Efforts to improve surface water quality can involve measures that affect soils. Implementation of BMPs, including erosion control structures, would reduce impacts from erosion of soils.

Water development projects can impact groundwater levels at either end of the project. Potential increases in desertification and wind erosion of soils can occur in areas where water is drawn away. All alternatives have beneficial impacts for soil resources.

4.2.3.4.3.2. Alternatives 1 through 4

There are no additional impacts to soil resources.

4.2.3.4.4. Integrated Vegetation Impacts on Soil Resources

4.2.3.4.4.1. Vegetation Impacts on Soil Resources

4.2.3.4.4.1.1. Impacts Common to All Alternatives

There likely would be no negative impacts on soil resources resulting from integrated vegetation management objectives or actions under any of the alternatives. With respect to effects on soil resources, all of the alternatives are essentially equivalent. Vegetation treatments (including treating noxious and invasive species) may expose soils to wind or water erosion, and impacts would depend on the nature and degree of disturbance. Minimizing the loss of native plant communities and the ecosystem services they provide, as well as mitigating for the impacts, will help to protect and restore soil resources in the planning area.

4.2.3.4.4.1.2. Alternative 1

Alternative 1 does not contain many management directives that are included in Alternatives 2, 3, and 4. Alternative 1 would be expected to have the least positive effect on soil resources.

4.2.3.4.4.1.2.1. Alternatives 2 and 3

The actions under Alternatives 2 and 3 designed to address objective 1.1 would require a no net loss of value in the planning area, which, in turn would be beneficial for soil resources, as discussed above. Hence, these alternatives have more beneficial impacts than Alternatives 1 and 4.

4.2.3.4.4.1.2.2. Alternative 4

The effects would be the same as Alternative 2 and 3, but less so since the loss of native plant communities and the ecosystem services they provide would be addressed on a case-by-case basis only. This may not capture ecosystem-wide disturbance footprint thresholds. This alternative has more beneficial impacts to soil resources than Alternative 1 but less than Alternatives 2 and 3.

4.2.3.4.4.2. Riparian Areas and Wetlands Impacts on Soil Resources

4.2.3.4.4.2.1. Impacts Common to All Alternatives

Appropriate management of riparian areas would help reduce anthropogenically accelerated erosion (and resultant deposition) of sediments that are directly related to the health and function of wetland soils. This effect would be localized and similar under all alternatives except that its degree would be dependent on the degree of functionality reached within riparian areas.

4.2.3.4.4.2.2. Alternative 1

Alternative 1 focuses mostly on impacts from grazing and OHV use on riparian areas and wetlands. Hence, Alternative 1 would be expected to have the least positive effect on soil resources.

4.2.3.4.4.2.2.1. Alternatives 2 and 3

The actions under Alternatives 2 and 3 designed to address Objective 1.1 would require a no net unmitigated loss of wetlands, riparian communities, and mesquite and acacia woodlands in the planning area, which, in turn, would be beneficial for soil resources as discussed above. Hence, these alternatives have more beneficial impacts than Alternatives 1 and 4.

4.2.3.4.4.2.2.2. Alternative 4

The effects would be the same as Alternative 2 and 3, but less so since the loss of wetlands, riparian communities, and mesquite and acacia woodlands would be addressed on a case-by-case basis only. This may not capture ecosystem wide disturbance footprint thresholds. This alternative has more beneficial impacts to soil resources than Alternative 1 but less than Alternatives 2 and 3.

4.2.3.4.4.3. Weeds Impacts on Soil Resources

4.2.3.4.4.3.1. Impacts Common to All Alternatives

Control of invasive and noxious weeds generally would indirectly improve soils in areas where impacts have occurred. Noxious weeds tend to out-compete native species and have undesirable effects, such as decreasing ground cover, removing soil moisture, or enhancing fire hazards.

Action WEED-01 would encourage activities to prevent the spread of and eradicate noxious weeds. This may cause localized, short-term impacts on soils (temporary loss of groundcover, etc.) while promoting longer term protection of soils. Most biological soil crusts are not affected by herbicides.

4.2.3.4.4.3.2. Alternative 1

Alternative 1 primarily focuses on tamarisk eradication, which has minor beneficial impacts on soils as described above. Alternative 1 would be expected to have the least positive effect on soil resources.

4.2.3.4.4.3.3. Alternative 2

The actions under Alternatives 2, 3, and 4 designed to address objective WEED-01 would be the same and would have similar beneficial impacts on soil resources. Alternatives 2 through 4 include a number of actions that would not be implemented under Alternative 1. To the extent that these actions are successful in reducing the spread of noxious weeds, they may also have beneficial impacts on soil resources. Because Alternative 2 would require a BLM-approved, project-specific weed management plan for all federal actions involving a disturbance footprint greater than one acre, unless otherwise determined by the BLM weeds specialist, it is likely to be more limiting (less beneficial) than Alternatives 3 and 4.

4.2.3.4.4.3.4. Alternative 3

The effects would be the same as Alternative 2, but less so since the disturbance footprint threshold for a project-specific weed management plan would be 5 acres. This alternative has more beneficial impacts than Alternatives 1 and 2.

4.2.3.4.4.3.5. Alternative 4

The effects would be the same as Alternative 3, but less so since the disturbance footprint threshold for a project-specific weed management plan would be 10 acres. This alternative has more beneficial impacts than Alternatives 1, 2, and 3.

4.2.3.4.4.4. Forests and Woodlands Impacts on Soil Resources

4.2.3.4.4.4.1. Impacts Common to All Alternatives

See the Forest & Woodland Products section under Resource Uses for this analysis.

4.2.3.4.5. Fish and Wildlife Impacts on Soil Resources

4.2.3.4.5.1. Impacts Common to All Alternatives

Small-scale activities, including wildlife water development with less than one acre of surface disturbance, involve short-term increases in erosion and soil compaction. Due to the small size of the areas, these activities would have negligible impacts on soil resources.

Implementation of mitigation measures to protect wildlife habitats would also protect soils and therefore would provide beneficial impacts for soil resources. Applying BMPs to maintain or improve wildlife habitats would also maintain or improve soils.

4.2.3.4.5.2. Alternatives 1 through 4

There are no additional impacts to soil resources.

4.2.3.4.6. Special Status Species Impacts on Soil Resources

4.2.3.4.6.1. Impacts Common to All Alternatives

All alternatives would provide varying special status species management strategies that would protect or improve soil resources. These strategies include use restrictions, creation of areas of ecological importance (in Nye County only), and development of mitigation measures to improve special status species habitats and buffer zones. Habitat improvement projects would also serve to protect and stabilize soils and therefore would provide beneficial impacts for soil resources.

4.2.3.4.6.2. Alternative 1

Alternative 1 does not contain many management directives that are included in Alternatives 2, 3, and 4. Alternative 1 would be expected to have the least positive effect on soil resources.

4.2.3.4.6.2.1. Alternative 2

The actions under Alternatives 2 and 3 are designed to require a no net unmitigated loss of special status species habitats in the planning area due to BLM-authorized activities, which, in turn, would be beneficial for soil resources, as discussed above. Further, this alternative establishes areas of ecological importance, which would cover over 27,000 acres. This would also offer additional protection to soil resources. Hence, this alternative has more beneficial impacts than Alternatives 1, 3, and 4.

Alternative 3

The actions under Alternative 3 are similar to those under Alternative 2, but without the additional protection offered by the established Areas of Ecological Importance. Hence, this alternative has more beneficial impacts on soil resources than Alternatives 1 and 4, but less than Alternative 2.

4.2.3.4.6.2.2. Alternative 4

The effects would be the same as Alternative 3, but less so since the loss of sensitive species habitats would be addressed on a case-by-case basis for BLM-authorized actions only. This may not capture ecosystem-wide disturbance footprint thresholds. This alternative has more beneficial impacts to soil resources than Alternative 1 but less than Alternatives 2 and 3.

4.2.3.4.7. Wild Horse and Burro Impacts on Soil Resources

4.2.3.4.7.1. Impacts Common to All Alternatives

A major and long-lasting negative impact of wild horses and burros comes from soil compaction and disruption of cyptobiotic soil crust, leading to erosion and disruption of nitrogen and carbon cycles. Biological soil crusts, present on desert soils, contribute to soil stability, nitrogen fixation, dust control and water-holding capacity. These crusts are extremely susceptible to surface disturbance, including trampling by wild horses and burros. The recovery rate from disturbance, trampling, and compaction is long and often ranges from centuries to millennia (Belnap and Lange 2003).

Small-scale activities, including impoundments with less than one acre of surface disturbance, involve short-term increases in erosion and soil compaction. Due to the small size of the areas, these activities would have negligible impacts on soil resources.

Direct impacts associated with the wild horse and burro gathers would consist of disturbance to soil surfaces immediately in and around the temporary gather site(s) and holding facilities. Impacts would be created by vehicle traffic and hoof action as a result of concentrating horses and burros and could be locally major in the immediate vicinity of the gather site(s) and holding facilities. Generally, these sites would be small (less than one half acre) in size. Any impacts

would remain site specific and isolated in nature. Impacts would be considered minimal as gathering and herding would be of short duration.

Normally, gather sites are located near or on roads, pullouts, water haul sites, or other flat areas, which have been previously disturbed, to enable easy access by transportation vehicles and logistical support equipment. These common practices would minimize the potential impacts on soils.

Indirect impacts from reduced concentrations of wild horses and burros would be reduced soil erosion and compaction. This reduction in soil erosion and compaction would be most notable and important in the vicinity of small springs and meadows currently experiencing high levels of disturbance and bare ground from excess wild horses and burros.

As wild horse and burro populations increase over time, and if they exceed high range AML, soil loss from wind and water erosion and invasion of undesired plant species would continue or expand as a result of over-utilization of vegetation, loss of perennial native grasses, and heavy trailing due to an overpopulation of wild horses within the HMAs. This loss would be most notable in the vicinity of small springs and meadows and other water sources with high levels of wild horse and burro use.

4.2.3.4.7.2. Alternative 1

Under Alternative 1, the effects on soil resources would be the same as described in the Impacts Common to All Alternatives. This alternative would be expected to have the least positive and most negative impacts on soil resources.

4.2.3.4.7.3. Alternative 2

Under Alternative 2, the effects on soil resources would be the same as described in the Impacts Common to All Alternatives. However, due to the suggested restrictions under WHB-05 and WHB-06, this alternative offers the most positive and least negative impacts on soil resources.

Alternative 3

Under Alternative 3, the effects on soil resources would be the same as described in the Impacts Common to All Alternatives. However, due to the suggested restrictions under WHB-05 and WHB-06, this alternative offers more positive effects and less negative impacts than Alternatives 1 and 4 for soil resources.

4.2.3.4.7.4. Alternative 4

Under Alternative 4, the effects to soil resources would be the same as described in the Impacts Common to All Alternatives, with the exception that under Alternative 4, wild horses and burros would be allowed in Gold Butte. Hence, the disturbance, due to wild horses and burros and the management thereof, described above, could occur in Gold Butte, as well. Further, due to the suggested restrictions under WHB-05 and WHB-06, this alternative offers some positive effects for soil resources, but less than Alternatives 2 and 3.

4.2.3.4.8. Cave and Karst Management Impacts on Soil Resources

4.2.3.4.8.1. Impacts Common to All Alternatives

There likely would be no impacts on soil resources resulting from cave and karst management objectives.

4.2.3.4.8.2. Alternatives 1 through 4

There are no additional impacts to soil resources.

4.2.3.4.9. Wildland Fire Management Impacts on Soil Resources

4.2.3.4.9.1. Impacts Common to All Alternatives

Wildland fire within the planning area (no matter if accidental or used as a management tool) reduces plant cover, litter, and biological soil crust, making soil resources highly susceptible to erosion. Emergency stabilization and burned area rehabilitation treatments (ES&R) would be implemented to reduce these impacts. Wildland fire increases wind erosion, which may have a negligible to major impact on public health, depending on fire location, especially among sensitive groups such as children, the elderly, or those with asthma or emphysema. Wildland fire increases water erosion, which may be a minor to major impact. Fire suppression can result in soil disturbance from vehicles and equipment such as fire engines and dozers. Impacts include removal of vegetation and disturbance to soils, increasing erosion potential. Impacts from erosion are greatest the first year after the fire, diminishing to minor after usually non-native vegetation is (re-)established. Water erosion can be major on limited areas, especially if the sediment impacts residential or industrial areas and transportation systems. These impacts would occur until vegetation and biological soil crusts become fully re-established.

Fire impacts would include reduction of soil nutrients from wind and water erosion, loss of shrubs or deep-rooted plants, reduced nutrient cycling, reduced vegetation productivity, increased compaction from loss of surface litter, reduction in organic matter, and the loss of biological crusts.

Initiation of ES&R actions would ensure timely stabilization of watersheds, reduction of flood hazards, replacement or re-establishment of vegetation through seeding, and recovery of perennial plants. The re-establishment of vegetative cover, litter, biological soil crust, and viable root mass would reduce the impacts of wind and water erosion. Stabilization of watersheds would prevent undue loss of topsoil, reducing loss of site potential. Short-term increases in water and wind erosion are unavoidable in the first year following a wildfire.

On the other hand, suppression of wildfires in the Mojave Desert ecosystem would reduce overall impacts on soil resources by retaining the vegetative communities and stabilizing the soil. This would maintain normal infiltration and sedimentation rates for soils since wildfires that are not rapidly contained may destroy cryptogamic soil crusts and vegetation over broad areas, increasing erosion and sedimentation rates.

Fires that burn with intense heat may create water-repellent layers in the soil below the surface that impede infiltration and plant growth and increase erosion. Impacts could range from negligible to major.

4.2.3.4.9.2. Alternative 1

Under Alternative 1, the impacts on soil resources would be similar to those described above. Fire suppression would be prioritized to protect areas identified in 1998. This would help protect soil resources within those areas, but may not reflect current resource needs.

4.2.3.4.9.3. Alternative 2

Under Alternative 2, the impacts are as described under Impacts Common to All Alternatives. Alternative 2 mandates a two-year closure to all activities on lands impacted by an wildfire in the planning area. This may lead to greater soil protection after a wildfire than the management directions in the other alternatives.

4.2.3.4.9.4. Alternatives 3 and 4

Under Alternatives 3 and 4, the impacts are as described under Impacts Common to All Alternatives. Alternatives 3 and 4 mandate area closures to activities on lands impacted by wildfire on a case-by-case basis. This may lead to soil protection after a wildfire. Hence, these alternatives have more beneficial impacts on soil resources than Alternatives 1, but less than Alternative 2.

4.2.3.4.10. Cultural Resources Impacts on Soil Resources

4.2.3.4.10.1. Impacts Common to All Alternatives

All of the alternatives result in indirect beneficial impacts on soil resources if human activities are restricted on lands with cultural resources by providing for their protection and preservation. With respect to effects on soil resources, all of the beneficial impacts would be essentially equivalent, but just vary by the amount of acres set aside as lands with cultural resources. More acres are set aside in Alternative 2 than the other Alternatives.

4.2.3.4.10.2. Alternative 1

Impacts to soil resources are as described in Impacts Common to All Alternatives.

4.2.3.4.10.3. Alternative 2

Alternative 2 offers the most protection for soil resources from cultural resources management because it has identified the most area (CUL-04) to be eligible to be protected, preserved, and maintained for cultural resources values.

4.2.3.4.10.4. Alternatives 3 and 4

Alternatives 3 and 4 offer protection and beneficial impacts for soil resources from cultural resources management because they identify areas (CUL-04) eligible to be protected, preserved, and maintained for cultural resources values, which in turn will be beneficial for soil resources. These alternatives set aside more land for protection than Alternative 1, but less than Alternative 2.

4.2.3.4.11. Paleontological Resources Impacts on Soil Resources

4.2.3.4.11.1. Impacts Common to All Alternatives

Small-scale activities, including excavations of paleontology sites for data recovery with less than one acre of surface disturbance, involve short-term increases in erosion and soil compaction. Due to the small size of the areas, these activities would have negligible impacts on soil resources.

However, all of the alternatives might result in indirect beneficial impacts on soil resources if human activities are restricted from lands containing important paleontological resources. The types of activities that might be restricted, such as OHV use, land disposals, ROWs, and mineral extraction, could be moderately destructive to soils and biological soil crusts.

Developing stipulations, use restrictions, and mitigation measures to avoid or reduce adverse impacts on lands containing paleontological resources would directly result in beneficial impacts to soil resources by reducing erosion potential.

4.2.3.4.11.2. Alternative 1

Impacts are as described above. Of all the alternatives, Alternative 1 offers the least protection to soil resources.

4.2.3.4.11.3. Alternative 2

Alternative 2 offers the most preservation and protection for paleontological resources because it precludes activities that could destroy, damage, or reduce the data potential of the paleontological resources within Tertiary-aged trackways and the Upper Las Vegas Wash.

4.2.3.4.11.4. Alternative 3

Alternative 3 offers more preservation and protection for paleontological resources than Alternatives 1 and 4 but less than Alternative 2. Impacts are described above.

4.2.3.4.11.5. Alternative 4

Impacts are described above. Alternative 4 offers less protection for soil resources than Alternatives 2 and 3, but more than Alternative 1 because it still permits activities that have the potential to impact paleontological resources following paleontological inventories (field surveys) and data collection prior to any surface-disturbing activities.

4.2.3.4.12. Visual Resource Management Impacts on Soil Resources

4.2.3.4.12.1. Impacts Common to All Alternatives

There likely would be no impacts on soil resources resulting from visual resource management objectives or actions under any of the alternatives. With respect to effects on soil resources, all of the alternatives would be essentially equivalent.

4.2.3.4.12.2. Alternatives 1 through 4

There are no additional impacts to soil resources.

4.2.3.4.13. Lands with Wilderness Characteristics Impacts on Soil Resources

4.2.3.4.13.1. Impacts Common to All Alternatives

All of the alternatives (except for Alternative 1) might result in indirect beneficial impacts on soil resources if human activities are restricted on lands with wilderness characteristics. With respect to effects on soil resources, all of the beneficial impacts would be essentially equivalent, but just vary by the amount of acres set aside as lands with wilderness characteristics.

4.2.3.4.13.2. Alternative 1

Since Alternative 1 does not have any management directives for lands with wilderness characteristics, no additional protection or benefit would be derived from this alternative.

4.2.3.4.13.3. Alternative 2

Alternative 2 offers the most protection for soil resources from lands with wilderness characteristics management because it has identified the largest area to be eligible for lands to be protected, preserved, and maintained for their wilderness characteristics. Further, Alternative 2 has stricter management prescriptions, which would also benefit soil resources more than the other alternatives. These management prescriptions allow for less disturbance (i.e. closed to commercial sale of vegetative resources; closed to fluid mineral leasing).

4.2.3.4.13.4. Alternative 3

Alternative 3 offers some protection for soil resources from lands with wilderness characteristics management because it has identified more acres than Alternatives 1 and 4 but less than Alternative 2 to be eligible for lands to be protected, preserved, and maintained for their wilderness characteristics. However, the management prescription allows for more soil disturbance than Alternative 2.

4.2.3.4.13.5. Alternative 4

Alternative 4 offers also some level of protection for soil resources from lands with wilderness characteristics management, but on fewer acres than Alternatives 2 and 3 and more than Alternative 1. The management prescription allows for more soil disturbance than Alternative 2.

4.2.3.5. Resource Uses

4.2.3.5.1. Forestry and Woodland Products Impacts on Soil Resources

4.2.3.5.1.1. Impacts Common to All Alternatives

There likely would be no negative impacts on soil resources resulting from forest/woodland products objectives or actions under any of the alternatives. Impacts are expected to be beneficial for soil resources.

4.2.3.5.1.2. Alternative 1

The effects under Alternative 1 would be the least beneficial to soil resources as it allows for the harvest of dead and/or down wood or BLM-marked green mesquite "trees" for dwarf mistletoe control even though only in approved areas. The removal of the biomass will slow the development of new and/or the recovery of existing O and A horizons in the soil. Furthermore, removal of the woody debris will increase the potential for wind and water erosion.

4.2.3.5.1.3. Alternative 2

The effects under Alternative 2 would be the most beneficial to soil resources as it prohibits commercial harvest and personal use of mesquite and acacia woodlands, including live, dead standing, or dead and down. Leaving the biomass in place will expedite the development of new and/or the recovery of existing O and A horizons in the soil.

4.2.3.5.1.4. Alternatives 3 and 4

The effects under Alternatives 3 and 4 will be more beneficial than those under Alternative 1 but less than those under Alternative 2. Both alternatives prohibit commercial harvest of mesquite and acacia woodlands, including live, dead standing, or dead and down, but allow for personal use of dead and down for on-site recreational campfires, except in areas closed to firewood gathering and subject to seasonal fire restrictions. While these alternatives do not remove the nutrients of the biomass from the general areas, the elimination of the woody debris will increase the potential for wind and water erosion.

4.2.3.5.2. Livestock Grazing Impacts on Soil Resources

4.2.3.5.2.1. Impacts Common to All Alternatives

A major and long-lasting negative impact of grazing comes from soil compactions and disruption of the cryptobiotic soil crust, leading to erosion and disruption of nitrogen and carbon cycles. Biological soil crusts, which are present on desert soils, contribute to soil stability, nitrogen fixation carbon sequestration, and water holding capacity. These crusts are extremely susceptible to surface disturbance associated with trampling by livestock. Grazing allows surface-disturbing activities associated with livestock operations and potentially increases erosion when sensitive surface cover provided by desert pavement and cryptobiotic crusts is disturbed. Exposure of fine material beneath the cover would make soils vulnerable to wind and water erosion. This disturbance area is extremely slow to recover, ranging from decades to millennia.

4.2.3.5.2.2. Alternative 1

The impacts under Alternative 1 are as described above, but more land would be disturbed under this alternative. In other words, Alternative 1 would allow for the most disturbances of desert soils by livestock and generate the most associated wind and water erosion. The areas with the following grazing allotments would experience the described impacts: Hidden Valley, Mount Stirling, Lower Mormon Mesa, Roach Lake, White Basin, Muddy River, Wheeler Wash, Mesa Cliff, Arrow Canyon in Battleship Wash, Flat Top Mesa, Jean Lake, and the Arizona-administered allotments.

4.2.3.5.2.3. Alternative 2

Under Alternative 2, all livestock grazing allotments in the planning area would be closed.

4.2.3.5.2.4. Alternative 3

The areas with the following grazing allotments would experience the described impacts: Hidden Valley, Lower Mormon Mesa, Flat Top Mesa, and the Arizona-administered allotments.

4.2.3.5.2.5. Alternative 4

The impacts under Alternative 4 are as described above. More soil resources will disturbed than in Alternatives 2 and 3, but less than in Alternative 1. The areas with the following grazing allotments would experience the described impacts: Hidden Valley, Lower Mormon Mesa, Flat Top Mesa, Muddy River, Wheeler Wash, and the Arizona-administered allotments.

4.2.3.5.3. Minerals Impacts on Soil Resources

Impacts Common to All Alternatives

In the planning area, mineral development would be allowed to continue on all lands not withdrawn from mineral entry or closed to mineral leasing under the respective alternatives. Construction activities that involve geothermal, oil and gas, mine development and mineral material pits would remove vegetation, thereby increasing erosion and soil compaction in the short term. Erosion would involve impacts from negligible to major, depending on the level of disturbance and the soil type. Long-term mitigations and reclamation are common to all alternatives. With reclamation and mitigation, impacts would be minor to major. Impacts from mineral development on soil resources include potential disturbances such as soil displacement and loss or burial of upper soil horizons. Soil disturbance would result in reduced water-holding capacity (possibly permanently), leading to potential loss of vegetation and increased erosion. If a large mine with leach pads, open pits, pit lakes and tailings piles is developed, major impacts on soils would occur. Much of the mine footprint would experience a long-term loss of soil productivity. Mitigation measures, including project design features, stipulations, and best management practices, would reduce the intensity and duration of impacts on soil resources, such as requiring soils to be salvaged when a project has ground disturbance. Salvaging and replacing or otherwise establishing a growth medium as part of the reclamation process would have a financial impact on the mineral's developers.

4.2.3.5.3.1. Fluid Leasable Minerals Impacts on Soil Resources

4.2.3.5.3.1.1. Impacts Common to All Alternatives

Impacts are described as above. In general, fluid leasable mineral development has less direct impacts on soil resources than other mineral resource development due to the smaller footprint of the operation.

4.2.3.5.3.1.2. Alternative 1

The effects under Alternative 1 are as described above, but on less land than Alternatives 2, 3 and 4. Impacts would be expected to range from negligible to major, depending on location and size of operations. See the Fluid Leasable Minerals section of Chapter 2 (p. 89) for exact acreages and correlated maps for locations.

4.2.3.5.3.1.3. Alternative 2

Under Alternative 2, the effects of fluid leasable minerals activities on soil resources are as described in the Impacts Common to All section, but on less land than Alternatives 3, and 4. See the Fluid Leasable Minerals section of Chapter 2 (p. 89) for exact acreages and correlated maps for locations.

4.2.3.5.3.1.4. Alternative 3

Under Alternative 3, the effects of fluid leasable minerals activities on soil resources are as described in the Impacts Common to All section, but on less land than Alternative 4 and on more land than Alternatives 1 and 2. See the Fluid Leasable Minerals section of Chapter 2 (p. 89) for exact acreages and correlated maps for locations.

4.2.3.5.3.1.5. Alternative 4

Under Alternative 4, the effects of fluid minerals activities on soil resources are as described in the Impacts Common to All section, but on more land than Alternatives 1, 2 and 3. See the Fluid Leasable Minerals section of Chapter 2 (p. 89) for exact acreages and correlated maps for locations.

4.2.3.5.3.2. Solid Leasable Minerals Impacts on Soil Resources

4.2.3.5.3.2.1. Impacts Common to All Alternatives

See the description under Impacts Common to All Alternatives in the beginning of the Minerals Impacts on Soil Resources section.

4.2.3.5.3.2.2. Alternative 1

The effects under Alternative 1 are as described above, but more land would be disturbed than under the other alternatives. In other words, Alternative 1 would allow for the most disturbances of desert-sensitive soils by mining activities and generate the most associated wind and water

erosion. See the Solid Leasable Minerals section of Chapter 2 (p. 87) for exact acreages and correlated maps for locations. Impacts would be expected to range from negligible to moderate.

4.2.3.5.3.2.3. Alternative 2

Under Alternative 2, the effects of mining activities to soil resources are as described in the Impacts Common to All section, but on less land than Alternatives 1, 3, and 4. See the Solid Leasable Minerals section of Chapter 2 (p. 87) for exact acreages and correlated maps for locations. Impacts would be expected to range from negligible to moderate.

4.2.3.5.3.2.4. Alternative 3

Under Alternative 3, the effects of mining activities to soil resources are as described in the Impacts Common to All section, but on less land than Alternatives 1 and 4 and on more land than Alternative 2. See the Solid Leasable Minerals section of Chapter 2 (p. 87) for exact acreages and correlated maps for locations. Impacts would be expected to range from negligible to moderate.

4.2.3.5.3.2.5. Alternative 4

Under Alternative 4, the effects of mining activities to soil resources are as described in the Impacts Common to All section, but on less land than Alternative 1 and on more land than Alternatives 2 and 3. See the Solid Leasable Minerals section of Chapter 2 (p. 87) for exact acreages and correlated maps for locations. Impacts would be expected to range from negligible to moderate.

4.2.3.5.3.3. Locatable Minerals Impacts on Soil Resources

4.2.3.5.3.3.1. Impacts Common to All Alternatives

See the description under Impacts Common to All Alternatives in the beginning of the Minerals Impacts on Soil Resources section.

4.2.3.5.3.3.2. Alternative 1

The effects under Alternative 1 are as described above, but more land would be disturbed than under the other alternatives. In other words, Alternative 1 would allow for the most disturbances of desert-sensitive soils by mining activities and generate the most associated wind and water erosion. See the Locatable Minerals section of Chapter 2 (p. 97) for exact acreages and correlated maps for locations. Impacts would be expected to range from negligible to moderate.

4.2.3.5.3.3.3. Alternative 2

Under Alternative 2, the effects of mining activities to soil resources are as described in the Impacts Common to All section, but on less land than Alternatives 1, 3, and 4. See the Locatable Minerals Section of Chapter Locatable Minerals section of Chapter 2 (p. 97) for exact acreages and correlated maps for locations. Impacts would be expected to range from negligible to moderate.

4.2.3.5.3.3.4. Alternative 3

Under Alternative 3, the effects of mining activities to soil resources are as described in the Impacts Common to All section, but on less land than Alternative 1 and on more land than Alternatives 2 and 4. See the Locatable Minerals section of Chapter 2 (p. 97) for exact acreages and correlated maps for locations. Impacts would be expected to range from negligible to moderate.

4.2.3.5.3.3.5. Alternative 4

Under Alternative 4, the effects of mining activities to soil resources are as described in the Impacts Common to All section, but on less land than Alternatives 1 and 3 and on more land than Alternative 2. See the Locatable Minerals section of Chapter 2 (p. 97) for exact acreages and correlated maps for locations. Impacts would be expected to range from negligible to moderate.

4.2.3.5.3.4. Saleable Minerals Impacts on Soil Resources

4.2.3.5.3.4.1. Impacts Common to All Alternatives

See the description under Impacts Common to All Alternatives in the beginning of the Minerals Impacts on Soil Resources section.

4.2.3.5.3.4.2. Alternative 1

The effects under Alternative 1 are as described above, but more land would be disturbed than under the other alternatives. In other words, Alternative 1 would allow for the most disturbances of desert sensitive soils by mining activities and generate the most associated wind and water erosion. See the Saleable Minerals section of Chapter 2 (p. 100) for exact acreages and correlated maps for locations. Impacts would be expected to range from negligible to moderate.

4.2.3.5.3.4.3. Alternative 2

Under Alternative 2, the effects of mining activities to soil resources are as described in the Impacts Common to All section, but on less land than Alternatives 1, 3, and 4. See the Saleable Minerals section of Chapter 2 (p. 100) for exact acreages and correlated maps for locations. Impacts would be expected to range from negligible to moderate.

4.2.3.5.3.4.4. Alternative 3

Under Alternative 3, the effects of mining activities to soil resources are as described in the Impacts Common to All section, but on less land than Alternatives 1 and 4 and on more land than Alternative 2. See the Saleable Minerals section of Chapter 2 (p. 100) for exact acreages and correlated maps for locations. Impacts would be expected to range from negligible to moderate.

4.2.3.5.3.4.5. Alternative 4

Under Alternative 4, the effects of mining activities to soil resources are as described in the Impacts Common to All section, but on less land than Alternative 1 and on more land than

Alternatives 2 and 3. See the Saleable Minerals section of Chapter 2 (p. 100) for exact acreages and correlated maps for locations. Impacts would be expected to range from negligible to moderate.

4.2.3.5.4. Recreation Impacts on Soil Resources

4.2.3.5.4.1. Impacts Common to All Alternatives

Recreation encompasses a wide range of activities including OHV travel, hiking, biking, horseback riding, target shooting, camping, rock climbing, fishing, hunting, and sightseeing. Impacts from recreation on soil resources can vary widely based on the type and intensity of recreation use.

Special recreation management areas (SRMAs) and extensive recreation management areas (ERMAs) are public land units that provide specific structured recreational activities, experiences, and benefit opportunities. Increased areas designated as SRMAs or ERMAs could affect soils by increased vehicle and pedestrian traffic and associated increases in compaction and erosion. Mitigation, including limits to new roads, vehicle access, trails, and activities, would be considered to limit impacts on resources. Impacts from OHV use are discussed below. There likely would be impacts on soil from recreation under any of the alternatives.

Damage to soil resources is expected to increase as recreation use increases throughout the planning area in both SRMAs and ERMAs. The concentrated activity in the SRMAs increases the probability of impacts on soils, such as erosion from increased stormwater runoff due to impervious or compacted surfaces in parking areas, structures, and trails. These impacts would be limited in extent and would be moderate to minor. Mitigation and maintenance is planned for race courses. Impacts are likely to be offset by those planned management actions, as well as the education about natural resource management provided by the SRMAs themselves. In the dispersed recreation occurring in the ERMAs, disturbed sites may be more numerous, but impacts on many of the individual disturbed sites would be minor due to previous disturbance. Dispersed recreation occurs in the ERMAs and in undeveloped portions of the SRMAs. Soil impacts are likely to increase as previously unaffected areas are used for camping, hiking, mountain biking, equestrian activities, and OHV use.

Compaction, rutting, a high proportion of bare ground, and a high risk of erosion from stormwater runoff exists in the designated race course areas. These impacts increase probability of erosion on and near roads, which often leads to further expansion of the affected area as vehicle operators drive around damaged road surfaces. There is no data available on the current extent of this type of damage or of the number of turnouts that have developed in the 100-foot zone on each side of the designated routes. The impacts are classified as minor since they are individually small areas and are not numerous. However, there is a high probability that activity would occur, leading to an increased area of disturbance along roads in the planning area.

There is also the risk of lead contamination in soils from bullets and the buildup of shooting debris and the highly disbursed nature of recreational target shooting could result in the buildup of solid waste in a number of locations in planning area. Impacts would be minor to moderate.

4.2.3.5.4.2. Alternative 1

The effects under Alternative 1 are as described above, but more land would be disturbed than under the other alternatives. In other words, Alternative 1 would allow for the most disturbances of desert-sensitive soils by recreation activities and generate the most associated wind and water erosion. See the Recreation section of Chapter 2 (p. 104) for exact acreages.

4.2.3.5.4.3. Alternative 2

Under Alternative 2, the effects of recreation activities to soil resources would be the least. See the Recreation section of Chapter 2 (p. 104) for exact acreages.

4.2.3.5.4.4. Alternative 3

Under Alternative 3, the effects of recreation activities to soil resources would be more than under Alternatives 2 and 4 but less than Alternative 1. See the Recreation section of Chapter 2 (p. 104) for exact acreages.

4.2.3.5.4.5. Alternative 4

Under Alternative 4, the effects of recreation activities to soil resources would be more than Alternative 2 but less than Alternatives 1 and 3. See the Recreation section of Chapter 2 (p. 104) for exact acreages.

4.2.3.5.5. Travel and Transportation Impacts on Soil Resources

4.2.3.5.5.1. Impacts Common to All Alternatives

Impacts from travel and transportation management are similar to recreation. Motor vehicle use would have a minor to moderate effect on soils as the route system is not clearly marked or delineated for the public, resulting in an expansion of non-designated routes. This expansion would result in loss of vegetative cover, thus destabilizing soils and making them susceptible to erosion and lower productivity. As OHV use increases, so would the expansion of non-designated routes. OHV activities in undisturbed and remote areas could lead to further disturbances in these areas. An OHV area allocation of Open would create the greatest level of risk for soil disturbance. In an open area, there are no restrictions on where visitors can travel to, so soils could be disturbed by OHV to any point in the open area, and from any point in the open area to other undisturbed areas. The least impactful places to allocate as open from a soil resources standpoint are areas that are already unvegetated or denuded and do not contain sensitive soils, such as biological soil crusts and desert pavement. Limited use OHV areas have less risk than open areas to cause disturbance to soils. A limited area offers more manageability from a soils management standpoint. Designated routes can be periodically monitored for new or spreading non-designated routes. Closed areas of course would result in the lowest risk of soil disturbance. Other types of travel, including by foot, horse, or bike, cause fewer impacts, although all could disturb soils.

The public travels in wash bottoms and dry streambeds that are part of the existing route system, impacting surface drainages, eroding banks, damaging vegetation, and leading to greater sedimentation during stormwater runoff. Use of wash bottoms as existing but undesignated travel routes is likely to increase use of new or unauthorized routes as vehicle operators exit or re-enter

drainages. However, streambeds in the planning area are free of sensitive soil resources, and the affected areas are locally small, resulting in a minor impact overall. The intersections of roads and washes are numerous enough to cause moderate impacts locally where the intersections occur.

Routes on soils with a high or moderately high potential for wind erosion are vulnerable to greater soil loss and larger contributions to air quality degradation, in particular, through the emission of small particles of dust that could lead to an increase in PM_{10} levels. In addition, routes on soil types with high silt content are often more susceptible to wind erosion. Site-specific analysis of soil type and silt content would occur before route designation.

Potential for water erosion is substantially greater on roads where stormwater runoff is concentrated and road drainage is not well developed. Gully erosion, soil loss, increased runoff, and sedimentation in drainages may not be apparent everywhere, but the impacts would be widespread in the areas of relatively high density of open roads. The impacts are also rated moderate to major because mitigation of impacts that have occurred would be impractical and the outcome would be in doubt, particularly since use of most of the roads would continue. Closures would reduce the impacts on soils, particularly on the sensitive areas of desert pavement and cryptobiotic crusts that are common in undisturbed areas. As a result of road closures, rutting, surface, and vegetation disturbance and wind and water erosion would occur wherever routes are closed. In those specific areas where road closures are concentrated, the impact on soil would decline from moderate to minor. Depending on the effectiveness of restoration plans for roaded areas, a road is likely to remain a water erosion hazard long after it is closed. Designation of routes in most areas should decrease OHV impacts over time by decreasing uncontrolled road proliferation, assuming resources are available for enforcement of designations.

Open travel areas would have the effect locally of increasing disturbance on soils within this area. While these areas can be suitably mitigated by restoration, impacts would be moderate to major locally, but minor regionally.

4.2.3.5.5.2. Alternative 1

Alternative 1 has the largest number of acres allocated as Open to OHVs, which would create the largest negative impact on soils. However, Alternative 1 also has more acres allocated as Closed than Alternatives 3 and 4 (but less than Alternative 2).

Alternative 1 also has a fourth designation of limited to existing roads, trails, and dry washes. This category contains the majority of the acres for Alternative 1. This allocation has a higher negative impact on soil resources than does the limited to designated routes allocation.

This is because there are more travel routes that go through wetland/riparian areas. It is also difficult to enforce this designation, and it can quickly lead to expanding numbers of roads and trails, any of which may lead to wetland/riparian areas. It is difficult to say in some instances whether a trail existed before a particular person drove on it, it may have been one set of tire tracks. But left unchecked, one set of tire tracks will quickly turn into a full-blown road, and previously undisturbed desert pavements and cryptobiotic crusts (and other sensitive soil types) will become disturbed.

Alternative 1 does not include any management actions that address travel management and route designation guidelines. The lack of these actions would have an indirect negative impact on soil resources in the planning area. Not taking into account resource effects of specific travel routes, this could result in more disturbance and degradation to desert pavements and cryptobiotic crusts.

4.2.3.5.5.3. Alternative 2

Alternative 2 has the smallest number of acres allocated as Open, and the largest amount of acres allocated as Closed. Therefore, Alternative 2 would have the least amount of negative impact on soil resources.

Alternatives 2, 3, and 4 have management actions that will designate specific travel management areas and create corresponding travel management plans. Route designation would be guided by criteria to protect wildlife, vegetation, threatened and endangered species, and other resources. If OHVs are causing significant adverse effects on any resources, the affected areas will be closed to travel until the situation can be remedied and mitigated. These management actions will have an indirect beneficial impact on desert pavements and cryptobiotic crusts (and other sensitive soil types) . If desert pavements and cryptobiotic crusts (and other sensitive soil types) loss would become a problem in a specific area due to travel, the routes would be closed until the disturbance could be addressed. This will prevent unnecessary desert pavements and cryptobiotic crusts (and other sensitive soil types) .

See Impacts Common to All Alternatives for more impacts from Alternative 2.

4.2.3.5.5.4. Alternative 3

Alternative 3 has the second highest number of acres allocated as Open, after Alternative 1.

Alternative 3 also has the lowest number of acres allocated as Closed. Therefore Alternative 3 would create a higher level of negative impact on soils resources than Alternatives 2 or 4.

See Alternative 2 and Impacts Common to All Alternatives for more impacts from Alternative 3.

All other management actions will have a negligible impact on soil resources.

4.2.3.5.5.5. Alternative 4

Alternative 4 has the second lowest number of acres allocated as Open, after Alternative 2. It has a significantly lower number of acres Open than does Alternative 3. Alternative 4 also has the second lowest number of acres allocated as Closed, however the number of closed acres is very close to the number of closed acres in Alternative 3. Therefore, Alternative 4 would likely have less negative impact on soil resources than Alternative 1 and 3, but a greater negative impact than Alternative 2.

See Alternative 2 and Impacts Common to All Alternatives for more impacts from Alternative 4.

All other management actions will have a negligible impact on soil resources.

4.2.3.5.6. Lands and Realty Impacts on Soil Resources

Various construction activities and ROWs authorized under lands and realty management (such as wind power, solar power, communication sites, transmission lines, roads, and pipeline projects, etc.) would impact soil resources.

4.2.3.5.6.1. Land Tenure (Disposals and Acquisitions) Impacts on Soil Resources

4.2.3.5.6.1.1. Impacts Common to All Alternatives

Land sales could affect soil resources by potentially losing ecosystem services provided by desert pavement and cryptobiotic soil crusts and by changing the vegetative cover through land-use changes, such as urbanization, or industrial development. Erosion would increase during construction and would be short term in some cases. Erosion and the loss of ecosystem services would involve impacts from negligible to major, depending on the level of disturbance, the soil type, and mitigation measures.

4.2.3.5.6.1.2. Alternative 1

Under Alternative 1, the impacts of lands and realty management on soil resources would be as described above, but on more acres than Alternative 2, but less than Alternatives 3 and 4. See the Lands and Realty section of Chapter 2 for exact acreages.

4.2.3.5.6.1.3. Alternative 2

Under Alternative 2, the effects of lands and realty management on soil resources would be as described above but on the least acres of all the alternatives. See the Lands and Realty section of Chapter 2 for exact acreages.

4.2.3.5.6.1.4. Alternative 3

Under Alternative 3, the effects of lands and realty management on soil resources would be as described above but on more acres than under Alternatives 2 and 1, but less than Alternative 4. See the Lands and Realty section of Chapter 2 for exact acreages.

4.2.3.5.6.1.5. Alternative 4

The impacts under Alternative 4 are as described above, but more land would be disturbed than under the other alternatives. In other words, Alternative 4 would allow for the most disturbance of desert sensitive soils by lands and realty management decisions and generate the most associated wind and water erosion and lead to the greatest loss of soil related ecosystem services. See the Lands and Realty section of Chapter 2 for exact acreages.

4.2.3.5.6.2. Land-Use Authorizations (Right-of-Ways, Leases, Permits) Impacts on Soil Resources

4.2.3.5.6.2.1. Impacts Common to All Alternatives

ROWs for utility-scale renewable energy development also would have measurable, widespread effects on soil resources. These are discussed separately below. Overall impacts on soils in the planning area would be moderate to major depending on the acreage of these lands. Local impacts on the disposed lands are difficult to quantify when the specific actions are unknown, but impacts in the moderate to major range are probable.

While application of dust palliatives (other than water) are likely to reduce erosion of soils on site-type and linear ROWs, re-vegetation and re-establishment of biological soil crust would offer the most beneficial mitigation.

4.2.3.5.6.2.2. Alternative 1 through 4

There are no additional impacts to soil resources.

4.2.3.5.6.3. Renewable Energy Impacts on Soil Resources

4.2.3.5.6.3.1. Impacts Common to All Alternatives

Implementing any projects would include project-specific mitigation and impacts. With respect to the effects on soil resources, all of the alternatives are essentially equivalent. Construction activities associated with renewable energy projects would remove vegetation, desert pavement and biological soil crust, increase wind and water erosion and soil compaction, and decrease carbon sequestration, water infiltration and nutrient cycling. Implementing projects would include project-specific BMPs, mitigation measures, and stipulations to reduce impacts.

Blading of large areas for solar energy facilities is estimated to potentially exceed 982,000 acres over the life of the plan (approximately one-third of the planning area). These energy developments would disrupt drainage patterns, cause surface disturbance and soil compaction resulting in increased erosion, runoff, and sedimentation over a large enough area to cause a moderate impact. The overall impact of utility-scale renewable energy development for this use, depending on actual disturbed acreages, would be major.

Further, development of renewable energy would require road access to the sites. All projects would involve construction, soil disturbance, and the potential for enhanced wind and water erosion.

Wind farms typically consist of a series of turbines located along ridges at the highest points in a watershed. Typically, soils are thin and the terrain is rocky in these areas. Although soil erosion may be enhanced, the effects on soil resources are likely to be minor. However, there may be few existing roads and these may be unsuitable for transporting the components and equipment to the site. Constructing new roads or improving existing roads is likely to result in enhanced erosion. Roads would need to be maintained to allow continued access for turbine maintenance.

Construction impacts on soil resources would be mitigated through BMPs.

Renewable energy development projects would have varying potential for impacting soil resources based on resource-specific and project-specific conditions. Mitigation measures for soil loss (especially biological soil crust) would be required and set on a case-by-case basis.

4.2.3.5.6.3.2. Alternative 1

The impacts under Alternative 1 are as described above, but on more land than any other alternative. Impacts range from moderate to major depending on the location and size of the project footprint.

Project-specific NEPA environmental review would be performed. Construction-related impacts would be mitigated by implementing BMPs. Delineation of rights-of-way avoidance and exclusion areas ensure mitigation measures or use restrictions are implemented for location of ROWs. Implementation of mitigation measures, BMPs, and SOPs would reduce soil erosion potential.

4.2.3.5.6.3.3. Alternative 2

The impacts under Alternative 2 are as described above, but on least amount of land than any other alternative. Impacts range from moderate to major depending on the location and size of the project footprint.

Project-specific NEPA environmental review would be performed. Construction-related impacts would be mitigated by implementing BMPs. Delineation of rights-of-way avoidance and exclusion areas ensure mitigation measures or use restrictions are implemented for the location of ROWs. Implementation of mitigation measures, BMPs, and SOPs would reduce soil erosion potential.

4.2.3.5.6.3.4. Alternative 3

The impacts under Alternative 3 are as described above, but on less land than under Alternatives 1 and 4. Impacts range from moderate to major depending on the location and size of the project footprint.

Project-specific NEPA environmental review would be performed. Construction-related impacts would be mitigated by implementing BMPs. Delineation of rights-of-way avoidance and exclusion areas ensure mitigation measures or use restrictions are implemented for location of ROWs. Implementation of mitigation measures, BMPs, and SOPs would reduce soil erosion potential.

Further, in Alternative 3, eight solar energy zones have been identified. These zones are thought to have the least impacts from solar energy development as compared to other areas within the planning area's variance areas.

4.2.3.5.6.3.5. Alternative 4

The impacts under Alternative 4 are as described above, but on less land than under Alternative 1. Impacts range from moderate to major depending on the location and size of the project footprint.

Project-specific NEPA environmental review would be performed. Construction-related impacts would be mitigated by implementing BMPs. Delineation of rights-of-way avoidance and exclusion areas ensure mitigation measures or use restrictions are implemented for location of ROWs. Implementation of mitigation measures, BMPs, and SOPs would reduce soil erosion potential.

4.2.3.5.6.4. Utility Corridors Impacts on Soil Resources

4.2.3.5.6.4.1. Impacts Common to All Alternatives

Utility corridors for major linear ROWs are designated under all alternatives throughout the planning area. The designation of these corridors would lead to some localized impacts on soil resources where surface-disturbing activities occur during construction or maintenance. Containing these uses in the corridors would limit their areal extent and represent a minor impact if corridors are re-vegetated to reduce bare soil, which, in turn, would reduce runoff and erosion. Depending on the soil type, impacts of the roads associated with the ROWs could also be mitigated with surfacing.

4.2.3.5.6.4.2. Alternative 1

Under Alternative 1, the impacts of lands and realty management on soil resources would be as described above but on more acres than Alternatives 2 and 3 but less than Alternative 4. See the Lands and Realty section of Chapter 2 for exact acreages.

4.2.3.5.6.4.3. Alternative 2

Under Alternative 2, the effects of lands and realty management on soil resources would be as described above but on the least acres of all the alternatives. See the Lands and Realty section of Chapter 2 for exact acreages.

4.2.3.5.6.4.4. Alternative 3

Under Alternative 3, the effects of lands and realty management on soil resources would be as described above but on more acres than under Alternative 2 but less than Alternatives 1 and 4. See the Lands and Realty section of Chapter 2 for exact acreages.

4.2.3.5.6.4.5. Alternative 4

The impacts under Alternative 4 are as described above, but more land would be disturbed than under the other alternatives. In other words, Alternative 4 would allow for the most disturbance of desert sensitive soils by lands and realty management decisions and generate the most associated wind and water erosion. See the Lands and Realty section of Chapter 2 for exact acreages.

4.2.3.6. Special Designations

4.2.3.6.1. Areas of Critical Environmental Concern Impacts on Soil Resources

4.2.3.6.1.1. Impacts Common to All Alternatives

The effects of ACEC management on soil resources would be beneficial because they are intended to protect fragile resources from irreparable damage. Hence, under all alternatives, mitigation measures would be developed to reduce impacts on important resource values within ACECs which would also serve to reduce impacts on soil resources. All new proposed ACECs

(Alternatives 2, 3 and 4) include some use restrictions for saleable, solid minerals, fluid minerals, and or recreation activities, all of which would provide additional protection for soil resources.

4.2.3.6.1.2. Alternative 1

Alternative 1 offers protection for soil resources from ACEC management because it has 23 ACECs identified or 1,014,301 acres. Since there are no new ACECs proposed under Alternative 1, there are no new beneficial impacts from this alternative on soil resources.

4.2.3.6.1.3. Alternative 2

Alternative 2 offers the most protection for soil resources from ACEC management because it has identified the largest area (1,444,578 acres) and the most ACECs (44) to be eligible for lands to be protected, preserved, and maintained for their critical environmental values.

4.2.3.6.1.4. Alternative 3

Alternative 3 offers protection and beneficial impacts for soil resources from ACEC management because it has identified more ACECs (41) and consequently more acres (1,292,216) than Alternatives 1 and 4, but less than Alternative 2 to be eligible for lands to be protected, preserved, and maintained for their for their critical environmental values.

4.2.3.6.1.5. Alternative 4

Alternative 4 offers some protection for soil resources from ACEC management because it has identified fewer ACECs (25) and consequently fewer acres (1,021,365) than Alternatives 2 and 3, but more than Alternative 1 to be eligible for lands to be protected, preserved, and maintained for their critical environmental values.

4.2.3.6.2. National Trails Impacts on Soil Resources

4.2.3.6.2.1. Impacts Common to All Alternatives

See the Cultural Resources section for impacts to soil resources.

4.2.3.6.3. Wild and Scenic Rivers Impacts on Soil Resources

4.2.3.6.3.1. Impacts Common to All Alternatives

There are no effects common to all alternatives from wild and scenic rivers (WSR) management.

4.2.3.6.3.2. Alternative 1

Under this alternative, all seven river segments are managed as eligible river corridors and would be given protection either through continued interim protective management or the development of comprehensive river management plans. This would provide additional measures within the 17,600 acres of WSR corridors that would promote natural rates of erosion and deposition

of alluvial and colluvial sediments. Additionally, activities that would result in direct loss or degradation of these soils would be restricted to maintain the ORVs of the eligible segments.

4.2.3.6.3.3. Alternative 2

The impacts on soil resources resulting from WSR management objectives under Alternative 2 would be the same as under Alternative 1 except that while the 17,600 acres under Alternative 1 are only eligible for protection, the same acreage would be found suitable under Alternative 2.

4.2.3.6.3.4. Alternative 3

Under Alternative 3, the effects on soil resources resulting from WSR management objectives would be the same as those described under Alternative 2, but for only 960 acres.

4.2.3.6.3.5. Alternative 4

Under this alternative, there would be no additional protection for soil resources from WSR management as no eligible stretches of river would be found suitable.

4.2.3.6.4. Wilderness Impacts on Soil Resources

4.2.3.6.4.1. Impacts Common to All Alternatives

There would be no effects common to all alternatives from wilderness management.

4.2.3.6.4.2. Alternative 1

Since Alternative 1 does not identify any management directives for wilderness, no additional protection or benefit would be derived from this alternative.

4.2.3.6.4.3. Alternatives 2 and 3

Alternatives 2 and 3 offer the most protection for soil resources from wilderness management because they have identified management directions that call for no net unmitigated decrease in the benchmark conditions generally prevailing in each wilderness at the time of congressional designation. Maintaining, or when possible, improving the benchmark quality of wilderness character will protect soil resources as well and is considered a beneficial impact.

4.2.3.6.4.4. Alternative 4

Alternative 4 offers less protection for soil resources from wilderness management compared to Alternatives 2 and 3 because it only calls for mitigation of permanent and temporary impacts to the wilderness resource from activities on adjacent public lands on a case-by-case basis.

4.2.3.6.5. Wilderness Study Areas Impacts on Soil Resources

4.2.3.6.5.1. Impacts Common to All Alternatives

Soil resources within wilderness study areas (WSAs) would benefit from use restrictions and other management strategies in accordance with the WSA Implementation Management Plan. Wilderness characteristics would all be managed according to FLPMA. If released by Congress, those WSAs would be managed in accordance with the multiple-use mandate of FLPMA.

If released by Congress, management of the WSAs would be equivalent under each of the alternatives. The management of WSAs as non-wilderness areas would include certain uses that may result in adverse impacts on soil resources, such as OHV use.

4.2.3.6.5.2. Alternative 1

Areas with wilderness characteristics would be managed with use restrictions to protect values. Such restrictions would also protect soil resources located within these areas.

4.2.3.6.5.3. Alternatives 2 and 3

Wilderness characteristics would be managed on a case-by-case basis and subject to site specific mitigation measures to reduce impacts on wilderness characteristics. Soil resources located within areas containing wilderness characteristics would benefit.

4.2.3.6.5.4. Alternative 4

Impacts under Alternatives 4 would be the same as under Alternatives 2 and 3 except that it allows for the mitigation of permanent and temporary impacts to WSAs from activities on adjacent public lands. These impacts could be to soil resources.

4.2.3.7. Cumulative Impacts on Soil Resources

4.2.3.7.1. Past and Present Actions/Impacts

Past and present impacts on soils have occurred in areas where vegetation has been removed and soil surface and underlying horizons have been disturbed. Where not conserved by best management practices that protect rangeland health, soils are vulnerable to wind and water erosion resulting from livestock and wild horse and burro grazing. The 1998 RMP has employed management actions that reduce soil erosion caused by grazing. Minerals, renewable energy, and lands and realty activities have also impacted soils in order to construct roads, power lines and facilities. Impacts on soils have varied based on the extent of disturbance. Land management tools, such as the designation of utility corridors has concentrated impacts within defined areas. Recreation activities have impacted soils where concentrated recreational use has occurred or in areas popular for OHV uses. These areas of higher OHV use experience increased vegetation community impacts, increasing potential for accelerated erosion of soils. Wildfires have exposed large areas where vegetation has been consumed increasing wind and water erosion potential for soils. Few impacts on soils from wildlife and special status species management have occurred and have been dependent on the timing, extent and type of habitat improvement projects.

Generally, habitat improvement projects improve or protect soils. Limited impacts on soils have occurred from wild horse and burro management. Areas experiencing concentrated wild horse and burro grazing have been prioritized for gathering wild horses and burros, if above AML, in order to maintain a thriving natural ecological balance. Use of BMPs and SOPs, project-specific mitigation measures, permit stipulations, post-fire emergency stabilization and rehabilitation treatments, and wild horse and burro gathers have reduced impacts on soils by protecting or re-establishing vegetation communities.

4.2.3.7.2. Reasonable Foreseeable Actions

Impacts would be similar to the past and present actions from livestock and wild horse and burro grazing. Increased mineral, lands and realty, and renewable energy developments would increase the potential for impacting soils. Intensity of impacts would be based on the extent and timing of disturbance, but most likely would be considered major. Impacts associated with mineral exploration and development would vary depending on the market value of minerals. Increased recreation OHV use would further increase potential for soil disturbance with the level of impacts dependent on the number of acres designated as open, closed, or limited through travel management. Impacts from wildfire would continue and are dependent on climate, weather, and potential for human caused fires. Most soil disturbance impacts based on ROW authorizations would be concentrated in designated utility corridors. Management actions that would reduce the intensity and degree of impacts include managing livestock grazing to meet rangeland health standards; applying BMPs, SOPs, stipulations and mitigation measures to minerals, lands and realty, and renewable energy activities; limiting OHV use to existing roads; implementation of fuel breaks at a landscape scale; and rehabilitation efforts. Soils located in lands and realty designated as avoidance or exclusion areas, priority wildlife habitats or within ACECs would receive further protection due to use restrictions.

Climate change is expected to have a minor to moderate impact on soil resources. As precipitation patterns are shifting from winter precipitation events to more severe summer precipitation, less water will be available for restorative processes of biological soil crusts, infiltration, and recharge. This will lead to a greater loss of vegetation and increased wind and water erosion. Increased erosion is also an impact from increased intensity of summer monsoons.

4.2.3.7.3. Cumulative Impact

4.2.3.7.3.1. Impacts Common to All Alternatives

As the population grows and the demand for energy and mined commodities increases, impacts on soils would also increase. However, implementation of management strategies across all alternatives would continue to reduce the potential for wind and water erosion of soils over time. Development of the OHV travel management plan and habitat management plans should further protect and improve soils. Emergency stabilization and rehabilitation treatments would stabilize soils in the long term following disturbance and associated impacts from wildfire.

4.2.3.7.3.2. Alternative 1

The cumulative impacts from Alternative 1 would be major. This is mostly reflecting the large previously undisturbed areas made available for renewable energy development and land disposals.

4.2.3.7.3.3. Alternative 2

While Alternative 2 has the most area set aside for preservation and conservation (in terms of ACECs, wildernesses, etc.) and has the most beneficial impacts on soil resources, the negative impacts would still be considered moderate. Again, this is mostly due to the large tracts of previously undisturbed land that will be made available for renewable energy development and land disposals.

4.2.3.7.3.4. Alternative 3

The cumulative impacts from Alternative 3 would be major. This is mostly reflecting the large previously undisturbed areas made available for renewable energy development and land disposals. However, the cumulative impacts would be less than Alternatives 1 and 4.

4.2.3.7.3.5. Alternative 4

The cumulative impacts from Alternative 4 would be major. This is mostly reflecting the large previously undisturbed areas made available for renewable energy development and land disposals. This alternative will have the most negative cumulative impacts on soil resources compared to the to other three alternatives.

4.2.4. Water Resources

4.2.4.1. Summary

The mandate to manage the land for multiple uses requires the BLM to consider some uses that have the potential to degrade water quality and impact the quantity of water available. Minimizing such impacts is a common theme of all of the alternatives. Actions that increase the intensity of land use could adversely impact water resources.

This section discusses the potential impacts on water resources from the proposed allocation decisions and management actions as noted in Chapter 2. The primary water resource characteristics that could be impacted by the alternatives are water flow in ephemeral channels (timing and quantity), surface and groundwater quality and quantity, and groundwater recharge. Sedimentation, nutrients in the form of fertilizer in irrigation return flows, temperature, flow alternation, and bacteria are the most common stream impairments in the planning area. However, the only impaired water bodies with hydrologic connections to drainages in the planning areas are those in the Virgin River and its confluence with Lake Mead Reservoir. The fragmented pattern of land ownership in the planning area makes linkage of existing impairments to specific sources or activities occurring on BLM-administered public lands difficult. Management actions that result in surface disturbance; mining; energy development; recreation, and the application of herbicides and pesticides near water bodies all have potential to affect water quality and quantity, including stormwater runoff.

Activities as far-ranging as recreation, mineral extraction, road construction, grazing, energy production, and land disposals all have potential to adversely impact water resources. Activities that disturb soils or reduce vegetation cover can lead to change in surface water run-off patterns and infiltration rates, as well as increased erosion, which, in turn, may result in more sediment being carried to streams or other surface water bodies.

4.2.4.2. Methods of Analysis

Methods and Assumptions

The management actions for each resource were compared to identify differences, which, where they occur, are usually differences of degree. Actions that would increase demand for water could have significant impacts in basins or watersheds where committed water rights allocations are already near or over the perennial yield. Alternatives with lower potential for soil disturbance are generally expected to result in fewer indirect impacts on water quality from sediment and nutrient loading. Alternatives with lower potential for introducing new sources of chemical inputs are generally expected to have lower potential for water quality degradation.

The methods to determine potential impacts on water resources included a review of relevant GIS data for the planning area. The GIS data were overlain with the actions found under each alternative, and conclusions were drawn based on an understanding that these types of actions may affect known surface and groundwater resources. Impacts on water resources are evaluated only from the perspective of water availability and quality. Effects are quantified where possible; in the absence of quantitative data, best professional judgment was used.

However, groundwater resources in Amargosa Valley and the recharge zones for Warm Springs Complex and Muddy River, in Moapa, were modeled using different development and

groundwater extraction scenarios. The modeling efforts were outsourced, peer-reviewed and took multiple years to complete.

Amargosa Valley

The groundwater flows in the southern part of the Amargosa Desert were evaluated using the USGS' Southern Amargosa eMbedded Model (SAMM). SAMM is a submodel of the Death Valley Regional Flow System (DVRFS) regional model. Water-level data currently are available primarily through USGS and State monitoring networks. Additionally, water-level data sets collected by Nye County were used in the SAMM. Water-level data from 1999 through 2003 have been compiled, quality assured, evaluated, and stored in a relational database for use in the flow model. Pumping data are available through the state or have been determined, in part, by analysis of irrigated areas using satellite imagery. As part of the refinement of the hydrogeologic framework the lithologic model produced by USGS Geology Discipline for the Amargosa Desert, hydrogeologic units (HGUs) were developed for the SAMM study area. The lithologic model contains considerably more detail than the basin-fill units depicted in the regional hydrogeologic framework model (HFM). These lithologic units were grouped into HGUs that were useful in representing the hydrogeology of the SAMM area. Hydraulic conductivity zones were also defined for the HGUs to capture detail in the HFM for the flow model. Modifications were done to the lithologic model. Aquifer test results were compiled for these HGUs to use as calibration criteria for the flow model.

Construction of the local-grid refinement (LGR) embedded model involved designing the model grid, producing the appropriate input data sets, and linking the LGR model to the updated regional model. Several modifications or revisions enhanced the DVRFS regional model, as well as integrated it more effectively with the LGR modeling technology used for the embedded model. The embedded model domain has a finer-scale representation of a subregion of the DVRFS model and includes Ash Meadows, Amargosa Farms, Devils Hole, and Stewart Valley.

The effects of existing and additional pumping in the southern Amargosa desert area on groundwater levels have been assessed. The following scenarios were evaluated:

1. **No-action scenario (2004-2044) (baseline) – No disposals in Armagosa Valley (Alternative 2)**
   a. 2003 actual pumping rates of 26,277 afa (acre-feet annually) total for Basin 230 (does not include 2 afa for each residence in Amargosa Valley)
2. **Full built-out Alternative 1, 4 (2004-2013, 2014-2044):**
   a. 34,824 acres; 6,965 5-acre lots each using 2 afa
   b. Pumping an additional 13,929 afa after 2013 (in addition to 2003 pumping rates)
3. **Order 1197 exclusion scenario: (Alternative 4) (2004-2013, 2014-2044)**
   a. No Disposals within 10 mile radius around Devil's Hole (Order 1197) (Except for 92 acre of trespass properties – no additional pumping is associated with these acres)
   b. 26,240 Acres [13,440 acres of LDR (Low-Density Residential) (or 2,987 4.5-acre lots) and 12,800 acres of RDR (Rural Density Residential)(or 2,560 5-acre lots)]
   c. Pumping an additional 11,094 acre-feet/year after 2013(in addition to 2003 pumping rates)
4. **Nye County scenario (Alternative 3):**
   a. 433 acres of agriculture (7 afa per acre) = 3031 afa plus
   b. 119 acres of residential (14.5 acre parcels at 2 afa each) = 16 afa
   c. Pumping an additional 3,047 acre-feet/year after 2013 (in addition to 2003 pumping rates)

The results from the emebedded model provide a detailed look at flow in the southern part of the Amargosa Desert and potential effects of increased pumping from development proposed for the area according to Nye County's approved Amargosa Valley Area Plan. It also allows BLM, the National Park Service and the U.S. Fish and Wildlife Service to assess effects of groundwater pumping on water levels in the Ash Meadows discharge area and in Devil's Hole, and impacts to the habitats of about a dozen threatened and endangered species. This is discussed in more detail in the Lands and Realty Impacts on Water Resources part of this section and the Special Status Species Section of this RMP. The detailed report on the modeling effort is available from the USGS (USGS 2014).

Warm Springs Complex and the Muddy River, Moapa

The groundwater flows in the recharge zones for Warm Springs Complex and the Muddy River, Moapa, was evaluated using a model specifically designed for Department of the Interior agencies by Tetra Tech Inc. This new three-dimensional model has been completed for all or parts of 13 hydrographic areas within the Colorado Regional Groundwater Flow System in SE Nevada. This model simulates the movement of groundwater in an area ranging from the Clover and Delaware Mountains on the north to the Las Vegas Valley Shear Zone and Lake Mead on the south, and from the Sheep Range on the west to the Virgin and Beaver Dam Mountains on the east. The model used information provided by federally funded geophysical studies, geologic mapping, new geologic cross-sections, synoptic discharge-measurement runs on the Muddy and Virgin Rivers, an ET study over the whole model area, boundary flux estimates developed by Jim Harrill (retired USGS hydrologist) and preliminary hydrogeochemical investigations. Other information, such as lithologic information from new drillholes and recent water-level and water-use data, has been provided by other (non-federal) parties and organizations with interest in the groundwater resources of the study area.

Initial development of this model was funded by the National Park Service and the U.S. Fish and Wildlife Service intermittently from 2000 – 2005. The model was completed with funding through the Southern Nevada Public Lands Management Act (SNPLMA) Conservation Initiatives Program as part of a project on behalf of the National Park Service, the U.S. Fish & Wildlife Service, and the Bureau of Land Management (collectively, the DOI bureaus). The impetus for the DOI bureaus to develop this model is to have a tool with which to make quantitative estimates of the future impacts on springs and streams throughout the model area as a result of ongoing pumping of existing groundwater rights and additional groundwater applications that had been pending before the Nevada State Engineer. Ultimately, these applications were denied, in part, due to the results of this modeling effort. The DOI bureaus pointed out the potential adverse effects to springs and streams on federal lands for which they have responsibility.

Twenty-seven hydrogeologic units (HGUs) were used to describe the different lithologic units and the complications caused by the tectonic history of the area. MODFLOW-2000 was used for the groundwater model. The HUF package, which was developed to allow areas of complicated geology to be simulated by MODFLOW, was used in this model, allowing hydrologic properties to be assigned to each HGU. Other packages that were instrumental in the development of the model include the MNW (which allowed pumping to be allocated to different model layers using information on the geology and hydrologic properties) and SFR2 packages. The SFR2 package allowed streamflow data to be used in the calibration process, and for the model to predict changes in streamflow that might occur as a result of pumping of the groundwater. Calibration was performed using a combination of regression (using PEST) and manual approaches. The model was calibrated based on many types of information, including measurements of water

levels and drawdown, discharge rates for springs, streamflow measurements, reported pumping rates that varied through time, etc. Simulated pre-pumping water levels agree well with observed water levels. The correlation between measured and simulated water levels was 0.96. For a more detailed description of the model, please refer to *Development of a Numerical Groundwater Flow Model of Selected Basins within the Colorado Regional Groundwater Flow System, Southeastern Nevada* (Tetra Tech Inc. 2012).

In summary, this model is a great improvement over previous models of the area because of the advances in information on the geology and hydrology of the study area and improvements in modeling codes available. This is also the first model to include the Virgin River Valley and Tule Desert basins into the Colorado Regional Flow System. It can be used to evaluate both incremental and cumulative effects of pumping in different areas within the model, and to estimate the magnitude and timing of changes that will occur as a result of use of the groundwater. Predictions made using the model are approximate, but can be used to guide decisions about management of the groundwater resource and to determine whether there will be impacts on sensitive environments and on other users of the water. The uncertainty in the predictions primarily affect the timing of when impacts become significant, not whether there will be impacts.

The model simulated seven different scenarios, which are described in detail in *Predictions of the Effects of Groundwater Pumping in the Colorado Regional Groundwater Flow System, Southern Nevada* (Tetra Tech Inc. 2012). In summary, the first two scenarios were developed within the framework of existing water right permits. The first scenario evaluates the effects of existing pumping, assuming that the average of the reported pumping during the years 2009, 2010, and 2011 would continue at that rate in the future. The exception to this statement is that the rate for pumping of carbonate-rock aquifer wells in Coyote Spring Valley and the Muddy River Springs Area in 2011 would continue in the future. The second scenario simulates pumping the full amount of all existing groundwater rights, continued into the future.

Scenarios 3 through 7 simulate pumping the full amount of all existing groundwater rights, plus groundwater applications before the Nevada State Engineer's Office through 2009, in five different steps. Scenario 3 simulates all existing groundwater rights plus all large (>1,000 af/yr) applications with filing dates up to and through 1989. Scenario 4 simulates all existing groundwater rights plus all large applications with filing dates up to and through 1994. Scenarios 5 through 7 continue similar cumulative simulations by including all large applications through 1999, 2004, and 2009, respectively.

The model simulations results were presented by the DOI agencies as a separate line of evidence in their interpretation of the Order 1169 pumping test impacts to convince the Nevada State Engineer (NSE) that many of these basins are already fully appropriated and/or over-appropriated and that additional pumping in these basins will likely cause injury to existing water rights and/or threatened/endangered species that rely on springs fed by this groundwater. In several of the NSE's recent rulings (Rulings #6254 — 6261), he notes that the DOI agencies (and others) have presented persuasive evidence that these basins cannot support additional groundwater development without impacts to existing water rights and/or groundwater-dependent species, which has resulted in his denial of more than 90 pending water right applications in several of the basins in the model area. The NSE rulings included hydrographic basins 210 (Coyote Valley), 215 (Black Mountains Area), 216 (Garnet Valley), 217 (Hidden Valley), 218 (California Wash), 219 (Muddy River Springs Area), 220 (Lower Meadow Valley Wash).

In addition, it should be noted that the Tetra Tech model is still a useful decision-making tool in this portion of the BLM Las Vegas Field Office coverage area for evaluating pumping impacts for proposed projects that might purchase or lease existing water rights in these basins, as well as proposed projects in the Tule Desert and Virgin River Valley basins that are not currently affected by the recent NSE rulings.

These results are discussed in more detail in the Land and Realty Impacts on Water Resources part of this section and the Special Status Species section of this RMP. The detailed report on the modeling effort and the results is available from the Tetra Tech or the DOI agencies (TetraTec 2012). The NSE ruling are downloadable from the Nevada Division of Water Resources' website.

Indicators

The following indicators were used to comparatively assess impacts on water resources for all other areas within Las Vegas Field Office and Pahrump Field Office:

- Acres of surface disturbance
- Acre-feet annually (afa) of groundwater pumping (predicted/potential)
- Location of disturbance (i.e. hydrologic basin, vicinity to water dependent resources)

Assumptions

Assumptions used to assess the impacts of the alternatives on water resources include:

- Substantial surface disturbance to soil, including exposure of bare ground, loss of vegetative cover, or rutting on un-surfaced roads could increase water runoff and downstream sediment loads; thereby degrading water quality, altering channel structure, and affecting overall watershed health. Water resource impacts other than groundwater impacts are closely associated with soils impacts.
- Special management designations, such as ACECs, wilderness study areas (WSAs), or special recreation management areas (SRMAs), that restrict use for the protection of one or more resources (and management actions for resource protection are properly implemented) have positive impacts on water resources. The positive impacts exceed any negative impacts that could accrue due to increased visitation caused by the designation itself.
- When a proposed management action requires monitoring and enforcement of use restrictions to be effective, such as routes designated as closed for travel management, resources will be available to ensure that the necessary monitoring and enforcement occurs.
- Groundwater resources would be managed to protect environmentally sensitive areas and to be a good neighbor to adjoining well owners. All development would require a demonstrated need and mitigation measures in order to not conflict with other resource management goals.

Program Areas with No Impacts on Water Resources

No impacts on water resources are anticipated for management actions relating to:

- Cultural Resources
- Visual Resource Management

4.2.4.3. Qualitative Intensity Scale

Impacts are described using ranges of potential impacts or in qualitative terms, if appropriate. When impacts are positive, it is so stated. The intensities of impacts are also described, where possible, using the following intensities:

- **Negligible:** The amount of surface disturbance, stormwater runoff volumes, or sediment delivered to channels would be very small. Changes in area of bare soil and removal of vegetative ground cover are below the level of detection. Groundwater withdraw would not be detectable at other wells or have any impacts to any surface water or groundwater dependent species.
- **Minor:** The amount of surface disturbance, or changes in other indicators resulting in changes to drainage patterns, stormwater runoff volumes, or sediment delivered to channels would be small, as would the area affected. Groundwater withdraw could potentially be detectable at other wells or have impacts to surface water or groundwater dependent species if unmitigated, but mitigation is possible. If mitigation were needed to offset adverse effects, it would be relatively simple to implement and would likely be successful.
- **Moderate:** The amount of surface disturbance, or changes in other indicators resulting in changes to drainage patterns, stormwater runoff volumes, or sediment delivered to channels would be readily apparent and would occur over a relatively wide area. Groundwater withdraw is likely to be detectable at other wells or have impacts to surface water or groundwater dependent species if unmitigated but mitigation is possible. Mitigating measures probably would be necessary to offset adverse effects and would likely be successful.
- **Major:** The amount of surface disturbance, or changes in other indicators resulting in changes to drainage patterns, stormwater runoff volumes, or sediment delivered to channels would be readily apparent and long term and would substantially change the indicators over a large area. Groundwater withdraw will negatively impact other wells or have impacts to surface water or groundwater dependent species. Extensive mitigation measures to offset adverse effects would be needed, and their success could not be guaranteed.

4.2.4.4. Resources

4.2.4.4.1. Air Quality Impacts on Water Resources

4.2.4.4.1.1. Impacts Common to All Alternatives

While all alternatives include measures to reduce impacts of emissions on water resources via deposition, aspects of all alternatives may increase the use of water to reduce the transmission of potential pollutants. This includes, but may not be limited to, the use of water in dust abatement and the use of water in fire suppression activities. Creation of PM_{10} due to travel on un-surfaced roads or construction activities in the planning area is a major concern and is often mitigated by using water as a dust suppressant. Here the greatest impact comes from the large-scale use of water. The different alternatives allow for varying amounts of acres to be developed (i.e. solar energy, land disposals, transmission lines), which would use water for dust abatement. While the effects are the same (use of water), the quantitative impacts vary among the different alternatives. Occasionally chemical palliatives may be used. If chemical dust palliatives are used anywhere in the planning area there is a probability that a portion of those chemicals would be washed into drainages during periods of stormwater runoff and eventually be consumed by wildlife. Due to the limited use of these chemicals (and approval from the U.S. Fish and Wildlife Service for each chemical dust palliative used), infrequent flood events, and dilution factors, this impact is minor to negligible.

4.2.4.4.1.2. Alternatives 1 through 4

There are no additional impacts to water resources.

4.2.4.4.2. Soil Resources Impacts on Water Resources

4.2.4.4.2.1. Impacts Common to All Alternatives

The most important concern to water quality is soil erosion. Soil erosion is a natural process and occurs under natural conditions at varying rates, dependent on geology, climate, slope, vegetation cover, and many other factors. One of the functions of streams and washes is to transport sediment. The sediment carrying capacity of a stream increases with flow. Streams in desert regions tend to decrease in velocity and power to transport sediment as they reach lower elevations, depositing their sediment loads onto alluvial fans or playas at the base of the mountain ranges where they originate. Many streams are ephemeral and carry flows only after the spring thaw or for short periods following local thunderstorms. Desert streams tend to carry high sediment loads during these brief high flow periods. Only a few streams within the planning area have perennial flow.

Soil disturbance and removal of vegetation cover tends to make soils more vulnerable to water erosion. However, the effects of increased erosion rates on water quality or morphology of most streams in the planning area, which tend to be ephemeral, are very different from the effects on perennial streams. Ephemeral streams tend to be highly turbid when they are flowing because they flow only when discharge rates are high enough to transport sediment. Ephemeral streams frequently migrate and cut new channels, resulting in a braided channel system on alluvial fans. Perennial streams or stream segments tend to form established channels. Riparian vegetation becomes established along these channels. During periods of high spring runoff or after thunderstorms, these streams also carry high flows supplemented by overland flow from the surrounding watershed, and the water may become briefly turbid from the increased sediment load. However, at most times, the flow of water to these perennial streams comes from shallow groundwater and springs and is moderate and clear.

Actions that protect and stabilize soils are expected to have beneficial impacts on water resources under each of the alternatives because they would reduce soil erosion. The alternatives differ in degree and probability of effectiveness (Alternative 1 differs from other Alternatives).

4.2.4.4.2.2. Alternative 1

Alternative 1 relies on a basic set of measures included in all of the alternatives to conserve soil, but does not specify some measures included in the other alternatives that might provide additional protection against erosion.

4.2.4.4.2.3. Alternatives 2 through 4

Alternatives 2 through 4 call for avoidance or fully mitigating surface disturbances to biological crusts, desert pavements and other sensitive or fragile soils and require restoration of most surface-disturbing activities. Further, Alternatives 2 through 4 call for improving soils within areas with high potential for biological crusts, desert pavements and other sensitive or fragile soils. These measures would be expected to provide greater indirect benefits to water resources than Alternative 1.

4.2.4.4.3. Water Resources Impacts on Water Resources

4.2.4.4.3.1. Impacts Common to All Alternatives

Water resources management actions common to all alternatives would apply BMPs to BLM-authorized activities; ensure that all planning area watersheds and surface waters are evaluated against and managed to meet the specifications of land health standards, which include watershed health, riparian health, and water quality standards; provide that waters used by the BLM will be governed by applicable state and federal regulations; ensuring that water use does not over-tax hydrographic basins based on NV State Engineer's determinations; and provide that any water rights acquired and any water sources developed by the BLM will be restricted to those actions consistent with multiple use. These actions would reduce impacts on water resources, promote healthier watersheds and surface waters while allowing for multiple uses, promote the protection of prior existing water rights for non-BLM water right holders, and provide that any water rights acquired and any water sources developed by the BLM will be restricted to those actions consistent with multiple use. All water rights applications that could potentially negatively impact publicly owned resources (streams, springs seeps, BLM-owned wells, groundwater dependent species) will be protested. Some of the management directives under Alternative 1 have already been achieved and therefore are not reflected in Alternatives 2 through 4.

4.2.4.4.3.2. Alternatives 1 through 4

There are no additional impacts to water resources.

4.2.4.4.4. Integrated Vegetation Impacts on Water Resources

4.2.4.4.4.1. Vegetation Impacts on Water Resources

4.2.4.4.4.1.1. Impacts Common to All Alternatives

There likely would be no negative impacts on water resources resulting from integrated vegetation management objectives or actions under any of the alternatives. With respect to impacts to water resources, all of the alternatives are essentially equivalent.

Healthy vegetation cover tends to protect soils from the direct impact of raindrops and slows runoff, which helps to reduce erosion. When runoff is slowed, water has more time to infiltrate the soil and recharge groundwater aquifers. Plant litter also softens the impact of raindrops and helps to maintain soil moisture. Plant roots help to stabilize soil and reduce erosion. All of the alternatives promote diverse and healthy vegetative cover, which would have the indirect effects of maintaining good surface water quality and maximizing groundwater recharge and storage.

Minimizing the loss of native plant communities and the ecosystem services they provide, as well as mitigating for impacts, will help protect water quality in the planning area.

Alternative 1 continues the current management prescriptions while Alternatives 2 through 4 equivalently provide additional management directions. However, the impacts to water resources are beneficial and equal under all alternatives.

4.2.4.4.4.1.2. Alternatives 1 through 4

There are no additional impacts to water resources.

4.2.4.4.4.2. Riparian Areas and Wetlands Impacts on Water Resources

4.2.4.4.4.2.1. Impacts Common to All Alternatives

There are no impacts common to all.

4.2.4.4.4.2.2. Alternatives 1 through 4

There are no additional impacts to water resources.

4.2.4.4.4.3. Weeds Impacts on Water Resources

4.2.4.4.4.3.1. Impacts Common to All Alternatives

Control of invasive and noxious weeds generally would indirectly improve water quality and quantity in areas where impacts have occurred. Noxious weeds tend to out-compete native species and have undesirable effects, such as decreasing ground cover, removing soil moisture, or enhancing fire hazard.

Action WEED-01 would encourage activities to prevent the spread of and eradicate noxious weeds. This may cause localized, short-term impacts on surface water quality (through application of chemicals, temporary loss of groundcover, etc.) while promoting longer term protection of surface water quality.

4.2.4.4.4.3.2. Alternative 1

Alternative 1 primarily focuses on tamarisk eradication, which has minor beneficial impacts on water resources, as described above. Alternative 1 would be expected to have the least positive effect on water resources.

4.2.4.4.4.3.3. Alternative 2

The actions under Alternatives 2, 3, and 4 designed to address objective WEED-01 would be the same and would have similar beneficial impacts on water resources. Alternatives 2 through 4 include a number of actions that would not be implemented under Alternative 1. To the extent that these actions are successful in reducing the spread of noxious weeds, they may also have beneficial impacts on water resources. Because Alternative 2 would require a BLM-approved project-specific weed management plan for all federal actions involving a disturbance footprint greater than one acre, unless otherwise determined by the BLM weeds specialist, it is likely to be more limiting than Alternatives 3 and 4 since most riparian areas would fall into this size category.

4.2.4.4.4.3.4. Alternative 3

The effects would be the same as Alternative 2, but less so because the disturbance footprint threshold for a project-specific weed management plan would be 5 acres. This alternative has more beneficial impacts than Alternatives 1 and 2.

4.2.4.4.4.3.5. Alternative 4

The effects would be the same as Alternative 3, but less so because the disturbance footprint threshold for a project-specific weed management plan would be 10 acres. This alternative has more beneficial impacts than Alternatives 1, 2, and 3.

4.2.4.4.4.4. Forests and Woodlands Impacts on Water Resources

4.2.4.4.4.4.1. Impacts Common to All Alternatives

See the Forest & Woodland Products section under Resource Uses for this analysis.

4.2.4.4.5. Fish and Wildlife Impacts on Water Resources

4.2.4.4.5.1. Impacts Common to All Alternatives

Each of the alternatives contains actions intended to improve wildlife habitats and protect riparian habitats. Measures that limit uses in order to benefit fish and wildlife (particularly fish) also have the potential to indirectly improve water quality and quantity.

Potential minor adverse impacts on water quality could result from populations of big game animals such as elk and deer since these animals contribute to similar impacts caused by livestock grazing (trampling riparian areas, compacting soils, being a source of waterborne pathogens). Other impacts could come from use by hunters, with potential indirect adverse effects on water resources associated with OHV use, increased fire danger, and pathogen loading associated with human use. Due to the small size of the riparian areas where hunting can occur, these activities would have negligible impacts on water resources. Implementation of mitigation measures to protect wildlife habitats would also protect water resources. Applying BMPs to maintain or improve wildlife habitats would also maintain or improve water resources.

4.2.4.4.5.2. Alternative 1

Management actions tend to be broader and less specific under Alternative 1 than the other alternatives. This does not mean that more specific actions could not be implemented under much less assurance that such actions would be implemented under Alternative 1.

4.2.4.4.5.3. Alternative 2

Alternative 2 provides the greatest benefit to water resources because it has direction to avoid BLM-authorized activities within one half mile of natural and artificial water source and associated riparian areas. This management directive is more limiting to negative anthropogenic caused impacts than Alternatives 3 and 4.

4.2.4.4.5.4. Alternative 3

The effects would be the same as Alternative 2 but less so since it only calls to avoid BLM-authorized activities within one quarter mile of natural waters and associated riparian areas and only to minimize impacts to artificial water sources due to BLM-authorized activities within one quarter mile of the water source on a case-by-case basis.

4.2.4.4.5.5. Alternative 4

The effects would be the same as Alternative 3, but less so since it is only calls to avoid BLM-authorized activities within one quarter mile of natural waters and associated riparian areas. Artificial water sources are not protected under Alternative 4.

4.2.4.4.6. Special Status Species Impacts on Water Resources

4.2.4.4.6.1. Impacts Common to All Alternatives

All alternatives would provide varying special status species management strategies that would protect or improve water resources. These strategies include use restrictions, protection measures, and development of mitigation measures to improve special status species habitats. Habitat improvement projects would also serve to protect or improve water resources.

4.2.4.4.6.2. Alternative 1

Alternative 1 continues the current management prescriptions, while Alternatives 2 through 4 provide additional management directions.

4.2.4.4.6.3. Alternatives 2

Alternative 2 provides the greatest benefit to water resources because of SSS-10, which mandates to “attain no net unmitigated loss of special status species habitat due to BLM-authorized activities.” This is especially important for land disposal actions in the Amargosa Valley and the groundwater source areas of Warm Springs and the Muddy River, Moapa. Further, this Alternative establishes Areas of Ecological Importance, cover over 27,000 acres in Nye County. This would also offer additional protection to water resources, due to limiting development and associated potential for groundwater withdraw, especially in the Northern Amargosa Desert Area. Hence, this alternative has more beneficial impacts than Alternatives 1, 3 and 4.

4.2.4.4.6.4. Alternative 3

Alternative 3 also provides great benefit to water resources because of SSS-10, which mandates to “attain no net unmitigated loss of special status species habitat due to BLM-authorized activities.” This is especially important for land disposal actions in the Amargosa Valley, Pahrump Valley, and the groundwater source areas of Warm Springs and the Muddy River, Moapa. Hence, this alternative has more beneficial impacts than Alternatives 1 and 4.

4.2.4.4.6.5. Alternative 4

Under SSS-10 under Alternative 4, the BLM is only required to "Minimize impacts to special status species habitats due to BLM-authorized activities." This provides less of a beneficial impact on water resources than Alternatives 2 and 3.

4.2.4.4.7. Wild Horse and Burro Impacts on Water Resources

4.2.4.4.7.1. Impacts Common to All Alternatives

Wild horses and burros cause adverse impacts on water quality when the animals congregate near surface water, overgraze sensitive areas, spread plant pests, increase pathogen loading to water bodies via surface water contact with manure, and compact or otherwise damage soil. Unlike livestock, which can be moved to other areas when impacts are observed, movements of wild horses and burros are not controlled because maintaining the free-roaming nature of wild horses and burros is an objective of all of the alternatives. Wild horses and burros tend to stay in the same watering areas all year, and this does not allow damaged areas to rest and recover.

Historical observation indicates that water resources impacts would be highest in areas with a moderate abundance of water and higher variability in abundance from year to year because animal numbers increase during good years and cannot be supported during low water years. Areas with relatively abundant sources of water experience few impacts. Areas that are consistently dry and have relatively few sources of water experience few impacts because these areas do not support significant wild horse and burro populations.

The most effective measures for reducing impacts on water resources are controlling populations and preventing wild horses and burros from using damaged or sensitive areas through the installation and maintenance of exclosure fences. The impacts of wild horses and burros on springs and seeps in the HMAs vary depending on the individual water source, water year, and climatic conditions and range from negligible to major.

4.2.4.4.7.2. Alternative 1

Alternative 1 does not allow for any new HMAs, but also does not suggest the use of fertility control. That could lead to greater herd sizes and consequently to greater disturbance of water resources in the existing HMAs. However, areas outside existing HMAs, especially in Gold Butte, would be better protected from disturbances caused by wild horses and burros and the management thereof.

4.2.4.4.7.3. Alternatives 2 and 3

There are no additional impacts to water resources.

4.2.4.4.7.4. Alternative 4

Under Alternative 4, the effects to water resources would be the same as described in the Impacts Common to All Alternatives, except that under Alternative 4, wild horses and burros would be allowed in Gold Butte. Hence, the disturbance, due to wild horses and burros and the management thereof, described above, could occur in Gold Butte, as well.

4.2.4.4.8. Cave and Karst Management Impacts on Water Resources

4.2.4.4.8.1. Impacts Common to All Alternatives

Karst refers to a geological terrain, which may underlie a wide area. Many karst features are found below the ground surface, and caves are just one of the more spectacular features associated with karst terrain. Cave and karst features would be inventoried under Alternatives 2, 3, and 4, and the inventory process would identify and prioritize the specific features requiring protection. Not all caves in karst terrain are associated with existing flowing water, but protecting karst features may directly protect some waters that flow through karsts. Some surface manifestations of karst terrain, such as sinkholes, make convenient dump sites that may also be conduits to groundwater. Furthermore, groundwater can flow rapidly through cavernous limestone and carry pollutants long distances. Therefore, public awareness of karsts and of these hazards to water resources may lead to lower potential for these impacts on water quality.

4.2.4.4.8.2. Alternative 1

Management actions under this alternative do not ask for the identification of significant cave and karst resources, but provide specific protection similar to those outlined in Alternative 2.

4.2.4.4.8.3. Alternative 2

Alternative 2 would treat cave and karst features in much the same way that other unique geological features would be protected. Use restrictions and avoidance area of one half mile for ROWs (except in designated corridors) would help to reduce the potential for adverse impacts on water resources in the vicinity of cave and karst features. Under Alternative 2, impacts on water resources would be expected to be the most beneficial of the four alternatives.

4.2.4.4.8.4. Alternative 3

Alternative 3 would designate a one quarter mile ROW (except in designated corridors) avoidance area around significant cave and karst resources, which would have potential beneficial impacts on exposed water in these caves or the aquifers these caves may interact with. Under Alternative 3, impacts on water resources would be expected to be more beneficial than Alternatives 1 and 4 but less than Alternative 2.

4.2.4.4.8.5. Alternative 4

Alternative 3 would designate a one quarter mile ROW (except in designated corridors) avoidance area around significant cave and karst resources, which would have potential beneficial impacts on exposed water in these caves or the aquifers these caves may interact with. Under Alternative 3, impacts on water resources would be expected to be more beneficial than Alternatives 1 and 4 but less than Alternative 2.

4.2.4.4.9. Wildland Fire Management Impacts on Water Resources

4.2.4.4.9.1. Impacts Common to All Alternatives

Fire removes vegetation cover and exposes soils to erosion, increasing the potential for sediments to be transported into water resources. Combustion can create a variety of toxic chemicals that may eventually be transported to water bodies in runoff or because of atmospheric deposition.

Fire suppression can result in disturbance from vehicles and equipment such as fire engines and dozers. Impacts include removal of vegetation and disturbance to soils increasing erosion potential and impacts on water. Use of retardant may impact water directly. These impacts are greater to lentic resources verses perennial streams because lentic areas are less dynamic and slower to recover. Impacts include reduced water quality and possible oxygen depletion. These direct impacts would be reduced based on implementation of mitigation measures that include buffer zones from water sources where retardant would not be applied. All alternatives will follow specific guidance provided in the fire management plan.

4.2.4.4.9.2. Alternative 1

Impacts under Alternative 1 are as described above Fire suppression would be prioritized to protect areas identified in 1998. This would help protect water resources within those areas, but may not reflect current resource needs.

4.2.4.4.9.3. Alternative 2

Under Alternative 2 the impacts are as described under impacts common to all. Alternative 2 mandates a two year closure to all activities on lands impacted by an wildfire in the planning area. This may lead to greater soil protection after a wildfire than the management directions in the other Alternatives. Since the most destructive impacts from a wildfire, after the fire itself, are caused by rainfall related erosion, soil protection will indirectly benefit water resources. More stable soils and revegetation will increase infiltration and recharge rates and lower run-off and sedimentation of surface water bodies.

4.2.4.4.9.4. Alternatives 3 and 4

Under Alternatives 3 and 4 the impacts are as described under impacts common to all. Alternatives 3 and 4 mandate area closures to activities on lands impacted by wildfire on a case-by-case basis. Hence, these alternatives have more beneficial impacts on soil resources than Alternatives 1, but less than Alternative 2.

4.2.4.4.10. Cultural Resources Impacts on Water Resources

4.2.4.4.10.1. Impacts Common to All Alternatives

Each of the alternatives could indirectly and beneficially impact water quality and might reduce water consumption in some areas. This would take place to the extent that project actions would require avoidance of or exclusion from some or all uses in areas with cultural value, for example, occupancy of mineral lands might be restricted due to presence of cultural resources. To the

extent that many cultural sites may be located near water resources, these beneficial impacts might be cumulatively important.

4.2.4.4.10.2. Alternative 1

Areas with cultural resources would be managed with use restrictions to protect values. Such restrictions would also protect water resources located within these areas.

4.2.4.4.10.3. Alternative 2

Alternative 2 offers the most protection for water resources from cultural resources management because it has identified the most area (CUL-04) to be eligible to be protected, preserved, and maintained for their cultural resources values.

4.2.4.4.10.4. Alternative 3 and 4

Alternatives 3 and 4 offer protection and beneficial impacts for water resources from cultural resources management because they identify areas (CUL-04) eligible to be protected, preserved, and maintained for their cultural resources values, which in turn will be beneficial for soil resources. These Alternatives set aside more land for protection than Alternative 1 but less than Alternative 2.

4.2.4.4.11. Paleontological Resources Impacts on Water Resources

4.2.4.4.11.1. Impacts Common to All Alternatives

All of the alternatives might result in indirect beneficial impacts on water quality if human activities are restricted from lands containing important paleontological resources. The types of activities that might be restricted could be moderately destructive to water quality, such as OHV use, land disposals, ROWs, and mineral extraction.

Developing stipulations, use restrictions, and mitigation measures to avoid or reduce adverse impacts on lands containing paleontological resources would indirectly result in beneficial impact to water resources by reducing erosion potential and transport of sediments that effect water quality.

4.2.4.4.11.2. Alternative 1

Alternative 1 offers more benefits for paleontological resources than Alternative 4, but less than Alternatives 2 and 3 (see below). Impacts are as described above.

4.2.4.4.11.3. Alternative 2

Alternative 2 offers the most protection for paleontological resources because it precludes activities that could destroy, damage, or reduce the data potential of the paleontological resources within Tertiary-aged trackways and the Upper Las Vegas Wash.

4.2.4.4.11.4. Alternative 3

Alternative 3 offers more protection for paleontological resources than Alternatives 1 and 4 but less than Alternative 2. Impacts are as described above.

4.2.4.4.11.5. Alternative 4

Alternative 4 offers the least protection for paleontological resources because it allows for activities that have the potential to impact paleontological resources to be permitted following paleontological inventories (field surveys) and data collection prior to any surface-disturbing activities.

Land development and recreation, which can have adverse impacts on water quality and quantity, probably would not be restricted to protect paleontological resources.

4.2.4.4.12. Visual Resource Management Impacts on Water Resources

4.2.4.4.12.1. Impacts Common to All Alternatives

Visual resource management actions are not expected to impact water resources since visual resource classification would not restrict uses but would only require that they conform to visual aesthetic guidelines. With respect to effects on water resources, all of the alternatives would be essentially equivalent and have no impact.

4.2.4.4.12.2. Alternatives 1 through 4

There are no additional impacts to water resources.

4.2.4.4.13. Lands with Wilderness Characteristics Impacts on Water Resources

4.2.4.4.13.1. Impacts Common to All Alternatives

All of the alternatives (except for Alternative 1) might result in indirect beneficial impacts on water resources if human activities are restricted on lands with wilderness characteristics. With respect to effects on water resources, all of the beneficial impacts would be essentially equivalent, but just vary by the amount of acres set aside as lands with wilderness characteristics.

4.2.4.4.13.2. Alternative 1

Since Alternative 1 does not have any management directives for lands with wilderness characteristics identified, no additional protection or benefit would be derived from this alternative.

4.2.4.4.13.3. Alternative 2

Alternative 2 offers the most protection for water resources from lands with wilderness characteristics management because it has identified the largest area (242,214 acres) to be eligible for lands to be protected, preserved, and maintained for their wilderness characteristics.

4.2.4.4.13.4. Alternative 3

Alternative 3 offers some protection for water resources from lands with wilderness characteristics management because it has identified more acres than Alternatives 1 and 4, but less than Alternative 2 to be eligible for lands to be protected, preserved, and maintained for their wilderness characteristics.

4.2.4.4.13.5. Alternative 4

Alternative 4 offers also some level of protection for water resources from lands with wilderness characteristics management, but on fewer acres than Alternatives 2 and 3, but more than Alternative 1.

4.2.4.5. Resource Uses

4.2.4.5.1. Forestry and Woodland Products Impacts on Water Resources

4.2.4.5.1.1. Impacts Common to All Alternatives

There likely would be no negative impacts on water resources resulting from Forest/Woodland Products objectives or actions under any of the alternatives. Impacts are expected to be beneficial for water resources instead.

4.2.4.5.1.2. Alternative 1

The effects under Alternative 1 would be the least beneficial to water resources as it allows for the harvest of dead and/or down wood or BLM-marked green mesquite "trees" for dwarf mistletoe control even though only in approved areas. The removal of the woody debris will increase the potential for wind and water erosion and potentially result in less groundwater infiltration and recharge.

4.2.4.5.1.3. Alternative 2

The effects under Alternative 2 would be the most beneficial to water resources as it prohibits commercial harvest and personal use of mesquite and acacia woodlands, including live, dead standing, or dead and down. Leaving the biomass in place will potentially increase groundwater infiltration and recharge.

4.2.4.5.1.4. Alternatives 3 and 4

The effects under Alternatives 3 and 4 will be more beneficial than those under Alternative 1 but less than those under Alternative 2. Both alternatives prohibit commercial harvest of mesquite and acacia woodlands, including live, dead standing, or dead and down, but allow for personal use of dead and down for on-site recreational campfires, except in areas closed to firewood gathering and subject to seasonal fire restrictions. These alternatives will increase the potential for wind and water erosion and potentially result in less groundwater infiltration and recharge.

4.2.4.5.2. Livestock Grazing Impacts on Water Resources

4.2.4.5.2.1. Impacts Common to All Alternatives

Livestock grazing under all of the alternatives is expected to continue to have impacts on water resources, especially on surface water quality. Potential impacts of grazing include sediment loading from soil eroded by wind and water. Grazing may cause vegetation loss, soil compaction, reduced runoff retention, riparian function loss, biological soil crust loss, direct soil disturbance, and runoff concentrated into animal trails, with consequent enhanced erosion. Grazing animals can alter vegetation communities, spread undesirable species, alter natural succession patterns, and potentially create conditions more susceptible to erosion and large-scale wildfires.

Grazing animals tend to congregate in riparian areas, such as accessible stream crossings, springs, seeps, shady level areas, or other small areas that may not be able to support large numbers of animals, independent of the adequacy of forage available within the grazing allotment. Therefore, forage adequacy, which is an indicator of the number of animals that can be sustained on a given allotment, may not account for concentrated impacts in riparian areas.

Grazing animals create waste that can introduce nutrients and pathogens to surface waters directly or indirectly through runoff. Excessive nutrient loading can lead to algal growth, depleted dissolved oxygen needed to support aquatic fauna, reduced water clarity and consequent increased water temperature, and other effects that reduce riparian function.

The effects of grazing occur at very low animal densities, vary over a wide spectrum, temporally and spatially and with slope, soil, climate, and vegetation. Relatively minor effects tend to be considered acceptable, and both subjective and objective criteria are used to evaluate them. These include estimates of sustainability (proper functioning condition of riparian habitat), trend analysis, and comparison to numerical standards (such as fecal coliforms and nitrate concentrations). In most areas, knowledge about the resilience of receiving waters is lacking because long-term studies have not yet been undertaken.

The surface disturbance around watering sources and gathering areas would increase during years when ephemeral grazing occurs. The disturbance could cause compaction of soils resulting in localized runoff, erosion, and delivery of sediments to ephemeral stream channels. Increased stocking rates during periods of ephemeral use, and the widespread occurrence of ephemeral vegetation when ephemeral use is permitted, increase the risk of erosion of fine sediments beneath sensitive soil covers to moderate for the periods of increased use.

The allotments of each alternative differ, and so will the degree of impact each alternative would have on water resources.

4.2.4.5.2.2. Alternative 1

Grazing would continue under the current management system, which would allow surface-disturbing activities associated with livestock operations to continue and potentially impact runoff and sedimentation. Disturbance to sensitive ground surface covers such as desert pavement and cryptobiotic crusts would expose fine-grained sediments to erosion. Increased erosion of fine-grained sediments would increase transport and delivery to ephemeral washes and, ultimately, the intermittent and perennial reaches of the Colorado River and other water resources including many springs. Impacts on sensitive surfaces would be minimized by livestock

stocking rates low enough to allow progress toward the desired plant community. This would keep disturbances small and site specific. Areas of greatest surface disturbance would be concentrated around watering sources and gathering areas. The small numbers of these sites would limit these effects.

The impacts under Alternative 1 are as described above, but more land would be disturbed than under the other alternatives. In other words, Alternative 1 would allow for the most disturbances of surface waters by livestock. The areas with the following grazing allotments would experience the described impacts: Hidden Valley, Mount Stirling, Lower Mormon Mesa, Roach Lake, White Basin, Muddy River, Wheeler Wash, Mesa Cliff, Arrow Canyon in Battleship Wash, Flat Top Mesa, Jean Lake, and the Arizona-administered allotments.

4.2.4.5.2.3. Alternative 2

Under Alternative, all livestock grazing allotments would be closed.

4.2.4.5.2.4. Alternative 3

Under Alternative 3, there would be fewer impacts to surface waters than under Alternatives 1 and 4. The areas with the following grazing allotments would experience the described impacts: Hidden Valley, Lower Mormon Mesa, Flat Top Mesa, and the Arizona-administered allotments.

4.2.4.5.2.5. Alternative 4

The impacts under Alternative 4 are as described above. More surface waters will disturbed than in Alternatives 2 and 3, but less than in Alternative 1. The areas with the following grazing allotments would experience the described impacts: Hidden Valley, Lower Mormon Mesa, Flat Top Mesa, Muddy River, Wheeler Wash, and the Arizona-administered allotments.

4.2.4.5.3. Minerals Impacts on Water Resources

Impacts Common to All Minerals

The primary goal of mineral resource management is to “provide orderly exploration and development of valuable minerals on federally owned mineral estate whether or not the surface estate is in federal ownership.” This goal does not necessarily have to conflict with water resources. In practical terms, based on past experience, the degree of impacts (especially long-term impacts) on water resources would likely depend highly on careful planning to accurately identify and quantify the impacts before a mineral project is started and on providing adequate financial assurances that impacts would be prevented or mitigated if they occur.

Thus, it is important that projects be carefully reviewed to ensure that they are bonded. All federal action mineral extraction or projects must pass through a public review process in which the general public, public agencies, and stakeholders are given the opportunity to comment on environmental documents based on project plans and identify the means by which the project proponent would comply with the minerals’ management objective of this resource while “minimizing impacts to other resources and their values.”

Mineral resource development projects have the potential for impacting water resources in a variety of ways, and project impacts would vary greatly based on resource-specific and

project-specific conditions. At the general level, a supply of water is usually needed to meet process requirements and to meet the demand created by workers, support facilities, and economic growth or development that may result from the project.

Mineral resource projects also generally generate waste, including wastewater and waste solids, that may come into contact with water.

In most cases, compliance with existing laws, regulations, and policies is sufficient to ensure that water resources would be protected. However, it remains very costly to clean up environmental damage once it occurs, so planning, prevention, and monitoring are the most important aspects of compliance.

All else being equal, the more restrictions on mineral development and the more land excluded from development, the less likely it is that water resources impacts would occur, although projects may differ greatly in the potential to impact water resources. As a result, the outcomes with respect to water might be expected to differ also; however, this is not necessarily the case because current mining regulations provided significant assurances that mines would be properly closed and the land rehabilitated.

Therefore, the assumption is that mineral stipulations to protect wildlife or other resource values would also indirectly provide protection of water resources.

4.2.4.5.3.1. Fluid Leasable Minerals Impacts on Water Resources

4.2.4.5.3.1.1. Impacts Common to All Alternatives

Fluid minerals (oil, gas, and geothermal resources) have relatively limited potential to impact water resources within the planning area, based on existing reconnaissance data about the occurrence of these minerals. There have been no APDs in the last 25 years and no GPDs at all in the planning area. Therefore, in practice, the alternatives would have similarly low potential for impacts on water resources by fluid mineral activities. However, should these activities occur, impacts on water resources from fluid mineral development activities could potentially include the following: (1) soil disturbance due to construction of roads, pipelines, and structures, which can increase erosion and lead to sediment loading of streams; (2) spills and releases of petroleum or other chemicals, which can degrade surface or groundwater quality; and (3) groundwater extraction and injection activities (especially of geothermal fluids) or injection of fluids (usually a variety of inorganic and organic constituents mixed with water or other liquids) used for unconventional oil and gas development (fracking) can impact aquifers, alter groundwater flow regimes, and under some conditions cause groundwater quality degradation. Impacts from (1) and sometimes (2) can be mitigated with the BMPs and stipulations provided in Appendix C (p. 1711), "Fluid Leasable Mineral Management." Scientific reports (USGS 2014, USGS 2013) have shown that the injection fluids have contaminated groundwater, which, in turn, has moved to surface water resources. These contaminations may have major impacts when special status aquatic species are dependent on these surface water resources. See the Special Status Species section for more details. The impacts would be specific to each area (or hydrographic basin within a regional flow system) of fluid mineral development, and environmental impacts would be analyzed in detail in project-specific environmental documents, as required by NEPA. Geothermal operations typically rely on reinjection of geothermal fluids so that the actual water consumption is low. Geothermal fluids are typically brines that reside within aquifer systems that are hydrologically isolated from potable water resources. Further, it is unlikely that any new

power plant in Southern Nevada (geothermal or otherwise) would be able to secure enough water rights for wet-cooled technology. The same water rights restrictions also make the use of "fresh water" for fracking very unlikely within the planning area. The impacts on water resources from fluid mineral resources are expected to range from minor to major depending on the alternative.

4.2.4.5.3.1.2. Alternative 1

The effects under Alternative 1 are as described above, but on less land than Alternatives 2, 3 and 4. Impacts would be expected to range from negligible to minor, depending on location and size of operations. See the Fluid Minerals Section of Chapter 2 for exact acreages and correlated maps for locations.

4.2.4.5.3.1.3. Alternative 2

Under Alternative 2, the effects of fluid minerals activities on water resources would be less than Alternative 3 and 4, since all hydrographic groundwater basins that support or are upstream of the habitat within a regional flow system of a proposed or listed and threatened or endangered aquatic species are closed to Fluid Mineral development. See the Fluid Minerals Section of Chapter 2 for exact acreages and correlated maps for locations. Impacts would be expected to range from negligible to minor.

4.2.4.5.3.1.4. Alternative 3

Under Alternative 3, the effects of fluid minerals activities on water resources are as described above, but on less land than Alternative 4, however, on more land than Alternatives 1 and 2. See the Fluid Minerals Section of Chapter 2 for exact acreages and correlated maps for locations. Impacts would be expected to range from minor to major.

4.2.4.5.3.1.5. Alternative 4

Under Alternative 4, the effects of fluid minerals activities on water resources are as described above, but on more land than Alternatives 1, 2 and 3. See the Fluid Minerals Section of Chapter 2 for exact acreages and correlated maps for locations. Impacts would be expected to have the potential to be major.

4.2.4.5.3.2. Solid Leasable Minerals Impacts on Water Resources

4.2.4.5.3.2.1. Impacts Common to All Alternatives

See the description under Impacts Common to All Minerals. As with any mineral extraction activities, solid leasable and locatable minerals extraction could result in ground disturbance, leading to erosion and sediment loading to surface water. Mine de-watering is a common activity associated with many mineral extraction operations, especially if it involves open pit mining. Potential impacts on water resources in the area range from minor to moderate. Such impacts would be addressed through BMPs and mitigation, including avoidance.

4.2.4.5.3.2.2. Alternative 1

The effects under Alternative 1 are as described above, but more land would be disturbed than under the other alternatives. In other words, Alternative 1 would allow for the most disturbances by mining activities, allow for the most consumption of water and generate the most associated wind and water erosion, which would potentially impact water quality. See the Solid Leasable Minerals Section of Chapter 2 for exact acreages and correlated maps for locations. Impacts would be expected to range from negligible to moderate.

4.2.4.5.3.2.3. Alternative 2

Under Alternative 2, the effects of mining activities to water resource would be the least. See the Solid Leasable Minerals Section of Chapter 2 for exact acreages and correlated maps for locations. Impacts would be expected to range from negligible to moderate.

4.2.4.5.3.2.4. Alternative 3

Under Alternative 3, the effects of mining activities to water resource would be more than under Alternative 2 but less than Alternatives 1 and 4. See the Solid Leasable Minerals Section of Chapter 2 for exact acreages and correlated maps for locations. Impacts would be expected to range from negligible to moderate.

4.2.4.5.3.2.5. Alternative 4

Under Alternative 4, the effects of mining activities to water resource would be more than Alternatives 2 and 3 but less than Alternative 1. See the Solid Leasable Minerals Section of Chapter 2 for exact acreages and correlated maps for locations. Impacts would be expected to range from negligible to moderate.

4.2.4.5.3.3. Locatable Minerals Impacts on Water Resources

4.2.4.5.3.3.1. Impacts Common to All Alternatives

See the description under Impacts Common to All Minerals. In addition, for some mineral extraction projects, dewatering is required that may generate large volumes of wastewater or fluids that must be contained until they can be safely discharged. Additionally, inactive pit mines that are below the water table and allowed to fill in once operation have ceased ultimately act as a groundwater sink as they can allow perpetual loss of large volumes of water due to evaporation. Currently, there is no method employed by the Nevada State Engineer to account for these evaporative losses in groundwater basin water budgets.

As with any mineral extraction activities, solid leasable and locatable minerals extraction could result in ground disturbance, leading to erosion and sediment loading to surface water. Mine de-watering is a common activity associated with many mineral extraction operations, especially if it involves open pit mining. Potential impacts on water resources in the area range from minor to moderate. Such impacts would be addressed through BMPs and mitigation, including avoidance.

4.2.4.5.3.3.2. Alternative 1

The effects under Alternative 1 are as described above, but more land would be disturbed than under the other alternatives. In other words, Alternative 1 would allow for the most disturbances by mining activities, allow for the most consumption of water and generate the most associated wind and water erosion, which would potentially impact water quality. See the Locatable Minerals Section of Chapter 2 for exact acreages and correlated maps for locations. Impacts would be expected to range from negligible to moderate.

4.2.4.5.3.3.3. Alternative 2

Under Alternative 2, the effects of mining activities to water resources would be the least. See the Locatable Minerals Section of Chapter 2 for exact acreages and correlated maps for locations. Impacts would be expected to range from negligible to moderate.

4.2.4.5.3.3.4. Alternative 3

Under Alternative 3, the effects of mining activities to water resource would be more than Alternatives 2 and 4 but less than Alternative 1. See the Locatable Minerals Section of Chapter 2 for exact acreages and correlated maps for locations. Impacts would be expected to range from negligible to moderate.

4.2.4.5.3.3.5. Alternative 4

Under Alternative 4, the effects of mining activities to water resource would be more than under Alternative 2 but less than Alternatives 1 and 3. See the Locatable Minerals Section of Chapter 2 for exact acreages and correlated maps for locations. Impacts would be expected to range from negligible to moderate.

4.2.4.5.3.4. Saleable Minerals Impacts on Water Resources

4.2.4.5.3.4.1. Impacts Common to All Alternatives

See the description under Impacts Common to All Minerals. Saleable minerals are widespread in the planning area, and quarry operations can generally be located away from water resources. Typically, saleable minerals do not contain significant amounts of soluble constituents that may leach from the waste material even if it comes into contact with water. Therefore, most quarry operations in the planning area present minor threats to surface or groundwater quality. Mine de-watering is a common activity associated with many mineral extraction operations, especially if it involves open pit mining. Potential impacts on water resources in the area range from minor to moderate. Such impacts would be addressed through BMPs and mitigation, including avoidance.

4.2.4.5.3.4.2. Alternative 1

The effects under Alternative 1 are as described above, but more land would be disturbed than under the other alternatives. In other words, Alternative 1 would allow for the most disturbances by mining activities, allow for the most consumption of water and generate the most associated wind and water erosion, which would potentially impact water quality. See the Saleable Minerals

Section of Chapter 2 for exact acreages and correlated maps for locations. Impacts would be expected to range from negligible to moderate.

4.2.4.5.3.4.3. Alternative 2

Under Alternative 2, the effects of mining activities to water resource would be the least. See the Saleable Minerals Section of Chapter 2 for exact acreages and correlated maps for locations. Impacts would be expected to range from negligible to moderate.

4.2.4.5.3.4.4. Alternative 3

Under Alternative 3, the effects of mining activities to water resource would be more than under Alternative 2 but less than Alternatives 1 and 4. See the Saleable Minerals Section of Chapter 2 for exact acreages and correlated maps for locations. Impacts would be expected to range from negligible to moderate.

4.2.4.5.3.4.5. Alternative 4

Under Alternative 4, the effects of mining activities to water resource would be more than Alternatives 2 and 3 but less than Alternative 1. See the Saleable Minerals Section of Chapter 2 for exact acreages and correlated maps for locations. Impacts would be expected to range from negligible to moderate.

4.2.4.5.4. Recreation Impacts on Water Resources

4.2.4.5.4.1. Impacts Common to All Alternatives

Recreation encompasses a wide range of activities including OHV travel, hiking, biking, horseback riding, target shooting, camping, rock climbing, fishing, hunting, and sightseeing. Impacts from recreation on water resources can vary widely based on the type and intensity of recreation use.

Impacts from OHV use are discussed below. There likelywould be impacts on water resources from recreation under any of the alternatives.

Damage to water resources is expected to increase as recreation use increases throughout the planning areas. Usually, designated routes (for OHV use) are at least one quarter mile away from riparian areas and water resources as discussed in the travel management plan. However, there are several instances where these OHV users travel through and negatively impact water resources.

These instances are mostly located in the Gold Butte and Mesquite areas and generally along the Virgin River. These are sensitive areas, where increased visitor use might lead to soil compaction (as at campsites or on trails), increased use of OHVs, and generation of water pollutants (sanitary waste, pathogens). Increased visitor use might require additional support facilities and infrastructure, such as improved access roads, potable water, sanitary facilities, waste disposal, and other facilities. Each of these can have adverse impacts on water resources. Improved access may lead to more visitor use and demand for more support facilities. The Gold Butte area of the planning area is remote, but there is increased demand for recreation opportunities from urban expansion in the Las Vegas area. Visitors from outside the planning area are more likely to stay

longer and to require facilities to support extended stays. Therefore, increased concentration of visitor use on few areas with desirable riparian settings is likely to result in increased impacts on the water resources in those areas. Here impacts can range from minor to moderate.

Dispersed recreation that occurs in the unaffected areas and in undeveloped portions of the SRMAs is likely to result in increased water resource impacts due to use of previously unaffected areas for camping, hiking, mountain biking, and equestrian activities. Most of the affected areas would be used for short periods and be relatively small in size. Campers are encouraged to use existing sites. The risk of increased stormwater runoff and sedimentation exists from increased compaction, rutting, and bare ground within the designated camping areas. Parking and camping along existing roads invite substantial expansion of the road surface and would increase the probability of erosion on and near roads, which could lead to further expansion of the affected area as vehicle operators drive around damaged road surfaces. These impacts result in increased runoff and delivery of sediments to ephemeral stream channels. There is no data available on the current extent of this type of damage, or of the number of turnouts that have on each side of the designated routes. The impacts are classified as minor since they are individually small areas and are not numerous. However, there is a high probability that increased activity would occur, leading to an increased area of disturbance along the 10,793 miles of roads in the planning area, which would have potential to impact water resources.

4.2.4.5.4.2. Alternative 1

The effects under Alternative 1 are as described above, but more land would be disturbed than under the other alternatives. Further, Alternative 1 would allow for the use of dry lakes while water is in the dry lakes (see TRV-01). This may lead to minor to moderate impacts on water quality within these lakes.

4.2.4.5.4.3. Alternatives 2 through 4

Under Alternatives 2 through 4, the effects of recreation activities to water resources are as discussed above. Use of dry lakes is restricted to times when these lakes are actually dry (see TRV-01). This would result in negligible impacts.

4.2.4.5.5. Travel and Transportation Impacts on Water Resources

4.2.4.5.5.1. Impacts Common to All Alternatives

Motor vehicle use is limited to existing and designated routes, trails, or areas. Motor vehicle use would have a minor to moderate effect on water resources as the route system is not clearly marked or delineated for the public, resulting in an expansion of non-designated routes. This expansion would result in travel through riparian areas (springs and seeps), as well as loss of vegetative cover, thus destabilizing riparian soils and making them susceptible to erosion and lower productivity. There are several instances where designated OHV routes travel through and negatively impact water resources. These instances are mostly located in the Gold Butte and Mesquite areas and generally along the Virgin River. Here impacts can range from minor to moderate.

The public travels in wash bottoms and dry streambeds that are part of the existing route system, impacting surface drainages, eroding banks, damaging vegetation, and leading to greater

sedimentation during stormwater runoff. Use of wash bottoms as existing and designated travel routes is likely to increase use of new or unauthorized routes as vehicle operators exit or re-enter drainages.

Further, roads have the potential to impact water resources during construction and maintenance and in normal operation. Roads collect, divert, concentrate, and otherwise alter natural drainage patterns and create potential for erosion during construction and use in the case of unimproved roads. They introduce pollutants via petroleum-based paving materials, deicing materials, dust palliatives, and spills from vehicles using the roads. Also, they provide routes for human activities to be rapidly introduced into new environments. Inadequately sized or poorly designed culverts, inadequate drainage and shoring, poor roadbed design, and other engineering issues can result in erosion or slope failure, leading to enhanced sediment transport to streams. Road surfaces can be preferential pathways for runoff. They cross every type of terrain and feature, from playa to uplands to riparian corridors, interrupting natural continuity and creating abrupt boundaries. Roads may cut and undermine slopes, and road fills may block natural drainage features. Each mile of a 15-foot-wide roadway represents nearly two acres of compacted soil taken out of productive use. These impacts would be similar under each of the alternatives. Roads also allow OHVs to penetrate many areas of the planning area, and OHV trails create additional erosion impacts. There are currently no accurate estimates of road density in the planning area and no estimate of the density of OHV trails. In many areas, ephemeral streams follow narrow canyons or gullies with steep side slopes, where the most favorable flat land for building a road is on the floodplain of a stream or ephemeral wash. The narrow valley floors require many cuts and fills that create potentially unstable roadbeds or slopes, and the unstable soils contribute to sediment impacts to water resources.

Travel routes that are located close to stream channels are a source of hydrologic connectivity between roads and channels. Hydrologic connectivity occurs where there is a continuous flow path from roads to streams. Examples include:

- Ditches that convey road derived or intercepted runoff to stream channels.
- Cross drain features such as water bars or dips that discharge sufficient water to create a gully, sediment plume, or a combination of both that extends to a stream channel.
- Fill slopes that encroach on stream channels.

Routes that are hydrologically connected to the washes in the planning area increase the likelihood of introducing road derived sediments and contaminants to the stream channels.

Under the existing conditions there are roads within 200 feet of stream channels. The existing travel management system has an overall minor impact. Motor vehicle use is currently limited to existing or designated routes. Roads concentrate and channel stormwater runoff and unless properly drained and maintained contribute a high proportion of sediment eventually reaching perennial streams. Overall, roads cause a moderate level of damage to water quality and can elevate the impacts during high flows.

Open travel areas would have the effect locally, of increasing disturbance on the wash bank within this area. While the area can be suitably mitigated by restoration, impacts would be moderate to major locally, but minor regionally.

4.2.4.5.5.2. Alternative 1

The impacts under Alternative 1 are as described above, but more land would be disturbed than under the other alternatives. In other words, Alternative 1 would allow for the most disturbances of surface water by travel management decisions. See the Travel Management Section of Chapter 2 for exact acreages and related maps for routes. Further, Alternative 1 would allow for the use of dry lakes while water is in the dry lakes (see TRV-01). This may lead to minor to moderate impacts to water quality within these lakes.

4.2.4.5.5.3. Alternative 2

Alternative 2 has the smallest number of acres allocated as Open, and the largest amount of acres allocated as Closed. Therefore, Alternative 2 would potentially have the least amount of negative impact on water resources of all the alternatives. Alternatives 2, 3, and 4 have management actions that will designate specific travel management areas and create corresponding travel management plans. Route designation would be guided by criteria to protect wildlife, vegetation, threatened and endangered species, and other resources. If OHVs are causing significant adverse effects on any resources, the affected areas will be closed to travel until the situation can be remedied and mitigated. These management actions will have an indirect beneficial impact on water resources. Travel planning and route designation using resource criteria will promote routes away from sensitive water resources. See Impacts Common to All Alternatives for more impacts from Alternative 2. All other management actions will have a negligible impact on water resources.

4.2.4.5.5.4. Alternative 3

Alternative 3 has the second highest number of acres allocated as Open, after Alternative 1. Alternative 3 also has the lowest number of acres allocated as Closed. Therefore Alternative 3 would create a higher level of negative impact on water resources than Alternatives 2 or 4. See Alternative 2 and Impacts Common to All Alternatives for more impacts from Alternative 3. All other management actions will have a negligible impact on water resources.

4.2.4.5.5.5. Alternative 4

Alternative 4 has the second lowest number of acres allocated as Open, after Alternative 2. Alternative 4 has a significantly lower number of acres Open than does Alternative 3. Alternative 4 also has the second lowest number of acres allocated as Closed, however the number of closed acres is very close to the number of closed acres in Alternative 3. Therefore, Alternative 4 would likely have less negative impact water resources than Alternatives 1 and 3, but a greater negative impact than Alternative 2. See Alternative 2 and Impacts Common to All Alternatives for more impacts from Alternative 4. All other management actions will have a negligible impact on water resources.

4.2.4.5.6. Lands and Realty Impacts on Water Resources

Various construction activities and ROWs authorized under lands and realty management (such as wind power, solar power, communication sites, transmission lines, roads, and pipeline projects, etc.) will impact water resources. Some uses can threaten the health of a watershed, reducing water retention and storage capacity. Some pollutants may be transported in surface water or by

overland flow before migrating vertically to groundwater, so that groundwater flow rates do not adequately represent the level of threat.

4.2.4.5.6.1. Land Tenure (Disposals and Acquisitions) Impacts on Water Resources

4.2.4.5.6.1.1. Impacts Common to All Alternatives

Continued management by the BLM provides public involvement in the decisions that affect those lands. BLM management may result in some benefits to water resources that would not occur under more dispersed ownership and management, particularly with respect to managing priority watersheds and other sensitive environments.

Land disposal actions on up to 194,738 acres in the planning area would affect water resources, particularly if the proposed future land use involved surface disturbance or removal of vegetation, such as for a housing development or solar energy facility. Water resources could also be affected if development on these parcels increases groundwater pumping that could lower water table elevations. New surface water developments on these lands would require water rights and/or new groundwater extraction. Impacts on water resources due to the disposal of these lands are likely to occur on most of the acres involved. Although land disposal itself has a minor impact on water resources, the maximum potential impact from future development would be minor to moderate in terms of surface disturbance due to the small number of acres affected but potentially moderate to major in terms of groundwater impacts if water intensive facilities or development are constructed. Potential impacts would be assessed on a proposal-specific basis.

L&R-09 calls for a set of criteria to be considered when evaluating land acquisition actions. The criteria would be the same for Alternatives 2 through 4 and similar under Alternative 1. The criteria to be considered in land acquisitions include public resource values, such as riparian areas, floodplains and wetlands, and fisheries along the Virgin River, which would provide direct beneficial impacts on water resources because management of currently discontinuous holdings within watersheds could be more consolidated. Checkerboard ownership is an artifact of historical decisions to encourage construction of railroads, with no consideration of hydrologic conditions and natural watershed boundaries. In general, management of contiguous areas within watersheds would give the BLM improved ability to influence outcomes at the watershed level, including regulating access and effectively controlling uses to benefit water.

Divesting lands that have low value for protecting water and other resources, but that could benefit municipalities, provide an opportunity to offset the cost of acquiring lands under Goal 2, with no impact on water resources. Land acquisitions and sales would be subject to project-level environmental evaluation and public participation under NEPA. Impacts from surface water use and groundwater pumping on disposed lands would reduce availability of water within watersheds possibly effecting congressionally designated areas, threatened and endangered species habitats, and areas containing special status species. Water might not be available to maintain healthy ecosystems. In particular land disposals in the Amargosa Valley and in the source groundwater watershed of Warm Springs and the Muddy River, Moapa, could lead to significant decline in the populations of up to 12 threatened and endangered species, depending on the alternative selected.

In other areas (outside of the Amargosa Valley and the headwaters of the Muddy River), land tenure adjustments either through acquisition, disposal, or exchange would affect water resources depending on land tenure objectives and needs; impacts would be difficult to qualify.

4.2.4.5.6.1.2. Alternative 1

Under Alternative 1, the impacts of lands and realty management decisions on water resources would be as described above but on more acres than Alternatives 2 and 3 but less than Alternative 4. See the Lands and Realty section of Chapter 2 for exact acreages. Impacts range from negligible to major depending on the location and size of the lands to be disposed.

The impacts being caused by potentially disposing lands in the Warm Springs, Moapa, area on water resources are major. (See the description of the Tetra Tech Model and Nevada State Engineer's rulings in the beginning of this section for more details.) According to the Nevada Division of Water Resources, the hydrographic groundwater basin, in which the majority of these lands identified for disposal are located, cannot support additional groundwater development without impacts to existing water rights and/or groundwater-dependent species, which has resulted in the denial of more than 90 pending water right applications in several of the basins in the model area. Refer to the Sensitive Status Species and Lands and Realty sections for more details.

The impacts being caused by potentially disposing lands in the Amargosa Valley on water resources are major. (See the description of the USGS SAMM Model in the beginning of this section for more details.) According to the SAMM pumping scenario for Alternative 1, disposing land in the Amargosa Valley for the use as intended according to the Amargosa Valley Area Plan (Nye County 2009), will result in groundwater withdraw of approximately 14,000 afa, in addition to the 2003 pumping rates. Currently, 26,277 afa have been appropriated in the Amargosa Valley groundwater basin. The Nevada State Engineer estimates the annual recharge within the basin to be 24,000 afa. According to the USGS modeling effort, the projected pumping will result in water level drop at Devil's Hole below the water level mandated by the U.S. District Court (Cappaert v. US, 1976), within the lifetime of this RMP. (See USGS report 2014 for details.) Federally reserved rights held by U.S. Fish and Wildlife Service at Ash Meadows will also be negatively impacted. Given Nevada water law – Order 1197 – this would likely result in the State Engineer making rulings "and orders as are deemed essential for the welfare of the area involved." Such a ruling might include the curtailing of groundwater pumping at several commercial enterprises in the valley. See the Socioeconomic section for impacts thereof. Further, water levels at the Ash Meadows National Wildlife Refuge, the main discharge area of the Amargosa Valley basin, are also expected to drop to levels that will lead to significant decline in the populations of several threatened and endangered species.

4.2.4.5.6.1.3. Alternative 2

Under Alternative 2, the effects of lands and realty management decisions on water resources would be as described above but on the least acres of all the alternatives. See the Lands and Realty section of Chapter 2 for exact acreages. Impacts range from negligible to major depending on the location and size of the lands to be disposed.

The impacts being caused by potentially disposing lands in the Warm Spring Moapa area on water resources would be minor under this alternative because only 86.5 acres (which are slated for direct sale to Reid Gardner Power Generation Station as of March 2014) are located in basins impacted by the NSE rulings. The remaining 606 acres are located in the Meadow Valley Wash hydrographic basin 205. Groundwater pumping in this basin will not impact Warm Springs. Minor impacts may be noticable in Meadow Valley Wash and its associated riparian habitat.

In Amargosa Valley, no lands are available for disposal from this alternative, hence, there are no additional impacts for lands and realty under Alternative 2.

4.2.4.5.6.1.4. Alternative 3

Under Alternative 3, the effects of lands and realty management on water resources would be as described above but on more acres than Alternative 2 but less than Alternatives 1 and 4. See the Lands and Realty section of Chapter 2 for exact acreages. Impacts range from negligible to major depending on the location and size of the lands to be disposed.

The impacts to Warm Springs, Moapa, would be negligible to minor under this alternative because land disposals would only occur downstream from the sensitive species habitats. However, as pointed out by the NSE, hydrographic basin 220 (Lower Meadow Valley Wash) cannot support additional groundwater development without impacts to existing water rights, which has resulted in his denial of all pending water right applications in the basin.

The impacts in the Amargosa Valley would be as described under Alternative 1 if all acres available for disposal would be sold. However, Nye County requested that we run a model based on the land disposals since the 1998 RMP. Under this scenario, only 552 acres would be disposed of at a maximum (both for agriculture and residential use), which would result in an additional groundwater withdraw of approximately 3050 afa in addition to the 2003 pumping rates. Consequently, under Alternative 3, the BLM would only seek a biological opinion from the U.S. Fish and Wildlife Service for the disposals of 552 acres. All further disposals would be evaluated under NEPA on a case-by-case basis. While the impacts are as described under Alternative 1, the time for the groundwater levels to reach the threshold level mandated by the U.S. District Court may be delayed past the lifetime of this RMP. Impacts, as evaluated in this analysis, would probably be minor to moderate under this scenario. Further mitigation may be necessary to reduce the impacts for any additional pumping to negligible.

4.2.4.5.6.1.5. Alternative 4

The impacts under Alternative 4 are as described above, but more land would be disturbed than under the other alternatives. In other words, Alternative 4 would allow for the most impacts to water resources by lands and realty management decisions. See the Lands and Realty section of Chapter 2 for exact acreages and locations. Impacts range from negligible to major depending on the location and size of the lands to be disposed.

The impacts to Warm Springs, Moapa, would be as described under Alternative 3, as the lands available for disposal are identical.

The impacts in the Amargosa Valley would be as described under Alternative 1. For the purpose of this current document, the USGS also modeled the effects of pumping on potentially disposed BLM land in the Amargosa Valley for the use as intended according to the Amargosa Valley Area Plan (Nye County 2009), minus any lands inside the 10 mile radius around Devil's Hole, as per the Nevada State Engineer's Order 1197. Under this scenario 27,741 acres would be disposed of at a maximum, which would result in an additional groundwater withdraw of approximately 10,500 afa in addition to the 2003 pumping rates. While the impacts are as described under Alternative 1, the time for the groundwater levels to reach the threshold level mandated by the U.S. District Court may be slightly delayed.

4.2.4.5.6.2. Land-Use Authorizations (Right-of-Ways, Leases, Permits) Impacts on Water Resources

4.2.4.5.6.2.1. Impacts Common to All Alternatives

Delineating ROW avoidance and exclusion areas would protect water resources within delineated areas by implementing use restriction on ROWs and/or would require development of mitigation measures to maintain, improve and protect wildlife habitats. These strategies would also benefit water resources. Negative impacts to water resources would stem from increased water usage and groundwater withdrawal associated with these land-use authorizations. These impacts are discussed throughout this section. Mitigation measures would likely be required on a project basis to offset these negative impacts.

4.2.4.5.6.2.2. Alternative 1

Under Alternative 1, the impacts of lands and realty management decisions on water resources would be as described above but on more acres than Alternatives 2 and 3 but less than Alternative 4. See the Lands and Realty section of Chapter 2 for exact acreages.

4.2.4.5.6.2.3. Alternative 2

Under Alternative 2, the effects of lands and realty management on water resources would be as described above but on the least acres of all the alternatives. See the Lands and Realty section of Chapter 2 for exact acreages.

4.2.4.5.6.2.4. Alternative 3

Under Alternative 3, the effects of lands and realty management on water resources would be as described above but on more acres than under Alternative 2 but less than Alternatives 1 and 4. See the Lands and Realty section of Chapter 2 for exact acreages.

4.2.4.5.6.2.5. Alternative 4

The impacts under Alternative 4 are as described above, but more land would be disturbed than under the other alternatives. In other words, Alternative 4 would allow for the most disturbances of surface water resources by lands and realty management decisions. See the Lands and Realty section of Chapter 2 for exact acreages.

4.2.4.5.6.3. Renewable Energy Impacts on Water Resources

4.2.4.5.6.3.1. Impacts Common to All Alternatives

Utility-scale renewable energy development would have measurable, widespread effects on water resources. Blading of large areas for solar energy facilities is estimated to potentially exceed 966,000 acres over the life of the plan. These energy developments would disrupt drainage patterns and cause surface disturbance and soil compaction, resulting in increased erosion, runoff, and sedimentation over a large enough area to have a moderate impact. Use of large quantities of groundwater may be needed for renewable energy development and production, and would result

in additional impacts on drainage patterns by causing subsidence in localized areas. Groundwater pumping would likely lower water table elevations and potentially impact neighboring wells or downstream water resources. Pumping impacts would be mitigated in future solar developments by use of dry cooling technologies, by using systems with entirely different means of generating electricity, off-site mitigation, and purchase and retirement of active and senior water rights or similar measures. The overall impact of utility-scale renewable energy development on water resources would be moderate to major.

Further, development of renewable energy would require road access to the sites. All projects would involve construction, soil disturbance, and the potential for enhanced erosion to impact surface water quality. Solar projects tend to be located on level terrain, such as on valley floors, where there are few sensitive surface water resources. Soil erosion by water would tend to be minor.

Wind farms typically consist of a series of turbines located along ridges at the highest points in a watershed. Typically, soils are thin and the terrain is rocky in these areas. Although soil erosion may be enhanced, the effects on surface water resources are likely to be minor, as well. However, existing roads may need to be reconstructed in order to be used, which may result in increased erosion. Constructing new roads or improving existing roads is likely to result in enhanced erosion and a potential threat to surface water quality. Roads would need to be maintained to allow continued access for turbine maintenance. Construction impacts on water resources would be mitigated through BMPs and therefore would be considered negligible to minor.

Renewable energy development projects would have varying potential for impacting water resources based on resource-specific and project-specific conditions. Generally, concentrating solar projects would require the greatest amount of water during operation. Wind energy and photovoltaic projects would require minimal use of water resources. In all cases, some supply of water is usually needed to meet the demand to operate these projects. Generally, requirements ensuring compliance with existing laws, regulations, and policies would address impacts related to water resources. Mitigation measures for water consumption would be required and set on a case-by-case basis. Impacts to groundwater resources vary from negligible to major, depending on technology used, location, and size of the project.

4.2.4.5.6.3.2. Alternative 1

The impacts under Alternative 1 are as described above, but on more land than any other alternative (982,487 acres are open for solar development, and 2,013,124 acres are open for wind development). Impacts range from moderate to major depending on the location and size of the project footprint.

Project-specific NEPA environmental review would be performed. Construction-related impacts would be mitigated by implementing BMPs. Delineation of rights-of-way avoidance and exclusion areas ensure mitigation measures or use restrictions are implemented for location of ROWs. Implementation of mitigation measures, BMPs, and SOPs would reduce impacts.

4.2.4.5.6.3.3. Alternative 2

The impacts under Alternative 2 are as described above, but on least amount of land than any other alternative (281,337 acres are open for solar development, and 560,110 acres are open

for wind development). Impacts range from moderate to major depending on the location and size of the project footprint.

Project-specific NEPA environmental review would be performed. Construction-related impacts would be mitigated by implementing BMPs. Delineation of rights-of-way avoidance and exclusion areas ensure mitigation measures or use restrictions are implemented for location of ROWs. Implementation of mitigation measures, BMPs, and SOPs would reduce impacts.

4.2.4.5.6.3.4. Alternative 3

The impacts under Alternative 3 are as described above, but on less land than under Alternatives 1 and 4 (456,917 acres are open for solar development, and 613,709 acres are open for wind development). Impacts range from moderate to major depending on the location and size of the project footprint.

Project-specific NEPA environmental review would be performed. Construction-related impacts would be mitigated by implementing BMPs. Delineation of rights-of-way avoidance and exclusion areas ensure mitigation measures or use restrictions are implemented for location of ROWs. Implementation of mitigation measures, BMPs, and SOPs would reduce impacts.

Further, in Alternative 3, five additional solar energy zones have been identified for the Pahrump Field Office and one for the Las Vegas Field Office. These zones are thought to have the least impacts from solar energy development as compared to other areas within the planning area's variance areas.

4.2.4.5.6.3.5. Alternative 4

The impacts under Alternative 4 are as described above, but on less land than under Alternative 1 (708,934 acres are open for solar development, and 1,325,440 acres are open for wind development). Impacts range from moderate to major depending on the location and size of the project footprint.

Project-specific NEPA environmental review would be performed. Construction-related impacts would be mitigated by implementing BMPs. Delineation of rights-of-way avoidance and exclusion areas ensure mitigation measures or use restrictions are implemented for location of ROWs. Implementation of mitigation measures, BMPs, and SOPs would reduce impacts.

4.2.4.5.6.4. Utility Corridors Impacts on Water Resources

4.2.4.5.6.4.1. Impacts Common to All Alternatives

The designation of corridors could lead to localized impacts on water resources from surface disturbance associated with construction or maintenance activities. Containing these uses in the corridors would limit the areal extent and represent a minor impact if corridors are revegetated to stabilize disturbed soils, which would reduce runoff, erosion, and sedimentation.

4.2.4.5.6.4.2. Alternative 1

Under Alternative 1, the impacts of lands and realty management decisions on water resources would be as described above but on more acres than Alternatives 2 and 3 but less than Alternative 4. See the Lands and Realty section of Chapter 2 for exact acreages.

4.2.4.5.6.4.3. Alternative 2

Under Alternative 2, the effects of lands and realty management on water resources would be as described above but on the least acres of all the alternatives. See the Lands and Realty section of Chapter 2 for exact acreages.

4.2.4.5.6.4.4. Alternative 3

Under Alternative 3, the effects of lands and realty management on water resources would be as described above but on more acres than under Alternative 2 but less than Alternatives 1 and 4. See the Lands and Realty section of Chapter 2 for exact acreages.

4.2.4.5.6.4.5. Alternative 4

The impacts under Alternative 4 are as described above, but more land would be disturbed than under the other alternatives. In other words, Alternative 4 would allow for the most disturbances surface water resources by lands and realty management decisions. See the Lands and Realty section of Chapter 2 for exact acreages.

4.2.4.6. Special Designations

4.2.4.6.1. Areas of Critical Environmental Concern Impacts on Water Resources

4.2.4.6.1.1. Impacts Common to All Alternatives

The effects of ACEC management on water resources would be beneficial because they are intended to protect fragile resources from irreparable damage. Hence, under all alternatives, mitigation measures would be developed to reduce impacts on important resource values within ACECs, which would also serve to reduce impacts on water resources. All new proposed ACECs (Alternatives 2, 3, and 4) include some use restrictions for saleable, solid minerals, fluid minerals, and or recreation activities, all of which would provide additional protection for water resources.

4.2.4.6.1.2. Alternative 1

Alternative 1 offers protection for soil resources from ACEC management because it has 23 ACECs identified or 1,014,301 acres. Since there are no new ACECs proposed under Alternative 1, there are no new beneficial impacts from this alternative on water resources.

4.2.4.6.1.3. Alternative 2

Alternative 2 offers the most protection for water resources from ACEC management because it has identified the largest area (1,444,548 acres) and the most ACECs (44) to be eligible for lands to be protected, preserved, and maintained for their critical environmental values.

4.2.4.6.1.4. Alternative 3

Alternative 3 offers protection and beneficial impacts for water resources from ACEC management because it has identified more ACECs (41) and consequently more acres (1,292,216) than Alternatives 1 and 4, but less than Alternative 2 to be eligible for lands to be protected, preserved, and maintained for their for their critical environmental values.

4.2.4.6.1.5. Alternative 4

Alternative 4 offers some protection for water resources from ACEC management because it has identified fewer ACECs (25) and consequently fewer acres (1,021,365) than Alternatives 2 and 3, but more than Alternative 1 to be eligible for lands to be protected, preserved, and maintained for their critical environmental values.

4.2.4.6.2. National Trails Impacts on Water Resources

4.2.4.6.2.1. Impacts Common to All Alternatives

See the Cultural Resources section for impacts on water resources.

4.2.4.6.3. Wild and Scenic Rivers Impacts on Water Resources

4.2.4.6.3.1. Impacts Common to All Alternatives

There would be no effects common to all alternatives from wild and scenic rivers (WSR) management.

4.2.4.6.3.2. Alternative 1

Under this alternative, all seven river segments are managed as eligible river corridors and would be given protection either through continued interim protective management or the development of comprehensive river management plans. This would provide additional measures within the 17,600 acres of WSR corridors that would promote natural rates of erosion and deposition of alluvial and colluvial sediments. Additionally, activities that would result in degradation of water quality would be restricted to maintain the ORVs of the eligible segments.

4.2.4.6.3.3. Alternative 2

The impacts on surface water and water quality resulting from WSR management objectives under Alternative 2 would be the same as under Alternative 1 with the exception that while the 17,600 acres under Alternative 1 are only eligible for protection, the same acreage would be found suitable under Alternative 2.

4.2.4.6.3.4. Alternative 3

Under Alternative 3, the effects on surface water and water quality resulting from WSR management objectives would be the same as those described under Alternative 2, but only for 960 acres.

4.2.4.6.3.5. Alternative 4

Under this alternative, there would be no additional protection for surface water and water quality from WSR management as no eligible stretches of river would be found suitable.

4.2.4.6.4. Wilderness Impacts on Water Resources

4.2.4.6.4.1. Impacts Common to All Alternatives

There would be no effects common to all alternatives from wilderness management.

4.2.4.6.4.2. Alternative 1

Since Alternative 1 does not identify any management directives for wilderness, no additional protection or benefits would be derived from this alternative.

4.2.4.6.4.3. Alternatives 2 and 3

Alternatives 2 and 3 offer the most protection for water resources from wilderness management because they have identified management directions that call for no net unmitigated decrease in the benchmark conditions generally prevailing in each wilderness at the time of congressional designation. Maintaining, or when possible, improving the benchmark quality of wilderness character, will protect water resources as well and is considered a beneficial impact.

4.2.4.6.4.4. Alternative 4

Alternative 4 offers less protection for water resources from wilderness management compared to Alternatives 2 and 3 because it only calls for mitigation of permanent and temporary impacts to the wilderness resource from activities on adjacent public lands on a case-by-case basis.

4.2.4.6.5. Wilderness Study Areas Impacts on Water Resources

4.2.4.6.5.1. Impacts Common to All Alternatives

Water resources within wilderness study areas (WSAs) would benefit from use restrictions and other management strategies in accordance with the WSA Implementation Management Plan. Wilderness characteristics would all be managed according to FLPMA. If released by Congress, those WSAs would be managed in accordance with the multiple-use mandate of FLPMA.

If released by Congress, management of the WSAs would be equivalent under each of the alternatives. The management of WSAs as non-wilderness areas would include certain uses that may result in adverse impacts on water resources, such as OHV use.

4.2.4.6.5.2. Alternative 1

Areas with wilderness characteristics would be managed with use restrictions to protect values. Such restrictions would also protect water resources located within these areas.

4.2.4.6.5.3. Alternatives 2 and 3

Wilderness characteristics would be managed on a case-by-case basis and subject to site specific mitigation measures to reduce impacts on wilderness characteristics. Water resources located within areas containing wilderness characteristics would benefit.

4.2.4.6.5.4. Alternative 4

Impacts under Alternatives 4 would be the same as Alternatives 2 and 3 except that it allows for the mitigation of permanent and temporary impacts to WSAs from activities on adjacent public lands. These impacts could be to water resources.

4.2.4.7. Cumulative Impacts on Water Resources

4.2.4.7.1. Past and Present Actions/Impacts

Past and present management of cattle grazing and wild horse and burro herds has led to short-term, persistent, and in some cases virtually irreversible impacts on water resources. Short-term impacts include minor disturbance of sediments in streams and direct introduction of urine and feces into water sources. These impacts are generally unnoticed once the cause is removed. Persistent impacts include overgrazing of riparian vegetation and stream bank alteration, which can lead to increased erosion and sedimentation, as well as temperature increases in non-thermal water sources due to lack of shade. These impacts can take as little as one growing season to diminish or may take many years, but they can eventually rehabilitate to a pre-disturbance state. Virtually irreversible impacts include severe erosion through stream widening or downcutting, which alter natural surface water flow processes and can lead to dewatering of wetland and riparian areas. These impacts would require decades of natural recovery or large scale anthropogenic (human controlled) rehabilitation before the impacts were no longer evident.

An additional impact on water resources due to the past and present activities related to cattle grazing and wild horse and burro management is the use of surface and groundwater sources for watering these animals. Stock water and wildlife represent a small number of water rights held within the planning area, and the volumes of water used for those rights are minimal relative to irrigation and municipal, mining, and industrial uses of water within the planning area. Water consumed by horses and cattle has not led to an observable decrease in available water for other uses.

Past and present impacts on water quality from lands and realty actions are wide ranging in their type, degree, and areal extent. The granting of rights-of-way can degrade water quality by allowing activities to cross streams which can lead to decreased riparian vegetation and increased erosion. These impacts can be caused by rights-of-way ranging from small unimproved access roads to cross-district, large-scale pipelines. Past and present lands and realty actions have also led to impacts on water resources through acquisition of land parcels that had previously been

identified for acquisition through land tenure adjustments. Lands acquired this way become subject to BLM regulations and management which, overall, protect water resources that may not have existed prior to the acquisition. Under the 1998 RMP, lands have been identified for disposal, and in some cases disposed of, that since have had known impacts on water resources or groundwater dependent resources, especially in the Pahrump and Amargosa valleys. FLPMA mandates that lands with high value resources, such as water, should not be identified for disposal. The BLM is unable to quantify the impacts from lands and realty actions because they are so dispersed in space, time, and severity. However, the worst-case scenario, which is plausible, could lead to significant decline in the populations of up to 12 threatened and endangered species, depending on the alternative selected. BLM land exchanges and disposals in the Amargosa Valley, and the consequential development of these lands have greatly contributed to the water level declines of the Devil's Hole pupfish, the listing thereof and the ensuing legal cases and actions, including Nevada State Engineer's Order 1197 and others discussed earlier in this section.

Past and present impacts on water resources from renewable energy have been negligible so far because only 400 acres have been developed on public land within the planning area. While the potential for impacts exist, none have been observed within the planning area. There have been no impacts on water resources from projects producing power from wind energy because none exist in the assessment area. Other impacts on water resources from renewable energy actions may occur due to ROWs associated with the project; these impacts are discussed above.

Past and present impacts on water resources from recreation are primarily attributed to OHV use. Where OHV users cross streams, springs, riparian areas, or wet meadows, there is generally a localized decrease in vegetation, an increase in disturbance of natural flow patterns (i.e., stream flow occupying a two-track instead of a natural channel), and an increase in erosion and deposition. These impacts can be short term or persistent depending on the frequency of use. OHV use, camping, and hunting may also lead to discrete, short-term decreases in water quality due to the introduction of pollutants including petroleum products, nutrients, and soaps. Impacts from these pollutants are likely short lived and spatially uncommon when the entirety of the planning area is considered. Because of the dispersed nature of these uses over time and space, it is impossible to quantify these impacts. However, persistent impacts on streams, springs, and meadows would likely be represented in the riparian functionality assessments, and therefore the impacts would be negligible to minor.

Past and present impacts on water resources from the management of wildlife and special status species leads to the preservation or improvement of water quality and quantity. The number of species requiring special management and the area of habitats over which that special management needed to be applied increased during the time period considered for past actions. This led to an increased number of water resources protected because of their proximity or inclusion in areas managed for wildlife and special status species. These protections include limiting or increasing mitigation of other activities that decrease or eliminate factors that cause erosion, depletion, or introduction of pollutants.

Past and present impacts on water resources from the suppression, fuels management, and ES&R activities of wildland fire management occur on two time scales: concurrent with the activity and long term. All three activity types can lead to increased erosion if surface water or wetland areas are traversed by emergency or non-emergency vehicles. These impacts are generally short term because of the one-time or very infrequent nature of the disturbance. Fuels management has a greater potential to impact water resources through disturbance of riparian vegetation because this activity generally occurs in areas where fire has not had a recent impact on existing vegetation.

Fire suppression and fuels management activities use BMPs and SOPs during the application of compounds like fire retardants and herbicides to minimize or eliminate the introduction of these compounds to water sources, but complete elimination of these impacts is not possible in all conditions. Upland fuels management has also had the potential to lead to short-term increases of sedimentation due to erosion of upland soils. Longer term impacts from these activities generally lead to an increase in quality of water resources. Fire suppression and fuels management help limit the number and size of severe fires, which often lead to excessive erosion and sedimentation due to loss of both riparian and upland vegetation, and an increase in run-off, and consequently reduces infiltration of precipitation. This has lead to the drying of springs and seeps in areas within the planning area that have experienced large fires in the past. ES&R activities have sought to accelerate the re-vegetation (through seedings, plantings, restriction of cattle use, etc.) of burned areas as well as minimize erosional processes during the time of re-vegetation (through installation of physical barriers, mulching of hillsides, etc.). The BLM is unable to quantify the impacts from the combination of these activities partially because of the nature of emergency actions and partially because they are dispersed in space, time, and severity.

4.2.4.7.2. Reasonable Foreseeable Actions

Future impacts on water resources from cattle grazing and wild horse and burro management would be identical in type but differ in distribution. Future impacts on water resources from mineral resource management are expected to remain the same or increase slightly and would likely be identical under all alternatives. The current understanding of mining activity trends indicates that the number of active mines within the planning area is likely to remain stable as older mines discontinue operations and new mines begin operations.

Future impacts on water resources from lands and realty actions vary greatly under the alternatives as discussed under past and present actions and in the two modeling efforts described earlier in this section. Large portions of the planning area are expected to be designated as exclusion or avoidance areas due to the presence of critical habitats. This designation would provide restrictions on lands and realty actions that can occur in these areas. This would, overall, provide for the preservation of water resources. Currently, proposed land tenure adjustments do not include areas with important water resources; however, the disposal of lands in areas where groundwater is overallocated or land development would lead to the lowering of the groundwater table to where it will impact groundwater dependent resources will lead to major impacts in the reasonably foreseeable future. These areas include Amargosa Valley, Pahrump Valley, and the groundwater basins surrounding the Muddy River and its source springs.

Future impacts on water resources from renewable energy projects are expected to be noticeable under all alternatives. These impacts would be greater in number than impacts currently observed. Each new plant would, though, have the same potential to decrease groundwater levels, disrupt surface water flows, and lead to the decline in riparian vegetation or groundwater dependent species depending on the plant's location and mitigation measures.

Future impacts on water resources from recreation are expected to be identical under all alternatives. These impacts would be identical in type, distribution, and severity (on a per impact event level) as those observed under the 1998 RMP. The frequency of impacts is likely to increase as population increases and therefore would likely lead to a greater severity of impacts when assessed as a whole.

Future impacts on water resources from wildlife and special status species management are likely to be similar in type as those observed under the 1998 RMP. It is expected, however, that increased awareness or concern over habitats of special status species would lead to increased protection of water sources, including groundwater levels, which would lead to improvement of or continued high water quality and quantity. Increased protection of water sources, however, may lead to a decrease in water available for other uses. This water availability decrease would be caused by the BLMs limitation of activities, which would use water or restrict access to water.

Future impacts on water quality from wildland fire management under Alternative 1 would be identical to those observed under the 1998 RMP. Fires are naturally unpredictable in size, location, timing, and frequency, however, the impacts on water resources as a whole within the planning area over the life of the proposed RMP would likely average out to be identical. Longer-term climate trends could cause an increase or decrease in fire activity, but this cannot be accurately predicted for the foreseeable future.

According to numerous published scientific studies, climate change is expected to have a moderate to major impact on water resources. As precipitation patterns are shifting from winter precipitation events to more severe summer precipitation, less water will infiltrate and recharge aquifers. This will lead to more springs and seeps, but especially perched aquifer springs, to become dry more frequently for longer periods of time. This, in turn, will lead to a greater loss of riparian vegetation and increased erosion. Increased erosion is also an impact from increased intensity of summer monsoons, which will lead to a decrease in water quality to receiving waters. Increased temperatures will also lead to increased evapotranspiration, which, in turn, will deplete surface and groundwater sources at a faster rate than in the past.

4.2.4.7.3. Cumulative Impact

4.2.4.7.3.1. Impacts Common to All Alternatives

Each alternative has a different emphasis, which is expected to result in different priorities for resource development. These priorities would be expected to result in higher probabilities for adverse impacts on water resources under some of the alternatives.

4.2.4.7.3.2. Alternative 1

Alternative 1 represents current management under guidance of the 1998 RMP. Alternative 1 contains fewer, and sometimes already achieved, management actions. In some cases, this is because new objectives have been formulated based on experience gained since the development of the previous plan. In other cases, new or different management options have been formulated to address existing as well as new objectives that are carried forward in the new RMP.

The cumulative impacts from Alternative 1 would be major. This is mostly reflecting the large previously undisturbed areas made available for renewable energy development and land disposals.

4.2.4.7.3.3. Alternative 2

Alternative 2 is the most protective of water resources because it involves the least new development, excludes potentially impactful uses, and prioritizes protection and restoration of resources when conflicts among uses occur.

While Alternative 2 has the most area set aside for preservation and conservation (in terms of ACECs, wildernesses, etc.) and has the most beneficial impacts on water resources, the negative impacts would still be considered moderate. Again this is mostly due to the large tracts of previously undisturbed land that will be made available for renewable energy development and land disposals.

4.2.4.7.3.4. Alternative 3

Alternative 3 is less didactic in its overall approach, alternatively emphasizing development priorities or preservation priorities according to resource realm. Alternative 3 therefore represents a compromise, and its impacts on water resources are expected to be generally intermediate between Alternatives 2 and 4. Overall, it tends to encourage economic development, but recognizes sensitive environmental concerns on a greater amount of land area, resulting in more acres excluded or restricted from conflicting uses than Alternative 4.

The cumulative impacts from Alternative 3 would be major. This is mostly reflecting the large previously undisturbed areas made available for renewable energy development and land disposals. However, the cumulative impacts would be less than Alternatives 1 and 4.

4.2.4.7.3.5. Alternative 4

Alternative 4 generally prioritizes development of resources for economic return, while relying on mitigation to reduce, rather than prevent, adverse impacts. Alternative 4 would likely have greater impacts on water quantity and quality than would Alternatives 2 and 3.

The cumulative impacts from Alternative 4 would be major. This is mostly reflecting the large previously undisturbed areas made available for renewable energy development and land disposals. This alternative will have the most negative cumulative impacts on water resources compared to the other three alternatives.

4.2.5. Integrated Vegetation

4.2.5.1. Vegetation

4.2.5.1.1. Summary

The goals of the vegetation program are to maintain land health and the ecosystem services provided by native plant communities on public lands by managing (1) the impact of BLM-authorized actions on native plant communities to ensure sustainability and resilience; (2) to maintain or improve the existing condition of native plant communities on public lands; and (3) long-term threats to Mojave Desert native plant communities in a coordinated and adaptive manner across the entire Mojave ecoregion. As discussed in Chapter 3, historically the BLM has managed native plant communities as a limitless, renewable resource. While native plant communities are renewable, if left to recover on their own, full recovery of ecosystem services is not expected within the lifetime of the RMP. Minimizing impacts to native plant communities through the restoration, revegetation, and rehabilitation of project-related disturbance and the mitigation of cumulative impacts in the planning area are important themes in Alternatives 2, 3, and 4.

This section discusses the potential impacts on vegetation resources for the proposed allocation decisions and management actions described in Chapter 2. The primary characteristics of native plant communities that could be impacted by the alternatives include a change in ecosystem services and economic value provided by native plant communities, changes in the structure and composition of native plant communities, and changes in the biotic and abiotic conditions needed to sustain stability and resiliency.

All BLM multiple-use activities have the potential to adversely impact native plant communities. Each proposed alternative has a different emphasis that results in different resource development priorities. Under some alternatives, these priorities result a higher probability of adverse impacts to native plant communities. Alternative 1 represents current management under guidance of the 1998 RMP. Alternative 1 includes two management directions for vegetation management: (1) manage to a desired potential natural community; and (2) as feasible, restore degraded lands. Since the 1998 RMP was signed, new information has become available regarding vegetation management, such as non-native species, fire, and climate change. Management actions under Alternatives 2, 3, and 4 reflect an updated understanding that native plant communities are a keystone to the Mojave ecosystem and are a finite resource unlikely to fully recover within the lifetime of the RMP. The majority of the management actions proposed in the Integrated Vegetation section fall under Alternatives 2, 3, and 4. Where there are potential economic impacts to users, a range of alternatives have been developed. Alternative 2 is the most protective of vegetative resources. Alternative 3 is similar to Alternative 2 but trends to encourage economic development while recognizing environmental concerns. Alternative 4 generally prioritizes economic returns. Alternative 4 would have a greater impact on the quantity and quality of native plant communities in the planning area.

4.2.5.1.2. Methods of Analysis

The impact of land allocation decisions and resource management actions on native plant communities are compared across alternatives. Where important outcomes or differences are identified, the effect to native plant communities is discussed. This analysis is largely qualitative

because impacts from resource management activities and resource uses are difficult to quantify using the available information and reasonably foreseeable future.

Effects are determined by assessing the impact of actions on the quantity, quality, and ability of the BLM to manage native plant communities. Some impacts would be direct while others would be indirect and could affect vegetation through a change in another resource.

Direct and indirect impacts to native plant communities could include but are not limited to disturbances that (1) cause injury or removal of individual plants; (2) change vegetation structure or composition, such as species abundance and diversity patterns at local and landscape scales; (3) change the biotic and/or abiotic environment, such as change in mortality or reproduction i.e. seed production, seed germination, and plant establishment; (4) reduce genetic or population fitness; (5) reduce resilience to disturbance, such as fragmentation; (6) change the level of ecosystem services provided; (7) increase or introduce competition with nonnative species for water, nutrients, and space; (8) and increase the potential for wildfire.

In addition to the general RMP assumptions and guidelines, the following assumptions were made for the vegetation resources analysis:

- Many actions that would occur within the planning area would be subject to best management practices (BMPs). Although BMPs are designed to minimize the effects of projects, they generally cannot eliminate all impacts. This impact analysis assumes that BMPs would minimize but not eliminate possible effects.
- The size and frequency of wildfires is expected to continue at current rates.
- Restoration and weed management activities funded through the Southern Nevada Public Lands Management Act will not continue after 2014.
- BLM-specific funding for vegetation management and restoration activities will continue at current funding levels.
- BLM-specific funding for law enforcement activities that protect vegetation resources from unauthorized impacts will continue at current levels.
- All surface-disturbing activities would include impact minimization and mitigation for the federally listed desert tortoise and its habitat.
- Vegetation management activities will be consistent with direction provided by the Integrated Vegetation Management Handbook.
- The effect of climate change on native plant communities will continue near current rates.
- Disposal lands will be developed.

4.2.5.1.3. Qualitative Intensity Scale

A range of qualitative terms has been used to gauge the intensity of each impact from one program area on another. Both positive and negative impacts are considered and, where necessary, the net impact of the two is discussed. Both generalized and specific definitions for vegetative resource impact intensity are summarized below:

- **Negligible:** General: There are no known impacts to resources or resource uses. Any change is undetectable and immeasurable. Specific: There are no direct and indirect impacts that can cause an appreciable change to native plant communities in the short and long term.
- **Minor:** General: Direct effects are apparent, measurable, small, localized, and contained within the footprint of the action. Indirect effects are undetectable. Specific: There would be a small but slightly noticeable change to a plant community and some individual plant loss. The

use of standard operating procedures to offset adverse impacts, including species measures, would be effective.

- **Moderate:** General: Direct effects would be readily apparent and measurable over a larger area but are still mainly within the footprint of the action. Indirect effects are apparent and measurable but do not exceed much beyond the footprint of the action. Specific: The impact would be very apparent and measurable. There would be a significant change to a plant community over large areas, a substantial plant loss. Mitigation would likely be needed to achieve recovery. The use of standard operating procedures to offset adverse impacts, including special measures to avoid affecting special status plants, animals, and important cultural resources, could be extensive, but should be successful.
- **Major:** General: Direct effects would be highly noticeable and extend well beyond the footprint of the action. Indirect effects would be readily apparent and measurable well beyond the footprint of the action. Specific: The impact to the native plant community would be severe. There would be substantial change across a large area within a plant community, and desired future conditions could not be achieved without substantial input. The extensive use of standard operating procedures and mitigation to offset the adverse effects would be necessary, and their success would not be guaranteed.

4.2.5.1.4. Resources

4.2.5.1.4.1. Air Quality Impacts on Vegetation

4.2.5.1.4.1.1. Impacts Common to All Alternatives

Dust palliatives and soil stabilizers used to achieve air quality standards have the potential to wash off treated sites and enter adjacent upland and riparian and wetland communities where they could have a negative effect on the establishment, growth, and mortality of native plant species. Dust emissions (from untreated dirt roads and projects) are known to negatively affect the photosynthesis of nearby plants reducing growth and reproduction. In general, best management practices implemented at the project level are expected to reduce dust emissions and minimize potential adverse impacts to native plant communities. Air quality management actions are expected to have a negligible impact on native plant communities.

4.2.5.1.4.1.2. Alternatives 1 through 4

The are no additional impacts to vegetation.

4.2.5.1.4.2. Soil Resources Impacts on Vegetation

4.2.5.1.4.2.1. Impacts Common to All Alternatives

In general, best management practices implemented during project planning and implementation to protect soil resources will benefit native plant communities. Management directions that maintain soil quality and reduce wind and water erosion provide a benefit to native plant communities by maintaining conditions necessary to support native plant community resilience and stability.

4.2.5.1.4.2.2. Alternative 1

Under Alternative 1, soil conservation actions are based on managing watersheds. Benefits to native plant communities would be based on watersheds and would not include sensitive soil types and desert pavement. The impact of soil resource management directions on native plant communities would be negligible.

4.2.5.1.4.2.3. Alternatives 2 through 4

Under Alternatives 2, 3, and 4, soil conservation and management actions would include desert pavement and unique soils that support endemic native plant communities that are dependent on unique soil types (such as gypsum and aeolian sands). The positive impact of soil management actions on native plant communities would be minor to moderate based on location and proposed action.

4.2.5.1.4.3. Water Resources Impacts on Vegetation

4.2.5.1.4.3.1. Impacts Common to All Alternatives

In general, management actions that maintain or improve water quality and reduce soil erosion have a benefit on native plant communities by maintaining native plant community resilience and stability.

4.2.5.1.4.3.2. Alternative 1

The are no additional impacts to vegetation.

4.2.5.1.4.3.3. Alternatives 2 through 4

Under Alternatives 2, 3, and 4, the RMP would extend protection of water resources beyond special status species to include wetlands, spring, seeps, riparian woodlands, and mesquite acacia woodlands. This increase in protection would result in a positive moderate to major impact on native plant communities depending on the project size and project location.

4.2.5.1.4.4. Integrated Vegetation Impacts on Vegetation

4.2.5.1.4.4.1. Vegetation Impacts on Vegetation

4.2.5.1.4.4.1.1. Impacts Common to All Alternatives

Under all alternatives, vegetation management actions provide the tools to manage for healthy native plant communities and ecosystems. Implementing standard operating procedures and project-specific mitigation measures are intended minimize or reduce impacts to native plant communities.

4.2.5.1.4.4.1.2. Alternative 1

Alternative 1 does not account for current advancements in knowledge and technology as related to landscape and ecosystem management and current policy to manage at a landscape scale and consistently across the Mojave ecoregion. Under Alternative 1, BLM would not mange for future climate change and shifts in the distribution and composition of native plant communities in the planning area. Under Alternative 1, BLM would continue existing management directions. This includes minimizing impacts to native plant communities by requiring proponents to revegetate temporary impacts to BLM lands where feasible and on a case-by-case basis. It is expected that some impacts would not be mitigated under this alternative. At the project level, the effect of this management action would be localized to the project area, and the impact would have a positive minor benefit; however, at a landscape scale, the requirement to restore temporary impacts over many projects would be major. At the landscape scale, this alternative does not mange for the cumulative loss of native plant communities, nor does it address regional scale declines in quality and quantity of native plant communities in the planning area.

4.2.5.1.4.4.1.3. Alternatives 2 and 3

Under Alternatives 2 and 3, BLM would manage for the cumulative loss of native plant communities at the landscape scale by providing for no net unmitigated loss of ecosystem values provided native plant communities. No net unmitigated loss means BLM would seek, to the extent practical, to maintain the current level of ecosystem services provided by native plant communities in the planning area. With substantial public input, BLM would develop an equitable approach to mitigate project-related permanent and temporary impacts to native plant communities and the ecosystem services they provide. Recognizing it will be necessary to incur permanent and long-term impacts to native plant communities to meet the BLM mission under no net unmitigated loss. BLM would seek offset permanent and long-term impacts by performing off-site and/or out-of-kind mitigation that would improve and/or protect ecosystem services provided by native plant communities elsewhere in the planning area. For example, as mitigation for development of a solar field, BLM could ask the proponent to provide partial funding for BLM law enforcement patrols or travel management planning in an ACEC elsewhere. On a landscape scale, mitigation performed under this alternative could be used to reduce impacts (such as fragmentation) to native plant communities, maintain the quality of native plant communities, and help adapt and respond to vegetation shifts under future climate change. The impact of this action would be regional in nature and would address cumulative impacts to native plant communities in the planning area. The impact of this management action would be a major positive benefit.

Under Alternatives 2 and 3, BLM would provide for no net unmitigated loss of mesquite acacia woodlands in the planning area. Regionally, mesquite acacia woodlands have been declining due to BLM actions, illegal woodcutting, and casual recreation. Because of substantial regional declines, the ability of this native plant community to recover from disturbance has been substantially reduced. This alternative would seek to maintain current mesquite acacia woodlands by managing the additive impact of individual BLM actions. Under this alternative, BLM would develop an equitable mitigation approach for mesquite acacia woodlands using input from the public. This management action would provide a major positive impact to mesquite acacia woodlands in the planning area.

Under Alternatives 2, 3, and 4, BLM would require revegetation of temporary impacts to native plant communities associated with right-of-way authorizations consistent with Southern Nevada

District Office Restoration Guidance. This alternative would require proponents to minimize project impacts using standardized guidance specific to the planning area. On a landscape scale, the impact on native plant communities would be a major benefit.

Under Alternatives 2, 3, and 4, BLM would seek to manage for future shifts in the distribution and composition of native plant communities due to climate change by introducing or reintroducing different native taxa that might be more appropriate to shifted climate conditions. This management alternative provides BLM with a management tool to adapt to future climate change. For example, BLM could choose to respond to climate change by reseeding burned areas using native seed source identified to a warmer Mojave bioclimatic zone to achieve a resilient and stable post-fire community. Depending on climate change scenarios, the impact of this management action could range from a moderate to major benefit because it will maintain biodiversity and ecosystem services provided by intact native ecosystems.

Under Alternatives 2, 3, and 4, BLM would use native plant species for all revegetation, restoration, and reclamation activities. Non-native species would be considered only under special circumstances where a suitable native species is unavailable and the non-native species has been demonstrated to be non-invasive. The impact of this management action is expected to be a major benefit because it will maintain the ecological connections and ecosystem services provided by intact native ecosystems.

Under Alternatives 2, 3, and 4, BLM would protect the genetic integrity of native communities by using source-identified seed and other materials during vegetation management activities and actions. This management action would protect the resiliency, stability, and ability of native plant communities to adapt to climate change by protecting the genetic diversity of native plant communities and the ecosystem processes dependent on it. Implementation of this alternative would improve the effectiveness of restoration actions because locally sourced seed typically is the best adapted to local site conditions. The impact of this management action is expected to be a major benefit because it will maintain the genetic integrity needed to maintain ecosystem stability and resilience.

Under Alternatives 2, 3, and 4, BLM would participate in cooperative research efforts that advance vegetation management in the Mojave ecoregion. The proposed management action would improve the management of native plant communities by directing participation in cooperative research and information-sharing efforts. This management direction is consistent with current BLM goals to improve management at a landscape scale and manage consistently and cooperatively across the Mojave ecoregion. The impact of this management action is expected to be a major benefit because it will promote and facilitate information sharing between BLM offices to maintain the ecological connections and ecosystem services at a landscape scale.

Under Alternatives 2, 3, and 4,, BLM would monitor vegetation change and regularly contribute to regional data collection and monitoring efforts (such as rapid ecoregional assessments and assessed inventory monitoring). The proposed management action would improve the management of native plant communities by directing participation in cooperative monitoring and data collection efforts such as BLM Assessment Inventory and Monitoring, BLM Rapid Ecoregional Assessment Updates and Landscape Conservation Cooperative Initiatives. This management direction is consistent with current BLM goals to improve management at a landscape scale and manage consistently and cooperatively across the Mojave ecoregion. The impact of this management action is expected to be a major benefit because it is integral to adaptive resource management.

Under Alternatives 2, 3, and 4, BLM would practice adaptive management by periodically reviewing vegetation monitoring results and current scientific literature to update best management practices and standard operating procedures in a way that reflects advancements in vegetation management. The proposed management action would improve vegetation management by requiring the periodic review of data collection efforts, current scientific literature, and technology. The proposed management action is consistent with current BLM policy and guidelines vegetation on a landscape scale and in a similar manner across the Mojave ecoregion. The impact of this management action is expected to be a major benefit because it is essential for integrating new management concepts into day-to-day BLM resource management.

Under Alternatives 2, 3, and 4, BLM would seek to develop consistency with other BLM field offices in the Mojave ecoregion in how the bureau manages vegetation, riparian, weeds, fuels, livestock grazing, and forestry and woodland products programs. The proposed management action would improve resource management and consistency across the Mojave ecoregion. The proposed management action is consistent with current BLM policy and guidelines for vegetation on a landscape scale and in a similar manner across the Mojave ecoregion. The impact of this management action is expected to be a major benefit because it is essential for integrating new management concepts into day-to-day BLM resource management.

4.2.5.1.4.4.1.4. Alternative 4

Under Alternative 4, BLM would address the loss of native plant communities, mesquite acacia woodlands, and the ecosystem services they provide on a case-by-case basis. Under this alternative, regional declines in the extent and quality of native plant communities would likely continue. Larger projects would likely bear a higher proportion of mitigation costs versus smaller projects. Management under Alternative 4 would be similar to management under Alternative 1, except when a project causes a substantial loss because of its size or location, would BLM develop specific mitigation measures to offset impacts to ecosystem services. This alternative would address regional declines in the quality and quantity of native plant communities on a case-by-case basis. This assumes not all impacts would be mitigated. This alternative would not manage the additive loss of native plant communities from all projects in the planning area. On a landscape scale, the beneficial impact of Alternative 4 would be minor because regional declines would continue, though at a diminished rate.

4.2.5.1.4.4.2. Riparian Areas and Wetlands Impacts on Vegetation

4.2.5.1.4.4.2.1. Impacts Common to All Alternatives

The largest threat to riparian woodlands and mesquite acacia woodlands is development. It is estimated that 90 percent of the historic riparian and mesquite acacia woodlands in Southern Nevada have been developed or converted to agricultural use. The retention of riparian and mesquite acacia woodlands in federal ownership is expected to provide a positive major benefit to native plant community management because it preserves BLM management authority over these important vegetation types and biological hotspots.

4.2.5.1.4.4.2.2. Alternative 1

The 1998 RMP does not mange for the cumulative loss to riparian communities and mesquite and acacia woodlands in the planning area. On a landscape scale, the impact of this management

direction would be major because cumulative loss of these important vegetation types would continue.

4.2.5.1.4.4.2.3. Alternatives 2 and 3

Under Alternatives 2 and 3, BLM would manage for no net unmitigated loss of riparian communities and mesquite and acacia woodlands within the planning area. Alternatives 2 and 3 address the regional decline in mesquite acacia woodlands in the planning area. Under this alternative, some mesquite acacia woodlands would be developed and impacted by BLM-authorized actions; however, the impacts would be offset with one site or off-site and in-kind or out-of-kind mitigation so that there is no net loss of the ecosystem values provided by wetlands, riparian communities, and mesquite and acacia woodlands in the planning area. The impact of this management direction would be a major benefit because it would seek to maintain the current level of ecosystem services provided by this unique vegetation community.

4.2.5.1.4.4.2.4. Alternative 4

Under Alternative 4, BLM would address impacts to riparian communities and mesquite and acacia woodlands in the planning area and the ecosystem services they provide on a case-by-case or as-needed basis. Under this alternative, BLM would recognize that regional declines in the extent and quality of native plant communities would continue for most day-to-day land-use authorizations. Management under Alternative 4 would be similar to Alternative 1, except when a project causes a substantial loss because of its size or location, would BLM develop specific mitigation measures that would offset impacts to ecosystem services. This alternative would address regional declines in the quality and quantity of native plant communities on a case-by-case basis. This assumes that not all impacts would be mitigated. This alternative would not manage the additive loss of native plant communities from all projects in the planning area. This alternative would not be consistent with management of riparian communities and mesquite acacia woodlands in California. On a landscape scale, the beneficial impact of the Alternative 4 management actions would be minor because regional declines would likely continue, though at a diminished rate.

4.2.5.1.4.4.3. Weeds Impacts on Vegetation

See the Weeds section under Integrated Vegetation for more information.

4.2.5.1.4.4.4. Forests and Woodlands Impacts on Vegetation

See the Forestry and Woodland Products section under Resource Uses for more information.

4.2.5.1.4.5. Fish and Wildlife Impacts on Vegetation

4.2.5.1.4.5.1. Impacts Common to All Alternatives

In general, surface-disturbing actions that alter vegetation characteristics (e.g., structure, composition, and production) also affect suitability for fish and wildlife, particularly where the disturbance removes or reduces cover and food resources. Even minor changes to vegetation communities can affect resident wildlife populations. In general, actions that conserve or restore fish and wildlife habitats have a positive benefit to native plant communities. Wildlife

management actions that protect or enhance landscape connectivity are expected to provide a major positive benefit to vegetation management by concurrently protecting and enhancing connectivity corridors for pollination, seed dispersal, and plant species migration in response to climate change. Some specific wildlife management activities used to create or modify habitats (such as thinning or planting) or habitat elements (such as wildlife guzzlers and water diversions) to benefit fish and wildlife can sometimes negatively affect native plant communities. In some cases, this could preclude reaching vegetation management goals. Adverse impacts to native plant communities resulting from wildlife management actions would largely be addressed at the project-specific level during NEPA. The impact from wildlife management actions could range from minor negative to major positive depending the action and location.

4.2.5.1.4.5.2. Alternatives 1 through 4

There are no additional impacts to vegetation.

4.2.5.1.4.6. Special Status Species Impacts on Vegetation

4.2.5.1.4.6.1. Impacts Common to All Alternatives

In general, actions that conserve and protect BLM special status species have a positive benefit to native plant communities by protecting the quality and quantity of native plant communities; in particular, management actions taken to protect BLM special status plants will protect native plant communities. Management actions implemented to conserve or improve habitats for the desert tortoise are expected to provide an important benefit to native plant communities. However, some special status species management actions could result in short-term or minor negative impacts to native plant communities. The impact from special status species management actions could range from minor negative, such as the creation of refugia for the relic leopard frog, to major positive, such protecting desert tortoise population connectivity corridors, depending the action and location.

4.2.5.1.4.6.2. Alternatives 1 through 4

There are no additional impacts to vegetation.

4.2.5.1.4.7. Wild Horse and Burro Impacts on Vegetation

4.2.5.1.4.7.1. Impacts Common to All Alternatives

In general, grazing by wild horses and burros has a negative effect on native plant communities. Grazing affects composition and productivity of native plant communities through selective grazing (Brooks et al 2006). It is commonly accepted that present-day Mojave Desert native plant communities did not evolve with significantly selective pressure from large-bodied herbivores (Beever et. al. 2003, Brown and McDonald 1995, Grayson 1987, Hall 1946), and desert vegetation is very slow to recover if overgrazed or disturbed (Abella et. al.2007, Tueller 1989). In the deserts of North America, inappropriate grazing by wild horses, burros, and livestock has significantly influenced resilience and resistance by reducing a major structural and functional component, specifically native perennial herbaceous species, and by serving as a dispersal agent for non-native invaders (Milchunas and others 1988; Van de Koppel and others 2002). Higher

grazing use is expected to increase selective grazing, which could result in lower densities of more palatable native forbs and native perennial grasses, especially in major use areas (such as around springs and watering areas). Depending on the location and number of animals, the negative impacts from wild horse and burro grazing on native plant communities can range from negligible, under low-intensity grazing, to major, where there is overgrazing.

4.2.5.1.4.7.2. Alternative 1

There are no additional impacts to vegetation.

4.2.5.1.4.7.3. Alternatives 2 through 4

Under Alternatives 2, 3, and 4, BLM would manage herd sizes to preserve and maintain a natural ecological balance and multiple-use relationships for that area. This management alternative is expected to provide a minor positive benefit to native plant communities by providing clarification on herd management area (HMA) management activities.

BLM also would change how forage utilization is calculated in HMAs by averaging forage use across the entire HMA instead of using representative sampling plots. Because wild horse and burro grazing pressure is highest in and around water developments, this adjustment could lead to over representation of forage availability in high-use areas. Depending on the location and number of animals authorized, this change could lead to higher numbers of animals and increased grazing pressure adjacent to watering and other major use areas within the HMA. Depending on how herd size is adjusted in response to forage availability, the negative impact on native plant communities from this management action could range from negligible to minor.

Under Alternatives 2, 3, and 4, BLM would repair and/or maintain dependable water sources to allow more even distribution of wild horses and burros throughout the HMA. Better distribution of water sources within the HMA is expected to have a minor positive effect on vegetation by reducing grazing pressure on native vegetation adjacent to water sources.

Under Alternatives 2, 3, and 4, BLM would consider new wild horse and burro ranges on a case-by-case basis. The creation of new ranges may or may not increase grazing pressure. Depending on the number of animals and location, the negative impacts of this management action could range from negligible to major.

4.2.5.1.4.8. Cave and Karst Management Impacts on Vegetation

4.2.5.1.4.8.1. Impacts Common to All Alternatives

In general, cave and karst resource management is not expected to affect vegetation management. The development or construction of infrastructure to manage or control visitor activity has the potential to impact native plant communities. These activities are expected to be small in scale and localized in nature. Potential negative impacts from these activities are expected to be negligible.

4.2.5.1.4.8.2. Alternatives 1 through 4

There are no additional impacts to vegetation.

4.2.5.1.4.9. Wildland Fire Management Impacts on Vegetation

4.2.5.1.4.9.1. Impacts Common to All Alternatives

Low-elevation Mojave Desert native plant communities are not adapted to fire. More than 90 percent of the planning area is in moderate to severe departure from historic fire and fuels conditions because of the presence of non-native annual grasses. On a local scale, the removal of plants and soil disturbance created by fire management or during construction of fire and fuel breaks would have a minor to moderate negative impact on native plant communities. However, on a landscape scale, fire and fuels management activities would provide a moderate to major positive impact on native plant communities because these activities minimize the amount of area burned and protect native plant communities by reducing the potential for large-scale fires.

4.2.5.1.4.9.2. Alternative 1

Alternative 1 does not reflect current advancements in knowledge and technology as related to fire and fuels management and the protection of native plant communities. The positive impact of management actions under Alternative 1 would range from negligible to minor depending on project size and location.

4.2.5.1.4.9.3. Alternatives 2 through 4

Under Alternatives 2, 3, and 4, the BLM would apply current knowledge and understanding of Mojave Desert ecology and fuels management. The updated management alternatives are expected to improve vegetation management and are expected to provide a positive effect to native plant communities. This positive effect could range from minor to major depending on the project size and location.

Under Alternatives 2, 3, and 4, the BLM would allow the construction of fuel breaks in native plant communities where appropriate to protect against wildfire as long as it is consistent with other resource management objectives. On a local scale, impacts to native plant communities resulting from construction of the fuel breaks would be negative minor. On a landscape scale, the proposed management action would improve protection of native plant communities from large wildfires such as those that occurred during 2005. This positive effect could range from minor to major depending on the project size and location.

Under Alternatives 2, 3, and 4, BLM would use prescribed fire as a tool to manage native plant communities as long as it is compatible with other resource management objectives. Prescribed burning would likely be appropriate only under a very limited number of circumstances and likely to be very small in scale because of safety and containment concerns. Long-term benefits are expected to outweigh short-term negative impacts. Depending on the size and location, the impact to native plant communities is expected to be positive negligible to minor.

4.2.5.1.4.10. Cultural Resource Impacts on Vegetation

4.2.5.1.4.10.1. Impacts Common to All Alternatives

In most cases, the protection of cultural resources will also protect native plant communities. For example, fencing cultural sites would protect vegetation from other impacts. In general, activities

associated with management of cultural resources would affect relatively small, localized areas and would not likely have measurable impacts on native plant communities. Even under the most intense management (i.e. site excavation), the amount of acreage disturbed would be relatively small. Increased heritage tourism and/or use of vegetation for traditional Native American purposes could result in some disturbance to vegetation. Impacts to native plant communities from cultural resources management could range from negative minor to positive minor depending on the project and location.

4.2.5.1.4.10.2. Alternatives 1 through 4

There are no additional impacts to vegetation.

4.2.5.1.4.11. Paleontological Resources Impacts on Vegetation

4.2.5.1.4.11.1. Impacts Common to All Alternatives

The protection of paleontological resources would tend to protect native plant communities. For example, designation of a paleontological ACEC could also protect native plant communities. In general, activities associated with management of paleontological resources would likely affect relatively small, localized areas and would not likely have measurable impacts on native plant communities. Even under the most intense management (i.e. site excavation), the amount of acreage disturbed would likely be relatively small. Increased tourism and interpretation of resources could result in some disturbance to vegetation. Impacts to native plant communities from paleontological resources management could range from negative minor to positive minor depending on the project and location.

4.2.5.1.4.11.2. Alternatives 1 through 4

There are no additional impacts to vegetation.

4.2.5.1.4.12. Visual Resource Management Impacts on Vegetation

4.2.5.1.4.12.1. Impacts Common to All Alternatives

In general, visual resource management is expected to benefit vegetation management because vegetation is an important component of the viewshed. Management actions that maintain the quality and character of the viewshed are also expected to conserve native plant communities

4.2.5.1.4.12.2. Alternative 1

Under Alternative 1, managing the planning area under VRM Class II standards would place some restrictions on development. These restrictions would limit disturbance and result in a positive benefit to native plant communities. The positive impact of this designation would be moderate. Managing the planning area to meet VRM Class III or IV objectives would place fewer restrictions on development and provide less protection for native plant communities. The negative impact would be moderate. Only wilderness areas would be managed as VRM Class I. Because restrictions on development within wilderness already exist, the impact on native plant communities from a VRM Class I designation would be negligible.

4.2.5.1.4.12.3. Alternatives 2 and 3

In general, impacts from VRM designations would be the same as Alternative 1. An increase in VRM Class II acreage would provide additional protection and a positive impact to native plant communities because of additional restrictions placed on development.

4.2.5.1.4.12.4. Alternative 4

In general, impacts from VRM designations would be the same as Alternative 1. A substantial increase in Class III and IV acreage would remove restrictions on surface-disturbing developments that would increase impacts to vegetation communities.

4.2.5.1.4.13. Lands with Wilderness Characteristics Impacts on Vegetation

4.2.5.1.4.13.1. Impacts Common to All Alternatives

In general, designating lands with wilderness characteristics is expected to benefit vegetation management because vegetation is an important component of wilderness character. Management actions that maintain the character of the area are expected to also conserve native plant communities.

4.2.5.1.4.13.2. Alternative 1

This designation does not exist in the 1998 RMP.

4.2.5.1.4.13.3. Alternative 2

BLM would manage lands with wilderness characteristics. This allocation would benefit native plant communities by restricting, reducing, or mitigating surface- and vegetation-disturbing activities. This alternative would provide the most protection to native plant communities. The positive benefit to native plant communities would be moderate.

4.2.5.1.4.13.4. Alternative 3

Under Alternative 3, impacts to native plant communities would be similar to Alternative 2. This alternative would provide less protection to native plant communities than Alternative 2.

4.2.5.1.4.13.5. Alternative 4

Under Alternative 4 impacts to native plant communities would be similar to Alternative 2. This alternative would provide less protection to native plant communities than Alternative 3.

4.2.5.1.5. Resource Uses

4.2.5.1.5.1. Forestry and Woodland Products Impacts on Vegetation

4.2.5.1.5.1.1. Impacts Common to All Alternatives

Three BLM forestry program activities have the potential to affect native plant communities in the planning area. These include (1) woodland and conifer stand management; (2) wood cutting; and (3) salvage and sale of cactus and yucca. There are limited opportunities to improve woodlands and conifer forests in the planning area. However, where stands are present, management of woodlands and conifer forest for healthy stands is expected to have a positive minor impact on native plant communities in the planning area. In general, woodcutting can have a positive or negative impact on native plant communities. However, under the 1998 RMP, very little firewood cutting was authorized in the planning area because of limited opportunities, conflicts with other resource management objectives, and ongoing illegal woodcutting. Cactus and yucca are government property. The salvage and sale of cactus and yucca from sites to be impacted by BLM land-use authorizations provides for responsible disposal of this government resource. Most salvaged cactus and yucca are used to restore or reclaim degraded public lands rather than sold to the public. Because salvage and sale of cactus and yucca are only from sites being disposed of or where ground-disturbing activities are authorized, impacts to native plant communities would be negligible.

4.2.5.1.5.1.2. Alternative 1

Under Alternative 1, BLM would allow harvest of dead and/or down wood or BLM-marked green mesquite “trees” for dwarf mistletoe control only in approved areas. This alternative does not reflect current conservation status of this vegetation community and advancements in knowledge as related to management of mesquite acacia woodlands. Mistletoe is no longer perceived as a threat to stand health. The berries of dwarf mistletoe are an important food source for migratory birds. The public has exploited this management action by illegally cutting trees and returning later to collect the trees as downed. Continuation of management actions under Alternative 1 would result in moderate negative impacts to native plant communities, in particular, mesquite acacia woodlands.

4.2.5.1.5.1.3. Alternative 2

Under Alternative 2, BLM would prohibit commercial harvest and personal use of mesquite and acacia woodlands, including live, dead standing, or dead and down. Alternative 2 would improve protection of mesquite acacia woodlands by prohibiting personal and commercial harvesting of mesquite acacia woodlands in the planning area. The impact of this management action would be a major benefit.

Under Alternatives 2, 3, and 4, the BLM would authorize commercial seed collections within identified seed-collection areas. Commercial seed collections outside designated seed collection areas would be authorized on a case-by-case basis except where otherwise prohibited (such as a wilderness area). Local seed collections for BLM-authorized project-specific restoration would be allowed within the project footprint and within 1,000 feet adjacent to the project area. This alternative provides opportunities for commercial seed collections on public lands. The primary purchaser of wildland collected seed is the BLM, project proponents implementing fire

rehabilitation, and restoration projects on public lands and other state and federal agencies. In general, native plant communities produce more seed than is needed for natural recovery. If seed is collected too frequently, this could reduce the amount of seed available for natural recovery. Seed collection is a discretionary activity; repeated seed collections in the same area that could affect native plant communities would be avoided. The impact of commercial seed collection on native plant communities would range from negligible to negative minor depending on the authorization and location.

Under Alternatives 2, 3, and 4, BLM would allow the collection of reasonable amounts of renewable native plant products including flowers, leaves, fruit, seeds, nuts, cones, berries, and dead-and-downed native vegetation for noncommercial, personal use, except within ACECs. In general, native plants produce more seed and flowers than are necessary to maintain ecosystem function. The collection of small amounts of plant products including flowers, leaves, fruit, seeds, nuts, cones, berries, and dead-and-downed native vegetation for noncommercial, personal use from multiple-use lands is expected to have a negligible impact to native plant communities because of the small quantities involved.

4.2.5.1.5.1.4. Alternatives 3 and 4

Most impacts would be similar to those under Alternative 2. Under Alternatives 3 and 4, BLM would prohibit commercial harvest of mesquite and acacia woodlands, including live, dead standing, or dead and down, but would allow personal use of dead and down for on-site recreational campfires, except in areas closed to firewood gathering and subject to seasonal fire restrictions. This alternative would allow for immediate personal use as part of a recreational campfire. This alternative would improve protection of mesquite acacia woodlands by prohibiting commercial harvest of mesquite acacia woodlands in the planning area. The impact of this management action to mesquite acacia woodlands would be negligible.

4.2.5.1.5.2. Livestock Grazing Impacts on Vegetation

4.2.5.1.5.2.1. Impacts Common to All Alternatives

Grazing allotments in the Mojave Desert have limited forage and do not consistently produce it; therefore, BLM manages grazing allotments under the Special Ephemeral Range Rules established in 1968 (43 CFR 4115.2). In general, livestock grazing has a negative effect on native plant communities. Grazing affects composition and productivity of native plant communities through selective grazing (Brooks et al 2006). It is commonly accepted that present-day Mojave Desert native plant communities did not evolve with significantly selective pressure from large-bodied herbivores (Beever et. al. 2003, Brown and McDonald 1995, Grayson 1987, Hall 1946), and desert vegetation is very slow to recover if overgrazed or disturbed (Abella et. al.2007, Tueller 1989). Higher grazing use is expected to increase selective grazing, which could result in lower densities of more palatable native forbs and native perennial grasses, especially in high-use areas (such as around springs and watering areas).

Under all alternatives, BLM would not administer livestock grazing in allotments managed by other districts, including the Mesquite Community, Azure Ridge, and Lime Springs allotments, which are managed by the Arizona Strip District. The impact of this action is expected to be negligible.

Under all alternatives, BLM would continue existing allotment closures. These closures were (1) implemented to protect desert tortoise critical habitat, as determined by the U.S. Fish and Wildlife Service; (2) relinquished by willing sellers of grazing interests (base property and/or water rights) to protect desert tortoise habitat and other species as mitigation under the Clark County Multiple Species Habitat Conservation Plan; and (3) by BLM because of agency and congressionally mandated changes in land management (including wilderness designations, land disposals, transfers to the state of Nevada, National Park Service, Bureau of Indian Affairs, and U.S. Forest Service). The rationale to close these allotments has not changed and remains valid today. Maintaining the existing allotment closures will have a positive effect on native plant community management because it would continue to remove selective gazing pressure on native plant communities. The beneficial impact of this action would be moderate.

Under all alternatives, shifting management focus toward key perennial forage species could have a negative impact on native plant communities by shifting management focus away from highly palatable native forb species that provide important ecosystem services, such as pollinator services and forage for insects and wildlife, which perennial species (native grasses) may not provide. This impact could range from minor to moderate depending on location and number of livestock authorized.

Under all alternatives, evaluation of available forage in ephemeral allotments under the Special Ephemeral Range Rules is expected to have a moderate positive benefit to native plant community management. Under all alternatives, placement of salt and mineral supplements away from water sources is expected to have a minor positive impact on native plant communities by distributing animals more evenly in the allotment and reducing overgrazing around water sources.

4.2.5.1.5.2.2. Alternative 1

Livestock grazing would continue on all active allotments. This includes the Flat Top Mesa, Lower Mormon Mesa, and Hidden Valley allotments. Depending on the location and number of animals, the impacts from domestic livestock grazing on native plant communities could range from negligible, under low-intensity grazing, to negative major, where there is overgrazing. Where there are moderate and major impacts to native plant communities in response to livestock grazing, mitigation measures could be required to maintain and/or restore previous levels of ecosystem services and values. These measures could include changes in the number of animals authorized, changes to the period of use, increasing pasture rest periods, and range improvement such as seeding with key native species Alternative 1 reflects 1998 desert tortoise habitat management prescriptions for outside of critical habitat. This management direction does not reflect current advancement and knowledge regarding vegetation management and desert tortoise habitat management. Management under this alternative could reduce ecosystem services and value provided by native plant communities. Under this alternative, the effect of livestock grazing on native plant communities would be negative. Depending on the number of animals and location, the impact could range from negligible to moderate.

4.2.5.1.5.2.3. Alternative 2

Under Alternative 2, all active and inactive grazing allotments would be closed. Closing allotments would benefit native plant communities by improving current levels of ecosystem services. The effect of this management action would be positive, and the impact would be moderate.

4.2.5.1.5.2.4. Alternative 3

Under Alternative 3, BLM would close all inactive allotments. This includes Roach Lake, White Basin, Mesa Cliff, Muddy River, Wheeler Wash, Arrow Canyon, Arrow Canyon in Battleship Wash, and Jean Lake. Most of these allotments have not been grazed in more than 20 years. Grazing interests for all but two allotments (Muddy River and Wheeler Wash) were purchased from willing sellers by Clark County as conservation mitigation to protect habitats for desert tortoise and other wildlife species under the Clark County Multiple Species Habitat Conservation Plan. Discontinuation of grazing in the inactive allotments has reduced selective grazing and increased native seed production, which in turn has increased the ecosystem services provided to native plant communities (such as higher-quality desert tortoise habitat, improved air and water quality, and improved viewshed for recreation and wilderness). In addition, the removal of grazing has improved the ability of native plant communities in these allotments to recover from disturbance (such as fire, nonnative species, and casual recreation) and adapt to future climate change. Closing these allotments will benefit native plant communities by maintaining current levels of ecosystem services and economic value. The effect of this management action would be positive, and the impact would be moderate.

Under Alternatives 2, 3, and 4, BLM would manage active grazing allotments in desert tortoise habitat consistent with the current biological opinion for desert tortoise. The BLM will initiate formal consultation on a case-by-case basis if any change is identified to the biological opinion grazing prescriptions. This alternative is expected to provide a benefit to native plant community resilience and improve ecosystem services by improving management of livestock selective grazing of annual forbs and other species that are important for desert tortoise. The effect of this management action is expected to be positive. The impact could range from negligible to moderate depending on the location.

4.2.5.1.5.2.5. Alternative 4

Under Alternative 4, all inactive allotments where the grazing interests have been purchased for conservation purposes would be closed. This includes Roach Lake, White Basin, Mesa Cliff, Arrow Canyon, Arrow Canyon in Battleship Wash, and the Jean Lake allotments. Under Alternative 4, inactive allotments, where the grazing preference has been abandoned (Muddy River and Wheeler Wash), would remain open. Impacts and effect to native plant communities would be similar to those discussed under all alternatives and Alternatives 2 and 3.

4.2.5.1.5.3. Minerals Impacts on Vegetation

4.2.5.1.5.3.1. All Minerals Impacts on Vegetation

4.2.5.1.5.3.1.1. Impacts Common to All Alternatives

In general, minerals and mineral materials exploration and development activities result in surface disturbance and other activities that negatively impact native plant communities by removing plants, altering soil conditions, reducing establishment, and favoring non-native plants. In addition, mining and minerals activities can affect landscape connectivity, the dispersal of native plants, pollinators, and wildlife interactions necessary to maintain species diversity, ecosystem stability, and resilience. These activities reduce the level of ecosystem services they provide. On a project-by-project basis, the negative impact of mining and minerals activities can range from

negligible to minor depending on the project size and location. On a landscape scale, the slow rate of recovery in the Mojave ecoregion means most reclaimed sites are not expected to return the full ecosystem services and values previously provided to these sites within the lifetime of the RMP. On a landscape scale, the negative impact to native plant communities can range from moderate to major depending on the number of minerals actions authorized.

Under all alternatives, BLM would continue to encourage the placement of minerals activities in previously disturbed areas or unvegetated areas as an impact minimization measure. Under all alternatives, BLM would apply impact minimization measures including post-project reclamation and bonding. While this is an effective tool for minimizing impacts, it does not address or mitigate the additive loss of native plant communities in the planning area resulting from minerals activities.

4.2.5.1.5.3.1.2. Alternative 1

There are no additional impacts to vegetation.

4.2.5.1.5.3.1.3. Alternative 2

Alternative 2 is the most restrictive for fluid leasable minerals, solid leasable minerals, and saleable minerals. The acres of native plant communities impacted by minerals activities are expected to be lower under this alternative. Under Alternative 2, the number of fluid mineral exploration sites would be very limited; less than 5 percent of the native plant communities in the planning area would be open or open with controlled surface use. Approximately one-third of native plant communities would be open to locatable minerals. Approximately half of the planning area would be open to saleable minerals. Impacts to vegetation and native plant communities from individual projects are expected to be largely localized; negative impacts from individual projects are expected to range from negligible to minor. Under this alternative, restrictions on minerals activities within ACECs would provide additional protection to native plant communities within ACECs. Using the 1998 RMP as a baseline for the potential number of minerals activities, on a landscape scale, negative effects from fluid, solid, and saleable minerals on native plant communities are likely to result in a minor to moderate impact.

4.2.5.1.5.3.1.4. Alternative 3

Alternative 3 provides a larger area open to fluid leasable minerals, solid leasable minerals, and saleable minerals than Alternative 2. Under Alternative 3, approximately one-third to one-half of native plant communities would be open to fluid mineral leases. Under this alternative, approximately half the planning area would be open to locatable minerals, and approximately half the planning area would be open to saleable minerals. Under this alternative, restrictions on minerals activities within ACECs would provide additional protection to native plant communities. Impacts from fluid leasable exploration could be higher; however, overall impacts to native plant communities under Alternative 3 would likely be similar to Alternative 2.

4.2.5.1.5.3.1.5. Alternative 4

Alternative 4 is the least restrictive for fluid leasable minerals, solid leasable minerals, and saleable minerals. The acres of native plant communities impacted by minerals activities are expected to be the highest under this alternative. Under Alternative 4, approximately three-quarters of the

planning area would be open to fluid minerals exploration through open or controlled surface use designations; this would include some ACECs. Under Alternative 4, approximately half of the planning area would be open to locatable minerals, and approximately two-thirds of the planning area would be open to saleable minerals. Under this alternative, negative impacts to vegetation and native plant communities from individual projects are expected to range from negligible to minor based on project size and location. On a landscape scale, the increased number of exploratory operations and authorizations could cause impacts to native plant communities that would extend well beyond the project footprint, in particular resulting in fragmentation and loss of ecosystem resilience and stability. The negative impacts under this alternative would be moderate to major.

4.2.5.1.5.4. Recreation Impacts on Vegetation

4.2.5.1.5.4.1. Impacts Common to All Alternatives

Recreation activities can result in surface disturbance that can negatively affect native plant communities. In addition, OHV activity is known to spread noxious weeds, create dust, and fragment native plant communities that over time affect ecosystem resiliency and recovery from disturbance. To the extent practical, special recreation permits and the general public are encouraged to use existing disturbed areas; however, casual and permitted recreation activities often result in negligible to minor unreported trampling, removal of plants, and soil compaction. This is particularly evident as the creation of new trails, road widening, route proliferation, corner cutting, and the creation of camping sites, staging areas, parking areas, and target shooting areas. In general, negative impacts from these activities are small, localized in nature, and have negligible to minor impacts. Because the Mojave Desert is slow to recover, these unauthorized impacts are additive. On a landscape scale, over the life of the RMP, the negative impacts of recreation activities on native plant communities are expected to rise as recreational use of public lands increases with population growth.

Under all alternatives, the BLM would continue to encourage the placement of recreation activities in previously disturbed areas or unvegetated areas as an impact minimization measure. Recurring vehicular activities in disturbed sites and unvegetated sites will preclude natural recovery in these areas. Soil compaction resulting from this activity could prevent natural recovery of these sites within the lifetime of the RMP. While this is an effective impact minimization measure, it does not offset the additive impacts to native plant communities, and off-site mitigation would be necessary. The most effective would likely be increased law enforcement, improved signage, travel management, and restoration of closed areas.

4.2.5.1.5.4.2. Alternative 1

Alternative 1 does not reflect current BLM policy and guidance for recreation management and management of native plant communities. This alternative reflects management for travel management and special recreation management areas appropriate for 1998. Impacts to native plant communities would be expected to continue relative to increases in the regional population. Negative impacts to native plant communities are expected to be major.

4.2.5.1.5.4.3. Alternatives 2 through 4

Under Alternatives 2, 3, and 4, BLM would maintain the majority of lands in the planning area open to recreational target shooting. Under this alternative, recreational target shooting areas are

expected to expand and increase in size as a result of casual use. Casual recreational use in the Mojave Desert is known to result in the trampling and removal of individual shrubs and compaction of soils. The impacts of casual use are expected to be localized, but on a landscape scale, off-trail use and road proliferation would occur. Over time, these activities will likely result in additive negative impacts. These impacts could preclude natural recovery of the ecosystem services and values within the lifetime of the RMP. On a landscape scale, the impact of this management action could range from minor to moderate depending on whether area closures or other steps are taken to regulate recreational target shooting.

Under Alternatives 2, 3, and 4, the BLM would designate SRMAs and ERMAs and implement specific management prescriptions within these areas. The designation of SRMAs and ERMAs and management of native plant communities as a component of the visitor use experience is expected to benefit native plant community management. However, limited BLM law enforcement capacity would likely mean enforcement of designations and management prescriptions may not be fully realized. Unless limited BLM law enforcement capacity can be resolved, potential negative impacts to native plant communities may not be outweighed by improved management of casual visitor use activities. Under this scenario, on a landscape scale, recreation management activities could have moderate negative impacts to native plant communities.

Under Alternatives 2, 3, and 4, during renewable energy project planning, BLM would consider off-site mitigation for the loss of recreation opportunities by providing additional recreational developments (e.g., developing trailheads, recreation facilities) for displaced recreation users. Under this alternative, off-site mitigation for the loss of recreation opportunities is likely to result in negative impacts to native plant communities in the planning area. Impacts from this mitigation could range from minor to moderate depending on the scale and location of the mitigation impact.

4.2.5.1.5.5. Travel and Transportation Impacts on Vegetation

4.2.5.1.5.5.1. Impacts Common to All Alternatives

Most users of BLM lands stay on existing roads and trails; however, casual recreation activities still result in route proliferation, road widening, and corner cutting as vehicle tires crush native vegetation and compact soils. Generally these impacts go unreported, unrepaired and unmitigated. On a local scale, negative impacts can range from negligible to minor. On a landscape scale, these impacts are additive and can result in landscape fragmentation and the loss of ecosystem services. Under the 1998 RMP, conservatively, at least 3,000 miles of new, unauthorized roads and trails were created by the public. On a landscape scale over the life of the RMP, the negative impacts of public travel on public lands is expected to increase as recreational activity increases with population growth. Travel management is expected to improve protection of BLM resources, including native plant communities, by providing more efficient network of roads and trails for public travel.

Under all alternatives, the BLM would continue to encourage the placement of designated routes in previously disturbed roads or unvegetated areas. The BLM receives very little appropriated funding for travel management planning, route designation, and closed route rehabilitation. The use of offsite mitigation funds to implement travel management planning and implementation, route rehabilitation, and support enforcement of travel management decisions is an appropriate way to protect and improve landscape connectivity and improve the ecosystem services provided by native plant communities.

4.2.5.1.5.5.2. Alternative 1

Alternative 1 does not reflect current BLM policy and guidance for travel and transportation management as it is related to the management of native plant communities. In general, the public would continue to use existing roads, trails, and dry washes except where otherwise noted. Under this alternative, impacts to native plant communities would be expected to continue and increase with regional population growth. Negative impacts to native plant communities are expected to be major.

4.2.5.1.5.5.3. Alternatives 2 through 4

Under Alternatives 2, 3, and 4, BLM would complete travel management planning for most of the planning area. At a local scale, the creation of new roads and trails, as well as some designation decisions, would be expected to negatively affect or remove native vegetation. Increased public access or use of some areas would result in negative impacts to native plant communities. Negative impacts resulting from opening new routes are expected to be outweighed by overall improved management of public use, reduced route proliferation, and improved ability to enforce travel management decisions. The impact of travel management actions on native plant communities could range from negligible to major depending on the location.

4.2.5.1.5.6. Lands and Realty Impacts on Vegetation

4.2.5.1.5.6.1. Land Tenure (Disposals and Acquisitions) Impacts on Vegetation

4.2.5.1.5.6.1.1. Impacts Common to All Alternatives

Under the 1998 RMP, the BLM issued roughly 1 million acres of right-of-way authorizations; a similar acreage is expected during the lifetime of the next RMP. In general, land-use authorizations and subsequent development result in surface disturbance and other activities that negatively affect native plant communities including, but not limited to, trampling or removing plants, altering soil conditions, changes in species composition, and favoring nonnative plants. In addition, development impacts the surrounding native plant communities by creating edge effects, reducing landscape connectivity, and affecting dispersal of native plants, pollinators, and the wildlife interactions. These activities can reduce the level of ecosystem services and economic value (such as forage for livestock, habitat for the desert tortoise, viewshed, and recreation). On a project-by-project basis, the negative impacts of land-use authorizations can range from negligible to major depending on the project size and location and can include no impact, temporary, and permanent impacts to native plant communities. The slow rate of recovery means temporary disturbances are not expected to recover to predisturbance levels over the lifetime of the RMP. On the landscape scale, the loss of ecosystem services and values on temporary disturbance sites are additive over the lifetime of the RMP. Impacts to the surrounding vegetation caused by permanent development are additive. Both temporary and permanent rights-of-way associated disturbance can interact with other BLM land-use activities (such as grazing, recreation) and fire to fundamentally shift species composition and diversity so that return to the predisturbance vegetation community may be not possible with current budgets and technology.

Under all alternatives, public lands would not be disposed of through Indian Allotment, Desert Land Entry, or the Carey Act authorities. In the planning area, there is very little agricultural quality public land suitable for disposal and under these authorities. Retention of suitable lands

in federal ownership is necessary to meet BLM regulatory obligations (such as threatened and endangered species, and federal reserve water rights) and BLM-managed water dependent resources and other multiple-use management objectives. Under all alternatives, BLM would continue to encourage the placement of land-use activities in previously disturbed areas as an impact minimization measure. Under Alternatives 2, 3, and 4, BLM would apply best management practices and impact minimization measures, such as post project restoration, and processing new communication sites requests as multiuser facilities. In general, mitigation will be necessary to maintain the current level of ecosystem services and values from native plant communities in the planning area to address the additive loss of ecosystem services from lands authorizations. The most effective mitigation will likely be increasing BLM capacity to better manage ACECs and multiple-use lands; this could include increased law enforcement, improved signage, travel management, and off-site restoration of degraded lands. Under all alternatives, three major types of land-use activities impact native plant communities: utility rights-of-way authorizations, renewable energy authorizations, and land disposals.

4.2.5.1.5.6.1.2. Alternative 1

Under Alternative 1, BLM would maintain current disposal boundaries. Impacts to native plant communities would be similar to those described above under all alternatives. Under Alternative 1, the fewest acres would be available for disposal; therefore, the magnitude of impacts would be the lowest under this alternative. Under Alternative 1, negative impacts from land disposals would range from minor to moderate based on the number of acres disposed of and developed.

4.2.5.1.5.6.1.3. Alternative 2

Under Alternative 2, approximately 3 percent of the planning area would be available for disposal in a similar configuration as Alternative 1; in most cases, the disposals would be adjacent to towns and cities in the planning area. The sale of public land would result in the conversion of native plant communities to urban, rural, or industrial use. Affects to native plant communities would be similar to those described under Impacts Common to All Alternatives. The impact of land disposals under Alternative 2 could range from negative minor to negative moderate depending on the number of parcels sold.

4.2.5.1.5.6.1.4. Alternative 3

Under Alternative 3, approximately 5 percent of native plant communities in the planning area would be available for disposal. Under this alternative, additional areas outside of established towns and cities would be established. The effects of disposal would similar to Alternative 2. Impacts to adjacent native plant communities would be higher because of an increase potential edge effects associated with the larger disposal footprint. The negative impact of land disposals under Alternative 3 could be moderate depending on the number of parcels sold.

4.2.5.1.5.6.1.5. Alternative 4

Under Alternative 4, approximately 8 percent native plant communities of the planning area would be available for disposal. This is more than twice the area that could be disposed under Alternative 2. The magnitude of the effects would be the highest under this alternative. The negative impacts could range from negative moderate to negative major depending on the number

of acres disposed. Mitigation would be necessary to maintain the current level of ecosystem services and values provided by native plant communities in the planning area.

4.2.5.1.5.6.2. Land-Use Authorizations (Right-of-Ways, Leases, Permits) Impacts on Vegetation

See Land Tenure Impacts to Vegetation.

4.2.5.1.5.6.3. Renewable Energy Impacts on Vegetation

4.2.5.1.5.6.3.1. Impacts Common to All Alternatives

See Land Tenure Impacts to Vegetation.

4.2.5.1.5.6.3.2. Alternative 1

Under Alternative 1, approximately one third of native plant communities in the planning area would available for solar energy development. Under current technology, the construction of solar facilities results in blading, mowing, or crushing all native vegetation within the solar field. After construction, vegetation is typically managed with applications of soil stabilizers, herbicide treatments, mowing, or other treatments to prevent the growth of any vegetation that could cause shading or carry fire. The effects to native plant communities from solar facility construction and operations result in the loss of nearly all the ecosystem services provided by native plant communities. Native plant communities adjacent to solar energy sites are indirectly affected. These effects include the introduction and spread of noxious weeds, loss of connectivity necessary for pollination, seed dispersal, plant migration, and an interruption of ecological processes that maintain native plant communities. These indirect affects lead to a loss of resiliency, reduced ability to recover from disturbances such as fire, and reduced ability to adapt to future climate change.

Currently in some parts of the planning area, there are overlapping applications. The average size of the current 21 pending solar projects in the planning area is approximately 3,000 acres. If three projects are authorized per year over the 30-year life of the RMP, then more than 270,000 acres would be directly impacted. Because most of the areas proposed for solar development are in flat valley bottoms or on bajadas, creosote bursage scrub would be the vegetation community most affected. Development of 270,000 acres would result in the loss of approximately 12 percent of creosote bursage scrub vegetation in the planning area. Because projects would be spread out over much of the area available for development, edge effects and other indirect impacts are likely to affect up to four times this area, approximately 1 million acres, or roughly half of creosote bursage scrub vegetation in the planning area. Under this scenario, overall impact of solar energy development on native plant communities would be major. There would be substantial change across a large area. When coupled with impacts from other multiple-use activities, desired future conditions in the ecoregion could not be achieved without substantial off-site mitigation.

Under Alternative 1, more than one-third of plant communities in the planning area would be available for wind energy development; however, most of this area as described in the BLM wind programmatic EIS has minor wind resource potential. Under current technology, areas with moderate and major potential are likely to be developed; this is roughly 10 percent of the area available for wind development, approximately 110,000 acres. Wind energy development projects

require large buffers to protect wind flow; based on the Searchlight wind project, less than 2 percent of the project area was directly impacted. This means the construction of wind turbines, roads, infrastructure, and temporary work areas associated with wind energy development will likely result in less than 2,200 acres of direct surface disturbance of native plant communities. In addition to direct impacts, construction of wind energy facilities will result in fragmentation of native communities and increase the potential for the introduction and spread of noxious weeds. The because of the relatively small number of acres affected, the overall impact of this activity on native plant communities is considered minor to moderate and would not extend beyond the project footprint.

4.2.5.1.5.6.3.3. Alternative 2

Under Alternative 2, approximately 20 percent of native plant communities in the planning area would available for solar energy development, and approximately 20 percent of native plant communities would be available for wind energy development. The reduction in acres available in Alternative 2 may concentrate renewable energy projects in smaller areas; this increased density would likely lead to increased negative impacts to the adjacent native plant communities. Because of the reduced area, overall impacts to native plant communities resulting from solar energy development would likely be lower than under Alternative 1 and range from moderate to major for solar and depending on the number of projects constructed. Because of the constraints to wind energy, the level of impact would remain similar to Alternative 1.

4.2.5.1.5.6.3.4. Alternative 3

Under Alternative 3, approximately one-quarter of plant communities in the planning area would be available for solar energy development, and approximately one-quarter of plant communities in the planning area would be available for wind energy development. Under this alternative, impacts to native plant communities would be concentrated in the western Clark County and the Nye County portions of the planning area. This would increase the magnitude of impacts in these portions of the planning area. Depending on the level of build-out, development could interfere with the ability of native plant communities in these areas to provide the ecosystem services that support other BLM multiple-use management objectives, such as range management for wild horses and burros and desert tortoise habitat management. Overall impacts to native plant communities resulting from solar and wind energy development would be similar to Alternative 1. Mitigation would be necessary to maintain the current level of ecosystem services and values provided by native plant communities in the planning area.

4.2.5.1.5.6.3.5. Alternative 4

Under Alternative 4, over one-third of native plant communities in planning area would be available for solar energy development and over one-third would be available for wind development. Impacts to native plant communities would be similar to Alternative 1. Substantial mitigation would be necessary to maintain the current level of ecosystem services and values provided by native plant communities in the planning area.

Under Alternative 4, BLM would establish four additional solar energy zones. This would result in the loss of approximately 250,000 acres of native plant communities within the SEZ boundaries. Additional development could occur within variance areas. Establishment of the Alternative 4 SEZs would create landscape barriers that would fragment the ecoregion. The proposed SEZs

would interrupt landscape-level processes, including the dispersal and migration of species; this would affect the ability of native plant communities to recover from fire, casual recreation, and other BLM multiple-use activities. Impacts to native plant communities would be more severe than Alternative 1. If full development under this alternative is realized, it would not be possible to mitigate adverse impacts, and residual impacts would threaten sustainable management of the ecosystem services and values provided by native plant communities in the ecoregion.

4.2.5.1.5.6.4. Utility Corridors Impacts on Vegetation

4.2.5.1.5.6.4.1. Impacts Common to All Alternatives

See Land Tenure Impacts to Vegatation.

4.2.5.1.5.6.4.2. Alternative 1

Under Alternative 1, BLM would maintain current utility corridors. Utility rights-of-way authorizations are used for telecommunications, electricity transmission, and petroleum and natural gas pipelines. To the extent practical, BLM attempts to place utility rights-of-ways within the same corridor for efficiency and as a way to minimize landscape-scale impacts. While placement in corridors is a landscape-scale impact minimization measure, on a local scale it concentrates impacts. Depending on corridor width and configuration, rights-of-way authorizations would still result in negative effects to native plant communities, such as a barrier to pollination, seed dispersal, and species movement. Construction and recurrent maintenance activities within corridors create disturbances that facilitate the introduction and transmission of weeds and fire. The construction of transmission lines involves the creation of access roads, tower sites, laydown, and pull sites, which result in permanent and temporary disturbances to native plant communities of different intensities. The construction of access roads can result in increased casual recreation and new impacts to native plant communities. The construction of pipelines involves the construction of access roads, trenching, and soil piles that directly disturb native plant communities. In general, construction of pipelines creates more surface disturbance than transmission lines. Under Alternative 1, impacts to native plant communities from utility corridor development are expected to range from moderate to major depending on the location and extent of build out.

4.2.5.1.5.6.4.3. Alternative 2

Under Alternative 2, there would be the fewest linear miles of utility corridors. Impacts to native plant communities would be similar to those described under Impacts Common to All Alternatives and Alternative 1. Due to high demand, utility rights-of-ways would likely be issued outside of corridors. This would spread out utility development across the landscape and lead to a greater landscape-level impact to native plant communities. For this reason, overall impacts to native plant communities would likely be major.

4.2.5.1.5.6.4.4. Alternative 3

Under Alternative 3, there would be more linear miles of utility corridors than Alternative 2; the number of acres of native plant communities affected would be higher than Alternative 2 but lower than Alternative 4. The overall magnitude of impact would be similar to Alternative 1.

4.2.5.1.5.6.4.5. Alternative 4

Alternative 4 contains the most miles of utility corridors. Effects to native plant communities would be similar to Alternative 1. Negative impacts to native plant communities would be the highest under this alternative and could range from moderate to major depending on the number of projects constructed. Substantial mitigation would be necessary to maintain the current level of ecosystem services provided by native plant communities in the planning area.

4.2.5.1.6. Special Designations

4.2.5.1.6.1. Areas of Critical Environmental Concern Impacts on Vegetation

4.2.5.1.6.1.1. Impacts Common to All Alternatives

In general, the designation of ACECs will benefit native plant communities by providing protection against BLM multiple-use activities. The level of protection extended to native plant communities will depend on the management directions and the relevance and importance criteria for which the ACEC was established. The lowest protection will be afforded by ACECs established to protect the public from natural hazards, and the highest protection will be afforded by ACECs established in part to protect a vegetation resource, such as a rare plant or riparian community. Under all alternatives, individual BLM management actions could result in negative impacts to native plant communities. Negative impacts are expected to be offset by improved visitor use or overall resource protection. Impacts to native plant communities are expected to range from positive moderate to positive major.

4.2.5.1.6.1.2. Alternatives 1 through 4

There are no additional impacts to vegetation.

4.2.5.1.6.2. National Trails Impacts on Vegetation

4.2.5.1.6.2.1. Impacts Common to All Alternatives

See Cultural Resources for impacts on vegetation.

4.2.5.1.6.2.2. Alternatives 1 through 4

There are no additional impacts to vegetation.

4.2.5.1.6.3. Wild and Scenic Rivers Impacts on Vegetation

4.2.5.1.6.3.1. Impacts Common to All Alternatives

In general, the designation of wild and scenic rivers (WSRs) will benefit native plant communities by providing protection against BLM multiple-use activities. Because of the limited area proposed for WSR designation, the impact to native plant communities is expected to be negligible.

4.2.5.1.6.3.2. Alternatives 1 through 4

There are no additional impacts to vegetation.

4.2.5.1.6.4. Wilderness Impacts on Vegetation

4.2.5.1.6.4.1. Impacts Common to All Alternatives

There are no impacts common to all alternatives.

4.2.5.1.6.4.2. Alternatives 1 through 4

There are no additional impacts to vegetation.

4.2.5.1.6.5. Wilderness Study Areas Impacts on Vegetation

4.2.5.1.6.5.1. Impacts Common to All Alternatives

There are no impacts common to all alternatives.

4.2.5.1.6.5.2. Alternatives 1 through 4

There are no additional impacts to vegetation.

4.2.5.1.7. Cumulative Impacts on Vegetation

4.2.5.1.7.1. Past and Present Actions/Impacts

Past and present BLM actions are identified and described in Chapter 3 (Affected Environment) and Chapter 4 (as part of Alternative 1). As discussed in Chapter 3, without active restoration, it is estimated that it will take the Mojave Desert 76 years for re-establishment of perennial plant cover and 215 years for re-establishment of both perennial and annual species cover. Because the Mojave Desert is so slow to recover, current native plant communities reflect cumulative damage incurred over 70 years of federal land management. During the 1998 RMP, an estimated 10 to 15 percent of the planning area has been directly impacted by land disposals and surface-disturbing activities associated with BLM rights-of-way authorizations. Potentially, an additional three times that has been indirectly impacted by BLM authorizations and activities. During the 1998 RMP, cumulatively BLM realty, minerals, and recreation program activities and authorizations have resulted in unmitigated impacts to native plant communities. On a landscape scale, cumulatively these unmitigated impacts have resulted in a decline in ecosystem services and economic value. If declines continue to go unmitigated, sustainable use and management goals under FLPMA may not be achievable. Currently, the BLM attempts to minimize project impacts by revegetation, restoration, and reclamation. However, this effort has been inconsistent, limited by technology and a lack of suitable native plant materials. At best, restoration can only facilitate natural recovery. Both natural and restoration are unable to fully return predisturbance ecosystem services and values within the lifetime of one or two RMPs. While important, restoration, reclamation, or revegetation of temporary disturbances does not mitigate the cumulative temporal loss and other direct and indirect impacts native plant communities.

4.2.5.1.7.2. Reasonable Foreseeable Actions

The population of Southern Nevada will likely reach 3 million; increased population will result in greater demand for BLM land-use authorizations and casual recreation opportunities in the planning area. With higher demand, impacts to native plant communities in the planning area will increase. BLM capacity to manage impacts to native plant communities through law enforcement, travel management, and restoration will likely remain unchanged from current levels. For the foreseeable future, higher demand without an increase in capacity will mean impacts to native plant communities will escalate.

Using conservative climatic models, much of the low-elevation creosote bursage scrub in the planning area will have a temperature profile similar to present-day Stove Pipe Wells in Death Valley, CA. As discussed in Chapter 3, climate change will affect the quality and quantity of native plant communities in the planning area. Climate change means the ability of native plant communities to recover from disturbance may be reduced. This could also mean native plant communities will probably not be able to provide the level of ecosystem services and economic value they provide today.

4.2.5.1.7.3. Cumulative Impact

4.2.5.1.7.3.1. Impacts Common to All Alternatives

Cumulatively, the proposed land-use allocations and management activities, impacts from past/present management actions, and the foreseeable future will result in major and irreversible impacts to native plant communities, ecosystem services, and economic value they provide.

All alternatives include a combination of management directions and land-use allocations that result in beneficial, negative and neutral impacts to native plant communities. Under all alternatives, cumulatively, negative impacts outweigh positive impacts. Management actions and land-use allocations that have a potential moderate to major positive affect on native plant communities include ACECs, special status species (in particular desert tortoise ACECs), lands with wilderness characteristics, travel management, visual resource management, and designated wilderness. The benefits from these programs to native plant communities are not cumulative and do not comprehensively protect the ecosystem functions needed to sustain robust, functioning native plant communities.

Wilderness, lands with wilderness characteristics, and areas with high VRM ratings offer very little protection because these areas are generally remote, rugged, and difficult to access; the threat posed to development and surface-disturbing activities to native plant communities in these areas is low. In general, these programs protect higher-elevation vegetation communities but offer little protection to low-elevation vegetation types such as creosote bursage scrub and mesquite woodlands that are subject to the highest development and casual recreation pressure. ACECs offer better protection to native plant communities; however, ACECs are created to protect relevance and importance values that may or may not provide a benefit to native plant communities or the ecosystem processes needed to maintain them. ACECs created to protect desert tortoises and special status plants such as the threecorner milkvetch and Pahrump Valley buckwheat offer the highest protection to native plant communities; however, these ACECs do not protect landscape connectivity and ecosystem function needed to maintain pollinator and general plant populations that occur on multiple-use lands. Travel management could offer a significant

benefit to native plant communities throughout the planning area by improving casual recreation management; however, its application is limited because BLM receives very little appropriated funding earmarked for this purpose.

Management actions and land-use allocations that have a potential moderate to major negative affect include lands and realty, minerals, recreation, livestock grazing, and wild horse and burro management. The negative impacts of these programs on native plant communities and their management are cumulative because most of these program activities are focused in low-elevation plant communities on bajadas and valley bottoms on multiple-use lands. Because these are multiple-use lands, there are often multiple overlapping activities/programs that can negatively impact native plant communities (for example, utility corridor, grazing allotment, and special recreation management area). These low-elevation vegetation communities are also under the highest pressure from nonnative annual grasses and fire, and recovery from disturbance may be the most difficult.

Under all alternatives, the BLM will minimize project impacts to native plant communities during the NEPA process. During the NEPA process, BLM would have the discretion to deny applications or develop project-specific mitigation that would reduce cumulative impacts to native plant communities. The proposed management alternatives differ in (1) the degree of impact; (2) the level of BLM commitment to minimize project-specific impacts through required revegetation or restoration; and (3) level of BLM commitment toward offsetting cumulative impacts through mitigation.

Potential mitigation measures could include both on-site or off-site and in-kind or out-of-kind mitigation. The first goal of this mitigation should be on a landscape scale to maintain the level of ecosystem services provided by native plant communities in the planning area. Potentially effective off-site mitigation could include increasing BLM law enforcement capacity; increasing BLM capacity to better manage ACECs and other lands already set aside for conservation; performing travel management planning and rehabilitating roads closed through the travel management process; restoring abandoned mines and failed restoration sites; vegetation management including reseeding within old burn scars; and the construction of fire breaks to prevent catastrophic wildfires. This could potentially include the collection of off-site mitigation fees to fund these activities.

4.2.5.1.7.3.2. Alternative 1

Under Alternative 1, BLM would continue current management and would not mitigate cumulative impacts to native plant communities. Where feasible, BLM would minimize cumulative impacts at the project level by requiring revegetation or restoration on a project-by-project basis. ACECs, wilderness, and lands with high VRM ratings would protect higher-elevation native plant communities from the limited threat of development. Cumulative impacts to native plant communities and the ecosystem services and economic value they provide would continue to decline. Under Alternative 1, BLM would need to substantially limit the number of land-use authorizations it approves each year to achieve FLPMA sustainable use and management goals.

4.2.5.1.7.3.3. Alternative 2

Under Alternative 2, BLM would develop an equitable approach for mitigating the cumulative loss of ecosystem services and value provided by native plant communities in the planning area. The goal of mitigation would be, to the extent practical and on a landscape scale, to maintain the

current level of ecosystem services provided by native plant communities. This approach would allow BLM to authorize projects that would impact native plant communities in the planning area by authorizing or performing management actions (mitigation) that would improve native plant communities or their protection elsewhere in the planning area so that within the planning area, the same overall level of service and value are maintained. This approach would be developed with substantial public involvement.

Under Alternative 2, BLM would minimize cumulative project level impacts to native plant communities by requiring all projects to develop and implement a revegetation plan that emphasizes a standardized approach. Under Alternative 2, a higher number of acres within ACECs, lands with wilderness characteristics, and lands with high VRM ratings, would protect more native plant communities from cumulative impacts. Under this alternative, BLM would likely be able to meet FLPMA sustainable use and management goals.

4.2.5.1.7.3.4. Alternative 3

Under Alternative 3, BLM would develop an equitable approach for mitigating the cumulative loss of native plant communities in the planning area so that no net loss of ecosystem services and value is incurred. This approach would be the same as under Alternative 2; impacts to native plant communities could still occur, but the impacts would be offset through mitigation in a way that results in improvement or improvement in management somewhere in the planning area.

Under Alternative 3, BLM would minimize cumulative project-level impacts to native plant communities by requiring all projects to develop and implement a revegetation plan that uses a standardized approach. Under Alternative 3, fewer acres of native plant communities would be protected within ACECs, lands with wilderness characteristics, and lands with high VRM ratings from cumulative impacts associated with land-use authorizations. Under this alternative, BLM would likely be able to meet FLPMA sustainable use and management goals.

4.2.5.1.7.3.5. Alternative 4

Under Alternative 4, BLM would address the loss of native plant communities and the ecosystem services they provide on a case-by-case basis and where possible reduce the unmitigated cumulative loss of value in the planning area. Under this alternative, cumulative impacts would not be systematically addressed. It is likely not all impacts would be mitigated. Larger projects would likely bare a higher share of any mitigation. Under Alternative 4, BLM would minimize cumulative project-level impacts to native plant communities by requiring all projects to develop and implement a revegetation plan using a standardized approach. Under Alternative 4, there would be the fewest acres of ACECs and lands with wilderness characteristics to protect native plant communities. Given the area available for renewable energy development and disposal in this alternative, BLM would be unable to mitigate landscape-scale impacts to native plant communities. BLM would likely be unable to meet FLPMA sustainable use and management goals for native plant communities under Alternative 4.

4.2.5.2. Riparian Areas and Wetlands

4.2.5.2.1. Summary

This analysis is qualitative because specific impacts of resource activities on riparian areas and wetlands can be difficult to quantify. A more detailed analysis would follow at the implementation stage, such as an environmental assessment (EA) or a permit renewal EA to comply with NEPA. The greatest impacts on riparian areas and wetlands within the planning area would be from land disposals, wild horses and burros, water resources, special status species, soils, fish and wildlife, recreation, travel management, ACECs, wild and scenic rivers, and wildland fire actions. There would be fewer impacts on riparian areas or wetlands from other resources including forest and woodland vegetation, weeds, wilderness characteristics, mineral resources, and wilderness study areas. However, it is in the BLM's judgment that several of the resources listed below are not likely to impact riparian or wetland resources. These areas are air quality, cultural resources, paleontological resources, caves and karsts, and visual resources.

Alternative 2 would provide the most protection to riparian and wetland resources by restricting treatments, activities, and OHV use in more areas. Alternative 3 would provide a more flexible approach by protecting these areas while allowing for multiple uses. Alternatives 1 and 4 would provide less protection for riparian and wetland areas because they allow for the greatest amount of federal land to be disposed of and/or developed.

4.2.5.2.2. Methods of Analysis

Some impacts would be direct, while others would be indirect and affect riparian areas and wetlands through a change in another resource (i.e. groundwater pumping). Direct impacts on riparian vegetation include development, disruption, trampling, or removal of rooted vegetation, resulting in a reduction in areas of native vegetation; mortality resulting from toxic chemicals; and actions that unequivocally reduce total numbers of plant species or reduce or cause the loss of total area, diversity, vigor, structure, or function of wildlife habitats.

The methods to determine potential impacts on riparian areas and wetlands included a review of relevant GIS data for the planning area. The GIS data were overlain with the actions found under each alternative, and conclusions were drawn based on an understanding that these types of actions may affect known riparian areas and wetlands, as well as surface and groundwater resources. Impacts on riparian areas and wetlands were evaluated also from the perspective of water availability and quality. Effects are quantified where possible; in the absence of quantitative data, best professional judgment was used.

Potential indirect impacts include loss of habitat suitable for colonization due to surface disturbance; introduction of noxious and invasive weeds by various mechanisms or conditions that enhance the spread of weeds; and general loss of habitat due to surface occupancy or surface compaction. Indirect impacts include those that cannot be absolutely linked to one action, such as decreased plant vigor or health from reduced water quality. Public uses that affect groundwater tables such as energy development or water importation or exportation projects would also cause indirect affects to riparian areas. Impacts include loss of or reduced size of riparian areas or reduced plant vigor due to loss of or reduction of surface water flows as a result of groundwater pumping.

Indicators

Indicators of the primary impacts on riparian and wetland resources as they relate to resource conflicts with other management programs within planning area are:

- Surface disturbance within the riparian and/or wetland vegetation community.
- Direct loss of riparian and wetland vegetation.
- Changes in ecological conditions necessary to support functioning and healthy riparian and/or wetland vegetation communities (i.e., impacts on soils or water supply and water quality).
- Introduction and spread of invasive weed species.

Assumptions

Impacts were identified using best professional judgment and were assessed according to the following methods and assumptions:

- Activities generally affect riparian and wetland vegetation by changing plant composition, seral condition, structure, production, ground or canopy cover, and soil resources.
- Restoring riparian and wetland vegetation is assumed to include an improvement in species composition and structure, including stand density and age, where appropriate (i.e. replacing non-natives with native plants).
- Riparian and wetland vegetation communities would be maintained with a mix of species composition, cover, and age classes within the site potential.
- Noxious and invasive weeds would continue to be introduced and spread as a result of ongoing vehicle traffic in and out of the planning area, recreational activities, wildlife and livestock grazing and their movements, and surface-disturbing activities.
- Noxious and invasive weeds would further expand into native plant communities, and disturbances to these communities would expand opportunities for the spread of nonnative invasive plant species.
- The BLM would continue to treat noxious and invasive weeds and pests on public land and grazing allotments. Livestock permit holders, ROW holders, mineral lease claims, and permit holders would continue to treat noxious and invasive weeds and pests on public land, as stipulated within their permits and authorizations.
- All surface-disturbing activities would include mitigation and adaptive management to reduce impacts on priority wildlife species and their habitats.
- In general, vegetative communities are considered to be in good condition, but small localized impacted areas may be present.

Program Areas with No Impacts on Riparian Areas and Wetlands

No impacts on riparian areas and wetlands are anticipated for management actions relating to:

- Air quality
- Cave and karst resources
- Paleontological resources
- Visual resources management

4.2.5.2.3. Qualitative Intensity Scale

The intensities of impacts are described using the following definitions:

- **Negligible:** The impact would not be detectable or measurable. There would be no appreciable change to riparian or wetland resources.

- **Minor:** The impact would be detectable and measurable. There would be a small but slightly noticeable change to a riparian and wetland plant community and some individual plant loss. The use of standard operating procedures to offset adverse impacts, including special measures, would be effective.
- **Moderate:** The impact would be very apparent and measurable. There would be a significant change to a riparian and wetland plant community over a large area and substantial individual plant loss. Mitigation would likely be needed. The use of standard operating procedures to offset adverse impacts, including special measures to avoid affecting special status plants and animals and important cultural resources, could be extensive but should be successful.
- **Major:** The impact would be severe. There would be a substantial change across a large area within a riparian and wetland plant community. The extensive use of standard operating procedures or mitigation to offset the adverse effects would be necessary, and their success would not be guaranteed.

4.2.5.2.4. Resources

4.2.5.2.4.1. Air Quality Impacts on Riparian Areas and Wetlands

4.2.5.2.4.1.1. Impacts Common to All Alternatives

There likely would be no impacts on riparian and wetland vegetation.

4.2.5.2.4.1.2. Alternatives 1 through 4

There are no additional impacts to riparian areas and wetlands.

4.2.5.2.4.2. Soil Resources Impacts on Riparian Areas and Wetlands

4.2.5.2.4.2.1. Impacts Common to All Alternatives

Soil erosion reduction measures, involving seeding and improving vegetative cover, would reduce compaction and increase infiltration, which would indirectly improve riparian and wetland health over the short term. As a result, vegetative productivity and diversity would be increased, which would increase litter, soil fertility, infiltration, and nutrient cycling in the long term.

Soil erosion is a natural process and occurs under natural conditions at varying rates, dependent on geology, climate, slope, vegetation cover, and many other factors. One of the functions of streams and washes is to transport sediment. The sediment carrying capacity of a wash or stream increases with flow. Washes and streams in desert regions tend to decrease in velocity and power to transport sediment as they reach lower elevations, depositing their sediment loads along riparian areas. Even though only a few streams within the planning area have perennial flow, riparian vegetation, such as mesquite acacia woodlands, occur in ephemeral channels on valley floors, especially in the Pahrump Valley, which has some of the healthiest remaining stands in Southern Nevada.

Soil disturbance and removal of vegetation cover tends to make soils more vulnerable to water erosion. However, the effects of increased erosion rates on water quality or morphology of most ephemeral channels are very different from the effects on perennial stream channels. Perennial streams or stream segments tend to form established channels. Riparian vegetation becomes established along these channels. However, ephemeral streams with established riparian

vegetation also tend to have established stream channels. During periods of high spring runoff or after thunderstorms, these streams also carry high flows supplemented by overland flow from the surrounding watershed, and the water may become briefly turbid from the increased sediment load.

Actions that protect and stabilize soils are expected to have beneficial impacts on riparian resources under each of the alternatives because they would reduce soil erosion to naturally occurring levels.

4.2.5.2.4.2.2. Alternative 1

Alternative 1 focuses on erosion control and tamarisk removal, which by itself is beneficial for riparian areas and wetlands, but does not specify any additional beneficial measures.

4.2.5.2.4.2.3. Alternatives 2 through 4

Alternatives 2 through 4 call for avoidance or fully mitigating surface disturbances to sensitive soils (including mesic soils occurring in riparian areas and wetlands) and require restoration of most surface-disturbing activities. These measures would be expected to provide greater indirect benefits to riparian areas and wetlands than Alternative 1.

4.2.5.2.4.3. Water Resources Impacts on Riparian Areas and Wetlands

4.2.5.2.4.3.1. Impacts Common to All Alternatives

Many water sources (including shallow basin-fill groundwater) in the planning area are associated with riparian and wetland areas, the protection of which would be assessed when protecting, obtaining, using, or developing these water sources. It is a responsibility of the State of Nevada Division of Water Resources to ensure that water use does not exceed perennial yield. Projects that lead to greater water use than recharge could lead to a lowering of water table/aquifers. Additionally, location of groundwater pumping plays an important role on impacts to resources, not just whether or not the perennial yield has been exceeded. This is unlikely to impact high-elevation, snowmelt-fed riparian areas, however, bajada and valley bottom spring sources and mesquite acacia riparian areas, as well as lower elevation springs, seeps, wetlands, and perennial streams could be impacted.

4.2.5.2.4.3.2. Alternative 1

Alternative 1 is primarily concerned with complying with water quality standards, which is beneficial for riparian areas and wetlands on the Virgin and Muddy rivers and Meadow Valley Wash in particular, but would provide the fewest action-specific protections of all the alternatives.

4.2.5.2.4.3.3. Alternatives 2 through 4

Beneficial impacts from water resources would be in compliance with water quality regulations and implementation of best management practices (BMPs) around water resources. This would protect riparian and wetland vegetation throughout the planning area. These alternatives also provide stronger and more explicit protection for water availability than Alternative 1.

4.2.5.2.4.4. Integrated Vegetation Impacts on Riparian Areas and Wetlands

4.2.5.2.4.4.1. Vegetation Impacts on Riparian Areas and Wetlands

4.2.5.2.4.4.1.1. Impacts Common to All Alternatives

There likely would be no negative impacts on riparian areas and wetlands resulting from integrated vegetation management objectives or actions under any of the alternatives. Healthy vegetation cover tends to protect soils by slowing runoff, which helps to reduce erosion and consequently sedimentation of riparian areas. Further, when runoff is slowed, water has more time to infiltrate the soil and recharge groundwater. Plant roots also help stabilize soil and reduce erosion. All of the alternatives promote diverse and healthy vegetative cover, which would have the indirect effects of maintaining good surface water quality and maximizing groundwater recharge and storage, all of which benefit riparian areas and wetlands.

Vegetation treatments (including treating noxious and invasive species) may expose soils to wind or water erosion, and impacts would depend on the nature and degree of disturbance. Minimizing the loss of native plant communities and the ecosystem services they provide, as well as mitigating for impacts, will help protect and restore riparian areas and wetlands in the planning area.

Alternative 1 continues the current management prescriptions while Alternatives 2 through 4 equivalently provide additional management directions. However, the impacts to riparian areas and wetlands are beneficial in all alternatives.

4.2.5.2.4.4.1.2. Alternative 1

Alternative 1 is primarily concerned with rehabilitation, reclamation or re-vegetation of areas subjected to surface-disturbing activities, where feasible, but would provide the fewest action-specific protections of all the alternatives.

4.2.5.2.4.4.1.3. Alternatives 2 through 4

The impacts to riparian resources are beneficial and equal under all alternatives, with the exception of VEG-02, which has much weaker and less protective language in Alternative 4. The beneficial impacts from integrated vegetation management would increase resilience of native plant communities and prevention of vegetative loss. These management directives would provide more protection and ensure the continuation of the beneficial impacts described above. These alternatives also provide stronger and more explicit protection for erosion control than Alternative 1.

4.2.5.2.4.4.2. Riparian Areas and Wetlands Impacts on Riparian Areas and Wetlands

4.2.5.2.4.4.2.1. Impacts Common to All Alternatives

Appropriate management of riparian areas would help reduce anthropogenically accelerated erosion (and resultant deposition) of sediments that are directly related to the health and function of wetlands and reduce direct and indirect anthropogenically produced pollution. This effect

would be localized and similar under all alternatives. Further, under all alternatives, riparian areas and wetlands will remain under federal ownership (unless it is in the public interest to dispose of them). Riparian areas will also be monitored and assessed as to their functionality.

Riparian and wetland areas are functioning properly when adequate vegetation, landform, or large woody debris is present to dissipate stream energy (in lotic systems) associated with high water flows. This would result in the following (note that these benefits only apply where applicable based on a wetland area's capability and potential):

- Reduce erosion and improve water quality.
- Filter sediment and capture bedload.
- Aid floodplain development.
- Improve floodwater retention and groundwater recharge.
- Develop root masses that stabilize stream banks against cutting (erosive) action.
- Develop diverse ponding.
- Channel characteristics to provide the habitat and the water depth, duration, and temperature necessary for fish production, waterfowl breeding, and other uses.
- Support greater biodiversity.

4.2.5.2.4.4.2.2. Alternative 1

Impacts under Alternative 1 are as described above. Further, this alternative calls for "the minimum requirement of proper functioning condition on all riparian areas is maintained or achieved." Unfortunately, funds and personnel are not available to monitor all the riparian areas and wetlands within the planning area or to ensure that this management directive is achieved.

4.2.5.2.4.4.2.3. Alternatives 2 and 3

Impacts under Alternatives 2 and 3 are as described above, plus they call for no net unmitigated loss of wetlands, riparian communities, and mesquite and acacia woodlands within the planning area. Alternatives 2 and 3 provide the most beneficial impacts for riparian and wetlands management.

4.2.5.2.4.4.2.4. Alternative 4

Impacts under Alternative 4 are as described in Alternative 2, except it addresses the loss of wetlands, riparian communities, and mesquite and acacia woodlands in the planning area on a case-by-case basis, instead of requiring no net unmitigated loss. This may result in major impacts to riparian areas and wetlands, especially when accumulated.

4.2.5.2.4.4.3. Weeds Impacts on Riparian Areas and Wetlands

4.2.5.2.4.4.3.1. Impacts Common to All Alternatives

Actions to decrease weeds on BLM-administered lands would indirectly improve riparian and wetland health and habitat values by increasing native species and decreasing the risk of catastrophic wildfire in both the short term and long term. Such a fire could damage or kill native vegetation, could allow weeds to spread, and could destroy wildlife habitats.

The actions under Alternatives 2, 3, and 4 designed to address objective WEED-01 would be the same and would have similar impacts on wetlands and riparian areas.

4.2.5.2.4.4.3.2. Alternative 1

Alternative 1, which primarily focuses on tamarisk eradication, was especially designed to improve riparian areas and wetlands. Action WEED-01 would encourage activities to prevent the spread of and eradicate noxious weeds. This may cause localized, short-term impacts (through application of chemicals, temporary loss of groundcover, etc.), while in the long term, it could achieve riparian and wetland health, structure, composition, and wildlife habitat goals more quickly.

4.2.5.2.4.4.3.3. Alternative 2

Alternatives 2 through 4 include a number of actions that would not be implemented under Alternative 1. To the extent that these actions are successful in reducing the spread of noxious weeds, they may also have beneficial impacts on riparian resources. Because Alternative 2 would require a BLM-approved, project-specific weed management plan for all federal actions involving a disturbance footprint greater than one acre, unless otherwise determined by the BLM weeds specialist, it is likely to be more limiting than Alternatives 3 and 4 since most riparian areas would fall into this category.

4.2.5.2.4.4.3.4. Alternative 3

The effects would be the same as Alternative 2, but less so because the disturbance footprint threshold for a project-specific weed management plan would be five acres. This alternative has more beneficial impacts than Alternatives 1 and 2.

4.2.5.2.4.4.3.5. Alternative 4

The effects would be the same as Alternative 3, but less so because the disturbance footprint threshold for a project-specific weed management plan would be 10 acres. This alternative has more beneficial impacts than Alternatives 1, 2, and 3.

4.2.5.2.4.4.4. Forests and Woodlands Impacts on Riparian Areas and Wetlands

4.2.5.2.4.4.4.1. Impacts Common to All Alternatives

See the Forest and Woodland Products section under Resource Uses for this analysis.

4.2.5.2.4.5. Fish and Wildlife Impacts on Riparian Areas and Wetlands

4.2.5.2.4.5.1. Impacts Common to All Alternatives

Improving aquatic habitats involves rehabilitating wetland and riparian vegetation to foster healthy aquatic communities by decreasing sedimentation and providing structural complexity, suitable water temperatures, canopy cover, and bank stabilization. Monitoring conditions and cooperating with agencies would ensure that habitat goals are met.

Actions to minimize erosion and sedimentation along access routes would indirectly benefit riparian and wetland vegetation by reducing soil disturbance and increasing infiltration. This would lead to improved riparian and wetland plant vigor and productivity.

Each of the alternatives contains actions intended to improve wildlife habitats and protect riparian habitat. Measures that limit uses in order to benefit fish and wildlife (particularly fish) also have the potential to indirectly improve riparian areas and wetlands.

Potential minor adverse impacts on riparian areas (especially springs) could result from populations of big game animals such as elk and deer because these animals contribute to similar impacts caused by livestock grazing (trampling riparian areas, compacting soils, being a source of waterborne pathogens). Other impacts could come from use by hunters, with potential indirect adverse effects on riparian resources associated with OHV use and increased fire danger associated with human use. Due to the small size of the riparian areas where hunting can occur, these activities would have negligible to minor impacts.

Implementation of mitigation measures to protect wildlife habitats would also protect riparian areas and wetland. Hence, applying BMPs to maintain or improve wildlife habitats would also maintain riparian resources. Further, coordination with agencies would identify and prioritize areas for rehabilitation, providing a more direct, effective, and efficient riparian and wetland restoration and improvement strategy.

4.2.5.2.4.5.2. Alternative 1

Management actions tend to be broader and less specific under Alternative 1 than the other alternatives. This does not mean that more specific actions could not be implemented under much less assurance that such actions would be implemented under Alternative 1.

4.2.5.2.4.5.3. Alternative 2

Alternative 2 provides the greatest benefit to riparian resources because it has direction to avoid BLM-authorized activities within one half mile of natural and artificial water sources and associated riparian areas. This management directive is more limiting to anthropogenic activities with negative impacts to riparian areas and wetlands than Alternatives 3 and 4.

4.2.5.2.4.5.4. Alternative 3

The effects would be the same as Alternative 2, but less so since it only calls to avoid BLM-authorized activities within one quarter mile of natural and artificial water sources and associated riparian areas.

4.2.5.2.4.5.5. Alternative 4

The effects would be the same as Alternative 3, but less so since it is only calls to avoid BLM-authorized activities within one quarter mile of natural waters and associated riparian areas.

4.2.5.2.4.6. Special Status Species Impacts on Riparian Areas and Wetlands

4.2.5.2.4.6.1. Impacts Common to All Alternatives

Special status species management across all alternatives would restrict or prevent certain activities within special status species habitats. These strategies include use restrictions, protection measures, and development of mitigation measures to improve special status species habitats. Maintaining and improving special status species habitats would improve riparian and wetland areas. Special status species protections would also help create a lower level of disturbance in riparian and wetland areas, preventing indirect effects, such as additional soil disturbance and noxious weed invasion, or direct disturbance to vegetation. Protections to special status species would be particularly effective, as many sensitive species are associated with wetland and riparian areas.

4.2.5.2.4.6.2. Alternative 1

Alternative 1 continues the current management prescriptions while Alternatives 2 through 4 provide additional management directions. Impacts are described as above.

4.2.5.2.4.6.3. Alternative 2

Alternatives 2 provides the greatest benefit to riparian areas and wetlands because of SSS-10, which mandates to "Attain no net unmitigated loss of special status species habitat due to BLM-authorized activities." This is especially important for land disposal actions in the Amargosa Valley, Pahrump Valley, and the groundwater source areas of Warm Springs and the Muddy River near Moapa. Further, this alternative establishes areas of ecological importance, which cover over 27,000 acres in Nye County. This would also offer additional protection to riparian resources due to limiting development and associated potential for groundwater withdraw, especially in the Northern Amargosa Desert area. Hence, this alternative has more beneficial impacts than Alternatives 1, 3 and 4.

4.2.5.2.4.6.4. Alternative 3

Alternative 3 also provides great benefit to riparian areas and wetlands because of SSS-10, which mandates to "Attain no net unmitigated loss of special status species habitat due to BLM-authorized activities." This is especially important for land disposal actions in the Amargosa Valley, Pahrump Valley, and the groundwater source areas of Warm Springs and the Muddy River near Moapa. Hence, this alternative has more beneficial impacts than Alternatives 1 and 4.

4.2.5.2.4.6.5. Alternative 4

Under SSS-10 under Alternative 4, the BLM is only required to "Minimize impacts to special status species habitats due to BLM-authorized activities." This provides less beneficial impacts to riparian areas and wetlands than Alternatives 2 and 3.

4.2.5.2.4.7. Wild Horse and Burro Impacts on Riparian Areas and Wetlands

4.2.5.2.4.7.1. Impacts Common to All Alternatives

Direct impacts on riparian and wetland vegetation resulting from wild horse and burro management actions include browsing and trampling of riparian vegetation, which alters the amount, condition, production, and vigor of riparian vegetation in grazed areas. Overuse of riparian vegetation next to water sources, troughs, and stock reservoirs causes indirect effects, such as soil disturbance and compaction, and direct effects, such as a loss of plant cover, which usually results in localized areas being dominated by invasive plants. Wild horses and burros directly impact riparian vegetation around watering locations by trampling and grazing plants, which reduces riparian species cover and diversity.

Protection and development of springs, seeps and development of alternative water sources mitigate impacts of wild horses on riparian and wetland habitat. Vegetation recovery on burned areas could be slowed or reduced by wild horses and burros. Wild horses and burros contribute to weed spread and introduction.

The most effective measures for reducing impacts on riparian areas and wetlands are controlling populations and preventing wild horses and burros from using damaged or sensitive areas through the installation and maintenance of closure fences. The impacts of wild horses and burros on riparian areas and wetlands in herd management areas (HMAs) range from negligible to major depending on the individual water source, water year, and climatic conditions .

4.2.5.2.4.7.2. Alternative 1

Alternative 1 does not allow for any new ranges, but it also does not suggest the use of fertility control. That could lead to greater herd sizes and consequently to greater disturbance of riparian areas and wetlands in the existing HMAs. However, areas outside existing HMAs, especially in Gold Butte, would be better protected from disturbances caused by wild horses and burros and the management thereof.

4.2.5.2.4.7.3. Alternatives 2 and 3

Under Alternatives 2 and 3 the effects to riparian areas and wetlands would be the same, as described in the Impacts Common to All Alternatives. However, maintaining established appropriate management levels (AMLs) as a population range, using gathers when AML is exceeded, and using fertility control agents would be the most effective methods in maintaining wild horse and burro numbers within AML. This would reduce the impact of wild horses and burros on riparian and wetland vegetation by decreasing the risk of soil compaction, trampling, and weed spread or introduction.

4.2.5.2.4.7.4. Alternative 4

Under Alternative 4, the effects to riparian areas and wetlands would be the same as described in the Impacts Common to All Alternatives with the exception that under Alternative 4, wild horses and burros would be allowed in Gold Butte. Hence, the disturbance, due to wild horses and burros and the management thereof, described above, could occur in Gold Butte, as well.

4.2.5.2.4.8. Cave and Karst Management Impacts on Riparian Areas and Wetlands

4.2.5.2.4.8.1. Impacts Common to All Alternatives

There likely would be no impacts on riparian and wetland vegetation.

4.2.5.2.4.8.2. Alternatives 1 through 4

There are no additional impacts to riparian areas and wetlands.

4.2.5.2.4.9. Wildland Fire Management Impacts on Riparian Areas and Wetlands

4.2.5.2.4.9.1. Impacts Common to All Alternatives

Wildland fires result in short-term loss of riparian and wetland vegetation and a long-term change in community composition. The riparian vegetation response to fire depends on the size, location, intensity, season, timing, amount of precipitation, pre-existing plant community condition, and the abundance of noxious and invasive weeds in the area. Fires have direct effects by changing the composition of the plant community, delaying plant succession, and removing woody vegetation and plant litter. Wildland fires might burn with enough heat to kill soil organisms and root systems, resulting in diminished plant recruitment and growth rates, particularly for fire-sensitive species. Emergency stabilization and burned area rehabilitation treatments, such as seeding with native perennial species, would be implemented to restore degraded riparian and wetland vegetation and directly improve riparian and wetland health in the long term. Burn areas lacking perennial plant species for natural recovery could be seeded.

Wildland fires create an opportunity for noxious and invasive weeds to become established or spread by removing aboveground vegetation, leaving burned areas more susceptible to noxious and invasive weeds. Some species of noxious and invasive weeds respond well to post-fire conditions and outcompete native species. In areas where noxious and invasive weeds occur or are in close proximity, wildland fire increases the likelihood of weed expansion. Firefighters and their equipment might also introduce or spread noxious and invasive weeds. Some mechanical controls disturb the soil surface and remove vegetation, creating an opportunity for noxious and invasive weeds to become established or to spread.

Suppressing wildfire and creating fuel breaks would prevent catastrophic destruction of riparian and wetland areas and would preserve native vegetation and diversity in these areas over the long term. Surface disturbance resulting from fire line construction, use of heavy equipment, and other fire suppression activities would have direct effects by damaging vegetation and indirect effects by accelerating soil erosion in localized areas. However, these areas would be rehabilitated to minimize long-term impacts.

Because fire retardants are composed largely of nitrogen and phosphorus fertilizers, they may encourage growth of some species at the expense of others, resulting in changes in community composition and species diversity. Differential growth may also influence herbivorous behavior; both invertebrate and vertebrate herbivores tend to favor post-fire regrowth.

Fuels management actions would result in short-term direct loss of vegetation on a small scale. Projects would re-establish desirable vegetative communities, providing for healthy, diverse

riparian and wetland areas over the long term. These actions would allow fire to play its natural role more frequently and would reduce the likelihood of catastrophic wildfire, which would protect native riparian and wetland vegetation in the long term and over large areas.

Implementing a response to wildfires based on the social, legal, and ecological consequences of the fire would indirectly protect riparian and wetland resources from catastrophic fire, which would protect vegetation and foster rehabilitation and improvement of riparian and wetland areas.

4.2.5.2.4.9.2. Alternative 1

Alternative 1 is similar to Alternative 2, and the impacts on riparian and wetland areas would be similar to those described above. Fire suppression would be prioritized to protect areas identified in 1998. This would help protect riparian and wetland areas within those areas, but may not reflect current resources needs. Therefore, the impacts on riparian areas and wetlands are expected to be similar to Alternatives 2, 3, and 4 but to a lesser extent.

4.2.5.2.4.9.3. Alternative 2

Under Alternative 2, the impacts are as described under Impacts Common to All. Alternative 2 mandates a two-year closure to all activities on lands impacted by a wildfire in the planning area. This may lead to greater soil protection after a wildfire than the management directions in the other alternatives. Because the most destructive impacts from a wildfire, after the fire itself, are caused by rainfall-related erosion, soil protection will indirectly benefit riparian areas and wetlands since these are often located downstream from wildfires.

4.2.5.2.4.9.4. Alternatives 3 and 4

Under Alternatives 3 and 4, the impacts are as described under Impacts Common to All. Alternatives 3 and 4 mandate area closures to activities on lands impacted by wildfires on a case-by-case basis. Hence, these alternatives have more beneficial impacts on soil resources than Alternatives 1, but less than Alternative 2.

4.2.5.2.4.10. Cultural Resources Impacts on Riparian Areas and Wetlands

4.2.5.2.4.10.1. Impacts Common to All Alternatives

Effects on riparian and wetland vegetation would be similar to the effects on water resources. In general, cultural resource management may place use restrictions or specific protection measures on areas containing riparian and wetland vegetation. This would take place to the extent that project actions would require avoidance of or exclusion from some or all uses in areas with cultural values, for example, ROWs for solar development might be restricted due to presence of cultural resources. To the extent that many cultural sites may be located near water resources, these beneficial impacts might be cumulatively important.

4.2.5.2.4.10.2. Alternative 1

Areas with cultural resources would be managed with use restrictions to protect values. Such restrictions would also protect riparian areas and wetlands located within these areas.

4.2.5.2.4.10.3. Alternative 2

Alternative 2 offers the most protection for riparian areas and wetlands from cultural resources management because it has identified the most area (CUL-04) to be eligible to be protected, preserved, and maintained for their cultural resource values.

4.2.5.2.4.10.4. Alternatives 3 and 4

Alternatives 3 and 4 offer protection and beneficial impacts for riparian areas and wetlands from cultural resources management because they identify areas (CUL-04) eligible to be protected, preserved, and maintained for their cultural resources values, which in turn will be beneficial for soil resources. These alternatives set aside more land for protection than Alternative 1 but less than Alternative 2.

4.2.5.2.4.11. Paleontological Resources Impacts on Riparian Areas and Wetlands

4.2.5.2.4.11.1. Impacts Common to All Alternatives

There likely would be no impacts on riparian and wetland vegetation.

4.2.5.2.4.11.2. Alternatives 1 through 4

There are no additional impacts on riparian areas and wetlands.

4.2.5.2.4.12. Visual Resource Management Impacts on Riparian Areas and Wetlands

4.2.5.2.4.12.1. Impacts Common to All Alternatives

Visual resource management actions are not expected to impact riparian areas and wetlands since visual resource classification would not restrict uses and would only require that they conform to visual aesthetic guidelines. With respect to effects on water resources, all of the alternatives would be essentially equivalent and have no impact.

4.2.5.2.4.12.2. Alternatives 1 through 4

There are no additional impacts on riparian areas and wetlands.

4.2.5.2.4.13. Lands with Wilderness Characteristics Impacts on Riparian Areas and Wetlands

4.2.5.2.4.13.1. Impacts Common to All Alternatives

All of the alternatives (except for Alternative 1) might result in indirect beneficial impacts on riparian areas and wetlands if human activities are restricted on lands with wilderness characteristics. With respect to effects on riparian areas and wetlands, all of the beneficial impacts would be essentially equivalent but vary by the amount of acres set aside as lands with wilderness characteristics.

4.2.5.2.4.13.2. Alternative 1

Since Alternative 1 does not have identify management directives for lands with wilderness characteristics, no additional protection or benefit would be derived from this alternative.

4.2.5.2.4.13.3. Alternative 2

Alternative 2 offers the most protection for riparian areas and wetlands from lands with wilderness characteristics management because it has identified the largest area (242,214 acres) to be eligible for lands to be protected, preserved, and maintained for their wilderness characteristics.

4.2.5.2.4.13.4. Alternative 3

Alternative 2 offers the most protection for riparian areas and wetlands from lands with wilderness characteristics management because it has identified the largest area (35,266 acres) to be eligible for lands to be protected, preserved, and maintained for their wilderness characteristics.

4.2.5.2.4.13.5. Alternative 4

Alternative 4 offers also some level of protection for riparian areas and wetlands from lands with wilderness characteristics management, but on fewer acres than Alternatives 2 and 3 and more than Alternative 1.

4.2.5.2.5. Resource Uses

4.2.5.2.5.1. Forestry and Woodland Products Impacts on Riparian Areas and Wetlands

4.2.5.2.5.1.1. Impacts Common to All Alternatives

There likely would be no negative impacts on riparian and wetland areas resulting from forest and woodland products objectives or actions under any of the alternatives.

4.2.5.2.5.1.2. Alternative 1

The effects under Alternative 1 would be the least beneficial to riparian and wetland areas as it allows for the harvest of dead and/or down wood or BLM-marked green mesquite “trees” for dwarf mistletoe control even though only in approved areas. The removal of the biomass will slow the development of new and/or the recovery of existing O and A horizons in the soil and consequently slow nutrient cycling and regeneration of riparian vegetation. The removal of the woody debris will increase the potential for wind and water erosion and potentially result in less groundwater infiltration and recharge. Further, this management direction may also encourage the illegal taking and or killing of mesquite trees in ephemeral riparian areas, particularly in the Pahrump and Stewart Valley areas.

4.2.5.2.5.1.3. Alternative 2

The effects under Alternative 2 would be the most beneficial to riparian and wetland areas as they prohibit commercial harvest and personal use of mesquite and acacia woodlands, including live, dead standing, or dead and down. Leaving the biomass in place will potentially increase groundwater infiltration and recharge and will expedite the development of new and/or the recovery of existing O and A horizons in the soil, which, in turn, will improve riparian vegetation vigor and regeneration.

4.2.5.2.5.1.4. Alternatives 3 and 4

The effects under Alternatives 3 and 4 will be more beneficial than those under Alternative 1 but less than Alternative 2. Both alternatives prohibit commercial harvest of mesquite and acacia woodlands, including live, dead standing, or dead and down, but allow for personal use of dead and down for on-site recreational campfires, except in areas closed to firewood gathering and subject to seasonal fire restrictions. While these alternatives do not remove the nutrients of the biomass from the general areas, the elimination of the woody debris will increase the potential for wind and water erosion and potentially result in less groundwater infiltration and recharge.

4.2.5.2.5.2. Livestock Grazing Impacts on Riparian Areas and Wetlands

4.2.5.2.5.2.1. Impacts Common to All Alternatives

Moderate to major negative impacts on riparian and wetland vegetation can result from livestock grazing management, which alters the amount, condition, production, and vigor of riparian vegetation in grazed areas. Impacts from grazing are usually related to a long duration of use during the growing season, especially hot season use, resulting in lower vigor of grazed species and a change in species composition. Overuse of riparian and wetland vegetation next to water sources, troughs, and stock reservoirs often cause soil disturbance and a loss of plant cover. Livestock directly impact riparian vegetation around watering locations by trampling and grazing plants, which reduces riparian species cover and diversity. Livestock also contribute to the spread of weeds.

The removal of livestock grazing would have greatest beneficial impact to riparian and wetland vegetation than any other action. Where cattle use is currently the greatest negative impact to degraded wetland and riparian areas (i.e. Virgin River, Gold Butte), potentially rapid and long-term benefits would be observed. Vegetative communities would benefit from reduced utilization, as well as a decrease or elimination of compaction, shearing, and other soil disturbing activities. Natural processes would begin to restore wetland functions, potentially leading to increased floodwater retention and groundwater recharge, which would further increase the potential extent of riparian and wetland vegetation.

Increased riparian and wetland vegetation have the potential to locally promote more intense fire activities, which may have greater short-term negative impacts on riparian and wetland communities than less intense fires. Riparian and wetland areas would benefit, however, from the removal of livestock use, which may lead to more complete rehabilitation after fire.

4.2.5.2.5.2.2. Alternative 1

Grazing would continue under the current management system, which would allow continued negative impacts to degraded wetland and riparian areas.

The effects under Alternative 1 are as described above, but more land would be disturbed than under the other alternatives. In other words, Alternative 1 would allow for the most disturbance of riparian areas and wetlands by livestock. The areas with the following grazing allotments would experience the described impacts: Hidden Valley, Mount Stirling, Lower Mormon Mesa, Roach Lake, White Basin, Muddy River, Wheeler Wash, Mesa Cliff, Arrow Canyon in Battleship Wash, Flat Top Mesa, Jean Lake, and the Arizona-administered allotments. Impacts would be moderate to major for riparian areas and wetlands in the grazing allotments and negligible on others.

4.2.5.2.5.2.3. Alternative 2

Under Alternative 2, all livestock grazing allotments would be closed.

4.2.5.2.5.2.4. Alternative 3

Under Alternative 3, there would be fewer impacts on riparian areas and wetlands than under Alternatives 1 and 4. The areas with the following grazing allotments would experience the described impacts: Hidden Valley, Lower Mormon Mesa, Flat Top Mesa, and the Arizona-administered allotments.

4.2.5.2.5.2.5. Alternative 4

The impacts under Alternative 4 are as described above. More riparian areas and wetlands will disturbed than in Alternatives 2 and 3, but less than in Alternative 1. The areas with the following grazing allotments would experience the described impacts: Hidden Valley, Lower Mormon Mesa, Flat Top Mesa, Muddy River, Wheeler Wash, and the Arizona-administered allotments.

4.2.5.2.5.3. Minerals Impacts on Riparian Areas and Wetlands

Impacts Common to All Minerals

Impacts on riparian and wetland vegetation could result from fluid leasable and locatable mineral development and mineral material sales and disposal. Most minerals management impacts non-riparian vegetation communities. Direct impacts associated with these actions include loss or injury of plants due to road building, excavation, and toxic responses from chemical use in mineral extraction; indirect effects include increased exposure to dust and other contaminants associated with construction of infrastructure and use of access roads. In the worst-case scenario, all vegetation would be removed from a parcel of land and the site would be permanently altered. Regulations, although they might differ among the mineral categories, are in place to protect vegetative communities and to ensure re-establishment of riparian and wetland vegetation following completion of the mineral and fluid management actions. Overall, riparian and wetland vegetation could be altered by minerals management actions, but mitigation measures would be implemented to lessen the impact.

4.2.5.2.5.3.1. Fluid Leasable Minerals Impacts on Riparian Areas and Wetlands

4.2.5.2.5.3.1.1. Impacts Common to All Alternatives

In addition to the impacts described under Impacts Common to All Minerals, unconventional oil and gas development (fracking) can have minor to major impacts on riparian ecosystems. USGS 2014, has shown that the injection fluids used in fracking have contaminated groundwater, which, in turn, have moved to surface water resources. These contaminations may have major impacts on riparian ecosystems by introducing toxic constituents. The impacts would be specific to each area (or hydrographic basin within a regional flow system) of fluid mineral development, and environmental impacts would be analyzed in detail in project-specific environmental documents, as required by NEPA. Geothermal operations typically rely on reinjection of geothermal fluids so that the actual water consumption is low. Water rights restrictions also make the use of "fresh water" for fracking unlikely within the planning area. The impacts on riparian resources from fluid mineral resources are expected to range from minor to major depending on the alternative.

4.2.5.2.5.3.1.2. Alternative 1

The effects under Alternative 1 are as described above, but on less land than Alternatives 2, 3, and 4. Because less land would be potentially disturbed than under the other alternatives, there is a smaller likelihood of disturbance in riparian and wetland areas. In other words, Alternative 1 would allow for the least disturbance by mining activities, allow for the least consumption of water, and generate the least associated wind and water erosion, which would potentially impact riparian areas and wetlands. Impacts would be expected to range from negligible to moderate, depending on location and size of operations. See the Fluid Minerals Section of Chapter 2 for exact acreages and correlated maps for locations.

4.2.5.2.5.3.1.3. Alternative 2

Under Alternative 2, the effects of fluid minerals activities to riparian areas and wetlands are as described in the impacts common to all section, but on less land than Alternatives 3, and 4. Under this alternative all hydrographic groundwater basins that support or are upstream of the habitat within a regional flow system of a proposed or listed and threatened or endangered aquatic species are closed to Fluid Mineral development. Impacts would be expected to range from negligible to moderate, depending on location and size of operations. See the Fluid Minerals Section of Chapter 2 for exact acreages and correlated maps for locations.

4.2.5.2.5.3.1.4. Alternative 3

Under Alternative 3, the effects of fluid minerals activities are as described above, but on less land than Alternative 4, however, on more land than Alternatives 1 and 2. See the Fluid Minerals Section of Chapter 2 for exact acreages and correlated maps for locations. Impacts would be expected to range from minor to major.

4.2.5.2.5.3.1.5. Alternative 4

Under Alternative 4, the effects of fluid minerals activities are as described above, but on more land than Alternatives 1, 2 and 3. Because more land would be potentially disturbed under this alternative than any the other alternatives, there is a greater likelihood of disturbance in riparian

and wetland areas. In other words, Alternative 1 would allow for the most disturbance by mining activities, allow for the most consumption of water, and generate the most associated wind and water erosion, which would potentially impact riparian areas and wetlands. See the Fluid Minerals Section of Chapter 2 for exact acreages and correlated maps for locations. Impacts would be expected to have the potential to be major, depending on location and size of operations.

4.2.5.2.5.3.2. Solid Leasable Minerals Impacts on Riparian Areas and Wetlands

4.2.5.2.5.3.2.1. Impacts Common to All Alternatives

See the description under Impacts Common to All Minerals.

4.2.5.2.5.3.2.2. Alternative 1

The effects under Alternative 1 are as described above, but because more land would be potentially disturbed than under the other alternatives, there is a greater likelihood of more disturbance in riparian and wetland areas. In other words, Alternative 1 would allow for the most disturbance by mining activities, allow for the most consumption of water and generate the most associated wind and water erosion, which would potentially impact riparian areas and wetlands. See the Solid Leasable Minerals Section of Chapter 2 for exact acreages and correlated maps for locations. Impacts would be expected to range from negligible to moderate.

4.2.5.2.5.3.2.3. Alternative 2

Under Alternative 2, the effects of mining activities to riparian areas and wetlands would be the least. See the Solid Leasable Minerals Section of Chapter 2 for exact acreages and correlated maps for locations. Impacts would be expected to range from negligible to moderate.

4.2.5.2.5.3.2.4. Alternative 3

Under Alternative 3, the effects of mining activities to riparian areas and wetlands would be more than under Alternative 2 but less than Alternatives 1 and 4. See the Solid Leasable Minerals Section of Chapter 2 for exact acreages and correlated maps for locations. Impacts would be expected to range from negligible to moderate.

4.2.5.2.5.3.2.5. Alternative 4

Under Alternative 4, the effects of mining activities to riparian areas and wetlands would be more than Alternatives 2 and 3 but less than Alternative 1. See the Solid Leasable Minerals Section of Chapter 2 for exact acreages and correlated maps for locations. Impacts would be expected to range from negligible to moderate.

4.2.5.2.5.3.3. Locatable Minerals Impacts on Riparian Areas and Wetlands

4.2.5.2.5.3.3.1. Impacts Common to All Alternatives

See the description under Impacts Common to All Minerals.

4.2.5.2.5.3.3.2. Alternative 1

Under Alternative 1, the effects of mining activities to riparian areas and wetlands would be more than under Alternative 2 but less than Alternatives 3 and 4 Because more land would be potentially disturbed than under the other alternatives, there is a greater likelihood of more disturbance in riparian and wetland areas. In other words, Alternative 1 would allow for the most disturbance by mining activities, allow for the most consumption of water and generate the most associated wind and water erosion, which would potentially impact riparian areas and wetlands. See the Locatable Minerals Section of Chapter 2 for exact acreages and correlated maps for locations. Impacts would be expected to range from negligible to moderate.

4.2.5.2.5.3.3.3. Alternative 2

Under Alternative 2, the effects of mining activities to riparian areas and wetlands would be the least. See the Locatable Minerals Section of Chapter 2 for exact acreages and correlated maps for locations. Impacts would be expected to range from negligible to moderate.

4.2.5.2.5.3.3.4. Alternative 3

Under Alternative 3, the effects of mining activities riparian areas and wetlands would be more than Alternatives 2 and 4 but less than Alternative 1. See the Locatable Minerals Section of Chapter 2 for exact acreages and correlated maps for locations. Impacts would be expected to range from negligible to moderate.

4.2.5.2.5.3.3.5. Alternative 4

Under Alternative 4, the effects of mining activities to riparian areas and wetlands would be more than under Alternative 2 but less than Alternatives 1 and 3. See the Locatable Minerals Section of Chapter 2 for exact acreages and correlated maps for locations. Impacts would be expected to range from negligible to moderate.

4.2.5.2.5.3.4. Saleable Minerals Impacts on Riparian Areas and Wetlands

4.2.5.2.5.3.4.1. Impacts Common to All Alternatives

See the description under Impacts Common to All Minerals.

4.2.5.2.5.3.4.2. Alternative 1

The effects under Alternative 1 are as described above, but because more land would be potentially disturbed than under the other alternatives, there is a greater likelihood of more disturbance in riparian and wetland areas. In other words, Alternative 1 would allow for the most disturbance by mining activities, allow for the most consumption of water and generate the most associated wind and water erosion, which would potentially impact riparian areas and wetlands. See the Saleable Minerals Section of Chapter 2 for exact acreages and correlated maps for locations. Impacts would be expected to range from negligible to moderate.

4.2.5.2.5.3.4.3. Alternative 2

Under Alternative 2, the effects of mining activities to riparian areas and wetlands would be the least. See the Saleable Minerals Section of Chapter 2 for exact acreages and correlated maps for locations. Impacts would be expected to range from negligible to moderate.

4.2.5.2.5.3.4.4. Alternative 3

Under Alternative 3, the effects of mining activities to riparian areas and wetlands would be more than under Alternative 2 but less than Alternatives 1 and 4. See the Saleable Minerals Section of Chapter 2 for exact acreages and correlated maps for locations. Impacts would be expected to range from negligible to moderate.

4.2.5.2.5.3.4.5. Alternative 4

Under Alternative 4, the effects of mining activities to riparian areas and wetlands would be more than Alternatives 2 and 3 but less than Alternative 1. See the Saleable Minerals Section of Chapter 2 for exact acreages and correlated maps for locations. Impacts would be expected to range from negligible to moderate.

4.2.5.2.5.4. Recreation Impacts on Riparian Areas and Wetlands

4.2.5.2.5.4.1. Impacts Common to All Alternatives

Managing BLM-administered lands to provide dispersed recreation could impact riparian and wetland vegetation throughout the planning area directly through human trampling or removal of vegetation and indirectly through weed introduction or spread.

Recreational use in general, but especially OHV use, would result in direct impacts on riparian vegetation, such as reduced vegetative cover and density, as well as indirect effects, such as soil compaction and increased dust. OHV users (as well as other users on a limited basis) would introduce and spread noxious and invasive weed seeds from their vehicles, shoes, clothing, and recreation equipment. Especially OHV activities in undisturbed and remote areas could distribute weed seeds into weed-free areas. These effects could decrease plant vigor and productivity and alter community plant composition.

To manage OHV use, the transportation plan would be updated and would account for wildlife habitats and riparian and wetland areas. BLM has enforcement capabilities per the NRS for enforcing restrictions. NEPA analysis would be done on specific sites to minimize impacts on riparian and wetland vegetation. Impacts can range from minor to moderate.

4.2.5.2.5.4.2. Alternative 1

The effects under Alternative 1 are as described above, but because more land would be potentially disturbed than under the other alternatives, there is a greater likelihood of more disturbance in riparian and wetland areas. See the Recreation and Travel and Transportation sections of Chapter 2 for exact acreages and correlated maps. Impacts would be expected to range from negligible to moderate.

4.2.5.2.5.4.3. Alternative 2

Under Alternative 2, the effects of recreation activities to riparian areas and wetlands would be the least. See the Recreation and Travel and Transportation sections of Chapter 2 for exact acreages and correlated maps. Impacts would be expected to range from negligible to moderate.

4.2.5.2.5.4.4. Alternative 3

Under Alternative 3, the effects of recreation activities to riparian areas and wetlands would be more than under Alternative 2 but less than Alternatives 1 and 4. See the Recreation and Travel and Transportation sections of Chapter 2 for exact acreages and correlated maps. Impacts would be expected to range from negligible to moderate.

4.2.5.2.5.4.5. Alternative 4

Under Alternative 4, the effects of recreation activities to riparian areas and wetlands would be more than Alternatives 2 and 3 but less than Alternative 1. See the Recreation and Travel and Transportation sections of Chapter 2 for exact acreages and correlated maps. Impacts would be expected to range from negligible to moderate.

4.2.5.2.5.5. Travel and Transportation Impacts on Riparian Areas and Wetlands

4.2.5.2.5.5.1. Impacts Common to All Alternatives

Maintaining roads would allow access to riparian and wetland areas for wildfire management and fire suppression, when necessary. This would protect native vegetation and would help achieve riparian and wetland rehabilitation goals in the long term.

Road and trail construction could directly impact riparian and wetland areas through vegetation removal and could cause indirect impacts through soil compaction, invasive and noxious weed spread, and dust proliferation. This could reduce plant diversity and vigor in the long term. Further, improved access to certain areas would facilitate restoration and improvement of riparian and wetland vegetation and would allow for multiple uses.

Invasive and noxious weed control measures would prevent weeds from spreading into riparian and wetland areas, prevent competition with native species, and indirectly help rehabilitate and improve riparian and wetland communities. Construction of new roads and trails through riparian areas can alter hydrologic function, which may lead to channelization, incision, and lateral erosion. This can result in loss of riparian vegetation due to erosion of bank, as well as water table lowering. Maintenance of existing roads may also promote the continued degradation of riparian areas where road crossings were improperly constructed. Maintenance of existing roads can also benefit riparian areas by ensuring that vehicular use remains concentrated on previously disturbed routes.

Restrictions on vehicular traffic would decrease compaction, erosion, rutting, and the impacts on hydrologic function as whole. This would result in positive effects on riparian and wetland vegetation in these areas.

Other impacts from travel and transportation management are similar to those from recreation. Motor vehicle use would have a minor to major effect on wetlands and riparian areas as the

route system is not clearly marked or delineated for the public, resulting in an expansion of non-designated routes. This expansion would result in loss of vegetative cover and sensitive wildlife habitats, thus destabilizing wetland and riparian soils and making them susceptible to erosion and lower productivity. As OHV use increases, so would the expansion of non-designated routes. OHV activities in undisturbed and remote wetland and riparian areas could lead to further disturbances in these sensitive areas. An OHV area allocation of open would create the greatest level of risk for wetland and riparian area disturbance. In an open area, there are no restrictions on where visitors can travel to, so wetlands and riparian areas could be disturbed by OHV from any point in the open area. The least impactful wetland areas to allocate as open from a wetland/riparian standpoint are areas that are already unvegetated or denuded, and do not contain sensitive resources other than water. Limited use OHV areas have less risk than open areas to cause disturbance to wetlands and riparian areas. A limited area offers more manageability from a wetland/riparian management standpoint. Designated routes can be periodically monitored for new or spreading non-designated routes. Closed areas would result in the lowest risk of wetland/riparian area disturbances. Other types of travel, including by foot, horse, or bike, cause fewer impacts, although all could disturb wetland/riparian areas, depending on the intensity of use.

4.2.5.2.5.5.2. Alternative 1

Alternative 1 has the largest number of acres allocated as open to OHVs, which would create the largest negative impact on soils. However, Alternative 1 also has more acres allocated as closed than both Alternatives 3 and 4 (but less than Alternative 2). Alternative 1 also has a fourth designation of limited to existing roads, trails, and dry washes. This category contains the majority of the acres for Alternative 1. This allocation has a higher negative impact on wetland/riparian areas than does the limited to designated routes allocation. This is because there are more travel routes that go through wetland/riparian areas. It is also very difficult to enforce this designation, and it can quickly lead to expanding numbers of roads and trails, any of which may lead to wetland/riparian areas. It is difficult to say in some instances whether a trail existed before a particular person drove on it; it may have been one set of tire tracks. But left unchecked, one set of tire tracks will quickly turn into a full-blown road, and previously undisturbed wetland/riparian areas will become disturbed. Alternative 1 does not include any management actions that address travel management and route designation guidelines. The lack of these actions would have an indirect negative impact on wetland/riparian areas in the planning area. Not taking into account resource effects of specific travel routes could result in more disturbance and degradation to native plant communities in wetland/riparian areas.

4.2.5.2.5.5.3. Alternative 2

Alternative 2 has the smallest number of acres allocated as open, and the largest amount of acres allocated as closed. Therefore, Alternative 2 would have the least amount of negative impact on wetlands/riparian areas of all the alternatives. Alternatives 2, 3, and 4 have management actions that will designate specific travel management areas and create corresponding travel management plans. Route designation would be guided by criteria to protect wildlife, vegetation, threatened and endangered species, and other resources. If OHVs are causing significant adverse effects on any resources, the affected areas will be closed to travel until the situation can be remedied and mitigated. These management actions will have an indirect beneficial impact on wetlands/riparian areas. If loss of wetlands/riparian areas becomes a problem in a specific area due to travel, the routes would be closed until the disturbance can be addressed. This will prevent unnecessary

loss of wetlands/riparian areas. See Impacts Common to All Alternatives for more impacts from Alternative 2.

4.2.5.2.5.5.4. Alternative 3

Alternative 3 has the second highest number of acres allocated as open, after Alternative 1. Alternative 3 also has the lowest number of acres allocated as closed. Therefore, Alternative 3 would create a higher level of negative impacts on wetlands/riparian areas than Alternatives 2 or 4. See Alternative 2 and Impacts Common to All Alternatives for more impacts from Alternative 3. All other management actions will have a negligible impact on wetlands/riparian areas.

4.2.5.2.5.5.5. Alternative 4

Alternative 4 has the second lowest number of acres allocated as open, after Alternative 2. It has a significantly lower number of acres open than does Alternative 3. Alternative 4 also has the second lowest number of acres allocated as closed, but the number of closed acres is very close to the number of closed acres in Alternative 3. Therefore, Alternative 4 would likely have less negative impact on wetlands/riparian areas than Alternatives 1 and 3, but a greater negative impact than Alternative 2. See Alternative 2 and Impacts Common to All Alternatives for more impacts from Alternative 4. All other management actions will have a negligible impact on wetlands/riparian areas.

4.2.5.2.5.6. Lands and Realty Impacts on Riparian Areas and Wetlands

4.2.5.2.5.6.1. Land Tenure (Disposals and Acquisitions) Impacts on Riparian Areas and Wetlands

4.2.5.2.5.6.1.1. Impacts Common to All Alternatives

Land disposals could affect riparian vegetation by changes in vegetative cover through urbanization or agricultural or industrial development.

Riparian vegetation and wildlife habitat values would considered when the Las Vegas and Pahrump field offices make disposal and acquisition decisions. Impacts on riparian and wetland vegetation would vary on a case-by-case basis, but impacts could be minimized or mitigated since only lands with low resource values should be identified for disposal, and further NEPA documentation would minimize potential impacts on riparian and wetland vegetation. Acquisition of riparian and wetland areas would provide additional opportunities to achieve riparian and wetland vegetation objectives.

L&R-10 states specifically that: “Lands to be disposed are located outside any ACEC, culturally sensitive area, special recreation management area, right-of-way corridor, wilderness study area, active communication site, riparian site, or cultural sites eligible for inclusion on the National Register of Historic Places.” However, several disposal areas have riparian areas within their boundaries. Disposals of parcels containing riparian areas will be addressed on a case-by-case basis. Potential mitigation actions could be used to offset these effects, reducing impacts to negligible or minor. If not mitigated, these impacts will be major as they will continue to contribute to regional declines of riparian areas and valuable habitats.

L&R-16 encourages the acquisition of "private lands contiguous to areas that contain significant resource values, such as the Virgin River" (quote from Alternatives 2 through 4, but Alternative 1 has similar language). This would be a specific beneficial impact for these riparian and wetland areas.

4.2.5.2.5.6.1.2. Alternative 1

The effects under Alternative 1 are as described above, but more riparian areas are available for disposal than under Alternative 2, but on fewer acres than Alternatives 3 and 4. Impacts range from negligible to major depending on the location and size of the lands to be disposed.

The impacts being caused by potentially disposing lands surrounding Warm Springs and the Muddy River, Moapa, on riparian areas and wetlands are major. (See the description of the Tetra Tech Model in the beginning of the Water Resources section in this chapter for more details.) If lands surrounding, but especially north of Warm Springs and the Muddy River, are disposed and developed, it is very likely — according to the Tetra Tech Groundwater Model — that the headwaters springs of the Muddy River will run dry. This will have a major negative impact on the wetlands and riparian areas of Warm Springs and the Muddy River and the associated sensitive species habitats. Refer to the Special Status Species section for more details.

The impacts being caused by potentially disposing lands in the Amargosa Valley on riparian areas and wetlands are major. (See the description of the USGS SAMM Model in the beginning of the Water Resources section of this chapter for more details.) According to the USGS modeling effort, the projected pumping will result in water level drops at Ash Meadows below the water levels necessary to maintain existing riparian areas and wetlands. Further, water levels at the Ash Meadows National Wildlife Refuge, the main discharge area of the Amargosa Valley Basin, are also expected to drop to levels that will lead to significant decline in the populations of several threatened and endangered species.

Under this alternative, the impacts being caused by potentially disposing lands in the Pahrump Valley are major. The Nevada Division of Water Resources (NDWR) regulates the appropriation of both surface and groundwater rights in Nevada and has determined that the Pahrump Valley basin is over-appropriated for groundwater rights. In the Pahrump Valley, basin groundwater rights equal to 62,617 afa have been appropriated, but the perennial yield equals only about 12,000 afa. These appropriation figures do not include the 11,000+ domestic wells (which equals to about 22,000 afa) located within the city of Pahrump, nor the groundwater pumped within California (within the California portion of the Pahrump Valley basin), which suggests the rate of groundwater withdrawal is potentially much greater. The mesquite bosques in the Pahrump Valley Basin are considered an important type of riparian habitat, getting their water from the shallow basin-fill aquifer. These mesquite bosques, located in Nevada and California, have been identified as a high priority area for conservation actions. One of the major impacts to these bosques comes from water management and the associated conservation objective to maintain groundwater at current or higher levels, above 35 feet below the ground surface. Potential pumping associated with land disposals will likely impact discharge to local mesquite bosques. While mesquite trees often have roots that are deeper than 35 feet, it is difficult for new tree recruitment to happen when water levels are declining. There are only a few places where new tree recruitment has been documented recently in the Pahrump Valley. In other words, with dropping water levels, the current mesquite population is a relic population that is not sustainable and will eventually die off.

4.2.5.2.5.6.1.3. Alternative 2

The effects under Alternative 2 are as described above, but on the least acres containing riparian areas for disposal than the other alternatives. Impacts range from negligible to major depending on the location and size of the lands to be disposed.

The impacts being caused by potentially disposing lands in the Warm Springs Moapa area on water resources would be minor under this alternative because only 86.5 acres (which are slated for direct sale to Reid Gardner Power Generation Station as of March 2014) are located in basins impacted by the NSE rulings. The remaining 606 acres are located in the Meadow Valley Wash hydrographic basin 205. Groundwater pumping in this basin will not impact Warm Springs. Minor impacts may be noticable in Meadow Valley Wash and its associated riparian habitat.

The mesquite bosques in the Pahrump Basin are considered an important type of riparian habitat in the region, hence the reasons for expanding the existing Mesquite ACEC under this alternative. However, the lands for disposal at the southern part of Pahrump do include some smaller riparian areas. These would most likely be lost when disposed, and their loss would contribute to the cumulative impacts. Further, should these lands be disposed and developed, the cone of depression from the potential groundwater withdrawal would likely cause the slow die-off of the existing riparian areas southwest of these parcels, again eliminating valuable habitats and adding to the cumulative impacts of their loss. In addition, other anthropogenic disturbance associated with development would threaten these nearby riparian areas. Without mitigation, these impacts would be considered minor to moderate.

4.2.5.2.5.6.1.4. Alternative 3

The effects under Alternative 3 are as described above, but the amount of riparian areas that are available for disposal is less than Alternative 4 but more than Alternatives 1 and 2. Impacts range from negligible to major depending on the location and size of the lands to be disposed.

The impacts to Warm Springs, Moapa, would be as described under Alternative 2, as the lands available for disposal are identical.

The impacts in the Amargosa Valley would be as described under Alternative 1 if all acres available for disposal would be sold. See the Water Resources section of this chapter for more details on the modeling effort conducted for this alternative. Under Alternative 3, the BLM would seek a biological opinion only from the U.S. Fish and Wildlife Service for the disposal of 552 acres and the associated groundwater withdrawal. All further disposals would be evaluated under NEPA on a case-by-case basis. While the impacts are as described under Alternative 1, the time for the groundwater levels to reach the threshold level where riparian areas will die off and the wetlands in Ash Meadows will cease to exist may be delayed past the lifetime of this RMP. Impacts would probably be minor to moderate under this scenario during the lifetime of this RMP. Further mitigation may be necessary to reduce the impacts for any additional pumping to negligible.

The impacts being caused by potentially disposing lands in the Pahrump Valley as suggested under this alternative are major. The impacts in the Pahrump Valley would be as described under Alternative 1, but more riparian areas would be disposed ofand die-off of remaining riparian vegetation would occur sooner. In particular, the lands for disposal along the southern part of Pahrump, stretching all the way to the borders of California and Clark County, contain important and vigorous riparian areas. These mesquite bosques would most likely be lost when disposed

of, and their loss would contribute to the cumulative impacts. Further, should these lands be disposed of and developed, the impacts from the potential groundwater withdrawal would likely cause the slow die-off of the existing riparian areas in the Pahrump Valley (on both sides of the state line), again eliminating valuable habitats and adding to the cumulative impacts of their loss. In addition, other anthropogenic disturbance associated with development would threaten these nearby riparian areas. Without mitigation, these impacts would be considered major.

4.2.5.2.5.6.1.5. Alternative 4

The effects under Alternative 4 are as described above, but more riparian areas are available for disposal than under any other alternative. Impacts range from negligible to major depending on the location and size of the lands to be disposed.

The impacts in the Amargosa Valley would be as described under Alternative 1. For the purpose of this document, the USGS also modeled the effects of pumping on potentially disposed BLM land in the Amargosa Valley for the use as intended according to the Amargosa Valley Area Plan (Nye County 2009), minus any lands inside the 10-mle radius around Devil's Hole, as per the Nevada State Engineer's Order 1197. While the impacts are as described under Alternative 1, the time for the groundwater levels to reach the levels resulting in the riparian vegetation to die off may be slightly delayed.

The impacts being caused by potentially disposing lands in the Pahrump Valley on riparian areas and wetlands, as suggested under this alternative, are major. Impacts would be similar to those described under Alternative 3, but most of the riparian areas in the Pahrump Valley would be disposed of or developed (see Renewable Energy section). Due to the groundwater withdrawal, the die-off of the remaining riparian vegetation, including those in currently protected by the BLM, would occur sooner.

4.2.5.2.5.6.2. Land-Use Authorizations (Right-of-Ways, Leases, Permits) Impacts on Riparian Areas and Wetlands

4.2.5.2.5.6.2.1. Impacts Common to All Alternatives

Direct effects from location of ROWs include surface disturbance and removal of vegetation to construct facilities such as power transmission lines, pipelines, roads, and communication facilities. Implementation of mitigation measures including requirements to restore and seed disturbed areas would reduce surface-disturbance impacts.

ROWs alter habitats with the footprint for the facilities that they authorize. ROWs could have direct effects by removing vegetation and indirect effects by compacting soil, causing noxious weed invasions, and increasing dust in these areas. Most of the footprints are localized and cover a small area, but ROWs tend to be linear and may stretch for miles. Many of the impacts associated with ROWs can be mitigated on a case-by-case basis. This would include water withdrawals in case of ROWs for wells. Further, ROW avoidance areas would benefit from the lack of disturbance when riparian areas and wetlands are present or in the vicinity of these avoidance areas.

4.2.5.2.5.6.2.2. Alternative 1

Under Alternative 1, the impacts of lands and realty management on riparian areas and wetlands would be as described above but on more acres than Alternatives 2 and 3 and less than Alternative 4. See the Lands and Realty section of Chapter 2 for exact acreages.

4.2.5.2.5.6.2.3. Alternative 2

Under Alternative 2, the effects of lands and realty management decisions on riparian areas and wetlands would be as described above but on the least acres of all the alternatives. See the Lands and Realty section of Chapter 2 for exact acreages.

4.2.5.2.5.6.2.4. Alternative 3

Under Alternative 3, the effects of lands and realty management decisions on riparian areas and wetlands would be as described above but on more acres than Alternative 2 and less than Alternatives 1 and 4. See the Lands and Realty section of Chapter 2 for exact acreages.

4.2.5.2.5.6.2.5. Alternative 4

The impacts under Alternative 4 are as described above, but more land would be disturbed than under the other alternatives. In other words, Alternative 4 would allow for the most disturbances of riparian areas and wetlands. See the Lands and Realty section of Chapter 2 for exact acreages.

4.2.5.2.5.6.3. Renewable Energy Impacts on Riparian Areas and Wetlands

4.2.5.2.5.6.3.1. Impacts Common to All Alternatives

Direct impacts on riparian vegetation could occur with issuance of ROWs, which require vegetation clearing and would disturb or destroy vegetation. Further, depending on the technology used, water usage and placement of groundwater wells may also impact riparian areas by lowering the water table, leading to the die-off of riparian vegetation or preventing the recruitment of new mesquite trees. (See Integrated Vegetation—Riparian and Wetlands Management: Impacts from Lands and Realty Management, Alternative 1 for a more detailed description of impacts.) Indirectly, ROWs may spread or introduce invasive and noxious weeds, thereby reducing riparian habitat health and diversity. However, BMPs, stipulations, and mitigation measures, including avoidance if implemented, could minimize impacts on riparian vegetation to minor; if unmitigated, impacts would be major.

Project-specific NEPA environmental review would be performed. Construction-related impacts would be mitigated by implementing BMPs. Delineation of rights-of-way avoidance and exclusion areas ensure that mitigation measures or use restrictions are implemented for location of ROWs. Such measures or restrictions help protect riparian areas and wetlands depending on their proximity to projects.

4.2.5.2.5.6.3.2. Alternative 1

The impacts under Alternative 1 are as described above, but on more land than any other alternative. Impacts range from moderate to major depending on the location and size of the project footprint.

Project-specific NEPA environmental review would be performed. Construction-related impacts would be mitigated by implementing BMPs. Delineation of ROW avoidance and exclusion areas ensure that mitigation measures or use restrictions are implemented for location of ROWs. Implementation of mitigation measures, BMPs, and SOPs would reduce impacts.

4.2.5.2.5.6.3.3. Alternative 2

The impacts under Alternative 2 are as described above, but on the least amount of land than under any other. Impacts range from moderate to major depending on the location and size of the project footprint.

Project-specific NEPA environmental review would be performed. Construction-related impacts would be mitigated by implementing BMPs. Delineation of rights-of-way avoidance and exclusion areas ensure that mitigation measures or use restrictions are implemented for location of ROWs. Implementation of mitigation measures, BMPs, and SOPs would reduce impacts.

4.2.5.2.5.6.3.4. Alternative 3

The impacts under Alternative 3 are as described above, but on less land than under Alternatives 1 and 4. Impacts range from moderate to major depending on the location and size of the project footprint.

Project-specific NEPA environmental review would be performed. Construction-related impacts would be mitigated by implementing BMPs. Delineation of rights-of-way avoidance and exclusion areas ensure that mitigation measures or use restrictions are implemented for location of ROWs. Implementation of mitigation measures, BMPs, and SOPs would reduce impacts.

Furthermore, in Alternative 3, five additional solar energy zones have been identified for the Pahrump Field Office and one for the Las Vegas Field Office. These zones are thought to have the least impacts from solar energy development as compared to other areas within the planning area's variance areas.

4.2.5.2.5.6.3.5. Alternative 4

The impacts under Alternative 4 are as described above, but on less land than under Alternative 1. Impacts range from moderate to major depending on the location and size of the project footprint.

Project-specific NEPA environmental review would be performed. Construction-related impacts would be mitigated by implementing BMPs. Delineation of rights-of-way avoidance and exclusion areas ensure that mitigation measures or use restrictions are implemented for location of ROWs. Implementation of mitigation measures, BMPs, and SOPs would reduce impacts.

4.2.5.2.5.6.4. Utility Corridors Impacts on Riparian Areas and Wetlands

4.2.5.2.5.6.4.1. Impacts Common to All Alternatives

The designation of corridors could lead to localized impacts on riparian areas and wetlands from construction or maintenance activities. Containing these uses in the corridors would limit the areal extent and represent a minor impact if corridors are revegetated to stabilize disturbed soils, which would reduce runoff, erosion, and sedimentation.

4.2.5.2.5.6.4.2. Alternative 1

Under Alternative 1, the impacts of lands and realty management decisions on riparian areas and wetlands would be as described above but on more acres than Alternatives 2 and 3 and less than Alternative 4. See the Lands and Realty section of Chapter 2 for exact acreages.

4.2.5.2.5.6.4.3. Alternative 2

Under Alternative 2, the effects of lands and realty management decisions on riparian areas and wetlands would be as described above but on the least acres of all the alternatives. See the Lands and Realty section of Chapter 2 for exact acreages.

4.2.5.2.5.6.4.4. Alternative 3

Under Alternative 3, the effects of lands and realty management decisions on riparian areas and wetlands would be as described above but on more acres than Alternative 2 and less than Alternatives 1 and 4. See the Lands and Realty section of Chapter 2 for exact acreages.

4.2.5.2.5.6.4.5. Alternative 4

The impacts under Alternative 4 are as described above, but more land would be disturbed than under the other alternatives. In other words, Alternative 4 would allow for the most disturbances of riparian areas and wetlands by lands and realty management decisions. See the Lands and Realty section of Chapter 2 for exact acreages.

4.2.5.2.6. Special Designations

4.2.5.2.6.1. Areas of Critical Environmental Concern Impacts on Riparian Areas and Wetlands

4.2.5.2.6.1.1. Impacts Common to All Alternatives

The effects of ACEC management on riparian habitats and wetlands would be beneficial because they are intended to protect fragile resources from irreparable damage. The alternatives differ in the amount of land they would protect.

4.2.5.2.6.1.2. Alternative 1

Alternative 1 offers protection for riparian areas and wetlands from ACEC management. Many of the acres protected by ACECs under this alternative contain riparian areas and wetlands. Since there are no new ACECs proposed under Alternative 1, there are no new beneficial impacts on riparian areas and wetlands.

4.2.5.2.6.1.3. Alternative 2

Alternative 2 offers the most protection and beneficial impacts for riparian areas and wetlands from ACEC management because it has identified the largest area and contains the most ACECs with riparian areas and wetlands that are eligible to be protected, preserved, and maintained for their critical environmental values.

4.2.5.2.6.1.4. Alternative 3

Alternative 3 offers protection and beneficial impacts for riparian areas and wetlands from ACEC management because it has identified more ACECs and consequently more acres containing riparian areas and wetlands than Alternatives 1 and 4, but less than Alternative 2.

4.2.5.2.6.1.5. Alternative 4

Alternative 4 offers some protection for riparian areas and wetlands from ACEC management because it has identified fewer ACECs and consequently fewer acres containing riparian areas and wetlands than Alternatives 2 and 3, but more than Alternative 1.

4.2.5.2.6.2. National Trails Impacts on Riparian Areas and Wetlands

4.2.5.2.6.2.1. Impacts Common to All Alternatives

See Cultural Resources for impacts on riparian areas and wetlands.

4.2.5.2.6.3. Wild and Scenic Rivers Impacts on Riparian Areas and Wetlands

4.2.5.2.6.3.1. Impacts Common to All Alternatives

There would be no effects common to all alternatives from wild and scenic rivers (WSR) management.

4.2.5.2.6.3.2. Alternative 1

Under this alternative, all seven river segments managed as eligible river corridors and would be given protection either through continued interim protective management or the development of comprehensive river management plans. This would provide additional measures within the 17,600 acres of WSR corridors that would promote natural rates of erosion and deposition of alluvial and colluvial sediments. Additionally, activities that would result in degradation of riparian areas and wetlands would be restricted to maintain the ORVs of the eligible segments.

4.2.5.2.6.3.3. Alternative 2

The impacts on riparian areas and wetlands resulting from WSR management objectives under Alternative 2 would be the same as under Alternative 1 except that while the 17,600 acres under Alternative 1 are only eligible for protection, the same acreage would be found suitable under Alternative 2.

4.2.5.2.6.3.4. Alternative 3

Under Alternative 3, the effects on riparian areas and wetlands resulting from wild and scenic river management objectives would be the same as those described under Alternative 2, but only for 960 acres.

4.2.5.2.6.3.5. Alternative 4

Under this alternative, there would be no additional protection for riparian areas and wetlands as no eligible stretches of river would be found suitable.

4.2.5.2.6.4. Wilderness Impacts on Riparian Areas and Wetlands

4.2.5.2.6.4.1. Impacts Common to All Alternatives

There are no impacts common to all alternatives from wilderness management.

4.2.5.2.6.4.2. Alternative 1

Since Alternative 1 does not identify any management directives for wilderness, no additional protection or benefit would be derived from this alternative.

4.2.5.2.6.4.3. Alternatives 2 and 3

Alternatives 2 and 3 offer the most protection for riparian areas and wetlands from wilderness management because they have identified management directions that call for no net unmitigated decrease in the benchmark conditions generally prevailing in each wilderness at the time of congressional designation. Maintaining, or when possible, improving, the benchmark quality of wilderness character will protect water resources and is considered a beneficial impact.

4.2.5.2.6.4.4. Alternative 4

Alternative 4 offers less protection for riparian areas and wetlands from wilderness management compared to Alternatives 2 and 3 because it only calls for mitigation of permanent and temporary impacts to wilderness from activities on adjacent public lands on a case-by-case basis.

4.2.5.2.6.5. Wilderness Study Areas Impacts on Riparian Areas and Wetlands

4.2.5.2.6.5.1. Impacts Common to All Alternatives

Riparian areas and wetlands within wilderness study areas (WSAs) would benefit from use restrictions and other management strategies in accordance with the WSA Implementation Management Plan. Wilderness characteristics would be managed according to FLPMA. If released by Congress, those WSAs would be managed in accordance with the multiple-use mandate of FLPMA.

If released by Congress, management of the WSAs would be equivalent under each alternative. The management of WSAs as non-wilderness areas would include certain uses that may result in adverse impacts on riparian areas and wetlands, such as OHV use.

4.2.5.2.6.5.2. Alternative 1

Areas with wilderness characteristics would be managed with use restrictions to protect values. Such restrictions would also protect riparian areas and wetlands located within these areas.

4.2.5.2.6.5.3. Alternatives 2 and 3

Wilderness characteristics would be managed on a case-by-case basis and subject to site-specific mitigation measures to reduce impacts on wilderness characteristics. Riparian areas and wetlands located within areas containing wilderness characteristics would benefit.

4.2.5.2.6.5.4. Alternative 4

Impacts under Alternative 4 would be the same as Alternatives 2 and 3 except that it allows for the mitigation of permanent and temporary impacts to WSAs from activities on adjacent public lands. These impacts could be to riparian areas and wetlands.

4.2.5.2.7. Cumulative Impacts on Riparian Areas and Wetlands

4.2.5.2.7.1. Past and Present Actions/Impacts

Because riparian vegetation is a controlling factor in the natural rates of erosion and deposition, many of the impacts on riparian habitat and wetlands were addressed in the discussion of impacts on water resources. Any additional impacts not described previously are addressed below. Most of the discussion below is related to mesquite habitats where surface water may not be present, therefore impacts would not have been described above.

Past and present impacts on riparian habitat and wetlands from livestock grazing and wild horse and burro management has been described above and are primarily caused by overutilization of riparian areas such as springs and seeps. In some areas, this has resulted in poor plant community assemblages as some species are preferentially grazed over others. Data are not available to describe the exact current state of functionality of riparian habitat at all springs and seeps. Other impacts resulting from livestock and wild horse and burro grazing include removal of riparian vegetation, stream bank trampling, and concentrated grazing within riparian areas resulting in increased potential for soil erosion and stream bank instability. The current land-use plan has

employed management actions to reduce concentrated grazing and has improved conditions in areas that are progressing toward or meeting standards for rangeland health. Gathering excess horses above appropriate management levels has not improved and stabilized conditions in riparian and wetland areas because these fertile animals reproduce faster than they can be gathered.

Past and present impacts on riparian habitats and wetlands from recreation not described above are primarily caused by camping and OHV use. Mesquite riparian areas and other riparian habitats with broad level ground have been favored by recreationists for many reasons. It has been common for campsites to become well established in areas that were once pristine. Camping activities in some areas have led to compaction and/or rutting of riparian soils, which decrease suitability for growth of riparian vegetation. Campsites often serve as a central location for OHV use, which has led to concentrated use of and impacts on riparian soils and vegetation. Fire rings are also common at and immediately adjacent to campsites. Negative impacts to mesquite acacia woodlands have also been caused by illegal cutting of mesquite trees for firewood. Continued visitation to mesquite areas and other riparian areas has also added to the increase of non-native plant species at these locations. The dispersed and unauthorized nature of the development of campsites as well as the irregular timing of use of campsites makes it impossible for the BLM to quantify the impacts from campsites and OHV activities to riparian habitat and wetlands.

Past and present impacts on riparian habitats and wetlands from wildland fire management due to suppression and fuels management activities not mentioned above have included the traversing of riparian vegetation and application of fire retardants in mesquite woodlands. In general, these activities have been brief in duration or severity and have not led to long-term impacts on riparian habitat and wetlands. Because of the dispersed and/or short-term nature of these activities, the impacts are unable to be quantified.

Minerals and lands and realty developments have impacted riparian vegetation by removing vegetation to construct facilities. BMPs, SOPs, project-specific mitigation measures, and permit stipulations have reduced environmental impacts on riparian areas on a limited basis. Unrestricted OHV use within riparian areas has removed vegetation and increased erosion potential in areas where new routes have been established. Wildfires have burned riparian areas, removing vegetation, increasing the likelihood of soil erosion, and have increased the potential for establishment and spread of weeds. Riparian and wetlands habitat restoration and emergency stabilization and rehabilitation treatments have improved areas over time.

4.2.5.2.7.2. Reasonable Foreseeable Actions

Future impacts on riparian habitat and wetlands from cattle grazing and wild horse and burro management are identical in type and distribution as those observed under the 1998 RMP. Cattle grazing impacts under Alternative 1 would likely be identical to those observed under the 1998 RMP. Livestock grazing impacts under Alternatives 2 and 3 would likely be lower than Alternatives 1 and 4 because a greater number of acres are closed to grazing. In all cases where a change of impact would be expected, the change would be for the benefit to riparian habitat and wetlands.

Future impacts on riparian habitats from renewable energy projects are expected to be noticeable under all alternatives. These impacts would be greater in number than impacts currently observed. Each new renewable power plant would, though, have the same potential to decrease groundwater levels and lead to the decline in riparian vegetation or groundwater-dependent species depending on the plants' location and mitigation measures.

Future impacts on riparian habitat and wetlands from wildland fire management under Alternative 1 would likely be identical to those observed under the 1998 RMP. Impacts from the other alternatives would be slightly different in that a more aggressive fuel treatment regime, i.e. prescribed burning. This may lead to long-term fire severity reduction which would result in less riparian habitat and wetlands impacts from a given fire. Construction of fuel breaks with emphasis at a landscape scale would reduce fire spread potential, thereby protecting or reducing the size of burned areas.

Climate change is expected to have a moderate to major impact on riparian areas and wetlands. As precipitation patterns are shifting from winter precipitation events to more severe summer precipitation, less water will infiltrate and recharge aquifers. This will lead to more springs and seeps, but especially perched aquifer springs, to become dry more frequently for longer periods of time. This, in turn, will lead to a greater loss of riparian vegetation. Increased temperatures will also lead to increased evapotranspiration, which, in turn, will deplete surface and groundwater sources at a faster rate than in the past.

4.2.5.2.7.3. Cumulative Impact

4.2.5.2.7.3.1. Impacts Common to All Alternatives

Each alternative has a different emphasis that is expected to result in different priorities for resource development. These priorities would be expected to result in higher probabilities for adverse impacts on riparian areas and wetlands under some of the alternatives.

4.2.5.2.7.3.2. Alternative 1

Alternative 1 represents current management under guidance of the 1998 RMP. Alternative 1 contains fewer, and sometimes already achieved management actions. In some cases this is because new objectives have been formulated based on experience gained since the development of the previous plan. In other cases, new or different management options have been formulated to address existing and new objectives that are carried forward in the new RMP.

The cumulative impacts from Alternative 1 would be major. This is mostly reflecting the large previously undisturbed areas made available for renewable energy development and land disposals.

4.2.5.2.7.3.3. Alternative 2

Alternative 2 is the most protective of riparian areas and wetlands because it involves the least new development, excludes potentially impactful uses, and prioritizes protection and restoration of resources when conflicts among uses occur.

While Alternative 2 has the most area set aside for preservation and conservation (in terms of ACECs, wildernesses, etc.) and has the most beneficial impacts on riparian areas and wetlands, the negative impacts would still be considered moderate. Again, this is mostly due to the large tracts of previously undisturbed land that will be made available for renewable energy development and land disposals.

4.2.5.2.7.3.4. Alternative 3

Alternative 3 alternatively emphasizes development priorities or preservation priorities according to resource realm. Alternative 3 therefore represents a compromise, and its impacts on riparian areas and wetlands are expected to be generally intermediate between Alternatives 2 and 4. Overall, it tends to encourage economic development, but it recognizes sensitive environmental concerns on a greater amount of land, resulting in more acres excluded or restricted from conflicting uses than Alternative 4.

The cumulative impacts from Alternative 3 would be major. This is mostly reflecting the large, previously undisturbed areas made available for renewable energy development and land disposals. However, the cumulative impacts would be less than Alternatives 1 and 4.

4.2.5.2.7.3.5. Alternative 4

Alternative 4 generally prioritizes development of resources for economic return while relying on mitigation to reduce, rather than prevent, adverse impacts. Alternative 4 would likely have greater impacts on riparian areas and wetlands than Alternatives 2 and 3.

The cumulative impacts from Alternative 4 would be major. This is mostly reflecting the large, previously undisturbed areas made available for renewable energy development and land disposals. This alternative will have the most negatives cumulative impacts on water resources compared to the other three alternatives.

4.2.5.3. Weeds

4.2.5.3.1. Summary

This section analyzes the impacts of proposed management actions on noxious and invasive species management. Impacts would result from actions that have the potential to spread or introduce noxious or invasive weeds or any other invasive species.

The potential for weed spread would be affected most by ground-disturbing activities, fire, and OHV management. Restrictions on management activities for the protection of other resources would affect the level, location, and effectiveness of weed management actions to reduce the potential for weed spread. Effects from other resources could be limited and localized, or in some instances, widespread in the planning area.

The factors that most differentiate one alternative from another in terms of their potential for weed infestation are the degree to which areas are open to ground-disturbing activities and activities that spread weed seed from one place to another (OHV, grazing, etc.). Alternative 2 overall would provide the greatest protection from weed spread, but it may limit the types of weed treatments that can be done. Alternative 3 would provide less protection from weed spread than Alternative 2, but significantly more protection from weed spread than Alternative 4. Alternative 3 would allow more flexibility in weed treatment options compared to Alternative 2. Alternative 4 allows for more surface-disturbing activities and calls for less aggressive mitigation measures and resource management. Therefore, Alternative 4 would offer the least protection and have the highest potential for noxious and invasive species spread throughout the planning area.

4.2.5.3.2. Methods of Analysis

Effects are conditions that change the potential for invasive species infestation or spread. Effect determinations are based on reasonably predictable responses of invasive species to a variety of conditions. Reasonably predictable responses include the following:

- Weeds often exploit disturbed areas and are adept at out-competing many native species.
- Most actions that disturb soil or vegetation will increase the potential for weed infestation.
- Weed infestation will often follow transportation routes, making transmission corridors, roadsides, routes, and trails ideal habitats for weeds and making vehicles, people, and animals prime mechanisms for the spread of weeds.
- Weeds thrive in ecosystems that are out of balance, either from a hydrological or vegetative perspective.
- Degraded or unhealthy rangelands are particularly prone to weed infestation due to disturbances caused by grazing livestock.
- Invasive insect and animal species also are adept at out-competing many native species and will exploit ecosystems that are out of balance.
- Actions that transfer materials, soil, water, or equipment from one place to another will increase the potential for the spread of both invasive animal / insect species and weeds.

Some impacts are direct, while others are indirect and affect vegetation through a change in another resource. Direct impacts on invasive species include direct removal and actions that unequivocally introduce or spread invasive species.

Potential indirect impacts would result from actions that would expose or compact the soil, alter hydrologic regime or water availability, reduce the health of native vegetation, remove native vegetation, or create conditions that would enhance the introduction or spread of invasive species.

While many specific populations of weed species are known in the planning area, the entire area has not been comprehensively inventoried. Therefore, it is difficult to predict which species, if any, may arise in a given area or to calculate the exact degree to which the planning area is affected. The analysis below focuses on explaining how existing or proposed management actions may contribute to the spread or management of weed populations. Species-specific predictions may be made in areas where weed data is available. This analysis is based on the following assumptions:

- Weeds are most likely to thrive in areas where the soil and vegetation have been disturbed, including burned areas, along linear features (roads, trails, utility corridors, etc.), and in denuded areas (staging areas, campsites, etc.).
- Current trends in plant succession and vegetation would continue.
- Vegetation communities would be maintained with a mix of species composition, cover, and age classes.
- Noxious and invasive species would continue to be introduced and spread as a result of ongoing vehicle traffic in and out of the planning area, recreational activities, wildlife and livestock grazing and movement, and surface-disturbing activities.
- Noxious and invasive weeds would further expand into native plant communities, and disturbances to these communities would expand opportunities for the spread of invasive weeds.
- Invasive animal species would further expand into native ecosystems and disturbance or actions that create an imbalance in the ecosystem would expand opportunities for the spread of invasive species.
- Invasive animal species would continue to be introduced and spread as a result of the movement of boats, vehicles, equipment, fire water-drafting equipment, etc., from one place to another.
- Total control of the spread of noxious and invasive species and pests is unlikely under any alternative.
- Population growth and development will result in increased land and resource uses.
- The BLM will continue to treat noxious and invasive weeds and pests on public land both internally and as stipulated within BLM permits and authorizations.
- Weed and pest control would continue to be carried out as described in BLM Manual-9011, Manual-9015, the district weed control plan, the Vegetation Treatments Using Herbicides on BLM Lands in 17 Western States Programmatic Environmental Impact Statement (Herbicide PEIS), and other applicable DOI, EPA, state, BLM, and county documents and regulations.

4.2.5.3.3. Qualitative Intensity Scale

A range of qualitative terms has been used to gauge the intensity of each impact from one program area on another. Both positive and negative impacts are considered and, where necessary, the net impact of the two is discussed. Both generalized and specific definitions for invasive and/or noxious species impact intensity are summarized below:

- **Negligible:** *General:* No known impacts to the management of noxious and/or invasive species. Any change is undetectable and immeasurable. *Specific:* No direct and indirect impacts that cause an appreciable change to the management of invasive and noxious species in the short and long term.

- **Minor:** *General:* Direct effects are apparent, measurable, small, localized, and contained within the footprint of the action. Indirect effects are undetectable. *Specific:* There would be a small but slightly noticeable impact to the spread of noxious and invasive species. The use of standard operating procedures and best management practices to offset adverse impacts would be effective.
- **Moderate:** *General:* Direct effects would be readily apparent and measurable over a larger area and have the potential to extend a small amount beyond the footprint of the action. Indirect effects are apparent and measurable but do not exceed much beyond the footprint of the action. *Specific:* The impact would be very apparent and measurable. There would be a significant change to invasive species populations over large areas, including introduction of new species and spread of existing populations. Mitigation would likely be needed to reduce spread. The use of standard operating procedures and best management practices to offset adverse impacts, including special measures to monitor and treat invasive species populations, could be extensive, but should be successful.
- **Major:** *General:* Direct effects would be highly noticeable and extend well beyond the footprint of the action. Indirect effects would be readily apparent and measurable well beyond the footprint of the action. *Specific:* The impact to the management of invasive and noxious species would be severe. There would be a substantial change across a large area within a plant community resulting from the introduction and spread of invasive species, and desired future conditions could not be achieved without substantial input. The extensive use of standard operating procedures, best management practices, and mitigation to offset the adverse effects would be necessary, and their success would not be guaranteed.

4.2.5.3.4. Resources

4.2.5.3.4.1. Air Quality Impacts on Weeds

4.2.5.3.4.1.1. Impacts Common to All Alternatives

Restrictions on prescribed fire and wildfire use to protect air quality may reduce opportunities to burn in any given year. This may prevent certain weed treatments from being implemented and may indirectly facilitate the introduction or spread of weeds. However, these restrictions are not expected to completely prevent implementation and accomplishment over the long term and therefore the impact on invasive species is minor. All other management actions will have a negligible impact on noxious and invasive species.

4.2.5.3.4.1.2. Alternatives 1 through 4

There are no additional impacts on weeds.

4.2.5.3.4.2. Soil Resources Impacts on Weeds

4.2.5.3.4.2.1. Impacts Common to All Alternatives

Maintaining and improving watersheds would indirectly prevent the introduction or spread of weed species by helping to establish native plant species in areas that are highly susceptible to weed invasions.

Weed treatment, including the use of herbicides, can potentially have a negative effect on soil resources through leaching and runoff, thereby affecting the ability of desirable plants to grow in the soil. However, the appropriate selection and application of herbicide will mitigate this risk. All herbicides used in the planning area will be from the list of BLM-approved herbicides in the Herbicide PEIS. Additionally, all applicable mitigation measures from the Herbicide PEIS, the herbicide label, and the district weed plan will be strictly adhered to during application. Prior to application, a pesticide use proposal (PUP) would be submitted and approved outlining application techniques.

Mechanical weed treatment methods in which the plant is removed from the ground may also impact soils temporarily as removing these cover plants will leave the soil more open to wind and water erosion. However, there are multiple management actions that call for restoration of disturbed and degraded areas. If restoration is implemented after invasive species are removed, the benefits will be two-fold. First, restoration with native plants will replace the soil cover that was removed and reduce erosion potential. Second, native species will provide competition for space and resources needed to keep invasive species from reinfesting the area.

4.2.5.3.4.2.2. Alternative 1

Alternative 1 does not include many of the management actions that would be beneficial in preventing the spread of noxious and invasive species, and thereby many parts of Alternative 1 will have a moderate indirect negative impact on the spread of invasive species.

By not including actions to restore degraded systems, the risk of weed introduction and spread will increase. Many invasive weeds are disturbance colonizers and will take advantage of the lack of competition that disturbance creates to infest a disturbed site.

Cryptogamic crusts and desert pavement decrease weed infestations by preventing weed seeds from getting through the crust and into the soil. Many native species of vegetation have special adaptations that allow them to reproduce and thrive in the presence of soil crusts either by vegetative reproduction or by seeds that are specially equipped to get through the crust and into the soil. Most nonnative invasive species will not have these adaptations, making it difficult for them to spread into areas with cryptogamic crusts or desert pavement. By allowing development on these sensitive soil types, the crusts and/or pavement will be broken, allowing invasive weeds to spread into the area. Once a biological soil crust is broken, it can take over 100 years to grow back.

Alternative 1 only mentions the removal of tamarisk. Removal of tamarisk would be beneficial as it is a Nevada noxious weed. However, the treatment of other noxious weeds is not included, nor are other restoration actions. Removal of tamarisk without removal of other weeds and/or restoration will likely create new weed infestations where the tamarisk was. By not expanding this action to include other weeds and restoration, it will likely have a major direct negative impact on the management of invasive weeds.

By not including a management action to avoid developments in the 100-year floodplain, these areas, which are highly susceptible to weed invasions, would be open to new disturbance. Floodplains have the potential for high densities of invasive species due to water availability, which is a scarce resource in the desert. By creating additional disturbance in these areas, the risk of spreading invasive species becomes much greater. Additionally, construction and vehicles in these areas would spread weed seeds, reproductive plant parts, or possibly even invasive

aquatic animal species from one area to another. Without this management action, there would be moderate indirect negative impact on the management of invasive species.

4.2.5.3.4.2.3. Alternatives 2 through 4

Alternatives 2, 3, and 4 will have moderate to major indirect beneficial impacts for reducing the spread of invasive weeds that are not included in Alternative 1. Intact desert pavement and cryptogamic crusts help deter weed infestations by preventing weed seeds from getting through the crust and into the soil. Many weed species will take advantage of a site where desert pavement or crust has been broken. By protecting these sensitive soil types from disturbance and development, the risk of invasive weed spread is reduced.

Many invasive weeds are disturbance colonizers. By limiting road disturbance, rehabilitating closed routes, and restoring disturbed areas, native species recruitment will help out-compete invasive and noxious weeds. Additionally, rehabilitating closed routes will prevent unauthorized travel on these routes. Humans and vehicles are known vectors of weed spread, so by preventing travel on closed routes, the risk of invasion or spread of weeds will decrease.

Floodplains and riparian zones are especially susceptible to weed invasions due to availability of water. Reducing disturbance in riparian zones by avoiding development in the floodplain will have a positive impact by limiting opportunities for invasion from disturbed soils.

4.2.5.3.4.3. Water Resources Impacts on Weeds

4.2.5.3.4.3.1. Impacts Common to All Alternatives

Multiple management actions across all alternatives will have a moderate, indirect beneficial effect by ensuring that water will be available for site recovery through monitoring and applying for appropriate water rights. Restoration and site recovery with native species after weed treatment is critical in long-term weed containment and eradication. By ensuring that adequate water is available for site recovery, native species will have the opportunity to recruit and grow, which will reduce the further spread and introduction of invasive species by providing competition for space and resources.

All other management actions for water resources will have negligible effects on noxious and invasive species.

4.2.5.3.4.3.2. Alternatives 1 through 4

There are no additional impacts on weeds.

4.2.5.3.4.4. Integrated Vegetation Impacts on Weeds

4.2.5.3.4.4.1. Vegetation Impacts on Weeds

4.2.5.3.4.4.1.1. Impacts Common to All Alternatives

Managing mesquite and acacia woodlands for their value as wildlife habitats could have a direct and indirect beneficial impact of moderate intensity on invasive weeds. Management

activities to maintain value for wildlife habitats may include weed removal, which would be a direct beneficial effect on weed management. Native wildlife is adapted to eat native vegetation, and nonnative vegetation may be less palatable and less nutritious, therefore it would likely be removed. Additionally, nonnative species may out-compete native species that are needed for wildlife forage and habitats. Also, managing mesquite and acacia woodlands for wildlife habitats would emphasize keeping these native species healthy and vigorous. This would create an indirect benefit to weed management by providing healthy plants for competition to keep out new invading weeds.

Similarly, managing for desired plant community or potential natural community would have a direct and indirect benefit of major intensity to weeds management. The direct benefit would be the removal of invasive weeds and nonnative species because they would not be included in the desired plant community or potential natural community. The indirect benefit would come from managing for health and vigor of native plant species, thereby providing competition for invading weeds.

4.2.5.3.4.4.1.2. Alternative 1

Alternative 1 does not include many of the management actions that would benefit weeds management that the other alternatives do.

While revegetating areas subject to surface disturbance would provide a beneficial impact, this alternative does not require it and calls for it only on a “where feasible” basis. Therefore, this alternative would provide less of a benefit to weeds management than the other alternatives.

Alternative 1 does not include a management action to mitigate the impacts from the loss of native plant communities and ecosystem services. By not mitigating the impacts from loss and disturbance to vegetation communities in the planning area, there will be more areas where weed species can invade. As more acres of the planning area become disturbed or denuded and ecosystem function is lost, there is less competition to keep weeds out, and invasive weeds can spread and thrive in these areas. Similarly, Alternative 1 does not include a management action to maintain connectivity of native plant communities by restoring closed roads and other linear features that prevent species dispersal. Linear disturbances are prime areas for weeds to invade and spread. The lack of competition and the disturbed soil along these linear features provides an easy weed invasion and establishment point. Travel by vehicles, wildlife, humans, and livestock can easily spread weeds along linear features by unknowingly carrying seeds and plant parts from one place to another.

Alternative 1 does not include a management action to maintain the resilience of native plant communities to climate change. This will have a major indirect negative impact on the management of invasive species. If resiliency is not maintained and native vegetation is lost, it would provide more opportunities for invasion by weed species. Weeds thrive in denuded areas and in areas where the ecosystem is out of balance. Not considering and managing for these changes could result in transitions from native vegetation communities to invasive weed monocultures.

Alternative 1 does not have a management action to use native seeds and materials for revegetation and restoration activities. This could have a moderate to major direct negative impact. By not having this management action, the option is available to use inappropriate nonnative species without consideration. If nonnative species are chosen that are inappropriate for the site in which

they are introduced, they can act invasively and out-compete native vegetation. Additionally, Alternative 1 does not include a management action to use seed and plant materials with the appropriate genetic composition for the site they are being placed. This could have an indirect negative impact on the management of weeds. If inappropriate genetics are used, the seeds may die or be unsuccessful at revegetating disturbed areas, or they may change the genetic makeup of the vegetation community over time. This could result in unsuccessful treatments that would leave disturbed and denuded areas, or result in the ecosystem being out of balance. Both of these results create situations in which invasive weeds could spread and thrive.

Alternative 1 also does not include several other management actions that would have a beneficial impact, such as participating in cooperative research efforts that advance vegetation management, monitoring vegetation change, practicing adaptive management, and developing consistency in BMPs and SOPs between field offices. By not including these actions, trends in vegetation and advances in management strategies may be missed or not implemented, which could result in decreased health of native vegetation and increased opportunities for weed invasions.

4.2.5.3.4.4.1.3. Alternatives 2 and 3

Alternatives 2, 3, and 4 include many management actions that were not included in Alternative 1 that will have beneficial impacts to the management of invasive and noxious species. Alternative 2 expands the management action from Alternative 1 to rehabilitate surface-disturbing activities, where feasible, to require restoration and rehabilitation on all BLM-authorized activities that will create surface disturbance. This action in Alternatives 2, 3, and 4 would expand the beneficial impact from Alternative 1 by reducing the amount of surface disturbance and providing native plant competition to reduce the invisibility of these areas.

Alternatives 2, 3, and 4 include a management action to mitigate the impacts of loss and disturbance to vegetation communities in the planning area. For Alternatives 2 and 3, the management action requires that actions are mitigated so that there is no net loss of value in the planning area. Overall, these alternatives will have a positive impact on the management of invasive species. By mitigating the impacts of loss and disturbance to vegetation communities, there will be fewer areas where weed species can invade. However, the treatment of large or severe weed infestations could cause short-term net loss of value in the planning area, and because recovery times can be long, recovery of loss could be delayed. Similarly, Alternatives 2, 3, and 4 include an action to maintain connectivity of native plant communities by restoring closed roads and other linear features that prevent species dispersal. This action will have a positive impact. Linear disturbances are prime areas for weeds to invade and spread. The lack of competition and the disturbed soil along these linear features provides an easy weed invasion and establishment point. Travel by vehicles, wildlife, humans, and livestock can easily spread weeds along linear features by unknowingly carrying seeds and plant parts from one place to another. Revegetation of these disturbances with native species will provide less disturbed ground and more competition for space and resources, making it difficult for weed species to invade.

Alternatives 2, 3, and 4 include a management action to maintain the resilience of native plant communities to climate change. This will have a major indirect positive impact on the management of invasive species. If resiliency is maintained, native vegetation communities would change in range but would maintain a native vegetative cover on the ground. This would decrease opportunities for invasion by weed species by reducing denuded areas and maintaining healthy native vegetation to provide competition for invaders.

Alternatives 2, 3, and 4 include a management action to use native seeds and materials for revegetation and restoration activities and to only use nonnatives under special circumstances. This could have a moderate to major positive impact on invasive weed management. Revegetation with native species will decrease the risk of weed invasion and spread by providing competition. In some circumstances, a nonnative species may be appropriate to best meet the management objectives on the site. However, the use of nonnatives in restoration should be considered very carefully to prevent introducing a new weed problem. Additionally, Alternatives 2, 3, and 4 include a management action to use seed and plant materials with the appropriate genetic composition for the site where they are being placed. This has an indirect beneficial impact. Seeds and plant materials with the appropriate genetics for the sites where they will be used on have the best chance of surviving and establishing. Additionally, the genetics of the entire area would be maintained and the plant community would remain in balance. Successful revegetation using appropriate species would provide competition that would reduce the invisibility of the site.

Alternatives 2, 3, and 4 also include management actions such as participating in cooperative research efforts that advance vegetation management, monitoring vegetation change, practicing adaptive management, and developing consistency in BMPs and SOPs between field offices. These actions will provide for the integration of trends in vegetation and advances in management strategies to be incorporated into the vegetation management program. By maintaining health and resilience of native plant communities through adaptive management, weed spread and introduction will be reduced.

4.2.5.3.4.4.1.4. Alternative 4

The analysis of Alternative 4 is the same as Alternatives 2 and 3 except for one management action. While Alternatives 2 and 3 call for mitigation of loss and no net unmitigated loss of vegetation communities and ecosystem services, Alternative 4 addresses these losses on a case-by-case basis. Alternative 4 states that unmitigated loss of value should be reduced where possible. While any reduction of unmitigated loss would have a beneficial impact on the management of invasive species, allowing some unmitigated loss to occur will have less of a positive impact than the no net unmitigated loss scenarios in Alternatives 2 and 3.

4.2.5.3.4.4.2. Riparian Areas and Wetlands Impacts on Weeds

4.2.5.3.4.4.2.1. Impacts Common to All Alternatives

Retaining woodlands and riparian areas in federal ownership would have a direct and an indirect beneficial impact of moderate intensity to preventing weed spread. Invasive species in the desert are frequently found near water sources and riparian areas. By keeping these areas in federal ownership, disturbance levels and vegetation communities can be managed, and weed invasions can be treated.

Completing assessments on all riparian areas to determine actions necessary to achieve proper functioning condition (PFC) will have a direct and indirect positive impact of moderate intensity on the management of invasive species. The actions needed to achieve PFC would include preventing or removing invasive species, as well as maintaining native plant communities that would make the site less invasible.

4.2.5.3.4.4.2.2. Alternative 1

Alternative 1 does not include a management action to address the unmitigated loss of wetlands, riparian areas, and mesquite/acacia forests. By not mitigating the impacts of loss and disturbance, there will be more areas where invasive species have the opportunity to spread. As more acres of the planning area become disturbed or denuded, there will be less competition from native species to keep invasive species from spreading.

Improving riparian areas would involve weed removal, which would cause a direct beneficial effect. However, riparian and wetlands protection could limit the type of weed treatments (e.g. chemical, mechanical) that could be used to contain and eliminate weeds in riparian areas. Protection restrictions are not expected to completely prevent weed removal over the long term, and therefore the intensity of this effect is low.

Similarly, ensuring that the minimum requirements of PFC are achieved on all riparian zones in the planning area will include weed treatment and removal, and therefore have a direct beneficial impact. This will also indirectly benefit invasive species management by improving the health of native plant communities and providing competition to invaders.

4.2.5.3.4.4.2.3. Alternatives 2 and 3

Alternatives 2 and 3 include a management action to address the unmitigated loss of wetlands, riparian areas, and mesquite/acacia forests, which was not in Alternative 1. Alternatives 2 and 3 require no net unmitigated loss of wetlands, woodlands, and riparian areas. By mitigating the impacts of loss and disturbance, there will be fewer areas where invasive species have the opportunity to spread. However, the treatment of large or severe weed infestations could temporarily create loss of these areas because recovery of the native vegetation is slow.

Alternatives 2, 3, and 4 include a management action to achieve PFC in all riparian areas by realizing and advancing ecological status. This would have indirect and direct positive impacts on the management of invasive species. Achieving PFC would include the removal and management of invasive species, as well as promoting healthy native plant communities that would provide competition for invaders.

4.2.5.3.4.4.2.4. Alternative 4

The analysis of Alternative 4 is the same as Alternatives 2 and 3 except for one management action. While Alternatives 2 and 3 call for mitigation of loss and no net unmitigated loss of riparian areas, wetlands, and woodlands, Alternative 4 addresses these losses on a case-by-case basis. Alternative 4 states that unmitigated loss should be reduced where possible. While any reduction of unmitigated loss would have a beneficial impact on the management of invasive species, allowing some unmitigated loss to occur will have less of a positive impact than the no net unmitigated loss scenarios in Alternatives 2 and 3.

4.2.5.3.4.4.3. Weeds Impacts on Weeds

4.2.5.3.4.4.3.1. Impacts Common to All Alternatives

Implementing weed management actions and conducting rehabilitation would directly reduce the introduction and spread of noxious and invasive species throughout the planning area.

4.2.5.3.4.4.3.2. Alternative 1

Alternative 1 has only one management action that addresses weed management, and it is focused only on the removal of tamarisk. While tamarisk removal is beneficial since it is a Nevada noxious weed, it does not take care of the problem of noxious weeds in the planning area. There are many other noxious and invasive species in the planning area. By treating tamarisk and not treating other weeds, it will actually increase the spread of understory weeds by opening up space and resources for them to spread.

Alternative 1 does not have any management actions that address BMPs, weed management plans, education, early detection and rapid response, weed-free materials, and coordinated efforts. The absence of these actions will have a major direct negative impact on the management of invasive species. Without implementing these actions, weeds will continue to spread unchecked, and prevention measures to stop introduction and spread will not be taken.

Alternative 1 also does not address any invasive species besides weeds. There are multiple invasive animal species that are now problematic in the planning area. This is a relatively new problem in the planning area and was not addressed in the 1998 RMP. However, without the ability to use integrated pest management techniques on invasive animals, fish, insects, etc., they will continue to spread and become a larger problem. If left unchecked, invasive animal species, much like invasive plants, can out-compete native species and create an ecosystem with no species diversity, which will drastically alter the food chain and the ecosystem.

4.2.5.3.4.4.3.3. Alternative 2

Under Alternatives 2, 3, and 4, implementing integrated pest management actions would directly reduce the introduction and spread of noxious and invasive species throughout the planning area. Allowing for multiple flexible weed treatment techniques, requiring BMPs in BLM-authorized activities, maintaining a district weed management plan, implementing restoration after weed removal, coordination through cooperative weed management areas, and conducting outreach and education, will all provide beneficial impacts to the management of invasive species.

Early detection and rapid response is the foundation for effective weed management and will have a direct beneficial impact to the weeds management program. Surveying the planning area on a regular basis and treating weeds as soon as possible increases efficacy and cost-savings in the management of invasive weeds. If weed infestations are allowed to spread, it may become impossible to eradicate the weed and would be extremely expensive to manage it.

Alternative 2 contains a management action to require a project-specific weed management plan for any BLM-authorized projects with ground disturbance of only one acre. This would have moderate to major direct positive impacts on the control of invasive species by surveying what species are of concern on the site and planning preventative actions and treatment activities if the weeds spread as a result of the disturbance. However, this action could also have a moderate

negative effect on the weeds program. Many projects in the planning area would fall within the greater than one acre threshold. This would put a strain on the program's budget and time because a large number of weed management plans would need to be prepared.

Alternatives 2 and 3 call for the requirement of using weed-free feed for livestock and weed-free gravel for authorized projects. These actions would have a moderate direct positive impact on the management of invasive species. Weeds can easily spread through livestock when they eat weed seeds in their feed and then defecate on public land. Weed seeds are also commonly spread in the transportation of materials, such as gravel, from one site to another. Requiring that these materials are certified weed-free will greatly decrease the spread of weeds through these routes.

Alternatives 2, 3, and 4 also include management actions that address invasive animal species. There are multiple invasive animal species that are now problematic in the planning area. This is a relatively new problem in the planning area and was therefore not addressed in the 1998 RMP. Invasive animal species, much like invasive plants, can out-compete native species and create an ecosystem with no species diversity, which will drastically alter the food chain and the ecosystem. Allowing the use of integrated pest management techniques will create a major direct beneficial impact to the management of these pests.

4.2.5.3.4.4.3.4. Alternative 3

Most of the management actions under Alternative 3 were analyzed under Alternative 2. One difference under Alternative 3 is that a project-specific weed management plan would be required for projects greater than five acres, instead of one acre as in Alternative 2. This action would still provide the beneficial impact of identifying, preventing, planning, and mitigating the spread of weeds on these BLM-authorized actions. However, it will also have a more positive impact on the weeds program itself when compared to Alternative 2. By increasing the threshold to five acres, it will drastically reduce the number of actions in the planning area that require a weed plan, saving both funding and time in the program while still addressing potential weed problems on larger disturbance areas.

4.2.5.3.4.4.3.5. Alternative 4

Most of the management actions under Alternative 4 were analyzed under Alternative 2. One difference under Alternative 4 is that a project-specific weed management plan would be required for projects greater than 10 acres, rather than five acres or one acre as in the other alternatives. While this would still provide a positive impact to the management of invasive weeds, it would not provide as much benefit as Alternatives 2 and 3. By increasing the threshold to 10 acres, many projects with significant disturbance and potential for weed spread would not require a weed management plan. While this alternative would save funds and time up front, it may create larger costly weed problems down the line that could have been prevented by implementing a weed management plan.

Also under Alternative 4, the use of weed-free feed and gravel materials changes from required to where feasible. While this alternative still provides a greater beneficial impact than Alternative 1, it also allows for the use of these products even if they contain weed seed or parts. This is a very common vector for weed spread. By not requiring the use of weed-free materials, invasive weeds can easily be introduced to new areas or spread from existing infestations.

4.2.5.3.4.4.4. Forests and Woodlands Impacts on Weeds

4.2.5.3.4.4.4.1. Impacts Common to All Alternatives

Maintaining woodland and conifer forests and achieving stand health and structure objectives would have a major beneficial impact on invasive species management by providing a less invasible ecosystem and competition for invaders. Limiting ground-disturbing activities in woodlands would also benefit the management of invasive species by reducing opportunities and locations for weeds to spread.

4.2.5.3.4.4.4.2. Alternatives 1 through 4

There are no additional impacts on weeds or impacts are negligible.

4.2.5.3.4.5. Fish and Wildlife Impacts on Weeds

4.2.5.3.4.5.1. Impacts Common to All Alternatives

Managing and protecting wildlife habitats to maintain forage and cover will have major direct and indirect beneficial impacts. This may include directly removing or treating invasive species or by promoting and protecting healthy vegetation communities, which will provide competition for invasive species.

Implementing releases and introductions of bighorn sheep from one area to another may have a minor negative impact on the management of invasive species. Wildlife, including bighorn sheep, often carry and spread weed seeds both by ingesting them and having them on their fur. As these animals move from one place to another, weed species could be spread or introduced to new areas. This impact can be partially mitigated by ensuring that the animals do not have plant parts or clumps of mud that could harbor weed seeds on them prior to relocation. In the overall scope of weed management in the planning area, this impact is not expected to create a large risk of spreading weeds.

Placement of additional water developments would result in more water on the landscape. If the water developments produce runoff or leak, it will create an opportune area for weeds to invade. Since water in the desert is so uncommon, weeds take full advantage of any source of water available. As long as developments are properly maintained, this should have a minor impact.

Protecting natural and artificial waters by providing minimum buffers for BLM-authorized activities could have moderate indirect positive effects and major direct negative effects. Not allowing activities such as off-road vehicle events and construction within one-quarter mile of riparian areas would be beneficial to preventing weed spread. Invasive species in the desert are frequently found near water sources and riparian areas. Off-road vehicles and surface disturbances are some of the main vectors in which invasive species move from site to site. Driving off-road vehicles or creating disturbance in or near riparian areas would create a high likelihood of introducing or spreading invasive and noxious species from other areas. However, weed treatments are also a BLM-authorized activity. Not allowing weed treatments within one quarter mile of waters would have a very high direct negative effect on the management of invasive species. Since many of the invasive species in the planning area are found near water, they would continue to spread and out-compete native plants. Rewording this management

action to allow for beneficial activities in these areas such as weed treatments, restoration, and emergency stabilization and rehabilitation could reduce the negative impact to negligible.

4.2.5.3.4.5.2. Alternative 1

All management actions in Alternative 1 besides those addressed in Impacts Common to All Alternatives will have a negligible impact on the management of invasive species.

4.2.5.3.4.5.3. Alternatives 2 through 4

Alternatives 2, 3, and 4 include a management action to limit fragmentation and enhance connectivity between habitats. This would provide a moderate to major indirect beneficial impact to the management of invasive species. Most invasive species will take advantage of the lack of competition provided by disturbances. Limiting fragmentation would include restoring disturbances and avoiding new disturbances that would fragment habitats. This would reduce the spread of noxious and invasive weeds.

Alternatives 2, 3, and 4 also include a management action to manage nonnative, nuisance, and overpopulated wildlife species through integrated pest management. This would produce a direct positive impact to the management of invasive species by removing and preventing invasive animal species and nuisance species.

Alternatives 2, 3, and 4 include a management action to inventory and monitor wildlife populations and their habitats. This would have a moderate indirect positive impact on managing invasive species. Monitoring wildlife habitats would provide more eyes on the ground and increase the chances of locating noxious and invasive species before they spread to other areas. This is part of the early detection rapid response (EDRR) method of invasive species management.

All other management actions that were not discussed in Impacts Common to All Alternatives will have a negligible impact on noxious and invasive species management.

4.2.5.3.4.6. Special Status Species Impacts on Weeds

4.2.5.3.4.6.1. Impacts Common to All Alternatives

Restoring and protecting riparian habitats for federally listed birds will be have a major beneficial impact by preventing disturbances and promoting healthy native vegetation communities.

Restoring and protecting Ash Meadows for federally listed fish, invertebrates, and plants will be highly beneficial to preventing the spread of invasive species. Many noxious weeds are found in springs and wet meadows due to the availability of water. Restoring and protecting these areas will provide competition for space and resources so that weed spread is minimized.

Management of special status species habitats could restrict certain weed treatments, such as using herbicides in desert tortoise habitat or cutting tamarisk in southwest willow flycatcher habitat. Impacts would be major and direct and would vary with the type of treatment proposed and with the nature and extent of the restrictions. The inability to use herbicides in desert tortoise habitat has already posed problems in the planning area. This district differs from many others in that the majority of land is special species habitat, primarily the desert tortoise. Herbicide is the most effective, and sometimes the only treatment option, to deal with many of the weed species

that infest desert uplands and riparian areas. To accomplish the management actions of restoring these habitats, weeds will have to be treated. It will be imperative to both the weeds program and the special status species program to find weed treatment methods, including specific types of herbicides, that are acceptable and readily available for use in special status species habitats.

4.2.5.3.4.6.2. Alternative 1

Alternative 1 does not include a management action to protect and restore aquatic habitats for listed fish species. This will have a moderate negative impact on invasive species management. Aquatic habitat is some of the prime areas for weeds and invasive animal infestations. If these areas are not protected or restored, then invasive species will continue to spread and expand into this special status species habitat. Fish barriers and other treatment of invasive aquatic animals would not take place, and habitats may be degraded or completely lost to invasive species.

Alternative 1 also does not include a management action to protect and restore upland habitat for the federally listed desert tortoise. This would also have a major indirect negative impact on invasive species management. Many invasive grasses and other weeds are found in desert uplands due to the availability of space and ability to out-compete native vegetation. If these areas are disturbed or denuded, they frequently convert to dense weed infestations. This can alter fire regimes, fire intensity, and fire return intervals, resulting in catastrophic damage to tortoise habitat.

All other Alternative 1 management actions besides those discussed in Impacts Common to All Alternatives will have a negligible impact on the management of invasive species.

4.2.5.3.4.6.3. Alternative 2

Alternatives 2, 3, and 4 include a management action to protect and restore aquatic habitat for listed species. This will have direct and indirect beneficial impacts of moderate intensity on invasive species management. Actions such as installing fish barriers or treating for invasive aquatic species would directly reduce the levels of invasive species and provide a healthier aquatic habitat. Additionally, protection of these habitats from disturbance and promotion of healthy native vegetation will minimize the spread of aquatic weeds.

Alternatives 2, 3, and 4 also include a management action to protect and restore desert upland habitat for the federally listed desert tortoise. This will have direct and indirect beneficial impacts of major intensity on invasive species management. Direct impacts would include weed treatments needed to restore habitat. Indirect benefits would come from protecting the area from disturbance and promoting a healthy native plant community.

4.2.5.3.4.6.4. Alternative 3

See Impacts Common to All Alternatives and Alternative 2. All other management actions for Alternative 3 will be negligible to invasive species management.

4.2.5.3.4.6.5. Alternative 4

See Impacts Common to All Alternatives and Alternative 2. All other management actions for Alternative 4 will be negligible to invasive species management.

4.2.5.3.4.7. Wild Horse and Burro Impacts on Weeds

4.2.5.3.4.7.1. Impacts Common to All Alternatives

Managing herd sizes and removing individuals when outside herd management areas (HMAs) or when management level is exceeded will have an indirect beneficial impact on invasive species management. Wildlife, including wild horses and burros, can spread noxious and invasive weeds by transporting them on their coats or by ingesting them and defecating in a new location. Managing herd size and keeping individuals in appropriate locations will help reduce the spread of invasive weeds.

Adding new water developments could have a minor indirect negative impact on invasive species spread. Water developments (particularly those that are in disrepair or are leaky) can create habitats for noxious and invasive weeds by providing a water source in an otherwise dry area. Additionally, vegetation communities immediately surrounding water developments tend to receive more trampling and disturbance than in other areas. Disturbed areas with a source of water would be a likely place for weed infestations to develop. However, if more water developments are available, it may reduce the trampling and disturbance at each development and spread it more uniformly across the HMA. Ensuring that herds are kept at appropriate levels and that water developments are kept in good repair will reduce the risk of introducing or spreading noxious and invasive species.

4.2.5.3.4.7.2. Alternative 1

Alternative 1 does not include any management actions to limit site-type ROWs or new surface-disturbing activities. This could cause a moderate indirect negative impact on managing invasive species by creating more areas for disturbance-colonizing weeds to invade and spread. Additionally, increased land use or traffic created by ROWs would increase the spread of invasive weeds since weed seeds and parts are frequently spread on vehicles and humans.

In Alternatives 1, 2, and 3, wild horses and burros would be excluded from Gold Butte Part A, which is desert tortoise critical habitat. This would have a moderate indirect beneficial impact on reducing the spread of invasive species. Many of the weed species that infest uplands and desert tortoise habitat are invasive annual grasses whose mode of transport is seeds that latch on to animals, humans, or vehicles passing by. The weeds seeds are spread over long distances in this matter and can easily move from an infested site to a non-infested site. By excluding wild horses and burros from this area, this route of weed spread will be reduced. This will also have a positive effect on reducing wildland fires in tortoise habitat, as most fires in desert uplands are a result of blankets of fuel comprised of these invasive grasses.

All other management actions under this alternative that were not discussed in Impacts Common to All Alternatives will have a negligible impact on invasive species management.

4.2.5.3.4.7.3. Alternative 2

In Alternative 2, site-type ROWs over five acres are excluded in HMAs, as well as new surface-disturbing activities that would negatively affect key habitat components. These management actions would result in a moderate indirect beneficial impact by preventing new disturbance where weed species could colonize. Additionally, any increase in activity and traffic

associated with ROWs, which have the potential to spread weeds from one place to another, would not occur.

All other management actions that are not discussed in Alternative 1 or in Impacts Common to All Alternatives will have a negligible impact on invasive species management.

4.2.5.3.4.7.4. Alternative 3

Impacts from management actions in Alternative 3 are the same as Alternative 2 except that in Alternative 3, site-type ROWs over five acres and new surface-disturbing activities would be avoided rather than excluded. Beneficial impacts would be similar to those in Alternative 2, but to a lesser extent since some of these ground-disturbing activities may still occur.

4.2.5.3.4.7.5. Alternative 4

Impacts from management actions in Alternative 4 are the same as Alternatives 2 and 3 except that in Alternative 4, site-type ROWs over five acres and new surface-disturbing activities would be handled on a case-by-case basis. Some beneficial impacts similar to those in Alternative 2 may still occur, but to a much lesser extent since these ground-disturbing activities may still occur at a greater level.

Additionally, Alternative 4 does not contain a management action that would exclude wild horses and burros from Gold Butte Part A ACEC (critical desert tortoise habitat). This would have a moderate indirect negative impact on the spread of invasive species since animals can be vectors of weed seed spread (particularly the invasive annual grasses that occur in desert uplands). The spread of invasive grasses would put the site at a higher risk of wildland fire.

4.2.5.3.4.8. Cave and Karst Management Impacts on Weeds

4.2.5.3.4.8.1. Impacts Common to All Alternatives

All management actions for cave and karst management would have a negligible impact on the management of invasive species.

4.2.5.3.4.8.2. Alternatives 1 through 4

There are no additional impacts on weeds.

4.2.5.3.4.9. Wildland Fire Management Impacts on Weeds

4.2.5.3.4.9.1. Impacts Common to All Alternatives

Under any wildfire control scenario, suppression activities could spread weed seeds or create conditions, such as soil disturbance, that favor weeds. A higher number of vehicles and a higher level of disturbance would lead to greater potential for weed spread. Minimum impact suppression tactics would minimize unanticipated effects on native vegetation during fire suppression activities.

However, wildfire suppression and the creation of fuel breaks would prevent catastrophic destruction of native vegetation, which would have a major impact on preventing weed invasions in these areas over the long term. Wildfire creates large areas of unvegetated soil. The majority of the native vegetation in the planning area is not fire adapted and takes many years to grow back after a fire. However, many of the nonnative invasive species, particularly red brome and cheatgrass, are highly fire adapted and will quickly invade an area after a fire. Many fires scars in Southern Nevada, such as the 2005–2006 complex fires, have converted to fields dominated by invasive annual grasses such as these. These weeds are highly flammable once they have dried out, so this type of conversion sets up the area for a re-burn. Once such cycles of weed growth and fire are established, native vegetation cannot be re-established unless intervention via restoration and revegetation takes place. The impacts created by suppression actions are smaller in scale than the impacts of large wildfire burn scars being invaded by weeds. Overall, suppression that reduces the size of fires will result in less negative impacts to the spread of weeds. The use of resource advisors would reduce unanticipated effects on resources, as well as reduce weed spread during fire suppression by ensuring that vehicles and equipment are washed and that suppression tactics will have the minimal impact possible. In addition, emergency stabilization and rehabilitation treatments, such as seeding with native plant species, will have a major impact on deterring the spread of invasive weeds.

Because fire retardants are composed largely of nitrogen and phosphorus fertilizers, they may encourage growth of some species, particularly weeds, at the expense of others, indirectly resulting in changes in community composition and species diversity. Green stripes of invasive grasses can be seen in areas where retardant was dropped.

Unlike many parts of the country, where fuels reduction can have a negative impact on the spread of invasive species, in Southern Nevada the majority of fuels are also invasive species. Reducing hazardous fuels such as tamarisk and red brome will also directly decrease the amount of invasive species present. Fuels management actions would result in a short-term loss of vegetation on a small scale that could provide opportunities for other weeds to invade. Restoration actions and use of BMPs can reduce this risk. In the long term, fuel reduction projects would re-establish native vegetative communities, thus indirectly lowering the potential for weed spread. As long as appropriate BMPs are used to reduce weed spread, fuel reduction efforts will have a major positive impact on invasive species management.

Some fire suppression tactics also have the potential to spread invasive animal species. One example that has occurred throughout the county is the spread of the invasive quagga mussel. Quagga mussels have infested Lake Mead and other water sources in and around the planning area. If water is drafted from the lake or other infested areas, it can easily spread the invasive mussels by dropping them on previously non-infested waters or riparian areas. Equipment for drafting should use filters or available technology to reduce the chance of picking up invasive species. Additionally, water drops should avoid springs and other natural water sources. Equipment should be cleaned regularly to ensure that invasive species are not spread via this route.

Overall, implementing a response to wildfires based on the social, legal, and ecological consequences of the fire would protect areas susceptible to invasion, which would reduce the potential for weed spread in these areas over the long term.

4.2.5.3.4.9.2. Alternative 1

Under Alternative 1, prescribed burning for resource enhancement purposes would be restricted to only a few areas. This could have a minor to moderate indirect negative impact by reducing the opportunity to use fire as a weed treatment tool. Prescribed burning can be a valuable tool by opening up dense stands of weeds such as tamarisk, allowing access for further treatments of these weeds or other weeds growing in the understory. Prescribed fires are also used to deal with the slash created by treating weeds such as tamarisk.

Alternative 1 does not include management actions for emergency stabilization and rehabilitation (ESR). This could have a major negative impact on weed spread. ESR actions are imperative for controlling the spread of invasive species after a wildfire. ESR treatments such as seeding and planting native vegetation, as well as controlling weed infestations, are needed to reduce the chance of conversion to invasive annual grass fields, which are at high risk or re-burns. Alternative 1 also does not have a management action that allows the closure of burned areas after a fire. In addition to increasing the risk to human health and safety, not being able to close an area would have a negative impact on weed spread. Leaving areas open after a fire increases the potential for weed seeds to be spread via vehicles and recreation activities in an area that is particularly vulnerable to weed invasion. Additionally, leaving the area open to recreation, particularly OHV use, would inhibit the effectiveness of ESR treatments, which would indirectly increase the risk of weed spread.

4.2.5.3.4.9.3. Alternatives 2 and 3

Alternatives 2, 3, and 4 contain management actions that would be beneficial to the management of weeds and invasive species. Management actions that allow prescribed burning throughout the planning area, ESR treatments, resource advisors, and area closures would all have moderate to major positive impacts on decreasing the spread of weeds after a fire.

Alternatives 2 and 3 allow the closure of burned areas throughout the planning area. This would have a moderate to major beneficial impact on invasive weed spread for the reasons described in Alternative 1.

4.2.5.3.4.9.4. Alternative 4

Alternative 4 only allows closure of burned areas that are in ACECs. While this would have a beneficial impact on the spread of invasive species in these areas, it excludes much of the planning area from having similar benefits. Areas outside ACECs may also need temporary closure after a fire for safety reasons and to prevent weed spread and allow ESR activities to take effect and establish native vegetation.

See Alternative 2 and Impacts Common to All Alternatives.

4.2.5.3.4.10. Cultural Resources Impacts on Weeds

4.2.5.3.4.10.1. Impacts Common to All Alternatives

Protecting cultural resources would prevent disturbance, thus indirectly lowering the potential for weed spread. Site monitoring, conservation measures, use restrictions, and law enforcement

would prevent disturbance to and degradation of the areas where cultural resources exist, including native vegetation. These areas are small relative to the remainder of planning area, so impacts would be minor and localized.

4.2.5.3.4.10.2. Alternatives 1 through 4

There are no additional impacts on weeds.

4.2.5.3.4.11. Paleontological Resources Impacts on Weeds

4.2.5.3.4.11.1. Impacts Common to All Alternatives

Paleontological management measures and law enforcement actions would prevent disturbance to and degradation of lands, which would indirectly deter the spread or introduction of weeds into these areas. These areas are small relative to the size of the planning area, so impacts would be minor and localized.

4.2.5.3.4.11.2. Alternatives 1 through 4

There are no additional impacts on weeds.

4.2.5.3.4.12. Visual Resource Management Impacts on Weeds

4.2.5.3.4.12.1. Impacts Common to All Alternatives

Weed expansion can be seen as having an indirect relationship to the amount of acreage in various visual resource management (VRM) classes. In general, alternatives that have more acres in VRM Classes I and II have lower potential for weed spread than those that have more acres in VRM Classes III and IV. This is because soil surface disturbance is minimized and the level of restoration of disturbed areas is increased to meet VRM Class I and II management objectives.

VRM Classes I and II could limit weed treatments in some areas. Treatments such as prescribed fire, cutting in large areas, herbicide use in large areas, or fence installation may not meet management objectives for Class I, and possibly Class II, without mitigation measures. However, in the long term, weed treatments would improve the quality of visual resources by returning the area to unfragmented native vegetation communities. Since the long-term impact of weed treatments is beneficial to VRM, the short-term negative VRM consequences are not anticipated to fully prevent treatment in areas that need it, regardless of VRM class.

4.2.5.3.4.12.2. Alternative 1

Alternative 1 has the fewest acres designated as VRM Class I and II. Therefore, this alternative would be the least effective in reducing the spread of invasive species.

4.2.5.3.4.12.3. Alternative 2

Alternative 2 has the highest number of acres in VRM Class I and II and would cause the greatest indirect reduction in the potential for weed spread.

4.2.5.3.4.12.4. Alternative 3

Alternative 3 has the second highest number of acres that would be managed to VRM Class I and II standards. This would indirectly reduce the potential for weed spread more so than Alternatives 1 and 4, but less than Alternative 2.

4.2.5.3.4.12.5. Alternative 4

Alternative 4 has the second fewest acres of VRM Class I and II and would be the less effective in reducing the potential for weed spread than Alternatives 2 and 3, but more effective than Alternative 1..

4.2.5.3.4.13. Lands with Wilderness Characteristics Impacts on Weeds

4.2.5.3.4.13.1. Impacts Common to All Alternatives

Similar to visual resource management, lands with wilderness characteristics also have an indirect relationship to how many acres are designated as lands with wilderness characteristics. In general, alternatives that have more acres designated as lands with wilderness characteristics will have a lower potential for weed introduction and spread than alternatives with fewer lands with wilderness characteristics acres. The specific management prescriptions assigned to the lands with wilderness characteristics vary by alternative, which will also have an effect on the potential for weed spread. But in general, lands with wilderness characteristics will reduce surface-disturbing activities, limit OHV use, limit ROWs, and limit the types and amount of mineral entry that is permitted. Overall, the designation of lands with wilderness characteristics will reduce the introduction and spread of noxious and invasive species.

4.2.5.3.4.13.2. Alternative 1

Lands with wilderness characteristics would not be designated under Alternative 1. None of the positive impacts that reduce the spread of weeds would occur as described in Impacts Common to All Alternatives. There is, however, one beneficial impact to not designating lands with wilderness characteristics, and that is that the types of weed treatments will not be restricted. Under other alternatives, certain weed treatments may not be used or may be limited. If no lands with wilderness characteristics are designated as described under Alternative 1, tool use would not be limited for this reason.

4.2.5.3.4.13.3. Alternative 2

Alternative 2 has the strictest management prescriptions. In this alternative, vehicles, OHV use, mineral entry, and ROWs are excluded. It also excludes the construction of new facilities that do not preserve or enhance wilderness characteristics. This alternative has the largest number of acres designated as lands with wilderness characteristics and would cause the greatest indirect reduction in the potential for weed spread.

This alternative does restrict the types of weed treatments that may be done. Minimum impact tool requirements may restrict the use of chainsaws or heavy equipment and prescribed fire to treat invasive species. This is not anticipated to stop weed treatments in these areas, therefore the impact should be minor. The benefits described above outweigh the impact of limited tool use.

4.2.5.3.4.13.4. Alternative 3

Alternative 3 has management prescriptions that are less strict than Alternative 2, but more strict than Alternative 4. In this alternative, vehicles are allowed but are restricted to designated routes, ROWs are avoided rather than excluded, and lands are open to fluid mineral leasing but closed to other types of mineral entry. It also restricts the construction of new facilities that do not preserve or enhance wilderness characteristics. This alternative has fewer acres designated as lands with wilderness characteristics than Alternative 2 but more acres than Alternative 4. It would result in less indirect reduction in the potential for weed spread than Alternative 2 but more reduction in potential weed spread than Alternative 4.

Tool use for weed treatment may also be limited under this alternative as described in Alternative 2.

4.2.5.3.4.13.5. Alternative 4

Alternative 4 has the fewest number of lands with wilderness characteristics acres of any alternative besides Alternative 1 (which has no acres) and has management prescriptions similar to Alternative 3. This alternative would cause the least indirect reduction in the potential for weed spread besides Alternative 1 (which would cause no reduction), as described under Impacts Common to All Alternatives.

4.2.5.3.5. Resource Uses

4.2.5.3.5.1. Forestry and Woodland Products Impacts on Weeds

4.2.5.3.5.1.1. Impacts Common to All Alternatives

Maintaining woodlands and conifer forests will have both a direct and an indirect beneficial impact of moderate intensity on managing invasive weeds. The maintenance of woodlands may include the direct removal of invasive weeds. It will also promote healthy native vegetation, which will reduce the invasibility of the site by weeds.

Assessing the potential to salvage and use desert plants in locations where surface-disturbing activities are going to occur will have a moderate indirect beneficial impact on invasive weed management. If these plants are not salvaged, they either become bladed over or trashed. By salvaging them, they can be used as restoration and revegetation materials for disturbed sites. Implementing restoration actions after weed treatments greatly improves the potential for long-term control and/or eradication of the weed species. Restoration of disturbed areas also helps prevent the introduction and/or spread of weeds into that area.

4.2.5.3.5.1.2. Alternative 1

Limiting collection of desert vegetation and other vegetative resources to only areas where surface-disturbing activities will occur may result in a minor negative impact. Weed treatments will be far more successful in the long term if they are followed by restoration with native vegetation. Sources for native vegetation can be scarce. While priority would be given to taking native vegetation for restoration from an area that will be disturbed, it may be necessary to take small amounts of native vegetation from undisturbed locations. The amount of plants or specific

species needed for restoration may not be available at a site that will be disturbed and may not be available commercially. Plants used from undisturbed locations are typically cuttings or plugs and do not comprise a large portion of the native vegetative community. Without the flexibility to obtain plant materials on site if needed, restoration may not be practical or effective, which would in turn increase the potential for the spread of weeds.

All other management actions for Alternative 1 would have a negligible impact on invasive species management.

4.2.5.3.5.1.3. Alternative 2

Alternatives 2, 3, and 4 limit project-specific seed collection to an area of 1,000 feet around the project site may have a moderate negative impact on invasive weed management. If the area to be seeded is large (such as post wildfire rehabilitation), 1,000 feet around the site may not be enough area to collect the appropriate number of seeds needed. Also, if all the seeds needed on a large project were taken from that 1,000-foot buffer area, the seed collection would take a large percentage of all of the seeds in that area, thereby reducing the seed bank for the area adjacent to the project. If not enough native, genetically appropriate seed is available, then restoration will not be as effective and may lead to increased potential for weed spread or reinfestation. More areas where project-specific seed collection is permitted are needed, such as the areas described for commercial seed collection.

All other management actions for Alternative 2 will have a negligible impact on invasive species management.

4.2.5.3.5.1.4. Alternative 3

See Alternative 2. All other management actions for Alternative 3 that are not described in Alternative 2 or Impacts Common to All Alternatives will have a negligible impact on invasive species management.

4.2.5.3.5.1.5. Alternative 4

See Alternative 2. All other management actions for Alternative 4 that are not described in Alternative 2 or Impacts Common to All Alternatives will have a negligible impact on invasive species management.

4.2.5.3.5.2. Livestock Grazing Impacts on Weeds

4.2.5.3.5.2.1. Impacts Common to All Alternatives

Livestock are a mechanism for seed dispersal. Many invasive weed seeds are specifically designed to latch onto a passing animal or person and then be transported from one place to another. Livestock also create more disturbance of the ground than an area without livestock would receive. Designating all allotments that have an existing closure as permanently closed and designating unallotted areas in southern Nye County as permanently closed to livestock grazing will have a moderate to major indirect positive impact on weed management by reducing potential weed spread via livestock.

Managing rangelands for key perennial forage species would have a moderate indirect positive effect on invasive species management. By managing for key native perennials, native plant cover would be maintained or improved, thereby reducing the likelihood of weed invasions. This action may also directly benefit invasive weed management by removing or treating weed species to provide space and resources for native perennial species.

Developing new range improvements and water developments could have a moderate indirect negative impact on invasive species spread. Livestock-created disturbances (trampling, denuding, compaction, breaking soil crusts, etc.) are typically more densely concentrated around range improvements and water developments. This disturbance and lack of native vegetation create opportunities for weed introduction and spread. Since livestock transport weed seeds, the risk of introducing weeds into newly disturbed areas is high.

Incorporating standards and guidelines to improve or maintain rangeland health will indirectly benefit weed management. Healthy rangelands have a lower abundance of invasive grasses and noxious weeds, which promote fire spread. This would, in turn, reduce the likelihood of catastrophic fire that may destroy native vegetation, making larger areas more susceptible to weed invasion. Incorporating guidelines to improve rangeland health would indirectly prevent weed invasion.

In general, livestock grazing increases the spread of invasive weeds by creating disturbance and transporting weed seeds on or in the livestock themselves. However, in some areas in the western U.S., livestock grazing is used as a beneficial treatment for weed infestations by encouraging the livestock to eat the weed species over the native plants. While potential does exist within the planning area for this, it needs further research and development and has not been implemented. Several of the noxious and invasive weeds in the planning area are toxic to livestock. Widespread invasive weeds such as red brome and cheatgrass are only palatable for a very short time while they are green. This period of time does not correspond to a typical grazing schedule in the planning area.

4.2.5.3.5.2.2. Alternative 1

All other management directions not discussed in Impacts Common to All Alternatives will have a negligible impact on the management of invasive species.

4.2.5.3.5.2.3. Alternative 2

Under Alternative 2, all livestock grazing allotments would be closed.

4.2.5.3.5.2.4. Alternative 3

Alternative 3 closes eight allotments in addition to those that are already closed. These allotments include Roach Lake, White Basin, Mesa Cliff, Muddy River, Wheeler Wash, Arrow Canyon, Arrow Canyon in Battleship Wash, and Jean Lake. This leaves three allotments, as well as the Arizona-administered allotments, open for livestock grazing in the planning area. Livestock grazing can have a moderate to major negative impact on noxious and invasive weeds, particularly if it is done at inappropriate times of year or with inappropriate herd sizes. Because livestock create disturbance and carry weed seeds, it is easy for weeds to be spread in this manner. Therefore, closing these allotments to livestock grazing will have a positive impact on managing the spread of invasive weeds.

All other management directions not discussed in Impacts Common to All Alternatives will have a negligible impact on the management of invasive species.

4.2.5.3.5.2.5. Alternative 4

Alternative 4 closes five allotments in addition to those that are already closed. These allotments include Roach Lake, White Basin, Mesa Cliff, Arrow Canyon in Battleship Wash, and Jean Lake. This leaves five allotments and the Arizona-administered allotments open for livestock grazing in the planning area. Livestock grazing can have a moderate to major negative impact on noxious and invasive weeds, particularly if it is done at inappropriate times of year or with inappropriate herd sizes. Since livestock create disturbance as well as carry weed seeds, it is very easy for weeds to spread in this manner. Alternative 4 will still have a beneficial impact on managing the spread of invasive weeds, but to a lesser extent than Alternatives 2 and 3 since more area will be open to grazing in the planning area.

All other management directions not discussed in Impacts Common to All Alternatives will have a negligible impact on the management of invasive species.

4.2.5.3.5.3. Minerals Impacts on Weeds

4.2.5.3.5.3.1. Fluid Leasable Minerals Impacts on Weeds

4.2.5.3.5.3.1.1. Impacts Common to All Alternatives

Exploration and development operations associated with fluid leasable and locatable mineral development, mineral material sales, and mineral disposal typically disturb some level of vegetation. These disturbances directly result in increased potential for weed spread, including import and export of weed seeds. Typically the more acres that are developed, the higher the potential for weed spread. Constraints such as no surface occupancy (NSO) and controlled surface use (CSU) do not necessarily reduce the risk of weed spread on federal lands. NSO allows for some exploration activities and could result in the relocation of the disturbance to another site and CSU would constrain how and when the surface could be used, but would still allow disturbance. Since each individual site will vary in regards to weed presence, the impacts of constraints such as NSO (either harmful or beneficial) would vary on a specific site-by-site basis and would not able to be determined on such a large scale. For the purposes of this analysis, the greatest number of acres open to any fluid mineral leasing, regardless of constraints, will be considered to have the highest risk of potential weed spread.

Under all alternatives, BMPs would be implemented and revegetation concurrent with the operation would be required, re-establishing native vegetation and indirectly preventing weed spread. If mineral entry were to occur on a site that is infested with noxious and/or invasive weeds, the action would have to be mitigated for potential weed spread by treating weeds before, during, and after operations, as well as monitoring for weed spread.

4.2.5.3.5.3.1.2. Alternative 1

Alternative 1 has the highest number of acres open to fluid mineral leasing, regardless of constraints. At this broad a scale, it is not possible to determine whether this would have a negative impact. This determination would be made in a site-specific NEPA analysis. There

are multiple known noxious weed populations in the areas that would be open to fluid mineral leasing, such as Sahara mustard, puncturevine, Malta starthistle, and others. Because of the number of acres open to fluid mineral leasing, Alternative 1 has the highest likelihood of all the alternatives to impact weed spread.

4.2.5.3.5.3.1.3. Alternative 2

Alternative 2 has the fewest acres open overall for fluid mineral leasing, regardless of constraints, and the most acres closed to fluid mineral leasing of all the alternatives. Therefore, this alternative is the least likely to impact the potential for weed spread.

4.2.5.3.5.3.1.4. Alternative 3

Alternative 3 has the third most acres open overall to fluid mineral leasing. Although it does have more acres with constraints than Alternative 4, it is too broad of a scale to determine whether this would have a beneficial impact. This determination would be made in a site-specific NEPA analysis. There are multiple known populations of noxious and invasive weeds in the open areas. Alternative 3 had the second most acres closed to fluid mineral leasing. Therefore, the likelihood of potential weed spread would be lower than Alternatives 1 and 4.

4.2.5.3.5.3.1.5. Alternative 4

Alternative 4 has the second highest number of acres open overall for fluid mineral leasing and would close the least number of acres. At this broad scale, it is not possible to determine whether this would have a negative impact to noxious and invasive weeds. This determination would be made during site-specific NEPA analysis. There are multiple known infestations of noxious weeds in the open areas. The likelihood of potential weed spread would only be lower than Alternatives 1.

4.2.5.3.5.3.2. Solid Leasable Minerals Impacts on Weeds

4.2.5.3.5.3.2.1. Impacts Common to All Alternatives

Exploration and development operations associated with fluid leasable and locatable mineral development, mineral material sales, and mineral disposal typically disturb some level of vegetation. These disturbances directly result in increased potential for weed spread, including import and export of weed seeds. Typically the more acres that are open to mineral development, the higher the potential for weed spread. Since each individual site will vary in regards to weed presence, the actual impacts would vary on a specific site-by-site basis and would not able to be determined on such a large scale. For the purposes of this analysis, the greatest number of acres open to solid mineral leasing will be considered to have the highest risk of potential weed spread.

Under all alternatives, BMPs would be implemented and revegetation concurrent with the operation would be required, re-establishing native vegetation and indirectly preventing weed spread. If mineral entry occurs on a site that is infested with noxious and/or invasive weeds, the action would have to be mitigated for potential weed spread by treating weeds before, during, and after operations, as well as monitoring for weed spread.

In all alternatives, solid mineral leasing is closed in riparian areas and natural springs. This will have a beneficial impact to the management of invasive species. Riparian areas and springs can have high densities of noxious and invasive weeds due to the availability of water. Disturbance in these areas can drastically exacerbate the weed problems. By closing these areas to solid mineral leasing, the potential for weed spread is reduced.

4.2.5.3.5.3.2.2. Alternative 1

Alternative 1 has the second largest number of acres open to solid mineral leasing and the second fewest acres closed of all the alternatives. There are multiple known noxious weed populations in the areas that would be open to solid mineral leasing, but weed treatment and monitoring can mitigate the risk of spreading these populations. Since Alternative 1 has more acres open to solid mineral leasing than Alternatives 2 and 3, it has a comparatively higher risk of negatively impacting weed spread.

4.2.5.3.5.3.2.3. Alternative 2

Alternative 2 has the fewest acres open to solid mineral leasing and the greatest number of closed acres of all the alternatives. There are multiple known noxious weed populations in the areas that would be open to solid mineral leasing, but weed treatment and monitoring can mitigate the risk of spreading these populations. Because Alternative 2 has the smallest acreage open to solid mineral leasing, it has the lowest potential to spread weeds.

4.2.5.3.5.3.2.4. Alternative 3

Alternative 3 has the second lowest number of acres open to solid mineral leasing and the second largest number of acres closed. There are multiple known noxious weed populations in the areas that would be open to solid mineral leasing, however weed treatment and monitoring can mitigate the risk of spreading these populations. Since Alternative 3 has a lower amount of acres open to solid mineral leasing than Alternatives 1 and 4, it has a comparatively lower risk of negatively impacting weed spread.

4.2.5.3.5.3.2.5. Alternative 4

Alternative 4 has the greatest number of acres open to solid mineral leasing and the fewest acres closed. There are multiple known noxious weed populations in the areas that would be open to solid mineral leasing, however weed treatment and monitoring can mitigate the risk of spreading these populations. Because Alternative 4 has the largest number of acres open to solid mineral leasing, it has the highest potential to negatively impact the spread of noxious and invasive weeds of all the alternatives.

4.2.5.3.5.3.3. Locatable Minerals Impacts on Weeds

4.2.5.3.5.3.3.1. Impacts Common to All Alternatives

Exploration and development operations associated with fluid leasable and locatable mineral development, mineral material sales, and mineral disposal typically disturb some level of vegetation. These disturbances directly result in increased potential for weed spread, including import and export of weed seeds. Typically the more acres that are open to mineral development,

the higher the potential for weed spread. Since each individual site will vary in regards to weed presence, the actual impacts would vary on a specific site-by-site basis and are not able to be determined on such a large scale. For the purposes of this analysis, the greatest number of acres open to locatable mineral development will be considered to have the highest risk of potential weed spread.

Under all alternatives, BMPs would be implemented and revegetation concurrent with the operation would be required, re-establishing native vegetation and indirectly preventing weed spread. If mineral entry occurs on a site that is infested with noxious and/or invasive weeds, the action would have to be mitigated for potential weed spread by treating weeds before, during, and after operations, as well as monitoring for weed spread.

4.2.5.3.5.3.3.2. Alternative 1

Alternative 1 has the greatest number of acres that would remain open to locatable mineral development after withdrawals. There are multiple known noxious weed populations in the areas that would be open to locatable mineral development, but weed treatment and monitoring can mitigate the risk of spreading these populations. Because Alternative 1 has the largest number of acres open to locatable mineral development, it has the highest potential to negatively impact the spread of noxious and invasive weeds.

4.2.5.3.5.3.3.3. Alternative 2

Alternative 2 has the fewest acres that would remain open to locatable mineral development after withdrawal. There are multiple known noxious weed populations in the areas that would be open to locatable mineral development, however weed treatment and monitoring can mitigate the risk of spreading these populations. Because Alternative 2 has the smallest acreage open to locatable mineral development, it has the lowest potential to spread weeds of all the alternatives.

4.2.5.3.5.3.3.4. Alternative 3

Alternative 3 has the second largest number of acres that would remain open to locatable mineral development after withdrawal. There are multiple known noxious weed populations in the areas that would be open to locatable mineral development, however weed treatment and monitoring can mitigate the risk of spreading these populations. Since Alternative 3 has more acres open to locatable mineral development than Alternatives 2 and 4, it has a comparatively higher risk of negatively impacting weed spread.

4.2.5.3.5.3.3.5. Alternative 4

Alternative 4 has the second lowest number of acres that would remain open to locatable mineral development after withdrawal. There are multiple known noxious weed populations in the areas that would be open to locatable mineral development, however weed treatment and monitoring can mitigate the risk of spreading these populations. Since Alternative 4 has a lower amount of acres open to locatable mineral development than Alternatives 1 and 3, it has a comparatively lower risk of negatively impacting weed spread.

4.2.5.3.5.3.4. Saleable Minerals Impacts on Weeds

4.2.5.3.5.3.4.1. Impacts Common to All Alternatives

Exploration and development operations associated with fluid leasable and locatable mineral development, saleable mineral development, and mineral disposal typically disturb some level of vegetation. These disturbances directly result in increased potential for weed spread, including import and export of weed seeds. Typically the more acres that are open to mineral development, the higher the potential for weed spread. Since each individual site will vary in regards to weed presence, the actual impacts would vary on a specific site-by-site basis and would not able to be determined on such a large scale. For the purposes of this analysis, the greatest number of acres open to saleable mineral development will be considered to have the highest risk of potential weed spread.

Under all alternatives, BMPs would be implemented and revegetation concurrent with the operation would be required, re-establishing native vegetation and indirectly preventing weed spread. If mineral entry occurs on a site that is infested with noxious and/or invasive weeds, the action would have to be mitigated for potential weed spread by treating weeds before, during, and after operations as well as monitoring for weed spread.

All alternatives include a management action that allows free-use permits to be issued to governmental entities within ACECs within one quarter mile of the center line of federal and state highways and county roads. Roadsides are frequently infested with noxious and invasive weeds due to the frequent disturbance along the side of the road and the transport of weed seeds on vehicles passing by. Additionally, water often flows down roadways, allowing weed species to germinate and survive better in these areas. Authorizing ground-disturbing activities along roadsides will further increase the risk of weed infestations and weed spread from one place to another by vehicles. Permits must include stipulations to continuously treat and monitor weed spread to mitigate the risks in these areas.

4.2.5.3.5.3.4.2. Alternative 1

Alternative 1 has the greatest number of acres open to saleable mineral development. There are multiple known noxious weed populations in the areas that would be open to saleable mineral development, but weed treatment and monitoring can mitigate the risk of spreading these populations. Because Alternative 1 has the largest number of acres open to saleable mineral development, it has the highest potential to negatively impact the spread of noxious and invasive weeds.

4.2.5.3.5.3.4.3. Alternative 2

Alternative 2 has the fewest acres that would be open to saleable mineral development. There are multiple known noxious weed populations in the areas that would be open to salable mineral development, but weed treatment and monitoring can mitigate the risk of spreading these populations. Because Alternative 2 has the smallest acreage open to saleable mineral development, it has the lowest potential to spread weeds.

4.2.5.3.5.3.4.4. Alternative 3

Alternative 3 has the second lowest number of acres open to saleable mineral development. There are multiple known noxious weed populations in the areas that would be open to saleable mineral development, but weed treatment and monitoring can mitigate the risk of spreading these populations. Since Alternative 3 has a lower amount of acres open to locatable mineral development than Alternatives 1 and 4, it has a comparatively lower risk of negatively impacting weed spread.

4.2.5.3.5.3.4.5. Alternative 4

Alternative 4 has the second largest number of acres open to saleable mineral development. There are multiple known noxious weed populations in the areas that would be open to saleable mineral development, but weed treatment and monitoring can mitigate the risk of spreading these populations. Since Alternative 4 has more acres open to saleable mineral development than Alternatives 2 and 3, it has a comparatively higher risk of negatively impacting weed spread.

4.2.5.3.5.4. Recreation Impacts on Weeds

4.2.5.3.5.4.1. Impacts Common to All Alternatives

Recreational activities can introduce and spread noxious and invasive weed seeds from vehicles, shoes, clothing, and recreational equipment. As recreation use increases, visitors from outside the area could bring in noxious and invasive weeds, including new invasive species on vehicles, clothing, gear, etc. Recreation activities that occur in undisturbed and remote areas could distribute weeds seeds into weed-free areas. Impacts could be moderate to major, direct and long term, and could take place over a large area. Site-specific NEPA analysis would be done on an implementation level to minimize impacts from weeds.

Large or repetitive events such as speed- and non-speed based events, OHV tours, etc., pose a particularly high risk to the spread of invasive weeds based on the large numbers of vehicles (either at once or over time) that could transport or spread weed seeds or reproductive parts. Additionally, speed-based events tend to create new disturbance around tight turns, in silty soil, and/or by taking shortcuts around designated routes. New disturbance combined with weed transport vectors could have major negative consequences for the management of invasive species. Mitigation measures and education on these types of permitted events is especially important.

4.2.5.3.5.4.2. Alternative 1

Under Alternative 1, management actions are very minimal, and no emphasis is placed on visitor outreach and education. This would have a major and indirect negative impact on the spread of invasive weeds. Some members of the public may not be aware of the problems caused by noxious and invasive species, may not recognize them on the land, and may not know what they can do to minimize the spread. Recreation has a high potential to spread invasive weeds. As recreational uses of public lands increase, so will the spread of weeds, unless it is mitigated through education and management prescriptions.

4.2.5.3.5.4.3. Alternatives 2 and 3

Alternatives 2, 3, and 4 all have a management action about providing visitors with information about resources and regulations on public lands. This will have a major positive impact on invasive species management. Teaching the public about noxious and invasive species, how to identify them, and what they can do to minimize the risk of spreading them will help prevent weed spread on a large scale.

Alternatives 2, 3, and 4 also include a management action that camping must occur in designated places or in previously disturbed sites if no designations are made. This action will have a moderate and indirect positive impact on invasive weed management. Designated sites can be regularly monitored for weed infestations and treated if necessary. Most disturbed sites that are used for camping have compacted soils and are used frequently enough that they are not ideal places for weeds to germinate. However, newly disturbed soil, created by setting up camp in a previously undisturbed site, creates an ideal place for weed spread. Weed seeds can travel on people, on vehicles, on pets, and on camping equipment. People could unknowingly distribute invasive weed seeds of a new species into freshly disturbed soil and create a new infestation on public lands.

Alternatives 2, 3, and 4 all have a management action that all permitted events will remain on designated routes, or existing routes in areas that have not been designated. This will have a major beneficial impact on the spread of weeds by limiting the amount of new disturbance. Recreational activities can spread weeds along designated or existing routes, as well. Routes should be regularly monitored for weed introduction or spread. Weed mitigation measures will be included as part of the special recreation permit to minimize the spread of weeds.

Increasing designations of special recreation management areas (SRMAs) and extensive recreation management areas (ERMAs) (Alternatives 2 and 3) from current levels could increase recreational use of these areas. This has the potential to negatively impact the spread of invasive species by increasing disturbance and vectors of weed seed spread. Conversely, designating these areas as SRMAs and ERMAs may reduce other types of disturbance such as mineral development, ROWs, leases, etc. Reduction of these types of disturbance is beneficial for weeds management while increases in recreation would have negative impacts. Mitigation through education, outreach, staying on designated roads, camping in designated locations, and implementing permit stipulations would help reduce this risk.

All other proposed management actions not described above or in Impacts Common to All Alternatives would have a negligible impact on the management of invasive species.

4.2.5.3.5.4.4. Alternative 4

In Alternative 4, there are fewer areas designated as SRMAs and ERMAs. This could have potentially positive and negative impacts for the management of invasive species. On the positive side, by not designating many of these areas as SRMAs and ERMAs, recreation activities would not be emphasized as much in these areas and would be focused elsewhere. Since recreational activities can increase the spread of weeds, reducing the number of recreational areas would be beneficial to weeds management. However, on the negative side, if these areas are not designated as SRMAs and ERMAs, they may be available for other types of ground-disturbing activities such as disturbance associated with ROWs, renewable energy, mineral exploration and development, leases, etc. These types of disturbances, depending on the size and duration, could be a larger

threat to the spread of weeds than recreation activities. As long as the impacts of designating more SRMAs and ERMAs are properly mitigated, the use of these areas for recreational purposes would likely have less negative impact on the spread of invasive weeds than would larger disturbances associated with development and ROWs.

4.2.5.3.5.5. Travel and Transportation Impacts on Weeds

4.2.5.3.5.5.1. Impacts Common to All Alternatives

Impact from travel and transportation management are similar to those of recreation. Off-highway vehicles (OHVs) could directly introduce and spread noxious and invasive weed seeds from vehicles and the riders' shoes, clothing, and recreational equipment. As OHV use increases, visitors from outside the area could bring in noxious and invasive weeds from other locations, including invasive species not previously found in the planning area. OHV activities in undisturbed and remote areas could distribute weed seeds into weed-free areas.

OHVs can spread weeds to remote locations that cannot be accessed by other means. An OHV area allocation of open would create the greatest level of risk for spreading weeds. In an open area, there are no restrictions on where visitors can travel, so weeds could be spread to any point in the open area, and from any point in the open area, to other weed-free areas. The places with the least amount of negative impact in which to allocate as open from a weed risk standpoint are areas that are already unvegetated or denuded and are used frequently enough that weeds would not be able to establish there. Limited use OHV areas have less risk than open areas. While weeds will still be spread by OHVs, they are limited to designated routes, so weed infestations will begin at or near the road or route and spread from there. A limited area offers more manageability from a weeds management standpoint. Designated routes can be periodically monitored for new or spreading weed infestations without having to monitor the entire area. Closed areas would result in the lowest risk of weed spread. Since OHVs are a known mechanism for weed seed dispersal, a closed area would have a greatly reduced risk of weeds spreading in this manner.

Other modes of travel such as hiking, equestrian, or cycling would likely cause fewer impacts than motorized travel. However, these modes of travel could still disturb soils, causing indirect effects or allowing for weed seed transport. Horses in particular have a higher risk of introducing weed seeds onto previously unaffected areas through manure. Groups of horses may also create soil and vegetation disturbances in areas where they are tethered overnight, increasing the potential for weed spread in confined areas.

4.2.5.3.5.5.2. Alternative 1

Alternative 1 has the largest number of acres allocated as open to OHVs, which would create the largest negative impact on the spread of invasive species. However, Alternative 1 also has more acres allocated as closed than Alternatives 3 and 4 (but less than Alternative 2).

Alternative 1 also has a fourth designation of limited to existing roads, trails, and dry washes. This category contains the majority of the acres for Alternative 1. This allocation has a higher negative impact on weed management than the limited to designated routes allocation does. This is because there are more travel routes for weeds to spread on and more routes to monitor if any existing road, trail, or dry wash is open to use. It is also very difficult to enforce this designation, and it can quickly lead to expanding numbers of roads and trails.

Alternative 1 does not include any management actions that address travel management and route designation guidelines. The lack of these actions would have an indirect negative impact on invasive weed management. Not taking into account resource effects of specific travel routes could result in more disturbance and degradation to native plant communities, which would result in more opportunities for weed spread.

4.2.5.3.5.5.3. Alternative 2

Alternative 2 has the smallest number of acres allocated as open and the largest amount of acres allocated as closed. Therefore, Alternative 2 would have the least amount of negative impacts.

Alternatives 2, 3, and 4 have management actions that would designate specific travel management areas and create corresponding travel management plans. Route designation would be guided by criteria to protect wildlife, vegetation, threatened and endangered species, and other resources. If OHVs are causing significant adverse effects on any resources, the affected areas will be closed to travel until the situation can be remedied and mitigated. These management actions will have an indirect beneficial impact on the management of invasive species. Travel planning and route designation using resource criteria will promote healthy vegetation and fewer disturbances, which in turn will reduce the spread of weeds. If weeds are becoming a problem in a specific area due to travel, the routes would be closed until the weed problem could be addressed. This would prevent unnecessary spread and introduction of noxious and invasive species.

4.2.5.3.5.5.4. Alternative 3

Alternative 3 has the second highest number of acres allocated as open, after Alternative 1. Alternative 3 also has the lowest number of acres allocated as closed. Alternative 3 would create a higher level of negative impact on invasive weeds management than Alternatives 2 or 4.

4.2.5.3.5.5.5. Alternative 4

Alternative 4 has the second lowest number of acres allocated as open, after Alternative 2. It has a significantly lower number of acres open than does Alternative 3. Alternative 4 also has the second lowest number of acres allocated as closed, but the number of closed acres is very close to the number of closed acres in Alternative 3. Therefore, Alternative 4 would likely have less negative impact on invasive weeds management than Alternatives 1 and 3, but a greater negative impact than Alternative 2.

See Alternative 2 and Impacts Common to All Alternatives for more impacts from Alternative 4. All other management actions will have a negligible impact on invasive species management.

4.2.5.3.5.6. Lands and Realty Impacts on Weeds

4.2.5.3.5.6.1. Land Tenure (Disposals and Acquisitions) Impacts on Weeds

4.2.5.3.5.6.1.1. Impacts Common to All Alternatives

Noxious and invasive weeds would be given consideration when the field offices or the district office make disposal and acquisition decisions, though the presence of invasive species would not considerably affect these decisions. As a result, weed spread or introduction to BLM-administered

lands would vary on a case-by-case basis, but impacts would likely be minimized since lands with little resource values would be identified for disposal, and further NEPA documentation would consider the potential for weed spread resulting from proposed actions. For lands being disposed of, treatment of noxious weeds would become the responsibility of the new owner.

4.2.5.3.5.6.1.2. Alternatives 1 through 4

There are no additional impacts to weed management.

4.2.5.3.5.6.2. Land-Use Authorizations (Right-of-Ways, Leases, Permits) Impacts on Weeds

4.2.5.3.5.6.2.1. Impacts Common to All Alternatives

ROWs alter habitats with their footprint for the facilities that are authorized. Most of the footprints are localized and cover a small area, but ROWs can be linear and stretch for many miles. If the disturbed areas are not properly reseeded with native vegetation, weeds could be introduced or spread over a large area. The risk of weed spread for each specific land-use authorization would be analyzed during site-specific NEPA analysis. Prevention measures, mitigation measures, BMPs, restoration requirements, or weed management plans may be used to lessen the risk depending on the size, location, and level of risk each project creates.

Placing linear ROWs inside existing utility corridors would have less negative impacts on the management of noxious and invasive weeds than creating new linear disturbances would. Using existing corridors will minimize the amount of new disturbance that could increase the spread of weeds. Additionally, it is more practical to manage weed infestations if there are fewer areas to monitor and treat. The utility corridors would be at high risk for weed spread because they would be disturbed and have frequent vehicle traffic, which could move weed seeds. But by consolidating multiple linear ROWs into one corridor, the entire corridor could be monitored and treated at the same time and the overall spread and distribution of weeds would be minimized. Similarly, maximizing the use of existing communication sites rather than creating new ones would also reduce the spread of weeds by limiting new disturbance.

4.2.5.3.5.6.2.2. Alternative 1

Alternative 1 has the fewest areas that are ROW avoidance or exclusion areas. By not designating as many of these areas, Alternative 1 would have the highest negative impact on potential weed spread by creating more opportunities for development, causing more soil and vegetation disturbance. This would be particularly impactful in sensitive resource areas or riparian zones.

4.2.5.3.5.6.2.3. Alternative 2

Alternative 2 has the most areas that are ROW avoidance or exclusion areas. Designating these areas as avoidance and exclusion would result in the least amount of negative impact to noxious and invasive weed spread by limiting the amounts of disturbance to soil and vegetation, particularly in sensitive resource areas.

4.2.5.3.5.6.2.4. Alternative 3

Alternative 3 has more areas that would be ROW avoidance or exclusion areas than Alternatives 1 and 4. However, it has fewer exclusion areas than Alternative 2. Overall, this would result in less negative impacts to noxious and invasive weed spread than Alternatives 1 or 4. This would be particularly beneficial in sensitive resource areas and riparian zones.

4.2.5.3.5.6.2.5. Alternative 4

Alternative 4 has fewer areas that would be designated as ROW exclusion and avoidance areas than Alternatives 2 and 3. Not designating as many of these areas would result in more negative impacts by allowing more development, which would disturb more soil and vegetation. This would be particularly impactful in sensitive resource areas and riparian zones.

4.2.5.3.5.6.3. Renewable Energy Impacts on Weeds

4.2.5.3.5.6.3.1. Impacts Common to All Alternatives

Developing renewable energy projects could directly introduce weed seeds or produce soil disturbance that indirectly favors weeds. Impacts would vary according to size, location, and type of renewable energy development and related infrastructure. Developing such projects may include issuing ROWs, constructing staging areas, constructing access roads, and blading sites, which would disturb soils and vegetation. As a result, the potential for weed spread would increase in these areas. BMPs, stipulations, mitigation measures, restoration plans, and weed management plans would be implemented to minimize the spread or introduction of weeds from renewable energy projects.

In general, solar energy development will have a larger negative impact on invasive species management than wind energy development. This is because in most solar energy developments, the entire site is bladed, vegetation is removed, and soil is disturbed, leaving the site open to weed invasion. In most wind energy developments, less vegetation and soil is disturbed because only the areas where the towers and access roads will be constructed are bladed.

4.2.5.3.5.6.3.2. Alternative 1

Alternative 1 has the least acres excluded from solar development of all the alternatives. Alternative 1 also has the most acres open for wind development. It has the fewest acres designated as solar energy zones, but this does not preclude solar development on non-excluded acres outside of these zones. Additionally, Alternative 4 establishes four new solar energy zones where solar development would be concentrated. For these reasons, Alternative 1 is expected to have the highest level of negative impacts on invasive species management.

4.2.5.3.5.6.3.3. Alternative 2

Alternative 2 has fewer acres excluded and more acres open to solar energy development than Alternative 3. However, it has more acres excluded and fewer acres open to wind energy development than Alternative 3. Since solar energy is expected to have a larger negative impact on weed spread, Alternative 2 will likely have a larger negative impact than Alternative 3.

4.2.5.3.5.6.3.4. Alternative 3

Alternative 3 has more acres excluded and fewer acres open to solar development than Alternative 2. Alternative 3 has fewer acres excluded and more acres open to wind development than Alternative 2. Alternative 3 has more acres excluded from both solar and wind development than Alternative 4. Since solar development is expected to have a larger negative impact than wind development on weed spread, Alternative 3 will have less of a negative impact than Alternatives 2 and 4.

4.2.5.3.5.6.3.5. Alternative 4

Alternative 4 has fewer acres excluded from both solar and wind energy development than Alternatives 2 and 3. Unlike Alternatives 2 and 3, Alternatives 1 and 4 have solar and wind energy avoidance areas. These will have some beneficial impact on weed spread; however they do not completely preclude development in these areas. Therefore, Alternative 4 is expected to have a larger level of negative impact on weed management than Alternatives 2 and 3.

4.2.5.3.5.6.4. Utility Corridors Impacts on Weeds

4.2.5.3.5.6.4.1. Impacts Common to All Alternatives

Placing linear ROWs inside existing utility corridors would have less of a negative impact on the management of noxious and invasive weeds than if utilities are spread out in different locations. Using existing corridors will minimize the amount of new disturbances that could increase the spread of weeds. Additionally, it is more practical to manage weed infestations if there are fewer areas to monitor and treat. The utility corridors will be at high risk for weed spread since they will be disturbed and have frequent vehicle traffic, which could move weed seeds. But by consolidating multiple linear ROWs into one corridor, the entire corridor can be monitored and treated at the same time and the overall spread and distribution of weeds throughout the planning area is minimized.

The larger the width of utility corridors, the greater the potential for negative impacts because more soil and vegetation will be disturbed. Additionally, more vehicles may travel through the corridor spreading weed seeds from one place to another. Multiple infestations of noxious weeds are known to occur in the proposed corridor locations. The specific impact would be determined through site-specific NEPA analysis. Mitigation measures, prevention, BMPs, restoration plans, and weed management plans would be implemented to reduce the risk of spreading or introducing invasive species in these areas.

4.2.5.3.5.6.4.2. Alternatives 1 through 4

There are no additional impacts on weeds.

4.2.5.3.6. Special Designations

4.2.5.3.6.1. Areas of Critical Environmental Concern Impacts on Weeds

4.2.5.3.6.1.1. Impacts Common to All Alternatives

Overall, the designation of ACECs would have an indirect positive impact on the spread of invasive species. This is because in general, ACECs limit surface-disturbing activities (ROWs, mineral exploration and development, travel management, etc.) to protect relevant and important resource values. Fewer disturbances mean fewer opportunities for invasive weeds to spread. Also, ACECs that have visual resources as one of the relevant and important values will typically receive a VRM rating of Class 1 or 2. This will also benefit the spread of invasive weeds by limiting disturbances to meet VRM class criteria.

Depending on what relevant and important values are responsible for the designation of an ACEC, there could be limitations to the types of weed treatments that can be performed. For example, desert tortoise ACECs limit the use of herbicides, and visual ACECs limit the use of certain mechanical treatments or fencing. However, these limitations are not expected to completely stop the treatment of noxious and invasive weeds. Weeds management in ACECs is often of critical importance to protect relevant and important values.

4.2.5.3.6.1.2. Alternative 1

Alternative 1 has the fewest ACEC designations and therefore will have the least amount of beneficial impact to the spread of weeds.

4.2.5.3.6.1.3. Alternative 2

Alternative 2 has the most ACEC designations and the strictest management prescriptions in terms of surface disturbance. Therefore, Alternative 2 would have the most beneficial impact to invasive species management.

Under Alternatives 2 and 3, there is a management action that says to attain no unmitigated loss of relevant and important resource values due to BLM-authorized activities. Treatment of large or severe weed infestations may have a temporary loss of resource values due to long recovery times in the Mojave Desert. However, in the long term, weed treatment would benefit the relevant and important resource values.

Alternatives 2, 3, and 4 limit project-specific seed collection to an area of 1,000 feet around the project site. This may negatively impact invasive weed management. If the area to be seeded is large (such as post wildfire rehabilitation), 1,000 feet around the site may not be enough area to collect the appropriate number of seeds. Also, if all of the seeds needed on a large project were taken from that 1,000-foot buffer area, the seed collection would take a large percentage of all of the seeds in that area, thereby reducing the seed bank for the area adjacent to the project. If not enough native, genetically appropriate seed is available, restoration will not be as effective and may lead to increased potential for weed spread or reinfestation. More areas where project-specific seed collection is permitted are needed, such as the areas described for commercial seed collection.

Alternatives 2, 3, and 4 have a management action to restore all temporary disturbance in ACECs. This would have a direct positive impact on weed spread by providing native competition in disturbed areas and reducing the potential for weeds to invade.

4.2.5.3.6.1.4. Alternative 3

Alternative 3 has significantly more ACEC designations than Alternatives 1 and 4, and only slightly fewer designations than Alternative 2. It also has management prescriptions that limit the majority of surface-disturbing activities. Therefore, Alternative 3 will have more beneficial impacts on weed spread than Alternatives 1 and 4, and only slightly less beneficial impacts than Alternative 2.

4.2.5.3.6.1.5. Alternative 4

Alternative 4 has significantly fewer ACEC designations than Alternatives 2 and 3, and only slightly more designations than Alternative 1. It also has the most lenient management prescriptions, which allow higher levels of disturbance. Therefore, Alternative 4 will have less beneficial impacts than Alternatives 2 and 3.

4.2.5.3.6.2. National Trails Impacts on Weeds

4.2.5.3.6.2.1. Impacts Common to All Alternatives

National trails have the potential to increase the spread of invasive or noxious species by increasing recreational use in remote areas. Humans, pets, clothing, and gear are known mechanisms of weed seed spread, and by traveling on national trails, they could spread weeds into areas that are not typically at risk from infestation. Monitoring and weed treatment along national trails would be needed to reduce this risk.

4.2.5.3.6.2.2. Alternatives 1 through 4

There are no additional impacts on weeds.

4.2.5.3.6.3. Wild and Scenic Rivers Impacts on Weeds

4.2.5.3.6.3.1. Impacts Common to All Alternatives

Tamarisk, camelthorn, and other noxious weeds are found in many river corridors, springs, and riparian areas in the planning area. These areas intersect or include sensitive species habitats and overlap wild and scenic river (WSR) areas. Impacts to noxious weed management would depend on the designation, constraints, and management requirements. Overall, designation of WSR segments would offer protection to areas by limiting surface-disturbing activities. This would in turn, provide beneficial impacts to invasive weed management by limiting areas of disturbance for weeds to infest.

Depending on the classification of the WSR segment, certain weed treatments may be limited because vehicle access may not be allowed. However, these limitations are not expected to completely preclude weed treatments, as overall, weed treatments would benefit the WSR segments by preserving outstandingly remarkable values.

4.2.5.3.6.3.2. Alternative 1

In Alternative 1, seven river segments would remain eligible for inclusion in the WSR system but would not receive the WSR designation at this time. However, these segments would receive interim management to protect the outstandingly remarkable values. While this alternative would not provide the long-term protection from surface-disturbing activities that Alternative 2 would, it still provides interim protection and management actions that limit disturbance. Alternative 1 would result in less beneficial impacts on invasive species management than Alternative 2, but more than Alternative 4.

4.2.5.3.6.3.3. Alternative 2

In Alternative 2, seven eligible river segments would be determined suitable for WSR designation, totaling 28.5 miles on BLM land. The management prescriptions for segments designated as wild would have the most beneficial impact on invasive species management by closing the area to mineral development, motorized travel, and ROWs. These prescriptions would greatly reduce the potential amount of disturbance and thereby limit opportunities for further weed spread. Segments designated as scenic or recreational would also have a beneficial impact on invasive species management by limiting ground-disturbing activities somewhat (but not to the extent of the wild designation). Since the most segments would be receiving the WSR designation under Alternative 2, it would have the most beneficial impacts on weed management.

However, WSR designation may limit the types of weed treatments that can be implemented in areas with known noxious weed infestations. However, these limitations are not expected to preclude weed treatment completely. Overall, management of noxious weeds in these segments would be beneficial to protect the characteristics that led to the WSR designation.

4.2.5.3.6.3.4. Alternative 3

In Alternative 3, only one eligible river segment would be determined suitable for WSR designation. This segment would receive the classification of recreational. This designation would still offer some protection to Meadow Valley Wash by limiting the amount of surface-disturbing activities. Since there would be no restrictions on motorized travel in Alternative 3, weed treatment options would not be as limited as in Alternative 2. However, significantly less area would receive the WSR designation in Alternative 3, offering less protection overall and less benefits to preventing weed spread.

4.2.5.3.6.3.5. Alternative 4

In Alternative 4, no segments would be determined suitable for WSR designation. Therefore, no segments would receive the protection of management prescriptions that limit surface-disturbing activities. This would have the least beneficial impacts to invasive species management.

4.2.5.3.6.4. Wilderness Impacts on Weeds

4.2.5.3.6.4.1. Impacts Common to All Alternatives

There are no impacts common to all alternatives for wilderness management.

4.2.5.3.6.4.2. Alternative 1

Alternative 1 has no management actions for wilderness. The absence of these actions has an indirect negative effect on the management of invasive weeds because these areas are not afforded any protection from weed-spreading vectors, such as vehicles, equipment, development, ROWs, etc.

4.2.5.3.6.4.3. Alternative 2

Alternatives 2, 3, and 4 have a management action to manage 12 wilderness areas within the planning area. The designation of wilderness provides protection to the area and prevents most surface-disturbing activities, as well as many activities known to spread weeds (such as vehicles, OHV, motorized equipment, etc.). Because of this, wilderness designations have an indirect beneficial impact on the management of invasive species.

Wilderness does limit the types of weed treatments that could be done in these areas. In most situations, motorized or mechanized equipment, as well as vehicles, cannot be used. Therefore, weed treatments would not involve chainsaws, chippers, plows, etc. Weed treatment personnel would have to hike in with equipment and supplies or use pack animals to carry equipment. Weed treatment in these areas would require more time and planning, but treatments can still be accomplished. Overall, wilderness areas have a proportionately lower amount of noxious and invasive weeds than other parts of the planning area due to the restrictions in place. If noxious weed species are found in wilderness areas, they would be treated as soon as possible using the EDRR method before they spread to adjacent lands. These restrictions are not expected to impede the treatment of noxious weeds altogether, but they may be more time-intensive, which may increase the cost of treatment.

Alternatives 2, 3, and 4 include a management direction to limit the number of access points into existing and future wilderness areas. This action would have an indirect beneficial impact on invasive species management. Human beings are known vectors that can carry weed seed from one place to another. Limiting access points will limit the areas where weed infestations will begin within the wilderness area. By frequently monitoring around the access points and treating as soon as weeds are found, weed infestations can be contained and possibly eradicated within the wilderness areas.

4.2.5.3.6.4.4. Alternative 3

See Alternative 2. Management actions not discussed in Alternative 2 will have a negligible impact on invasive species management.

4.2.5.3.6.4.5. Alternative 4

See Alternative 2. Management actions not discussed in Alternative 2 will have a negligible impact on invasive species management.

4.2.5.3.6.5. Wilderness Study Areas Impacts on Weeds

4.2.5.3.6.5.1. Impacts Common to All Alternatives

Managing wilderness study areas (WSAs) within the planning area would minimize activities that would normally increase the potential for weed spread. Limiting vehicles to designated routes will lower the risk of weed spread into remote areas. Hikers can potentially spread weeds into these areas, as well. Mitigation, education, and BMPs will help reduce this risk. Overall, the management of WSAs will have an indirect beneficial impact on invasive species spread.

Certain types of weed treatments could be limited within WSAs, lowering the effectiveness of weed control or eradication in these areas in the long term. However, these limitations would not completely preclude weed treatment in these areas.

4.2.5.3.6.5.2. Alternatives 1 through 4

There are no additional impacts on weeds.

4.2.5.3.7. Social and Economic Impacts on Weeds

4.2.5.3.7.1. Tribal Interests Impacts on Weeds

4.2.5.3.7.1.1. Impacts Common to All Alternatives

Weeds management is likely a common interest. Collaborative agreements could created to improve weed management. Tribal interest could limit the types of weed treatments that could be used in areas that have Native American religious importance, reducing the effectiveness of weed management in that area.

Management of tribal interests would be expected to have little effect on weed management and would be managed at current levels.

4.2.5.3.7.1.2. Alternatives 1 through 4

There are no additional impacts on weeds.

4.2.5.3.7.2. Public Health and Safety Impacts on Weeds

4.2.5.3.7.2.1. Impacts Common to All Alternatives

Concerns over public health and safety may limit or create difficulties implementing certain types of weed treatments. For example, some members of the public do not approve of herbicide treatments because of health and safety concerns. As long as herbicides are used in a manner consistent with the label and supplemental BLM mitigation measures, there would be no impact on public health and safety. Education could help mitigate these concerns.

Improper storage of large quantities of pesticides can create a risk to public health and safety by creating the potential for leaks, fires, or explosions. These risks are almost completely mitigated

by following storage guidelines on labels and are consistent with federal and local rules. The fire company will be made aware of the location and contents of pesticide storage facilities.

4.2.5.3.7.2.2. Alternatives 1 through 4

There are no additional impacts on weeds.

4.2.5.3.7.3. Social and Economic Conditions Impacts on Weeds

4.2.5.3.7.3.1. Impacts Common to All Alternatives

Managing noxious and invasive species is an expensive task. It is estimated that on a national scale, the value of management actions and damages to wildland and agricultural land caused by the spread of invasive species has cost billions of dollars. This impact is not only felt by the federal government, but also by states, counties, cities, and private landowners.

As the population of southern Nevada increases, the risk of further spread of invasive species will increase. The costs of management actions needed to control and eradicate noxious weed spread will continue increasing, as well. Efficiencies can be had by creating partnerships to manage invasive species, such as cooperative weed management areas.

4.2.5.3.7.3.2. Alternatives 1 through 4

There are no additional impacts on weeds.

4.2.5.3.8. Cumulative Impacts on Weeds

4.2.5.3.8.1. Past and Present Actions/Impacts

Past and present actions that are relevant to weed management include land tenure changes, fires and suppression, fuel and vegetation treatments, mineral development, population growth, urban development, ROWs, renewable energy development, recreational use, travel management, restoration activities, grazing, regional planning efforts, and weed management efforts. The types of impacts that have occurred and would continue to occur from weed infestations include the loss of plant diversity, loss of wildlife habitats, loss of soil integrity, changes in fire intensity and frequency, loss of hydrologic function, and overall reduced ecosystem function.

Past and present actions that have been and are currently being used to manage invasive weeds include weed inventory, weed treatment, monitoring of treatments, NEPA analysis, pesticide use tracking, education and outreach, partnerships, and managing invasive animal and insect species.

4.2.5.3.8.2. Reasonable Foreseeable Actions

Reasonably foreseeable future actions that would affect weed management include increasing population growth, increasing use of public lands, increasing mineral and renewable energy development, increasing recreational use, increasing fire frequency and intensity, and increases in development.

Future actions that will be used to manage invasive weeds are similar to past and present actions, including using adaptive management and partnerships to increase efficacy and efficiency.

4.2.5.3.8.3. Cumulative Impact

4.2.5.3.8.3.1. Impacts Common to All Alternatives

The spread of invasive species is expected to continue under all alternatives, but at different scales and intensities. The types of impacts that have occurred and would continue to occur include removal or disturbance of vegetation, loss of plant diversity, loss of soil integrity, changes in fire regime, and reduced ecosystem function. Alternatives that emphasize resource protection and contain management actions to limit ground-disturbing activities are expected to have fewer negative impacts on the spread of invasive species than alternatives that emphasize development.

Climate change is expected to expand the areas where invasive species can spread over the long term. Increased wildfire intensities and return intervals will also increase the spread of invasive species.

4.2.5.3.8.3.2. Alternative 1

Under this alternative, management of public lands would continue on the current trajectory. As land use and development continue, invasive species are expected to continue to spread. As ROWs, renewable energy developments, mineral exploration, and recreation uses continue with limited amounts of restoration, more and more ground will be disturbed, creating further opportunities for invasive species to be introduced and spread.

4.2.5.3.8.3.3. Alternative 2

Emphasis on conservation of resources on public lands in Alternative 2 would likely have a beneficial impact on invasive species. Reducing potential commercial, mineral, and energy development on BLM lands would likely decrease the spread of invasive species. Reducing areas open to OHV would decrease the risk of vehicles spreading weed seeds.

Increased designations such as wilderness, wilderness study areas, ACECs, lands with wilderness characteristics, wild and scenic rivers, etc., would have a beneficial impact on the spread of invasive species by reducing land uses and recreation types in these areas. However, some designations may limit the types of weed treatments that are available, particularly in wilderness where vehicles and mechanized equipment cannot be used. Overall, invasive species will continue to spread under all alternatives, but Alternative 2 provides the most prevention and treatment actions to limit the spread to the minimum amount possible.

4.2.5.3.8.3.4. Alternative 3

Under Alternative 3, land uses and conservation of resources are balanced. This type of management would have both negative and positive impacts on weed management, depending on activity types and locations. Alternative 3 has more management actions that are expected to benefit the management of invasive species than Alternatives 1 and 4, such as restoration and protective designations. Overall, the spread of invasive species is expected to continue,

but management actions to prevent and treat invasive species will limit the scope and scale of weed spread.

4.2.5.3.8.3.5. Alternative 4

Emphasis on development and use of public lands in Alternative 4 would likely lead to higher risks and negative impacts to invasive species spread than would other alternatives. This would also be true for increased recreational activities and mineral and energy developments. Invasive and noxious plant species would be expected to increase over the long term under this alternative more so than Alternatives 2 and 3.

4.2.5.4. Forests & Woodlands

See the Forestry and Woodland Products section under Resource Uses.

4.2.6. Fish and Wildlife

4.2.6.1. Summary

The primary impacts on wildlife resources stem from resource conflicts with other management programs within the planning area. Impacts to fish and wildlife resources from other management programs include loss or alteration of native habitats, decreased food, water, and cover availability and quality, increased habitat fragmentation, and changes in habitats and species composition. Impacts may also include displacement of species into neighboring habitats, interruption of travel corridors, and disruption of species behavior, leading to reduced reproductive fitness or increased susceptibility to predation and indirect and/or direct mortality. Surface-disturbing actions that alter vegetation characteristics (e.g., structure, composition, and production) can affect habitat suitability for wildlife, particularly where the disturbance removes or reduces cover and food resources. Even minor changes to natural habitats can affect resident wildlife populations.

Habitat alteration, fragmentation, and/or loss occurs when habitat components needed for species survival (e.g., forage and cover) are removed or when larger contiguous habitat is broken up (fragmented) by surface-disturbing activities. This results in a reduction in usable ranges and disruption of movements among habitats, transitional areas, and breeding areas. Displacing activities may not directly affect components, but they force animals to move into less desirable habitats, increasing competition for available resources with other species and uses. Disturbance could introduce noise or dust that could disturb species during sensitive periods, which could indirectly affect reproduction or cause species to abandon areas such as nest sites or areas that contain key habitat components such as important food or cover resources. Stress inflicted on species could also deteriorate species' health and fitness, which could affect survivability. Displaced wildlife incurs a physiological cost either through excitement (preparation for exertion) or through locomotion.

The direct and indirect impacts of management actions on fish and wildlife resources may vary widely, depending on a variety of factors, such as the dynamics of the habitat (e.g., community type, size, shape, complexity, seral state, and condition), season, intensity, duration, frequency, and extent of the disturbance, rate and composition of vegetation recovery, change in vegetation structure, type of soils, topography and microsites, animal species present, and the ability of fish or wildlife species to leave or recolonize a site after a disturbance. Occurrence of these disruptive activities over an extended period of time in areas on or adjacent to wildlife habitats could cause either temporary or permanent displacement of wildlife. Impacts from displacement would be greater for those wildlife species with limited existing habitats and/or a low tolerance for disturbance.

Proposed management practices such as habitat maintenance and enhancement may help mitigate many of the effects from these actions. Habitat maintenance or enhancement can maintain or improve vegetative conditions, reduce soil loss, improve soil water-holding capabilities, control the spread of invasive species, increase forage production, and restore ecological integrity and function. In general, vegetation treatments and restoration would improve habitat conditions or provide missing habitat components, and reduce sedimentation in water sources occupied by wildlife. These treatments could provide diverse habitats for various wildlife species.

4.2.6.2. Methods of Analysis

Impacts on general fish and wildlife populations are discussed in this section. Some species of fish and wildlife are also considered special status species; impacts on those specific species are discussed in the Special Status Species section. Fish and wildlife populations fluctuate, sometimes widely, in response to natural factors such as wildfire, abundance or scarcity of forage or prey items, and climate extremes such as drought and severe winters. These factors make it difficult to discern potential Impacts on Fish and Wildlife resulting from specific management actions and from impacts caused by natural factors. Changes or stressors to habitat components (e.g., vegetation, water, soil, or air) are likely to cause direct and indirect effects on wildlife and fish. Therefore, potential effects on habitats are the principal focus of this assessment.

Fish and wildlife health within the planning area is directly related to the overall ecosystem health, native habitat abundance, habitat fragmentation, and wildlife security provided, and thus most resource management actions have at least an indirect effect on fish and wildlife. Impact analysis on fish and wildlife resources includes an assessment of whether each action would result in the possible destruction, degradation, or modification of habitats, as well as impacts that could improve wildlife and aquatic habitats. Although some data on known locations and habitats for some species within the planning area are available, data for most wildlife species is very limited or nonexistent due to lack of funding or other resource constraints. In absence of quantitative data, best professional judgment was used according to the following assumptions:

- Habitats would be managed for wildlife, with an emphasis on migratory birds and special status species.
- Most surface-disturbing activities would include avoidance and minimization measures, as well as mitigation and adaptive management to reduce impacts on special status species and their habitats, which would also benefit wildlife species in general.
- Success of mitigation is dependent on proper implementation/adaptive management and can be predicted by past results of similar mitigation.
- Implementation-level actions would be further assessed at an appropriate spatial and temporal scale and level of detail.
- Additional field inventories could be needed to support implementation-level decisions, which may be subject to further analysis under NEPA.
- The BLM would continue to manage fish and wildlife habitats in coordination with the Nevada Department of Wildlife.

4.2.6.3. Qualitative Intensity Scale

Impacts are described using ranges of potential impacts or in qualitative terms, if appropriate. When impacts are positive, it is so stated. The intensities of impacts are also described, where possible, using the following intensities:

- **Negligible:** Impacts include but are not limited to: wildlife remaining in the area without having to relocate due to interactions or surface disturbance created by humans, livestock, or other wildlife; wildlife expending little to no energy to avoid such interactions or surface disturbance; and wildlife not being beleaguered during normal every day routines such as resting, feeding, or drinking. Populations would be expected to remain at current levels or increase. Habitat connectivity would remain intact; movements, seasonal or otherwise, would not be affected. Overall change to wildlife populations, habitat quality and quantity, or habitat connectivity would be undetectable.

- **Minor:** Impacts could include but are not limited to: wildlife having to move small distances but remaining in the same vicinity as before the interactions or surface disturbance created by humans, livestock, or other wildlife; wildlife expending minor amounts of energy to avoid such interactions; and wildlife routines being beleaguered for a short term. Populations would be expected to remain at current levels or increase. Habitat connectivity would remain intact, and movements, seasonal or otherwise, would be affected only for brief periods during such interactions. Overall change to wildlife populations, habitat quality and quantity, or habitat connectivity would be apparent and measurable but small in scale and localized with in the footprint of the action.

- **Moderate:** Impacts could include but are not limited to: wildlife vacating the area for a short time but returning shortly after actions are no longer considered a threat; wildlife expending moderate energy to avoid interactions or surface disturbance created by humans, livestock, or other wildlife. Species may experience reduce breeding/nesting success if they are forced to abandon nests or if the increased energy expenditure lowers their ability to care for their young. Populations would be expected to remain at current levels or decrease slightly. Habitat connectivity could be reduced, and movement corridors, seasonal or otherwise, could be affected for longer periods of time. Overall change to wildlife populations, habitat quality and quantity, or habitat connectivity would be readily apparent and measurable over a larger area but would occur mainly within the footprint of the action.

- **Major:** Impacts could include but are not limited to: wildlife moving great distances to avoid interactions or surface disturbance created by humans, livestock, or other wildlife; wildlife vacating the area over the long term or abandoning it altogether; or wildlife expending moderate to great amounts of energy to avoid such interactions. These impacts would likely result in decreased reproductive rates, as well as death of some individuals. Populations would be expected to decline locally. Species with strong site fidelity would be the most impacted. Habitat connectivity could be reduced or movement corridors fragmented. Wildlife movements, seasonal or otherwise, could be affected for long periods of time, and corridors could be eliminated due to frequency of such uses or other factors associated with them. Overall change to wildlife populations, habitat quality and quantity, and habitat connectivity would be highly noticeable and extend well beyond the footprint of the action.

- **Short-term:** Impacts would generally last less than a single year or growing season.

- **Long-term:** Impacts would result in a change in a resource, or its condition would last longer than a single year or growing season.

4.2.6.4. Resources

4.2.6.4.1. Air Quality Impacts on Fish and Wildlife

4.2.6.4.1.1. Impacts Common to All Alternatives

Air quality has limited effects on wildlife. The scope of these effects would be limited to dust, smoke, or other air pollution and the impacts of these on the health of the animals. Specific methods used to meet air quality standards, such as applying water or chemical palliatives to control dust, may impact wildlife if the use of water results in declines in local water sources or if the chemicals are toxic to wildlife. All alternatives are designed to meet air quality standards

but do not specify approved or prohibited control methods. Impacts from specific dust control measures would need to be analyzed on a case-by-case basis under all alternatives. If air quality is improved through the use of methods that are not harmful to wildlife, impacts to wildlife could range from negligible to positive. If methods are used that are harmful to wildlife, impacts from air quality management could range from minor to moderate.

4.2.6.4.1.2. Alternatives 1 through 4

There were no additional impacts to fish and wildlife.

4.2.6.4.2. Soil Resources Impacts on Fish and Wildlife

4.2.6.4.2.1. Impacts Common to All Alternatives

Under all alternatives, wildlife habitats would be indirectly conserved via conservation measures to prevent erosion and other degradations to soil, which in turn diminishes impacts on vegetative cover and thus wildlife habitats. Effective watershed management, which minimizes erosion, maintains hydrologic flow, and indirectly maintains vegetative community health, would result in healthy and diverse plant communities, which in turn provide wildlife habitats. Preventing sedimentation in water courses also can improve the health of fish and other aquatic species populations. Maintaining soil processes and their components, such as litter, appropriate vegetation, and good infiltration, is important to land health, which is directly related to habitat quality. Reclamation measures further restore wildlife habitats that have already been impacted. Overall impacts on wildlife from the soils management direction are expected to be positive.

4.2.6.4.2.2. Alternative 1

Alternative 1 would not have language to protect sensitive soils. While this could still be done on a case-by-case basis, not having these management directions may lead to more projects being approved that have negative impacts on wildlife compared to the other alternatives.

4.2.6.4.2.3. Alternatives 2 through 4

Protection of fragile soil areas and implementation of erosion control measures would reduce erosion and surface runoff, which could enhance wildlife habitat. These management directions would provide an additional positive benefit to wildlife compared to Alternative 1.

4.2.6.4.3. Water Resources Impacts on Fish and Wildlife

4.2.6.4.3.1. Impacts Common to All Alternatives

All alternatives propose to protect water quality and to ensure adequate water is available to meet management goals. Protecting water quality will also help protect aquatic species that live in the water, as well as species that drink from the water sources. Actions designed to increase BLM access to water sources for wildlife and habitat improvements would likely result in more stable or increased wildlife populations. Ensuring that water is available to wildlife when analyzing proposed water developments for other uses would help protect wildlife populations. Overall, water management directions are expected to have a positive impact on wildlife.

4.2.6.4.3.2. Alternative 1

Alternative 1 would not have language to protect hydrologic function by avoiding riparian areas and 100-year floodplains. While this could still be done on a case-by-case basis, not having these management directions may lead to more projects being approved that have negative impacts on wildlife compared to the other alternatives.

4.2.6.4.4. Alternatives 2 through 4

Protecting the hydrologic function of washes and waterways will also benefit downstream wildlife and their habitats. This management direction would provide an additional positive benefit to wildlife compared to Alternative 1.

4.2.6.4.5. Integrated Vegetation Impacts on Fish and Wildlife

4.2.6.4.5.1. Vegetation Impacts on Fish and Wildlife

4.2.6.4.5.1.1. Impacts Common to All Alternatives

General vegetation management, including managing for potential natural community (PNC), would maintain available forage and maintain or enhance wildlife habitat and thus have an overall positive benefit to wildlife. Restoring communities would improve the long-term ecological health and habitat condition. Restoring roads, facilities, or improvements that are no longer necessary could deter continued use of the areas, resulting in reduced disturbance to wildlife habitat and reduced habitat fragmentation. In addition, noise and disturbance associated with roads would be eliminated by reclaiming roads. Treatments for restoration could cause temporary disturbances to wildlife occupying these areas. Using native species for restoration will help ensure the use of plants that native wildlife are adapted to use for cover and food.

4.2.6.4.5.1.2. Alternative 1

Alternative 1 would not contain many of the management actions proposed in the other alternatives that could benefit wildlife and their habitats. These actions could still be carried out on a case-by-case basis, but not having these management directions would not provide as wide a range of positive benefits to wildlife compared to the other alternatives.

4.2.6.4.5.1.3. Alternative 2

Requiring no net unmitigated loss of vegetation communities would mitigate for loss of wildlife habitat. Mitigation actions could help improve wildlife habitats in other locations. Requiring mitigation for all the ecosystem services lost due to a project and not just mitigating for loss of desert tortoise habitat as is done under the 1998 RMP will provide benefit to a wider range of wildlife species. Maintaining connectivity of plant communities and restoring roads and linear features will also help maintain and restore connectivity for wildlife species. Managing native plant communities for climate change would also help wildlife species as they respond to climate change. Protecting the genetic integrity of vegetation will benefit wildlife by increasing success of restoration projects. Also, some wildlife (especially insects) may be locally evolved to match

the local, genetically unique vegetation. Genetic varieties from elsewhere may not be as suitable for these species, and thus their habitats would be degraded.

Monitoring vegetation change and cooperating in vegetation research efforts will also benefit wildlife by studying and tracking their habitats. Cooperation with and contributing data to regional efforts will help study and track vegetation and thus wildlife habitats at a regional and landscape level rather than just at the level of the SNDO. Using adaptive management to inform and improve best management practices and management actions for vegetation will also benefit wildlife by helping ensure that the best, most-informed actions are being taken to manage their habitats. Trying to consistently manage across BLM districts in the Mojave will help ensure vegetation and thus wildlife habitat are being managed consistently at a landscape scale, and each district can benefit by lessons learned by other districts.

4.2.6.4.5.1.4. Alternative 3

Impacts from Alternative 3 would be similar to those under Alternative 2.

4.2.6.4.5.1.5. Alternative 4

Impacts from Alternative 4 would be similar to those under Alternative 2 except that Alternative 4 does not have management direction requiring no net unmitigated loss of vegetation communities. Loss of the ecosystem services and thus wildlife habitats would be dealt with on a case-by-case basis. These losses could still be mitigated for, but it would not be required. Thus it is assumed that some amount of wildlife habitats will be lost without commensurate mitigation that benefits habitats elsewhere.

4.2.6.4.5.2. Riparian Areas and Wetlands Impacts on Fish and Wildlife

4.2.6.4.5.2.1. Impacts Common to All Alternatives

Actions that would improve riparian stream and wetland proper functioning condition (PFC) would in turn improve habitats for riparian- and wetland-dependent wildlife species, especially through increases in quantity and quality of riparian vegetation. In addition to their importance to fish and aquatic species, riparian areas are critical to wildlife in the planning area and often support higher levels of biodiversity compared to the surrounding uplands. Retaining riparian and mesquite-acacia areas in federal ownership and restoration actions in these areas would maintain or improve wildlife habitat conditions, provide direct protection of wildlife habitats, and retain adequate water supply to support fisheries.

4.2.6.4.5.2.2. Alternative 1

Language about buffers around water sources would still conflict with guzzler language in other resource sections and thus continue to cause management confusion. Alternative 1 would not contain many of the management actions proposed in the other alternatives that could benefit wildlife and their habitats. These actions could still be carried out on a case-by-case basis, but not having these management directions would not provide as wide a range of positive benefits to wildlife compared to the other alternatives.

4.2.6.4.5.2.3. Alternative 2

Requiring no net unmitigated loss of riparian areas would mitigate for loss of wildlife habitats. Mitigation actions could help improve riparian habitat in other locations.

4.2.6.4.5.2.4. Alternative 3

Impacts from Alternative 3 would be similar to those under Alternative 2.

4.2.6.4.5.2.5. Alternative 4

Impacts from Alternative 4 would be similar to those under Alternative 2 except that Alternative 4 does not have language requiring no net unmitigated loss of riparian communities. Loss of riparian communities and thus wildlife habitats would be dealt with on a case-by-case basis. These losses could still be mitigated for, but it would not be required. Thus it is assumed that some amount of riparian wildlife habitat will be lost without commensurate mitigation that benefits habitats elsewhere.

4.2.6.4.5.3. Weeds Impacts on Fish and Wildlife

4.2.6.4.5.3.1. Impacts Common to All Alternatives

Management of noxious and invasive species would improve the ecological health and condition in treated areas over time, which may provide necessary habitat components for wildlife, but could cause temporary disturbances to wildlife occupying treated areas. Spread of noxious and invasive weeds affects habitat quality for wildlife by decreasing vegetative diversity and production, which can have a negative impact on wildlife populations. By reducing the quantity of invasive plant species, competition would be decreased, allowing better opportunity for native species to thrive. Although weed treatments would generally improve wildlife habitats in the long term, short-term minor disturbances to wildlife would occur. Weed treatment actions could remove forage and cover in areas dominated by weeds, resulting in short-term minor impacts on wildlife that use weed infested areas. Short-term impacts would vary by type of application. Treatments, especially mechanical treatments, would cause some species to temporarily avoid treated areas.

Noxious weed control measures would help prevent conditions that reduce riparian habitat health and water quality. Reduction of total acres impacted by invasive plants would positively affect riparian habitat, water quality, and aquatic resources. Mechanical treatments would include crushing or removal of vegetation and disturbance of soils. These impacts could accelerate soil erosion potential of areas treated and could allow transporting of sediments into water sources, affecting water quality and fish habitat. Chemical treatments and prescribed burning for weeds management may be more effective for weed management in some cases. Assuming chemical treatments would be applied with all applicable guidelines (including stream buffers), effects on wildlife at the population level are not expected.

4.2.6.4.5.3.2. Alternative 1

Management direction for weeds would be focused on control of tamarisk. A weed management plan for projects would not be required by the RMP but could still be required on a case-by-case basis.

4.2.6.4.5.3.3. Alternative 2

Management direction for weeds would be broadened to cover prevention and control of all types of weeds. Requiring weed management plans for projects one acre or greater would help minimize potential spread of invasives into neighboring wildlife habitats on many BLM-approved projects. Participating in cooperative weed management areas would help manage weeds at a landscape scale, thus benefiting wildlife habitats at a landscape scale.

4.2.6.4.5.3.4. Alternative 3

Impacts from Alternative 3 would be similar to those under Alternative 2 except that weed management plans would be required for projects with a disturbance footprint of 5 acres or more. This will cover fewer projects than in Alternative 2, and thus more projects could lead to the spread of invasives into neighboring wildlife habitats due to not having a plan in place.

4.2.6.4.5.3.5. Alternative 4

Impacts from Alternative 4 would be similar to those under Alternative 2 except that weed management plans would be required only for projects with a disturbance footprint of 10 acres or more. This will mean that except for only the large projects, most projects will not require a weed plan, which could lead to the spread of invasives and other non-native species.

4.2.6.4.5.4. Forests and Woodlands Impacts on Fish and Wildlife

4.2.6.4.5.4.1. Impacts Common to All Alternatives

Salvaging cactus and yucca from construction areas and transplanting them to other sites could provide additional habitats in areas receiving transplants for species that use these species, such as birds for nesting.

4.2.6.4.5.4.2. Alternatives 1 through 4

There were no additional impacts to fish and wildlife.

4.2.6.4.6. Fish and Wildlife Impacts on Fish and Wildlife

4.2.6.4.6.1. Impacts Common to All Alternatives

The wildlife objectives stress the importance of natural ecological processes and functions and focus on land uses and discretionary actions to support multiple uses that are consistent with sustaining these natural ecological processes and functions. In general, the wildlife management directions would have an overall positive benefit for fish and wildlife and their habitats. Implementing management actions to restore or improve wildlife habitats would ensure wildlife habitats are sustainable, healthy, and diverse. Restoration activities could cause short-term habitat disturbance during project construction but would improve wildlife habitats in the long term. Fish and wildlife introductions, reintroductions, and augmentation would allow for management flexibility to ensure healthy, viable, and well-distributed wildlife populations. Introductions of species into areas where they did not previously exist, though, could lead to

unexpected competition with local populations of other species. Control of non-native, nuisance, and overpopulated species would have direct impacts on those specific species but would reduce the impacts those species are having on other wildlife.

Avoidance and mitigation measures to limit impacts on migratory birds would help reduce impacts from ground-disturbing activities and give birds a better opportunity for reproductive success during crucial breeding periods. Using best management practices for migratory birds, including raptors, would provide for use of seasonal and spatial buffers, as well as mitigation, to maintain and enhance nesting and foraging habitats. Managing power lines to reduce the risk of bird electrocution, collision, perching, and nesting, as found in best management practices from the Avian Power Line Interaction Committee (APLIC), would reduce injury and mortality to birds, especially raptors. Management of ROWs and ROW corridors for the siting and construction of facilities, such as communication towers, and using measures to avoid and minimize impacts on migratory birds likely would minimize or avoid mortality of migratory birds from guy wires, lighting, and other associated features, enhancing overall habitats for migratory birds.

New wildlife water developments (guzzlers) benefit most game and nongame species in the area by providing more reliable water sources in currently occupied areas and allowing them to colonize new areas that were previously lacking adequate water sources. New wildlife waters could have an impact if they attract wildlife in numbers great enough to displace or damage animal species that are already present in the area. Increases in populations may be beneficial to some species and detrimental to others. For instance, insect numbers may increase and provide a greater abundance of food for birds and bats but may also increase the incidence of disease (e.g., West Nile virus) transmission to some species of wildlife.

Some wildlife species may out-compete other species for use of the water source, such as burros that effectively exclude bighorn sheep from water sources. Actions taken to modify and design water developments to reduce competition would help reduce these impacts. Wildlife also may become dependent on these water sources and could be affected if the water source is removed, not maintained, or allowed to go dry. The impact could include species having to vacate the area and find new water sources. A species could face mortality if unable to relocate. Construction of guzzlers would disturb small areas of habitat and could displace, injure, or kill small, less-mobile species depending on the level of surface disturbance required. During construction, wildlife within the local area could be disturbed from breeding, feeding, and sheltering.

4.2.6.4.6.2. Alternative 1

Alternative 1 contains a protection measure for water sources (quarter-mile buffer) that contradicts water resource protection management directions for other resources (e.g. riparian). Maintaining all of these actions would continue to cause management confusion. Alternative 1 does not contain many of the management directions proposed in the other alternatives that could benefit wildlife and their habitats. These actions could still be carried out on a case-by-case basis, but not having these management directions would not provide as wide a range of positive benefits for wildlife compared to the other alternatives.

4.2.6.4.6.3. Alternative 2

Avoiding authorized actions within one half mile of natural waters and within one half mile of artificial waters would help protect these important wildlife habitats and water sources from disrupting activities occurring nearby. Species could abandon these areas due to human presence

and loud noises occurring near the water sources. The buffers would also protect other habitats for wildlife around the water source.

Actions to limit and reduce fragmentation would help ensure habitat connectivity, which would benefit wildlife populations at a landscape scale by helping to ensure their overall population viability and ability to move into other areas in response to natural and man-made disturbances in their current area. Actions to limit direct mortality and reduced reproductive success of wildlife during projects would help species be able to at least finish rearing young and move to neighboring undisturbed habitats. This would help maintain viable populations across the landscape.

Inventorying and monitoring wildlife population and their habitats would allow the BLM to be able to track trends and identify potential issues to help inform future management issues. This would help manage for viable and diverse wildlife populations in the long term. Cooperating in research efforts on wildlife in the Mojave would help improve knowledge on management of wildlife at a local and landscape level. Cooperating on the research would also help ensure that the research results are more applicable to BLM-managed areas. Updating best management practices with the most current knowledge of wildlife management would help improve their effectiveness in actually protecting wildlife. Consistently managing wildlife with other BLM field offices in the Mojave and implementing recommendations from the NDOW Wildlife Action Plan would help ensure management actions are meeting their goals at a landscape scale.

4.2.6.4.6.4. Alternative 3

Impacts under Alternative 3 would be similar to those under Alternative 2 except that the avoidance buffer around natural water sources would be one quarter mile instead of one half mile as in Alternative 2. In addition, management direction for artificial water sources would be only to minimize impacts and not full avoidance. The reduced buffer for natural waters and softer language for artificial waters could lead to some additional impacts to secretive species sensitive to human presence or loud noises. It would also protect less habitat surrounding the water sources.

4.2.6.4.6.5. Alternative 4

Impacts under Alternative 4 would be similar to those under Alternatives 2 and 3 except that the avoidance buffer around natural water sources would be one quarter mile and there would be no buffer around artificial water sources. The reduced buffer around natural waters could lead to some additional impacts to secretive species sensitive to human presence or loud noises. It would also protect less habitat surrounding the water sources. No protection would be provided around artificial waters. Artificial water sources are often the only source of water for wildlife over large areas due to degradation or loss of natural water sources from human activities. Not providing a buffer around artificial water sources could lead to impacts to some wildlife species if they are scared off from using the water sources due to permitted activities and there are not alternate water sources nearby.

4.2.6.4.7. Special Status Species Impacts on Fish and Wildlife

4.2.6.4.7.1. Impacts Common to All Alternatives

Maintaining or improving habitats for special status species would also benefit other wildlife dependent on similar habitats. Restrictions on uses within special status species habitats would also help reduce impacts on wildlife populations.

4.2.6.4.7.2. Alternative 1

Alternative 1 would not contain some of the management directions proposed under the other alternatives that would also benefit wildlife populations. These actions could still be carried out on a case-by-case basis, but not having these management directions would not provide as wide a range of positive benefits for wildlife compared to the other alternatives.

4.2.6.4.7.3. Alternative 2

Managing and protecting important genetic and demographic corridors for listed and sensitive species will also protect corridors for wildlife that use similar habitats. Mitigation performed as part of no net unmitigated loss of sensitive species habitats would also likely benefit many other wildlife species that use similar habitats. The management prescriptions, including land-use restrictions, in the Nye County areas of ecological importance would help limit the types of ground-disturbing activities that could occur in these areas and thus help limit impacts to wildlife in these areas.

4.2.6.4.7.4. Alternative 3

Impacts under Alternative 3 would be similar to those under Alternative 2 except that there would be no areas of ecological importance identified in Nye County. This could lead to impacts to wildlife in these areas if projects are approved that would not have been approved under Alternative 2.

4.2.6.4.7.5. Alternative 4

Impacts under Alternative 4 would be similar to those under Alternative 3 except that impacts to sensitive species would only need to be minimized and would not have to meet the no net unmitigated standard. Minimizing impacts would also help minimize impacts to other wildlife species, but it is assumed that less mitigation would be done under this alternative compared to Alternatives 2 and 3. Similar to Alternative 3, Alternative 4 would not identify areas of ecological importance in Nye County.

4.2.6.4.8. Wild Horse and Burro Impacts on Fish and Wildlife

4.2.6.4.8.1. Impacts Common to All Alternatives

Wild horses and burros (WHB) and their management result in several impacts on wildlife and habitats. Wild horses and burros compete with wildlife for forage, water, and cover. As large herbivores (horses, in particular), they consume relatively large amounts of vegetation and water.

They can also facilitate the introduction or spread of weeds that degrade wildlife habitats. Wild horses and burros can trample vegetation and thus degrade wildlife habitats. Research has demonstrated that areas inhabited by wild horses have fewer plant species and less grass, shrub, and overall plant cover than areas without horses, and more invasive plant species and weeds. They can also trample wildlife directly, as well as collapse burrows. Studies show reptiles and mammals that depend on burrows and brush cover to survive and breed are lower in species diversity and less abundant in wild horse and burro occupied sites. Similar to livestock, they can also cause substantial impacts on riparian areas by eating and trampling vegetation and other aquatic organisms, increasing soil erosion and compaction, decreasing stream bank stability, altering the flow patterns of water courses, degrade water quality through wastes, and increase soil sedimentation. Overall, wild horses and burros can cause negligible to major impacts to fish and wildlife. Where wild horse and burro density is high, lands are degraded, water resources are limited, and native species are already stressed, impacts can be substantial. Wild horse and burro management directions to manage herd sizes and reduce impacts on the ecosystem would help reduce the magnitude of the impacts on wildlife. Removing wild horse and burro populations in Herd Areas that have been determined to have insufficient habitat resources necessary to sustain healthy horse populations would increase overall wildlife health and diversity.

All alternatives identify the need to maintain appropriate management levels (AML) within herd management areas (HMAs) and limit forage utilization, and would use the gather process as a tool to meet that need. Gathering would help prevent excess impacts from overpopulation of wild horse and burro herds and help ensure adequate forage, water, and overall habitat condition for wildlife. Gathers can also cause short-term stress and displacement of wildlife resulting in disruption of life-cycle behaviors. Habitat monitoring, for sustainability, would be an ongoing process that may result in adjustment of AML. If unacceptable adverse impacts occur from wild horse and burro use, corrective management actions would be taken. This action is important in ensuring healthy habitats for wildlife.

Water sources developed for wild horses and burros may have a positive or negative impact on wildlife depending on the type of water source development. Wild horses and burros tend to dominate water sources, alter their habitats, and drive away wildlife. Thus if natural water sources are made accessible for wild horses and burros, it could negatively impact wildlife that also use the water source. If artificial water sources are developed for wild horses and burros, it could benefit wildlife by reducing impacts at natural sources as the horses and burros switch to using the artificial source. This is only likely to happen though, if in conjunction with building an artificial water source, the nearby natural water sources are fenced to exclude wild horses and burros. Other wildlife could also use the artificial water source if they aren't out-competed by horses or burros. However, developing alternate water sources for wild horses and burros could increase impacts of wild horses and burros on wildlife habitat by increasing the risk of soil compaction, trampling, and weed spread or by introducing weeds in areas that may not have been impacted by wild horses and burros in the past. Further, it could increase direct competition for forage between wild horses and burros and wildlife species by concentrating wild horses and burros in areas that may not have been used by horses and burros in the past due to limited or lack of available water. Development of alternate water sources may involve construction activities that could displace wildlife and injure or kill some small, less mobile, or subsurface species.

The installation of underpasses in highway ROWs for use by horses and burros would also help other wildlife be able to cross under highways. This would help reduce mortality of species trying to cross highways and also help reduce habitat fragmentation by providing connectivity between habitats on either side of highways.

4.2.6.4.8.2. Alternative 1

Under Alternative 1, horses and burros would be managed for zero animals in Gold Butte Part A ACEC. This would help reduce impacts to wildlife in this area.

4.2.6.4.8.3. Alternative 2

Similar to Alternative 1, Gold Butte Part A ACEC would be managed for zero horses and burros, which would benefit wildlife in this area. The use of fertility control to manage horse and burro population growth may help reduce impacts from overpopulation and impacts from frequent gathers. Excluding ROWs of 5 acres or greater and excluding surface-disturbing activities that adversely impact key horse and burro habitat components with HMAs would also benefit wildlife in the areas by limiting habitat disturbance actions.

4.2.6.4.8.4. Alternative 3

Impacts under Alternative 3 would be similar to those under Alternative 2 except that ROWs and other surface-disturbing activities would only be avoided and not excluded. Wildlife habitats would still be protected by these avoidance areas, but the protection would not be as strong as in Alternative 2.

4.2.6.4.8.5. Alternative 4

Impacts under Alternative 4 from the management action about the use of fertility control would be the same as those under Alternative 2. Alternative 4 would not contain language to manage Gold Butte Part A ACEC for a zero AML. This could lead to impacts from horses or burros as they move in from surrounding areas and are not gathered. ROWs of 5 acres or more may be allowed and thus could also impact wildlife due to habitat loss. Avoiding surface-disturbing activities during the foaling season may also protect wildlife that also breed and rear young during the same period. It would not protect from long-term habitat loss, though, because the surface-disturbing activity could still take place outside of foaling season.

4.2.6.4.9. Cave and Karst Management Impacts on Fish and Wildlife

4.2.6.4.9.1. Impacts Common to All Alternatives

Implementation of mitigation measures or use restrictions to protect cave and karst resources and provide for public safety would also serve to protect wildlife habitats and disruption of species that use caves for habitat (e.g. bats) and thus provides an overall positive benefit to wildlife. Implementing closures or registration requirements could help reduce impacts to wildlife that use the caves. Use restrictions could also help prevent the future spread of white-nose syndrome (WNS), a disease rapidly spreading from the east to central United States affecting hibernating bats. Currently WNS or the cold-loving fungus that causes WNS, has not been observed on western public lands, but it is likely to make its way here in the near future based on its current rate of spread. The SNDO will work to incorporate the BLM's WNS Interim Response Strategy in coordination with the state office. Enlisting the help of caving organizations to help monitor caves would help track and identify potential impacts to the caves. Not allowing public release of cave data will help reduce impacts to caves from increased visitation that could adversely

impact wildlife or their habitats. Not allowing commercial development of caves and requiring special recreation permits for commercial and organized groups would also help limit impacts to caves due to high visitation levels.

Installing fences and bat gates would prevent injury to the public, as well as reduce disturbance to wildlife species especially during critical life cycle stages such as hibernation. Improper installation of bat gates may disrupt air flows to caves. Some bat species may relocate if habitat needs are altered by changes in air flow. Bat gates would also preclude access to caves by other larger species by removing habitats and forcing some species to relocate. However, fencing may reduce the potential for wildlife mortality by keeping wildlife away from dangerous shafts.

4.2.6.4.9.2. Alternative 1

Managing caves as ROW avoidance areas would help protect the wildlife that use the caves. The management direction as written, though, is unclear as to how close a ROW can be placed near a cave or whether it is just the cave entrance itself that is the avoidance area, but something could be built right next to the cave.

4.2.6.4.9.3. Alternative 2

Identifying significant caves could help prioritize protection and management of caves important to wildlife species. Actions to restore damaged cave and karsts systems could help restore habitats for wildlife species and make the cave more suitable for use by wildlife. Designating significant caves as ROW avoidance areas with a half mile buffer would protect the cave resources and wildlife habitats within the half-mile area surrounding the cave.

4.2.6.4.9.4. Alternative 3

Impacts would be similar to those under Alternative 2 except that the ROW avoidance areas would only have a quarter mile buffer. This would protect less surrounding wildlife habitat compared to Alternative 2.

4.2.6.4.9.5. Alternative 4

Impacts would be similar to those under Alternative 2 except that there would be no set ROW avoidance area for caves except when the ROW is determined to block access or compromise cave resource values. This could lead to impacts to wildlife habitats that surround the cave and potential impacts to cave wildlife resources that were unknown at the time of analysis.

4.2.6.4.10. Wildland Fire Management Impacts on Fish and Wildlife

4.2.6.4.10.1. Impacts Common to All Alternatives

Wildfires can directly impact fish and wildlife by altering or reducing suitable habitats, displacing animal species, and by affecting air quality due to smoke and ash. Immediate post-fire conditions raise light penetration and temperatures on and immediately above and below soil surfaces and can reduce soil moisture, affecting ground-dwelling species. Mortality and/or injury to wildlife can also occur. While small mammals, reptiles, and amphibians are most at risk of death because of their limited mobility, occasionally large mammals are killed by severe fast-moving wildfires,

typically from smoke inhalation. Species using nests, dens, and burrows within the range of a wildfire are most susceptible to risk of mortality. Even aquatic species such as fish, especially those in small or shallow streams and ponds, can be impacted by fires through increased temperatures, loss of vegetative cover, and deposition of ash.

Fire management activities have the potential to directly and indirectly impact fisheries and wildlife habitats throughout the planning area, depending on treatment timing, extent, location, elevation, duration, fuel, severity of fires, and habitat type or vegetation community and soil type of treated area. Effects of fire management on vegetation have the potential to directly or indirectly effect fish and wildlife species that inhabit them or areas adjacent to (or downstream from) them. Fish or other aquatic organisms are at risk of injury or mortality if water is pumped from nearby streams, fire retardant pollutes the water, vehicles disturb the habitat, and proper BMPs are not followed.

Impacts from most suppression techniques would be short term, temporary, and minor, particularly if sensitive habitats are mitigated or avoided. The use of heavy equipment or hand tools for fireline construction removes or crushes vegetation and disturbs soil. This disturbance can increase the risk of invasive species introduction, soil erosion and may cause injury or death to small wildlife species. Hand line construction would remove and disturb soil and vegetation, possibly affecting animals such as small mammals, invertebrates, and ground-nesting birds. The presence of hand line crews in remote locations could directly disturb some wildlife. Removal of live vegetation can also lead to soil erosion and increased siltation in adjacent wetlands and streams. Personnel and equipment can introduce nonnative seeds, and fire lines can provide germination sites for weedy species.

Retardant drops and fire line construction may affect wildlife habitats in linear strips. Direct effects may also result from the introduction of fire retardant, aviation fuel or lubricants into streams and wetlands, erosion of exposed soils from fire line construction on steep slopes adjacent to streams, or reduced natural stream flow during water drafting and pumping. These impacts could degrade the water quality of fisheries. Off-road travel during fire suppression can collapse dens and burrows, destroy nests, and wildlife can be injured or killed by being struck by vehicles or from being inside collapsed features.

The obvious benefits that may be realized from fire suppression are the minimization of fire size and disturbance to wildlife and habitats. Emergency stabilization and rehabilitation activities such as erosion control measures and reseeding performed after fires would facilitate restoration of burned habitats, benefiting species that use these areas.

With suppression being implemented where unplanned wildfire is not desirable, and wildland fire use, prescribed fire, and non-fire fuel treatments being used to minimize fuel loading, vegetation communities and wildlife habitats would transition over time to more closely reflect conditions associated with a habitat's natural fire regime. This would create a more diverse and stable ecosystem that would have a reduced threat of severe wildland fire. Resource protection measures would limit short-term and long-term impacts on wildlife resources from wildland fire. Over the long term, wildland fire management actions would reduce the risk of severe wildland fire and associated suppression activities.

Hazardous fuel reduction treatments could impact wildlife through habitat disturbance including loss of cover when vegetation causing excess fuel loads is removed. Prescribed fire could have similar effects as other wildland fires; however, due to site-specific project plans for prescribed fire, the BLM would minimize or avoid these effects. Because actions to protect resources

and project-specific analyses would limit impacts of prescribed fire and other hazardous fuel treatments, short-term impacts from these fire management activities would be minimized or eliminated and there would be a long-term benefit of reducing the risk of future catastrophic wildland fires.

4.2.6.4.10.2. Alternative 1

There were no unique impacts identified for Alternative 1.

4.2.6.4.10.3. Alternative 2

Emphasis would be placed on fire suppression in non-fire adapted ecosystems, such as desert tortoise habitat, as well as riparian and wetland areas. Uncontrolled wildfires in riparian areas, due to their limited distribution in the planning area and importance as wildlife habitat, can have major impacts on numerous wildlife species. Emergency stabilization and rehabilitation activities such as erosion control measures and reseeding performed after fires would facilitate restoration of burned habitats, benefiting species that use these areas. Resource advisors during fire suppression activities could help reduce impacts from suppression actions by providing input on where and how to implement the actions so that they have the least amount of impact on wildlife as possible. The use of herbicides for fuels reduction could impact wildlife if the chemicals used are harmful to wildlife or if they disturb species habitat, but over the long term it would benefit wildlife by reducing the risks of future catastrophic fires. Closure of burned areas for two years would benefit wildlife in the area by reducing additional impacts after fires that may slow habitat recovery or disturb already stressed animals.

Fuel breaks would help reduce the chances of large scale wildfires that could destroy large areas of wildlife habitat. Construction of the fuel breaks, though, will disturb wildlife habitat and species in the footprint of the fuel break. The fuel break could also lead to habitat fragmentation, similar to a road, for a few species that are reluctant to cross the cleared area. In addition, OHV use of the fuel break would cause similar impacts as those discussed under impacts from recreation. Prescribed fires could have a short-term negative impact on wildlife but should have a long-term positive impact. Prescribed fires are usually conducted during the spring or fall and are generally cooler than summer wildland fires. Temporary direct effects of prescribed fire are the alteration of habitats and displacement of wildlife. Some injury and death could occur especially for small, less mobile species. However, these treatments would improve the vegetative diversity, age class, production, and overall habitat quality.

4.2.6.4.10.4. Alternative 3

Impacts under Alternative 3 would be similar to those under Alternative 2 except that closures would be issued only on a case-by-case basis. This would benefit wildlife because it would allow burned areas to be closed if additional disturbances would slow recovery or further stress wildlife.

4.2.6.4.10.5. Alternative 4

Impacts under Alternative 4 would be similar to those under Alternative 3.

4.2.6.4.11. Cultural Resource Management Impacts on Fish and Wildlife

4.2.6.4.11.1. Impacts Common to All Alternatives

Authorized excavation of cultural sites localities could result in localized loss of wildlife habitat. The short- and long-term impacts to wildlife associated with these actions would be negligible to minor given the limited footprint of such actions on the landscape. The possibility of increased human presence around cultural sites managed for public recreational use could displace wildlife species from habitat surrounding those sites, depending on the location and level of human presence associated with the site. Cultural resource management guidance prohibiting surface disturbance near some archaeological sites would indirectly protect vegetation and wildlife habitats in those areas. Management to protect traditional areas and TCPs would also help protect wildlife and habitats in those areas through limitations on the type of activities that could occur. Cultural site monitoring could also inform management of impacts that are also affecting wildlife populations.

4.2.6.4.11.2. Alternative 1

There were no unique impacts identified for Alternative 1.

4.2.6.4.11.3. Alternative 2

Management directions for preserving the Old Spanish Trail and potentially other national historic trails would provide various degrees of wildlife and fish protection by restricting surface-disturbing and other disruptive activities within the protected zone of the trail. However, preserving national historic trails may limit or prohibit land treatments and habitat restoration projects that would benefit wildlife. Excluding surface-disturbing activities within 500 feet of cultural sites in ACECs would also protect wildlife and their habitats in the buffer zone.

4.2.6.4.11.4. Alternative 3

Impacts would be similar to Alternative 2 except that the exclusion zone around cultural sites within ACECs would be only 100 feet. This would protect less wildlife habitat, but surface-disturbing activities are limited within ACECs in general, so this smaller buffer is not expected to cause any additional negative impacts to wildlife and their habitats.

4.2.6.4.11.5. Alternative 4

Impacts under Alternative 4 would be similar to those under Alternative 3.

4.2.6.4.12. Paleontological Resources Impacts on Fish and Wildlife

4.2.6.4.12.1. Impacts Common to All Alternatives

Data recovery efforts and studies of paleontological resources could result in localized impacts to wildlife species and their habitat due to increased human presence and surface disturbance during excavation. Impacts to wildlife are expected to be negligible to minor based on the limited footprint of paleontological resources within the district.

4.2.6.4.12.2. Alternative 1

Protecting the Arrow Canyon Bird Track site would help protect wildlife and habitats within the vicinity of the site. This alternative would not provide management guidance on the collection of common insect and botanical fossils which could lead to impacts to wildlife and their habitats during unmanaged collection activities.

4.2.6.4.12.3. Alternative 2

Protecting vertebrate paleontological sites, including precluding activities at Tertiary-aged trackways and the Upper Las Vegas Wash, along with only allowing permitted collection in other areas, would also protect surrounding wildlife and their habitats. This would protect more areas compared to Alternative 1. Developing on-site interpretation, though, could lead to increased visitation that could lead to localized impacts to wildlife around these interpretive sites. Limiting collection of common insect and botanical fossils to designated areas would help limit impacts from collection activities on wildlife throughout the district. It could lead to increased impacts in the designated areas though due to concentrated collection pressure in those areas.

4.2.6.4.12.4. Alternative 3

Impacts would be similar to those in Alternative 2 except that activities in Tertiary-aged trackways or the Upper Las Vegas Wash would not be precluded. This could lead to impacts to wildlife and habitats in these areas if surface-disturbing activities are permitted. Alternative 3 would allow non-commercial collection of common insect and botanical fossils throughout the district unless it is incompatible with other resource protection. This could lead to some impacts from collection activities on wildlife habitats, but collection could be stopped if it is determined to be causing an undesirable impact.

4.2.6.4.12.5. Alternative 4

Impacts would be similar to those in Alternative 3 except that Alternative 4 would permit surface-disturbing activities in areas with paleontological resources after the sites have been inventoried and data has been collected. This would not provide protection of wildlife and their habitat in the long term because it would still allow the site to be disturbed.

4.2.6.4.13. Visual Resource Management Impacts on Fish and Wildlife

4.2.6.4.13.1. Impacts Common to All Alternatives

Restrictions on visually obtrusive developments on VRM Class I and Class II areas would provide more protection to wildlife and associated habitat from development activities within these areas compared to VRM Class III or IV areas. VRM Class I and II areas, though, may increase the difficulty of accomplishing habitat improvement actions and may affect the dimensions and locations of habitat treatments. These VRM guidelines could limit the extent or effectiveness of restoration activities because such treatments could change the visual character of vegetative communities. The long-term benefit to wildlife from a VRM Class I or II designation should outweigh any localized restrictions on habitat improvements. Surface-disturbing activities in

areas designated as VRM Class III and especially Class IV would not be as limited, and thus these areas are expected to receive more negative impacts to wildlife and their habitats.

4.2.6.4.13.2. Alternative 1

Alternative 1 would designate fewer acres as Class I and II compared to Alternatives 2 and 3. It would also designate fewer acres of Class II compared to Alternative 4 but the same amount of acres of Class I. Alternative 1 would designate more acres as Class III and fewer acres of Class IV compared to the other alternatives.

4.2.6.4.13.3. Alternative 2

Alternative 2 would designate the most acres of Class I compared to the other alternatives and more acres of Class II compared to Alternatives 1 and 4 but fewer than in Alternative 3. It would designate more acres of Class III compared to Alternatives 3 and 4 and fewer than in Alternative 4. It would also designate fewer acres of Class IV compared to Alternatives 3 and 4 but more than in Alternative 1. Overall, Alternative 2 would designate the most acres of Class I and II and thus provide the most protection to fish and wildlife.

4.2.6.4.13.4. Alternative 3

Alternative 3 would designate the same amount of Class I as Alternatives 1 and 4 but fewer than in Alternative 2. It would designate more acres of Class II than the other alternatives. Alternative 3 would designate fewer acres of Class III and more acres of Class IV compared to Alternatives 1 and 2.

4.2.6.4.13.5. Alternative 4

Alternative 4 would designate the same amount of Class I as Alternatives 1 and 3 but fewer than in Alternative 2. It would designate fewer acres of Class II than Alternatives 2 and 3 but more than in Alternative 1. Alternative 4 would designate fewer acres of Class III and more acres of Class IV compared to the other alternatives. Overall, Alternative 4 would provide the least benefit to fish and wildlife.

4.2.6.4.14. Lands with Wilderness Characteristics Impacts on Fish and Wildlife

4.2.6.4.14.1. Impacts Common to All Alternatives

Because no lands with wilderness characteristics exist in Alternative 1, there are no impacts common to all alternatives.

4.2.6.4.14.2. Alternative 1

No areas would be managed as lands with wilderness characteristics and thus there would be no benefits to wildlife and their habitats from this management anywhere in the district.

4.2.6.4.14.3. Alternative 2

Alternative 2 would manage the most acres as lands with wilderness characteristics. Actions to preserve wilderness characteristics in these areas would also help protect wildlife and their habitats by limiting surface-disturbing and disruptive activities. The closure of the areas to motorized and mechanized travel and the exclusion of ROWs would further limit impacts to wildlife and help previously disturbed areas start to recover. Closure of the areas to mining and no surface occupancy for oil and gas would also help limit impacts to wildlife. There could be minor negative impacts to wildlife from this management if habitat improvement projects that would benefit wildlife are restricted to maintain wilderness characteristics. The overall benefits of lands with wilderness characteristics to wildlife and their habitats would outweigh any localized restrictions on wildlife projects.

4.2.6.4.14.4. Alternative 3

The impacts under Alternative 3 would be similar to those under Alternative 2 except that fewer acres would be managed as lands with wilderness characteristics. In addition, motorized and mechanized travel would be limited to designated trails, and the areas would be ROW avoidance areas instead of exclusion areas. Thus impacts to wildlife from designated OHV routes such as mortality and habitat fragmentation could still occur. ROWs could still be approved in the areas, which could cause habitat loss and fragmentation.

4.2.6.4.14.5. Alternative 4

The impacts under Alternative 4 would be similar to those under Alternative 3 except that fewer acres would be managed as lands with wilderness characteristics compared to Alternatives 3.

4.2.6.5. Resource Uses

4.2.6.5.1. Forestry and Woodland Products Impacts on Fish and Wildlife

4.2.6.5.1.1. Impacts Common to All Alternatives

Managing woodlands and conifer forests for all aged stands with good understory will benefit wildlife by providing a wider range of woodland and forest structural habitats compared to single-aged stands. This will help maintain and possibly increase wildlife diversity. Firewood cutting and gathering could have negative impacts on wildlife due to human presence and habitat disturbance in the immediate vicinity of the cutting and gathering activity. Limiting firewood cutting and gathering to designated areas and imposing restrictions when needed would help minimize impacts to wildlife, including removal of nests.

4.2.6.5.1.2. Alternative 1

Allowing the harvesting of dead and down or marked “green” mesquite and acacia, even in approved areas, can impact wildlife due to human presence and habitat disturbance. Mesquite and acacia are important habitats for many wildlife species due to the cover and food they can provide compared to surrounding desert scrub habitats. Many desert bird species will nest in mesquite and acacia trees. Many wildlife species that are normally considered desert scrub species will utilize

mesquite and acacia as cover from predators and during high summer temperatures. Mesquite and acacia habitats are restricted in the planning area and thus impacts to these important wildlife habitats can have moderate to major impacts to numerous wildlife species.

4.2.6.5.1.3. Alternative 2

Prohibiting the collection of live, dead, or down mesquite and acacia throughout the planning area would help protect this important wildlife habitat from impacts during collection activities. Allowing commercial seed collections would impact wildlife in collection areas due to human presence and potential disturbance to habitats during collection activities such as damage to plants depending on collection method. Collection could have impacts on granivorous wildlife such as rodents, birds, and ants that eat seeds as the main part of their diet. These impacts are expected to be negligible to minor due to the localized nature of collections and the ability to control collection impacts through the permitting process. Allowing personal collection of plant materials could have very localized impacts to wildlife through human presence and impacts to plants being used by individual wildlife for food or shelter. These impacts are assumed to be negligible on the landscape.

4.2.6.5.1.4. Alternative 3

Impacts from Alternative 3 would be similar to those under Alternative 2 except that personal collection of dead and down mesquite acacia for on-site recreational campfires would be allowed in areas open to firewood gathering. This could cause localized impacts to wildlife habitats due to habitat disturbance. Some species utilize dead and down mesquite and acacia for cover and nesting material. Removal of dead branches from trees may also disturb or destroy nests if done during the breeding season. Wildlife already disturbed by the presence of campers in the area, though, would not be expected to be disturbed further by on-site collection activities.

4.2.6.5.1.5. Alternative 4

Impacts from Alternative 4 would be similar to Alternative 3.

4.2.6.5.2. Livestock Grazing Impacts on Fish and Wildlife

4.2.6.5.2.1. Impacts Common to All Alternatives

Overall, negative impacts to wildlife from grazing can range from minor to major. Livestock can compete with wildlife for space, forage, cover, and water resources. In addition, livestock grazing may disturb soils, alter vegetation structure and composition, and impact water quality, thus affecting wildlife habitats. Livestock hooves can collapse burrow entrances, dens, and nests. Urine and manure affect water quality, which would influence aquatic species composition and overall health. Grazing is also a source of introduction and spread of non-native and invasive plants. Fences associated with grazing allotments can create travel barriers for some wildlife species and provide perches for predators. Fences may also injure some species as they try to cross under or through the fence. Jones (2000), in a quantitative review of 54 grazing studies in the arid west, reported that 11 of 16 wildlife or habitat variables examined showed significant detrimental effects of livestock grazing. Examples of variables impacted included species diversity and richness, shrub cover, grass cover, seedling survival, cryptogamic crust cover, soil/water infiltration rate, soil erosion, and liter biomass.

Impacts to riparian areas include loss of vegetation, soil disturbance, sedimentation and erosion, changes in water quality, and changes in channel morphology and bank stability. Complete suspension of grazing from riparian areas that are currently being grazed can also lead to negative impacts to some wildlife species. Removal of grazing pressures from riparian areas can lead to vegetative overgrowth resulting in loss of open water habitats needed by some wildlife species and reduction of dissolved oxygen in the remaining water. Increased transpiration due to increased vegetation densities can also lead to loss or reduction of surface water. By altering vegetation composition, structure, and diversity, grazing alters wildlife habitat and animal species composition in the grazed area that usually occurs at varying levels across the landscape. High levels of habitat alteration can lead to habitat fragmentation and loss of connectivity between neighboring, ungrazed habitats.

Management to achieve rangeland health standards would help limit impacts and help maintain healthy ecological conditions, including healthy habitats for wildlife. Constructing rangeland development projects and new water sources would cause short-term losses of vegetation for wildlife habitat by removing or trampling vegetation but could improve water availability for wildlife and support distribution of wildlife in the long term. Moderate impacts typically occur within areas where livestock are concentrated, such as water sources, salting and supplement areas, or areas in which livestock are trailed or worked (e.g. corral or other area where livestock are gathered, sorted, etc.). Keeping salt and mineral supplements at least a mile from water sources will help protect against impacts to water quality and thus impacts to aquatic and riparian species.

Allotments would continue to be broadly categorized, based on management goals, as “I” (improve), “M” (maintain), or “C” (custodial). Each alternative also recognizes that each allotment is a complex mix of resources values and circumstances, best addressed through an adaptive management approach. Examples of circumstances that would continue to be addressed with adaptive management are drought, insect infestation and fire. Livestock grazing may be restricted partially or completely for such reasons. Range betterment funds would be used to improve rangeland conditions. Monitoring data would be used to ensure that resource objectives were being achieved. Monitoring data would also be used to determine if adjustments to animal unit months (AUMs) or forage allocation between livestock and wildlife were needed to achieve objectives. These actions would result in habitat conditions conducive to healthy fish and wildlife populations, which is important during times when additional stressors (drought, insect infestation, and fire) impact habitats.

Natural recovery of habitats exposed to grazing depends on the intensity of the past grazing and the local conditions. If livestock grazing is discontinued on an allotment administered by SNDO for the purposes of improving wildlife habitats, the area may also need to be closed to other multiple-use activities to allow the allotment to return to natural conditions for supporting the normal diversity of wildlife species.

4.2.6.5.2.2. Alternative 1

Under Alternative 1, all currently open allotments would remain open. All but three of these allotments are currently inactive. Leaving the inactive allotments open to grazing would potentially lead to the reintroduction of grazing impacts into these areas.

4.2.6.5.2.3. Alternative 2

Under Alternative 2, all allotments, including the three currently active allotments, would be closed to grazing. Thus grazing as a potential impact to fish and wildlife would be removed from the entire planning area.

4.2.6.5.2.4. Alternative 3

Under Alternative 3, only the three currently active allotments would remain open for grazing. Thus grazing impacts would not be introduced into areas not currently experiencing these types of impacts. Grazing impacts, though, would continue in the three allotments that would remain open.

4.2.6.5.2.5. Alternative 4

Under Alternative 4, in addition to the three currently active allotments that would remain open in Alternative 3, two additional allotments that are currently inactive would also remain open. This could result in the reintroduction of grazing, and thus potential impacts to fish and wildlife, into the two allotments that are currently inactive.

4.2.6.5.3. Minerals Impacts on Fish and Wildlife

4.2.6.5.3.1. Impacts Common to All Alternatives

Overall, impacts to wildlife from mining activities can range from minor to major. The location and size of minerals or mining operations and the amount of human activity would dictate the level of impacts on wildlife species. Impacts on wildlife and habitats from minerals exploration and development generally occur from surface disturbance and thus loss and fragmentation of habitats, as well as disturbances from noise (e.g. blasting, excavation) and activity associated with construction, operation, and maintenance of facilities and roads. Abandoned mines serve as important year-round habitats for bats. Some mining operations may disturb or destroy cracks and crevices in cliffs where bats or birds are roosting. Hibernacula and/ or maternity colonies of bats can be severely impacted by mining practices, and even reclaimed areas may never again be suitable habitat for some species. Even mining claim markers, if made from open hollow pipes, can cause wildlife mortality if individuals become trapped inside the pipe.

Fluid minerals development would result in habitat loss and fragmentation from installing roads, pipelines, power lines, drilling pads, sumps, and production facilities, from contouring surface profiles, and from making other surface modifications. If operations include surface pits, such as oil pits, these pits can cause mortality to wildlife that venture onto or land in the pit. It is BLM standard practice that pits containing harmful fluids be maintained in a manner that prevents migratory bird mortality, thus eliminating potential effects. Depending on the technology used and the drilling location and depth, fluid minerals developments could impact the groundwater through a lowering of the water table or through groundwater contamination. These impacts to the groundwater could result in impacts to springs and other surface waters that are near to or down-gradient of the drilling activities. This could lead to major impacts to aquatic wildlife species due to loss or degradation of aquatic habitats.

Solid mineral exploration and development would result in habitat loss and fragmentation from test pits, overburden removal and storage, material extraction, roads, fences, pipelines, power

lines, production facilities, contouring of surface profiles, and other surface modifications. These disturbed areas can increase the risk of invasive and non-native weed introduction and spread, while decreasing habitat quality. Surface disturbance associated with exploration and testing would be localized and small in scale. Surface disturbance associated with extraction for salable minerals and solid leasable minerals, where larger pit mines are necessary, would be localized, but at a larger scale. Extraction of locatable minerals generally results in scattered, small-scale, localized impacts. These impacts may be short term or long term depending on the duration of mining activities or length of leases.

Sites that may require new access roads would also result in loss and fragmentation of habitat, affecting some wildlife species more than others. Material haul trucks can cause direct mortality to wildlife and increase air pollution. Access roads can also lead to the spread of invasive species. If open to the general public, new access roads may lead to increased public visitation in areas that are currently inaccessible by vehicles. Increased human activity can displace wildlife from the area and introduce trash. If these types of disturbances occur near water sources, impacts to wildlife that are dependent on these areas can be even greater.

In addition to those impacts, the presence of structures such as buildings or transmission lines can impact some wildlife species that are sensitive to visual changes to the landscape. Impacts can also be associated with collision with light structures; some species are suspected to be attracted to them or some species can become disoriented and experience disrupted flight patterns. Transmission lines can cause injury or death to avian species by collision or electrocution, as well as providing artificial perching/hunting and nesting opportunity for raptors and ravens. Therefore, predation is unnaturally increased along these lines, as is predator density. Some wildlife species could become accustomed to the activity over a relatively short period of time, negating the impact on that species through habituation. In some situations, depending on the mineral operation, surface water amount and quality may also be affected. Operations that impact the water table or alter the water quality of aquifers can even have impacts on down gradient springs and riparian areas that are distant from the operation itself. Impacts to water resources could lead to major impacts to wildlife, such as aquatic species, that are dependent on these water sources for survival.

Extraction of salable and solid leasable minerals can include nighttime activities, which introduce artificial light that can either attract or displace wildlife and can disrupt normal behavior patterns. Insects can be attracted to this light source and in turn attract other predator species to the area. Animals that are active at night may be less habituated to human activity. Vehicles may be more likely to strike wildlife at night when visibility is reduced.

Open pit mining may have significant impacts on foraging habitat for bats and birds through destruction of native vegetation, loss of the native insect communities, and water sources that may be destroyed or polluted. Gold mining operations that use cyanide extraction methods can lead to ponds contaminated with cyanide, which can be attractive to wildlife as a drinking source particularly in arid locations. Pits or ponds containing hypersaline water can pose a mortality threat to migratory birds through ingestion of toxic brine, susceptibility to avian botulism, and sodium crystallization on feathers, which destroys thermoregulatory and buoyancy functions. It is BLM standard practice that pits containing harmful fluids be maintained in a manner that prevents migratory bird mortality, thus eliminating potential effects. This may include fencing or installing nets over the pits.

Impacts from each alternative would vary based on the number of acres opened, closed, or withdrawn and based on special or standard stipulations or mitigation measures. In addition,

the types of restrictions, such as those on siting and operation, that can be applied vary by the type of mineral activity and whether or not they are saleable, leasable, or locatable resources. Generally, the greater the restrictions on disturbance, the fewer the impacts on wildlife and habitat. For example, controlled surface use (CSU) and no surface occupancy (NSO) for fluid minerals could limit or remove impacts due to surface-disturbing activities respectively. The requirement of validity exams on existing mining claims in desert tortoise ACECs would benefit wildlife by limiting surface-disturbing activities to only those claims actually containing valid minable amounts of minerals.

New sites and associated impacts on wildlife would be analyzed under NEPA and Endangered Species Act requirements. Necessary avoidance, minimization, and mitigation measures and stipulations would be applied to reasonably protect affected natural resources. Proposed use and occupancy applications would be reviewed prior to approval to ensure that these activities are in compliance with law, regulation and policy. Compliance inspections involving all mineral use activities would be conducted. Reclamation or rehabilitation of mineral operations could include recontouring, stabilization, revegetation, and removal of facilities before closure. While mine reclamation may restore habitats for some wildlife species, it is assumed that due to the slow recovery rates of desert habitats, the sites would remain unsuitable for some species for a long time after mine closure.

4.2.6.5.3.2. Alternative 1

While Alternative 1 would have the fewest acres closed to fluid mineral leasing, the majority of the planning area would be designated as no surface occupancy. Thus Alternative 1 would have the fewest number of acres of wildlife habitats that could be potentially be impacted by surface-disturbing activities associated with a fluid mineral lease. Alternative 1 would have the second most acres open for solid mineral leasing of all the alternatives and thus more acres of wildlife habitat could be impacted by this activity compared to Alternatives 2 and 3.

4.2.6.5.3.3. Alternative 2

Alternative 2 would have the most acres closed to solid mineral leasing of all the alternatives. It would have more acres closed to fluid mineral leasing compared to Alternatives 3 and 4. Overall, Alternative 2 would provide the most protection to wildlife species.

4.2.6.5.3.4. Alternative 3

Alternative 3 would have more acres closed to solid mineral leasing than Alternatives 1 and 4 but less than Alternative 2. It would have the least number of acres closed to fluid minerals but more acres of NSO than in Alternative 4. Overall, Alternative 3 would provide more protection to wildlife compared to Alternatives 1 and 4 but less than Alternative 2.

4.2.6.5.3.5. Alternative 4

Alternative 4 would have the most acres open to solid mineral leasing. It would have the second most closed to fluid mineral leasing but the most acres open without stipulations. Overall, Alternative 4 would provide the least protection for wildlife compared to the other alternatives.

4.2.6.5.3.6. Fluid Leasable Minerals Impacts on Fish and Wildlife

4.2.6.5.3.6.1. Impacts Common to All Alternatives

See above discussion on impacts from minerals actions in general.

4.2.6.5.3.7. Solid Leasable Minerals Impacts on Fish and Wildlife

4.2.6.5.3.7.1. Impacts Common to All Alternatives

See above discussion on impacts from minerals actions in general.

4.2.6.5.3.8. Locatable Minerals Impacts on Fish and Wildlife

4.2.6.5.3.8.1. Impacts Common to All Alternatives

See above discussion on impacts from minerals actions in general.

4.2.6.5.3.9. Saleable Minerals Impacts on Fish and Wildlife

4.2.6.5.3.9.1. Impacts Common to All Alternatives

See above discussion on impacts from minerals actions in general.

4.2.6.5.4. Recreation Impacts on Fish and Wildlife

4.2.6.5.4.1. Impacts Common to All Alternatives

Recreation encompasses a wide range of activities including OHV travel, hiking, biking, horseback riding, target shooting, camping, rock climbing, fishing, hunting, and sightseeing. Impacts from recreation on wildlife can vary from negligible to major based on the type and intensity of recreation use. Impacts would include disruption of wildlife species, interference with life cycle needs and habitat damage and fragmentation. Motorized vehicle use would have greater effects than non-motorized use due to the increased size, weight, and speed of motorized vehicles. Effects would also be greater in areas that receive frequent and/or intense recreation use. Areas that would be subject to more visitation would include easily accessible locations, such as along major roads, near communities, or in areas that offer attractive opportunities for recreation. Wildlife with specialized or localized habitat requirements, such as aquatic species, are more likely to be impacted compared to more wide ranging habitat generalist species that can more easily leave an area where recreation impacts are occurring.

Recreation users could inadvertently trample wildlife and vegetation while driving, camping, hiking, or exploring. Humans, horses, pets, and vehicles could act as dispersal agents for invasive weeds, which degrade wildlife habitats. Uncontrolled pets can also harass, injure, or even kill wildlife. Recreation users could introduce noise and other disturbance that could disturb species during sensitive periods (e.g. mating, nesting), which could indirectly affect breeding and reproduction or cause species to abandon areas. Increased human-wildlife interaction could cause animals to alter behaviors, home ranges, and habitat use and to become physiologically stressed.

Displaced wildlife incurs a physiological cost through excitement (preparation for exertion) and/or through locomotion. A fleeing or displaced animal incurs additional costs through loss of food/water intake and potential displacement to lower quality habitat. Chronic or continuous disturbance could result in reduced animal fitness and reproductive potential, and abandonment of young (mortality).

Hunting would have effects on certain species. Individual animals are killed or injured and population demographics are altered. Animals may also alter use patterns in response to hunting. Recreation users may also leave behind trash or partially eaten food that can lead to a localized increase in scavengers, such as ravens, which may also prey on other wildlife in the area. Recreational hunting can also lead to increased lead contamination in the environment and gut piles contaminated with lead left from harvested animals can also cause mortality to wildlife if consumed.

OHV use can directly impact wildlife species through mortality and/or injury from OHV collisions and indirectly impact wildlife through habitat damage and noise and dust generation. The low-frequency noise emitted by OHVs may affect the central auditory system of species such as kangaroo rats that have evolved sensitive hearing to detect predators, potentially resulting in direct injury or indirectly by increased predation. Studies have found reduced density and biomass of reptiles, small mammals, and plants in OHV use areas (Randall et al. 2010).

Recreation management activities that result in increased human presence would have localized impacts on wildlife and fish species. Constructing new trails and recreation facilities, which would be subject to site-specific environmental NEPA and Section 7 ESA review, could introduce new areas of surface disturbance and concentrate human presence, depending on the location of the trails/facilities. Avoidance, minimization, and mitigation measures, as well as stipulation, could be applied to these projects to help reduce impacts on wildlife. Larger scale visitation, such as commercial, competitive, and group activities, could have moderate to major impacts, but effects would be minimized through the requirement of a special recreation permit that could include use restrictions and mitigation measures. Development of new water-based recreation sites would increase impacts on fish and aquatic habitats through increased visitor use. Seasonal closures of special status species habitats would also provide protection for other wildlife from disruptive activity during sensitive periods.

Camping and overnight use of areas would have impacts due to the longer stay and nighttime use. Collecting wood for fires reduces the amount of woody material available for wildlife habitats or to protect the soil surface and can be a risk for potential wildfire. In the absence of sanitation facilities, human or other animal waste could alter soil nutrient levels and water chemistry, which would affect habitats and water quality. More trash would be generated, which can be a potential attractant for ravens or other predators. Multiple meals would generate food smells and waste that could attract wildlife. There is the potential for human/wildlife interactions and risk of injury or conditioning of wildlife to human presence. Tent or trailer placement could damage vegetation or compact soils. Night lighting can either attract or displace wildlife and disrupt normal behavior patterns. Continuous or frequent human and pet activity could displace wildlife for long periods and have a greater effect than transient day-use activities.

The main difference between the alternatives is in the designation of different areas as SRMAs or ERMAs. Designation of areas as SRMAs could increase public awareness and consequently increase visitation. The possibility of increased human presence SRMAs, concentrating around staging areas, trails, and other developed recreation sites could displace wildlife species from

habitats surrounding developed sites and result in trampling, collection, and other inadvertent removal of wildlife and plant species, depending on the location and level of human presence associated with the site. Increasing planning efforts and management presence in SRMAs, though, could decrease impacts from recreation activities. Implementation plans for each SRMA could include mitigations to reduce impacts to wildlife and their habitat. Designation of areas as ERMAs may lead to lower visitation levels and thus lower impacts on wildlife due to less-developed recreation opportunities, but it could conversely lead to more impacts to wildlife due to less management oversight. The impacts from Transportation on Wildlife section reviews the impacts from designating areas as closed, open, or limited to designated routes for travel.

4.2.6.5.4.2. Alternative 1

There were no unique impacts identified for Alternative 1.

4.2.6.5.4.3. Alternative 2

The requirement for vehicles to park only in designated parking areas or previously disturbed areas would help limit impacts to wildlife habitats by not creating new disturbance due to vehicles being parked in previously undisturbed areas. During the designation process for parking areas, areas that could cause adverse impacts to wildlife could be identified and avoided. Similar to designated parking areas, designated camping areas or camping only in previously disturbed areas could also help limit impacts to wildlife by limiting new disturbances. Potential camping areas that could adversely impact wildlife could be identified and avoided during the designation process.

4.2.6.5.4.4. Alternative 3

Except for different recreation area designations, the impacts under Alternative 3 would be similar to those under Alternative 2.

4.2.6.5.4.5. Alternative 4

Except for different recreation area designations, the impacts under Alternative 4 are similar to those under Alternatives 2 and 3.

4.2.6.5.5. Travel and Transportation Impacts on Fish and Wildlife

4.2.6.5.5.1. Impacts Common to All Alternatives

Roads and trails can fragment and reduce habitats, increase injury and mortality to wildlife by vehicles, increase access for predators, and alter home range and migration corridors of wildlife. Roads and trails near urban areas also often become sites for illegal dumping, which can damage habitats and attract scavengers. Roads and trails can also lead to the introduction and spread of invasive and non-native species that are transported by vehicles. On a general scale, roads decrease habitat quality, fragment wildlife habitat, and impair populations as well as genetic diversity. Impacts to wildlife could range from minor to major. The magnitude of impacts varies by species and susceptibility to disturbance, habitat types, size and traffic volume of roads, and seasonal use. Roads and trails increase human-wildlife interactions. Major impacts typically occur where use is more frequent and severe and interactions between wildlife and humans are greater. These are typically routes and roads that are maintained for more frequent, higher-speed, and

multiple modes of travel. Paved roads can lead to high levels of wildlife mortality because many wildlife species, especially nocturnal reptiles and rodents, use paved roads to warm up at night and are thus highly susceptible to collisions with vehicles. Interactions and impacts are fewer in areas where roads and trails are infrequently used, such as rough, unpaved roads, or wilderness trails.

Species that are less mobile, have large home ranges, follow distinct migration patterns, or are wary of humans are affected the most by roads. Motorized vehicle use and associated human uses that impact critical habitat niches for wildlife, such as den, nest, or roost sites, critical foraging areas, migratory travel corridors, and security areas, are particularly vulnerable to wildlife disturbances and displacement. Washes (often used as travel routes) contain the most important habitats for amphibians, reptiles, and migratory birds, especially during drought conditions. Allowing travel in navigable washes would have direct and indirect impacts to plants and wildlife. Flood and sediment damage from improperly maintained roads and trails can degrade surrounding habitats, especially aquatic habitats. Decommissioning roads that present problems to the environment would reduce wildlife and habitat impacts in select locations.

The alternatives differ in the number of acres designated as open, closed, and limited to designated routes. Open areas are mostly areas devoid of or have sparse vegetation. Wildlife still occur in these barren areas including species specially adapted to live in these types of habitats, such as dune-specialized insects, birds, and reptiles. Even playas contain specialized invertebrates such as fairy shrimp (*Branchinecta* spp.) and tadpole shrimp (*Triops* spp.), and their eggs can be damaged by OHV use. These invertebrates are an important food source for many migratory birds after the eggs hatch when the playas fill with water after heavy rain events. The ability of vehicles to travel anywhere within these areas can lead to disturbances throughout the area impacting the wildlife community as a whole. Areas closed to travel help remove or reduce the impact of vehicles on wildlife. Old routes may remain and still cause habitat fragmentation for some species unless the routes are restored.

Most of the district would be designated as limited to designated routes in each alternative. Limiting vehicles to designated routes could help reduce impacts to wildlife in these areas depending on the number and location of designated routes. OHV use on designated routes could still result in the disturbance or displacement of wildlife through human presence, noise, dust, and disruptive activities. A well-designed route system that gives consideration to wildlife habitats could support wildlife by limiting fragmentation, closing specific routes causing adverse impacts to wildlife, and directing visitors away from sensitive wildlife resources.

4.2.6.5.5.2. Alternative 1

Alternative 1 would not contain some of the management directions proposed in the other alternatives that would be beneficial to wildlife. Alternative 1 would have the most area designated as open compared to the other alternatives. It would have the second most acres designated as closed due to the closure of the Las Vegas Valley SRMA, which would be limited to designated routes in the other alternatives. The rest of the planning area would be either limited to designated routes or limited to existing roads, trails, and dry washes. Limiting travel to existing roads, trails, and dry washes does not provide as much protection to wildlife as limiting travel to designated routes because it does not provide the option of analyzing and protecting sensitive wildlife resources through the route designation process. Washes often contain a higher diversity of wildlife compared to neighboring upland habitats, and thus allowing travel through washes can lead to impacts numerous wildlife species and their habitats.

4.2.6.5.5.3. Alternative 2

Most of the district would be designated as limited to designated routes in each alternative. Limiting vehicles to designated routes could help reduce impacts to wildlife in these areas depending on the number and location of designated routes. OHV use on designated routes could still result in the disturbance or displacement of wildlife through human presence, noise, dust, and disruptive activities. A well-designed route system that gives consideration of wildlife habitat could support wildlife by limiting fragmentation, closing specific routes causing adverse impacts to wildlife, and directing visitors away from sensitive wildlife resources. Alternative 2 would designate the least number of acres as open and the most acres as closed to travel compared to the other alternatives and thus provide the most protection to wildlife. Closing dry lake beds to vehicle use when the lake beds have standing water would help reduce impacts to invertebrates that hatch and reproduce under these conditions, as well as birds or other species using this critical water source. It would also help reduce impacts to other wildlife such as migratory birds that feed on the invertebrates during these periods. The ability to close areas and routes due to adverse impacts to resources including wildlife would help manage these impacts before they get too severe.

4.2.6.5.5.4. Alternative 3

Impacts under Alternative 3 would be similar to those under Alternative 2 except that Alternative 3 would designate more areas as open and fewer acres as closed to travel. It would thus provide less protection to wildlife compared to Alternative 2 but would be similar to the other alternatives.

4.2.6.5.5.5. Alternative 4

Impacts under Alternative 4 would be similar to those under Alternative 2 except that Alternative 4 would designate more areas as open and fewer acres as closed to travel. It would thus provide less protection to wildlife compared to Alternative 2 but would be similar to the other alternatives.

4.2.6.5.6. Lands and Realty Impacts on Fish and Wildlife

Impacts on fish and wildlife from most lands and realty management actions range from minor to major and include habitat loss, habitat fragmentation, degradation of habitat, species displacement, injury and/or mortality and potential loss of diversity from development and other permitted facilities. Besides direct habitat loss, vertical structures, such as poles, towers, and buildings can provide perches and nesting structures for predators. Animals can also collide with towers, aerial lines, guy wires, and other structures with vertical components. Lights on structures can also impact species, especially nocturnal species that rely on dark skies for navigation, as a behavioral cue, or for concealment from predators.

4.2.6.5.6.1. Land Tenure (Disposals and Acquisitions) Impacts on Fish and Wildlife

4.2.6.5.6.1.1. Impacts Common to All Alternatives

For land disposals, the level of impact depends on the size of the parcels, the type and current condition of habitat on the parcels, location of the parcels on the landscape, location of the parcels in relation to other developments and surrounding habitat, species present on parcels, and the ultimate disposition or type and level of development on the parcels. Disposed parcels located

next to already developed parcels or that do not fully block wildlife movement corridors would cause less fragmentation compared to parcels fully surrounded by undeveloped land or parcels that completely block the movement of wildlife between neighboring habitats. Parcels that are already disturbed and thus have degraded wildlife habitat would cause less impact to wildlife than the disposal of undisturbed, pristine, high-quality habitats due to presumed species presence/use.

Future development of the disposed parcels could also impact vegetation and wildlife habitat adjacent to those lands due to increased human pressure, including the proliferation of roads and trails, on the undeveloped lands. This pressure would in turn impact wildlife species by eliminating adequate forage, cover, and breeding habitat and increasing non-native and invasive species. The disposal of large parcels of land around growing communities also eliminates the buffer zone created to protect wildlife and wildlife habitat and increases urban sprawl. Disposal of parcels may also lead to groundwater withdrawals from future development that lead to a lowering of the water table which could cause major impacts to nearby springs and riparian areas that provide important wildlife habitat.

Benefits to fish and wildlife resources could also occur from lands and realty management by acquiring sensitive habitat and/or locations of known special status species. Conversion of these private lands to public lands could be managed in a way to support protection of wildlife habitat and restrict development of sensitive resources. Habitat fragmentation could be reduced via land acquisition and adjustment. Larger blocks of contiguous lands allow for consistent management of wildlife habitats without unregulated private land activities interspersed. Degraded habitat on acquired lands could be improved.

4.2.6.5.6.1.2. Alternative 1

Alternative 1 would have more acres proposed for land disposal compared to Alternative 2 but fewer than Alternatives 3 and 4.

4.2.6.5.6.1.3. Alternative 2

Alternative 2 would have the least amount of acres proposed for land disposal and thus result in the lowest impacts to fish and wildlife.

4.2.6.5.6.1.4. Alternative 3

Alternative 3 would have more acres proposed for land disposal than Alternatives 1 and 2 but fewer than Alternative 4..

4.2.6.5.6.1.5. Alternative 4

Alternative 4 would have the most acres proposed for land disposal and thus lead to the most loss of wildlife habitats of all the alternatives.

4.2.6.5.6.2. Land-Use Authorizations (Right-of-Ways, Leases, Permits) Impacts on Fish and Wildlife

4.2.6.5.6.2.1. Impacts Common to All Alternatives

In general, land-use authorization (LUA) developments (including power lines, pipelines, and communication sites), and associated access roads, would disturb wildlife habitats, and the level of impacts would depend on the location and size of the LUA. While impacts from some individual projects are localized and small, multiple projects cause a cumulative impact to species affected on the landscape scale over the long term. LUAs that include groundwater pumping could cause major impacts to nearby springs and riparian areas that provide important wildlife habitat. Most communication site ROWs would be located in common (within existing or shared ROWs), which would help reduce the overall impacts of such projects. Co-locating communication sites would also limit the need for new access roads. Small LUA developments could cause habitat fragmentation for small wildlife but are unlikely to cause considerable fragmentation for larger wildlife. Access roads associated with LUAs, though, can often cause more habitat fragmentation than the facility itself. The designation of areas as exclusion or avoidance zones for LUAs would reduce impacts to wildlife by limiting development in these areas.

4.2.6.5.6.2.2. Alternative 1

Alternative 1 would have the fewest acres designated as avoidance or exclusion for LUAs and thus could lead to the most impacts to wildlife of all the alternatives from this type of activity. Avoiding ROWs within one-quarter mile of caves would help reduce impacts to bats and other wildlife that may be using the caves. The buffer would also protect wildlife habitats surrounding the cave.

4.2.6.5.6.2.3. Alternative 2

Alternative 2 would have the most acres designated as avoidance or exclusion for LUAs and thus would lead to the fewest impacts to wildlife of all the alternatives from this type of activity. Avoiding ROWs within one-quarter mile of caves would help reduce impacts to bats and other wildlife that may be using the caves. The buffer would also protect wildlife habitats surrounding the cave.

4.2.6.5.6.2.4. Alternative 3

Alternative 3 would have the fewer acres designated as avoidance or exclusion for LUAs compared to Alternative 2 but more than Alternatives 1 and 4. Avoiding ROWs within one-quarter mile of caves would help reduce impacts to bats and other wildlife that may be using the caves. The buffer would also protect wildlife habitats surrounding the cave.

4.2.6.5.6.2.5. Alternative 4

Alternative 4 would have the fewer acres designated as avoidance or exclusion for LUAs compared to Alternatives 2 and 3 but more than Alternatives 1. Avoiding ROWs within one quarter mile of caves would help reduce impacts to bats and other wildlife that may be using the caves. The buffer would also protect wildlife habitats surrounding the cave.

4.2.6.5.6.3. Renewable Energy Impacts on Fish and Wildlife

4.2.6.5.6.3.1. Impacts Common to All Alternatives

The level of impact from renewable energy projects depends on the size, location, species presence and use and type of facility. Solar development projects, due to their size and normal practice of clearing all vegetation, grading, leveling the ground at the site, and fencing the entire site can have major impacts to wildlife. The location of solar projects mostly in valley bottoms can limit the ability of species to move between alluvial fans and mountain ranges on either side of the project thus greatly reducing connectivity and increasing habitat fragmentation. The intense heat (solar flux) and high intensity lights generated from some solar technologies can cause singeing, blinding, internal hemorrhage or other injury and kill birds or bats that fly too close or are in the direct path of the installations. Blunt force trauma and predation has also been documented at several solar facilities. Migratory birds may also mistake large expansive fields of reflective continuous blue solar panels for water sources and try to land on them, leading to collisions with the panels. Birds for which the primary habitat is water have been over represented in mortalities at some desert ecosystem facilities. Insect mortality has also been documented at some facilities and may serve as an attractant for migratory birds that feed on these insects. Given the limited data available of mortality monitoring and associated variables at solar facilities, it is difficult to know the true scope of avian mortality.

While wind projects often have an overall ROW footprint that is larger than solar projects, surface disturbance is normally isolated to the areas around the turbines, access roads, and associated facilities and not the entire site. Thus they cause less direct habitat disturbance compared to solar projects. Wind farms create other types of impacts to wildlife, though. Wind turbines kill or injure bats, raptors, and other migratory birds that collide with or suffer barotrauma from them. Impacts have shown to usually be much greater for bats compared to birds in terms of overall mortality rates. This type of impact can be even greater if the turbines are located in the path of important migratory flyways or near bat roosts or hibernacula. Studies suggest the taller the turbines and the larger the rotor swept area of the blade, the greater the impacts on wildlife. Access roads to the turbines remove habitats, create habitat fragmentation, and can lead to increased OHV use, as well as disrupt connectivity and prevent/reduce movement for some species.

For both solar and wind projects, ROWs such as access roads, power lines, and substations located to support the projects would remove vegetation necessary to sustain wildlife habitats. Human disturbances from construction, operation, and maintenance of facilities, such as noise, movement, and vibrations, would alter wildlife behavioral use patterns in the vicinity of the project. Some impacts from these types of projects could be avoided and/or minimized by employing best management practices and project design stipulations, and by implementing mitigation measures, which would minimize impacts. Making towers, ponds and panels less attractive or accessible to birds may help mitigate mortality/injury events to wildlife.

4.2.6.5.6.3.2. Alternative 1

Under Alternative 1, there would be more acres open to solar developments and more acres open to wind developments compared to the other alternatives. If this leads to more renewable energy projects being developed compared to the other alternatives, there would be more impacts to fish and wildlife compared to the other alternatives.

4.2.6.5.6.3.3. Alternative 2

Alternative 2 would have the fewest acres open to solar developments and the fewest acres open to wind developments. Thus it would provide the most protection to wildlife from these types of developments.

4.2.6.5.6.3.4. Alternative 3

Alternative 3 would have more acres open for solar and wind developments compared to Alternative 2 but fewer than Alternatives 1 and 4.

4.2.6.5.6.3.5. Alternative 4

Alternative 4 would have more acres open for solar and wind developments compared to Alternatives 2 and 3 but fewer than Alternative 1.

4.2.6.5.6.4. Utility Corridors Impacts on Fish and Wildlife

4.2.6.5.6.4.1. Impacts Common to All Alternatives

Similar to co-locating communication sites discussed above, the designation of utility corridors would help reduce overall impacts to wildlife by reducing the number of access roads needed and focusing disturbance in specific areas instead of spread across the landscape. This would help reduce overall habitat fragmentation across the landscape, although impacts would still exist to species affected. Many of the proposed corridors already include existing utility ROWs and infrastructure. Impacts in corridors from new power lines could be reduced by requiring the use of the same access road for multiple projects thus limiting new surface disturbance to new spur roads and pole footprints. Impacts could also be reduced by limiting use of access roads to administrative use only.

4.2.6.5.6.4.2. Alternative 1

Alternative 1 would have the most designated corridors. Some of the corridors would be narrower than in the other alternatives. Thus Alternative 1 could lead to the most impacts to fish and wildlife on a landscape scale but the other alternatives with wider corridors could cause more impacts in specific locations.

4.2.6.5.6.4.3. Alternative 2

Alternative 2 would have the fewest corridors and many of the corridors would be narrower than those in Alternatives 3 and 4. Thus Alternative 2 would cause the least amount of impacts to fish and wildlife from development within the corridors.

4.2.6.5.6.4.4. Alternative 3

Alternative 3 would have more and wider corridors compared to Alternative 2 but fewer and narrower corridors compared to Alternative 4.

4.2.6.5.6.4.5. Alternative 4

Alternative 4 would have more corridors compared to Alternatives 2 and 3 and would have the widest corridors of all the alternatives.

4.2.6.6. Special Designations

4.2.6.6.1. Areas of Critical Environmental Concern Impacts on Fish and Wildlife

4.2.6.6.1.1. Impacts Common to All Alternatives

Generally special management areas such as ACECs result in protection of wildlife and long-term improvement or at least maintenance of habitat quality because of numerous use restrictions. ACEC management could reduce or eliminate surface disturbance, development, and other disruptive activities, thereby protecting wildlife habitats. Use restrictions in ACECs could include ROW exclusion or avoidance, closure or limits to mineral exploration, limits to or exclusion of certain types of recreation use such as high-speed events, limits of travel to designated routes, and closure to grazing. All of these restrictions would help protect wildlife and their habitats to various degrees. Actions to protect and restore habitats for special status species in the ACECs would also protect and improve habitats for other wildlife species. If next to other protected lands, ACECs can play an important role in providing and protecting connectivity between habitats for numerous wildlife species.

The main difference between the alternatives is the number and size of ACECs proposed for designation and thus the number of acres of wildlife habitats potentially protected. Use restrictions and some management directions for special status species also can vary between alternatives for some ACECs. For a description of impacts of the different levels of resource use restrictions on wildlife in ACECs, refer to the discussion of the overall impacts of each resource use on wildlife. Higher levels of protection and improvement of special status species habitats would provide higher levels of benefits to other wildlife species.

4.2.6.6.1.2. Alternative 1

Alternative 1 would not designate any new ACECs beyond what has already been designated. It would thus protect the fewest acres of wildlife habitat of all the alternatives.

4.2.6.6.1.3. Alternative 2

Alternative 2 would designate the most new ACECs and increase the size of some of the existing ACECs. It would also have the most restrictive management prescriptions for surface-disturbing activities of all the alternatives. It would thus protect the most acres of wildlife habitat of all the alternatives.

4.2.6.6.1.4. Alternative 3

Alternative 3 would designate fewer new ACECs and not increase the size of some existing ACECs as much as Alternative 2. It would also have slightly less restrictive management

prescriptions compared to Alternative 2. Thus Alternative 3 would protect less wildlife habitat than Alternative 2 but more than Alternatives 1 and 4.

4.2.6.6.1.5. Alternative 4

Alternative 4 would designate a couple of new ACECs but not as much as in Alternatives 2 and 3. It would also have less restrictive management prescriptions than Alternatives 2 and 3. Thus Alternative 4 would protect less wildlife habitat than Alternatives 2 and 3 but more than Alternative 1.

4.2.6.6.2. National Trails Impacts on Fish and Wildlife

4.2.6.6.2.1. Impacts Common to All Alternatives

See Cultural Resources for impacts on fish and wildlife.

4.2.6.6.2.2. Alternatives 1 through 4

There are no additional impacts to fish and wildlife.

4.2.6.6.3. Wild and Scenic Rivers Impacts on Fish and Wildlife

4.2.6.6.3.1. Impacts Common to All Alternatives

Flowing rivers and streams are a rare resource in the district and provide vital habitats for many wildlife species within the planning area. This includes fish, aquatic invertebrates, and amphibians that live in these rivers and other wildlife that use the rivers as the source of water and food. Because no river segments are proposed to be determined to be suitable for WSR designation under Alternative 4, there are no impacts to wildlife common to all alternatives.

4.2.6.6.3.2. Alternative 1

Managing eligible river segments to protect their outstandingly remarkable values (ORVs) and free-flowing nature would provide direct protection to fish and wildlife ORVs within 28.5 miles of river corridors. Under this alternative, a suitability determination would not be made, but the eligible river corridors would be given protection through continued interim protective management. This would provide additional measures that would promote fish and wildlife habitat health and functionality.

4.2.6.6.3.3. Alternative 2

Managing suitable river segments to protect their ORVs, free-flowing nature, and tentative classification would provide direct protection to wildlife ORVs within 28.5 miles of river corridors. Management direction to close the suitable rivers to mining, no surface occupancy for oil and gas, closing Wild river segments to OHV use, excluding ROWs on wild and scenic river segments, and avoiding ROWs on recreational river segments would all help protect fish and wildlife populations that live in or use the river corridors some time during the year.

4.2.6.6.3.4. Alternative 3

Only three miles of Meadow Valley Wash would be determined suitable with a tentative classification of recreational. Management direction to close the river segment to mining, no surface occupancy for oil and gas, and avoiding ROWs would all help protect wildlife populations that live in or use the river segment some time during the year. All other eligible river segments would be found not suitable and thus wildlife and their habitats along these segments would no longer be afforded protection under interim management under the Wild and Scenic Rivers Act.

4.2.6.6.3.5. Alternative 4

All currently eligible river segments would be determined not suitable and thus wildlife and their habitats along these segments would no longer be afforded protection under interim management under the Wild and Scenic Rivers Act.

4.2.6.6.4. Wilderness Impacts on Fish and Wildlife

4.2.6.6.4.1. Impacts Common to All Alternatives

A wilderness designation provides the highest level of protection for fish and wildlife by limiting most ground-disturbing activities, prohibiting use of motorized and mechanized vehicles, and providing large areas of unfragmented habitats. Limits on the type of wildlife management actions that can be taken in wilderness may limit possibilities for certain types of habitat improvements or other research benefiting fish/wildlife and associated habitats. The impacts due to these limits are minimal compared to the overall benefit to wildlife provided by wilderness.

4.2.6.6.4.2. Alternative 1

Alternative 1 has no management actions for wilderness. Wilderness areas would still provide protection for wildlife due to limits on activities spelled out in the Wilderness Act itself.

4.2.6.6.4.3. Alternative 2

Attaining no net unmitigated loss of wilderness benchmark conditions could include mitigation for impacts to wildlife populations which would benefit these populations. Limiting access points into wilderness areas could reduce impacts to wildlife due to human presence in other parts of the wilderness but could increase impacts due to concentrated use at the limited access points depending on visitation levels. Cooperative research on wilderness resources could include research on wildlife that would help increase knowledge about wildlife populations and better inform future management. Developing wilderness management plans could help identify needs in each wilderness to help protect and improve wildlife habitats.

4.2.6.6.4.4. Alternative 3

Impacts under Alternative 3 would be similar to those under Alternative 2.

4.2.6.6.4.5. Alternative 4

Impacts under Alternative 4 would be similar to those under Alternative 2 except that there would be no requirement for no net unmitigated loss of wilderness benchmark conditions. Mitigation for impacts to wildlife could still occur on a case-by-case basis, but it is assumed that some impacts to wildlife would not be mitigated.

4.2.6.6.5. Wilderness Study Areas Impacts on Fish and Wildlife

4.2.6.6.5.1. Impacts Common to All Alternatives

Similar to wilderness areas, WSAs provide areas of relatively undisturbed and unfragmented wildlife habitats within the planning area. Management of WSAs consistent with BLM management policy, including limiting construction of new structures and limiting motorized and mechanized vehicle access to designated routes, would indirectly protect and enhance wildlife and their habitats. These limits, though, could increase the difficulty of accomplishing habitat improvement treatments. The impacts due to these limits are minimal compared to the overall benefit to wildlife provided by WSAs. Actions taken to improve the wilderness character in WSAs, such as restoration, would also benefit wildlife by improving their habitats.

4.2.6.6.5.2. Alternative 1

There were no unique impacts identified for Alternative 1.

4.2.6.6.5.3. Alternatives 2 and 3

Attaining no net unmitigated loss of wilderness characteristics in WSAs could include mitigation for impacts to wildlife populations that would benefit these populations.

4.2.6.6.5.4. Alternative 4

Alternative 4 would have no requirement to attain no net unmitigated loss of wilderness characteristics. Mitigation for impacts to wildlife could still occur on a case-by-case basis, but it is assumed that some impacts to wildlife would not be mitigated.

4.2.6.7. Cumulative Impacts on Fish and Wildlife

4.2.6.7.1. Past and Present Actions/Impacts

Lands and realty actions, minerals exploration and extraction, renewable energy development, livestock grazing, wild horses and burros, and OHVs have previously and currently impact wildlife through loss, fragmentation, and adverse modification of habitats. In many cases, this has led to mortality or displacement of wildlife. These activities have also fragmented habitats with additional noise, roads, fences, structures, and human presence. Besides impacting habitats, livestock and wild horses and burros also compete with wildlife for water and forage. Land disposals have also led to increased water withdrawals in some of the basins. Invasive species have also been introduced or spread by many of these actions, which has resulted in the degradation of habitat quality for many wildlife species. Wildlife in the planning area have also

been impacted by actions taking place on private land and land managed by other federal and state agencies. For BLM-authorized activities that have had to go through the NEPA process, project-specific mitigation measures, permit stipulations, best management practices and standard operating procedures have been used to try to reduce impacts.

Wildfires have burned habitats, causing wildlife to relocate to new areas, or perish if nearby suitable habitats are not available. Many of these areas have been altered by the establishment and spread of weeds. Emergency stabilization and rehabilitation efforts have been used to try to reduce wildfire impacts. Actions such as fire suppression, prescribed fire, vegetation manipulation, seeding, fencing and use restrictions have had short-term negative impacts on wildlife and habitats. The goal of such actions has been to preserve these communities, which benefits wildlife in the long term.

Some past and present BLM actions have resulted in beneficial effects for wildlife. This includes the designation of wilderness areas, wilderness study areas, ACECs, and national conservation areas. Efforts have been made to maintain or increase special status wildlife, big game, and game bird populations through reintroduction and augmentation projects. Restoration projects have been done to help improve habitats in both upland and riparian habitats. Numerous artificial water sources (guzzlers) have been constructed to help support these populations. Non-target species also use and benefit from such water projects. Gathering wild horses and burros that are in excess of AML has improved habitat conditions overall by leaving more water, food, and cover available for wildlife use.

Actions by other federal and local agencies have also benefited wildlife in the planning area. From 1998 to 2006, the Clark County Multiple Species Habitat Conservation Plan, in partnership with the Nature Conservancy, purchased the base property and water rights associated with more than 16 allotments from willing sellers as mitigation for desert tortoise and other species covered under the plan. Following the purchase, the new owners (Clark County) relinquished the grazing permits and preferences associated with the allotments. The MSHCP has also implemented numerous other conservation projects as part of their mitigation that have benefited wildlife. Lands managed by other federal and state agencies in the area also help protect wildlife at a landscape scale including lands managed by the National Park Service, U.S. Forest Service, Department of Energy, Department of Defense, and Nevada State Parks.

4.2.6.7.2. Reasonable Foreseeable Actions

As the human population increases, it is anticipated that lands and realty actions, renewable energy development, minerals exploration and extraction, OHV use, and recreational activities would also increase. Clark County, as of fall 2013, has approximately 61,000 acres left to develop under its MSHCP. Pahrump and Mesquite are also pursuing HCPs that would streamline development of private land in those areas. As more private land is developed, there will be an increased need for more utility lines and roads. There are also currently 140,420 acres of pending solar applications. Approval of these projects will also result in new utility lines and access roads. Impacts from recreational activities are also expected to increase as more users are forced to use the same areas due to loss of other areas due to development or resource protection.

4.2.6.7.3. Cumulative Impact

4.2.6.7.3.1. Impacts Common to All Alternatives

Under all alternatives, there will be a cumulative net loss of wildlife habitats within the planning area due to surface-disturbing activities, including disposals, renewable energy development, grazing, minerals developments, ROW development, OHV use, wildland fire, and invasive species. Some projects can have far reaching impacts beyond their local footprint through such actions as lowering of water tables, altering watershed hydrologic patterns, or introduction of invasive species that then spread throughout the landscape. There are management prescriptions and mitigation prescribed under the alternatives intended to reduce the magnitude of these impacts and restore some of the soil, vegetation, and habitat lost. Some land uses would be prohibited or restricted to varying degrees based on the alternatives selected; however, all alternatives would implement BMPs, SOPs, and required mitigation measures and permit stipulations to minimize impacts on wildlife and their habitats. Recreation management and OHV travel management would reduce impacts based on the number of acres designated as open, limited, or closed to OHV travel.

4.2.6.7.3.2. Alternative 1

Alternative 1 would have the least amount of acres with protective land-use designations such as ACECs and lands with wilderness characteristics. It would have the most or second most acres combined that are designated for disposal or open for solar and wind, minerals, grazing, and OHV use. Management directions for special status species, wildlife, and integrated vegetation also do not reflect current resource knowledge and therefore do not provide as much benefit to wildlife compared to other alternatives. Thus, over time it is expected there would be more unmitigated cumulative impacts to wildlife compared to other alternatives.

4.2.6.7.3.3. Alternative 2

Alternative 2 would designate the most acres with protective land-use designations such as ACECs and lands with wilderness characteristics. It would have the least number of acres combined designated for disposal or open for solar and wind, minerals, grazing, and OHV use. Management directions for special status species, wildlife, and integrated vegetation would reflect current resource knowledge and therefore provide more benefit to wildlife compared to other alternatives. The requirement for no net unmitigated loss of ecosystem services, riparian areas, and special status species habitats would also help reduce cumulative impacts to wildlife. Thus, over time, it is expected there would be less unmitigated cumulative impacts to wildlife under Alternative 2 compared to other alternatives.

4.2.6.7.3.4. Alternative 3

Alternative 3 would have similar management directions for special status species, wildlife, and integrated vegetation as Alternative 2 and also require no net unmitigated loss of ecosystem services, riparian areas, and special status species habitat. It would designate two fewer ACECs, and other ACECs would be smaller compared to Alternative 2. Fewer acres would be designated as lands with wilderness characteristics compared to Alternative 2. In addition, it would have more acres combined designated for disposal or open for solar and wind, minerals, grazing, and OHV

use compared to Alternative 2. Thus, over time, it is expected there would be more unmitigated cumulative impacts to wildlife compared to Alternative 2 but less than in Alternatives 1 and 4.

4.2.6.7.3.5. Alternative 4

Alternative 4 would designate four additional ACECs and some acres as lands with wilderness characteristics and thus would have more acres set aside for protection compared to Alternative 1 but less than Alternatives 2 and 3. It would have the most or second most acres combined designated for disposal or open for solar and wind, minerals, grazing, and OHV use. Management directions for special status species, wildlife, and integrated vegetation would be similar to Alternatives 2 and 3 but without the requirement for no net unmitigated loss of ecosystem services, riparian areas, and special status species habitats. Thus, over time, it is expected there would be more unmitigated cumulative impacts to wildlife compared to Alternatives 2 and 3. There may be more acres of wildlife habitat lost compared to Alternative 1 but the mitigation level would be expected to be greater than under Alternative 1. Thus there may actually be less unmitigated cumulative loss of wildlife compared to Alternative 1.

4.2.7. Special Status Species

4.2.7.1. Summary

Special status species include both wildlife and plant species. The objectives of the BLM special status species policy are to conserve and/or recover Endanagered Species Act-listed species and the ecosystems on which they depend so that ESA protections are no longer needed for these species and to initiate proactive conservation measures that reduce or eliminate threats to BLM sensitive species to minimize the likelihood of and need for listing of these species under the ESA. It is the policy of the BLM that actions authorized by the BLM shall further the conservation and/or recovery of federally listed species and conservation of BLM sensitive species. Because the impacts analyzed under the Integrated Vegetation (p. 608) and Fish and Wildlife sections (p. 717) also could apply to special status species, refer to those sections for a more general discussion of impacts from the proposed management directions and alternatives. Due to their limited population sizes and/or distributions and existing threats, impacts on special status species are likely to be more significant than impacts on non-special status species.

4.2.7.2. Methods of Analysis

Impact analysis on special status species included an assessment of whether each action could result in the potential loss of individuals or possible destruction, degradation, or modification of habitats, as well as whether actions could benefit or improve population sizes, distributions, and/or habitats. Known and potential special status species locations and habitat locations were considered in the analysis; however, the potential for species to occur outside these areas was also considered and, as a result, some impacts are discussed in more general terms given the lack of data for the resource area.

Various laws, regulations, and policies require that special status species be fully analyzed in any BLM decision that could affect those species or their habitats. Analysis would include inventory, monitoring, evaluation, and identification of mitigation of effects. Avoidance, minimization, and mitigation actions could include project relocation or redesign (avoidance), monitoring, and site-specific mitigation. In absence of quantitative data, best professional judgment was used according to the following assumptions:

- Activities that lead to listing species would not be authorized.
- No surface disturbance would be authorized until a special status species inventory of the project area is completed by a qualified botanist or biologist.
- The U.S. Fish and Wildlife Service would be consulted under ESA requirements on any action that could potentially affect any federally proposed, listed, or candidate plant or animal species or their habitats.

4.2.7.3. Qualitative Intensity Scale

Impacts are described using ranges of potential impacts or in qualitative terms, if appropriate. When impacts are beneficial, it is so stated. The intensities of impacts are also described, where possible, using the same intensity terms as used in the Integrated Vegetation (p. 608) and Fish and Wildlife sections (p. 717).

4.2.7.4. Resources

4.2.7.4.1. Air Quality Impacts on Special Status Species

4.2.7.4.1.1. Impacts Common to All Alternatives

Impacts from air quality management directions on special status species would be similar to those discussed under the Integrated Vegetation and Fish and Wildlife sections.

4.2.7.4.1.2. Alternatives 1 through 4

There are no additional impacts to special status species.

4.2.7.4.2. Soil Resources Impacts on Special Status Species

4.2.7.4.2.1. Impacts Common to All Alternatives

Under all alternatives, impacts to special status species and their habitats could be reduced by conservation measures to prevent erosion and other degradations to soil. Preventing sedimentation in water courses also can also help reduce impacts to the habitats and health of federally listed and BLM sensitive fish and aquatic invertebrates. Maintaining soil processes and their components, such as litter, appropriate vegetation, and good infiltration, can help protect the habitats of special status species, especially special status plants that rely more heavily on intact soil processes to provide sufficient nutrients and water.

4.2.7.4.2.2. Alternative 1

Alternative 1 would not have management directions to protect sensitive soils. This could lead to impacts to special status plant species that occur on sensitive soils such as the gypsum endemic species. Potential impacts to these species would still be analyzed during the NEPA and ESA process but would not have the added protection of an RMP direction to protect and avoid these areas if possible.

4.2.7.4.2.3. Alternatives 2 through 4

Protection of fragile soil areas, such as gypsum soils, would help protect the special status plants that are restricted to these fragile soil types. Implementation of erosion control measures would also help protect and improve habitats for special status species.

4.2.7.4.3. Water Resources Impacts on Special Status Species

4.2.7.4.3.1. Impacts Common to All Alternatives

All alternatives propose to protect water quality and to ensure adequate water is available to meet management goals. Protecting water quality will also help protect special status species such as fish and aquatic invertebrates, as well as sensitive species such as bighorn sheep, birds, and bats that drink from the water sources. Actions designed to ensure or increase BLM access to water

sources to meet management objectives could result in more stable or increased populations of special status species that are dependent upon these water sources.

4.2.7.4.3.2. Alternative 1

Alternative 1 would not have management direction to protect hydrologic function by avoiding riparian areas and 100-year floodplains. This could lead to impacts on riparian-dependent species such as federally listed and sensitive riparian birds, fish, and aquatic invertebrates. Potential impacts to these species would still be analyzed during the NEPA and ESA process but would not have the added protection of an RMP direction to protect these areas if possible.

4.2.7.4.3.3. Alternatives 2 through 4

Protection of the hydrologic function of washes and waterways would also help protect and improve habitats for special status species.

4.2.7.4.4. Integrated Vegetation Impacts on Special Status Species

4.2.7.4.4.1. Vegetation Impacts on Special Status Species

4.2.7.4.4.1.1. Impacts Common to All Alternatives

Overall, impacts from integrated vegetation management directions on special status species would be similar to those already discussed under the Integrated Vegetation and Fish and Wildlife sections.

4.2.7.4.4.1.2. Alternative 1

Alternative 1 would not contain many of the management directions proposed in the other alternatives and would not provide as wide a range of benefits to special status species compared to the other alternatives.

4.2.7.4.4.1.3. Alternative 2

Requiring no net unmitigated loss of vegetation communities would also mitigate for loss of special status species habitats. This would help achieve, and work in conjunction with, the requirement of no net unmitigated loss of BLM sensitive species habitats as proposed in the Special Status Species section. Requiring mitigation for all the ecosystem services lost due to a project, and not just mitigating for loss of desert tortoise habitat as is done under the 1998 RMP, will provide benefit to a wider range of special status species.

4.2.7.4.4.1.4. Alternative 3

Impacts from Alternative 3 would be similar to those under Alternative 2.

4.2.7.4.4.1.5. Alternative 4

Alternative 4 does not have management directions requiring no net unmitigated loss of vegetation communities. Loss of ecosystem services and special status species habitats would be dealt with on a case-by-case basis. These losses could still be mitigated for but it would not be required. Thus it is assumed that some amount of special status species habitats would be lost without commensurate mitigation that benefits habitats elsewhere.

4.2.7.4.4.2. Riparian Areas and Wetlands Impacts on Special Status Species

4.2.7.4.4.2.1. Impacts Common to All Alternatives

Retaining riparian and mesquite-acacia areas in federal ownership and restoration actions in these areas to improve proper functioning condition would protect, maintain, and improve these habitats for numerous special status species including the federally listed and BLM sensitive fish, aquatic invertebrates, and riparian birds. Riparian habitats are very limited in the planning area , thus any loss or degradation of these habitats can have major impacts on special status species that have already experienced declines.

4.2.7.4.4.2.2. Alternative 1

Management direction to have protective buffers around water sources would provide benefits to bighorn sheep and other special status species that use the guzzlers, but the management direction would conflict with management directions regarding guzzlers in other sections.

4.2.7.4.4.2.3. Alternative 2

Requiring no net unmitigated loss of riparian communities would also mitigate for the loss of special status species habitats. This would help achieve, and work in conjunction with, the requirement of no net unmitigated loss of BLM sensitive species habitats as proposed in the Special Status Species section.

4.2.7.4.4.2.4. Alternative 3

Impacts from Alternative 3 would be similar to those under Alternative 2.

4.2.7.4.4.2.5. Alternative 4

Alternative 4 does not have management directions requiring no net unmitigated loss of riparian communities. Loss of riparian communities and thus special status species habitats would be dealt with on a case-by-case basis. These losses could still be mitigated for, but it would not be required. It is assumed that some amount of special status riparian species habitat would be lost without commensurate mitigation that benefits habitats elsewhere.

4.2.7.4.4.3. Weeds Impacts on Special Status Species

4.2.7.4.4.3.1. Impacts Common to All Alternatives

Overall, impacts from weeds management would be similar to those already discussed under the Integrated Vegetation and Fish and Wildlife sections.

4.2.7.4.4.3.2. Alternative 1

Management direction for weeds would be focused on control of tamarisk. This would still benefit some special status species such as the southwestern willow flycatcher and yellow-billed cuckoo, but other special status species are impacted by different non-native and invasive species. A weed management plan for projects would not be required by the RMP but could still be required on a case-by-case basis.

4.2.7.4.4.3.3. Alternative 2

Management direction for weeds would be broadened to cover prevention and control of all types of weeds. Requiring weed management plans for projects one acre or greater would help minimize potential spread of invasives into neighboring special status species habitats on many BLM approved projects. Participating in CWMAs would help manage weeds at a landscape scale, thus benefiting special status species habitats at a landscape scale.

4.2.7.4.4.3.4. Alternative 3

Impacts from Alternative 3 would be similar to those under Alternative 2 except that weed management plans would be required for projects with a disturbance footprint of five acres or more. This will cover fewer projects than in Alternative 2, thus more projects could lead to the spread of invasives into neighboring special status species habitats due to not having a plan in place.

4.2.7.4.4.3.5. Alternative 4

Impacts from Alternative 4 would be similar to those under Alternative 2 except that weed management plans would be required only for projects with a disturbance footprint of 10 acres or more. This will mean that except for only the large projects, most projects will not require a weed plan and could lead to the spread of invasive and other non-native species.

4.2.7.4.4.4. Forests and Woodlands Impacts on Special Status Species

4.2.7.4.4.4.1. Impacts Common to All Alternatives

Overall, impacts from forest and woodland management would be similar to those already discussed under the Integrated Vegetation and Fish and Wildlife sections.

4.2.7.4.4.4.2. Alternatives 1 through 4

There are no additional impacts to special status species.

4.2.7.4.5. Fish and Wildlife Impacts on Special Status Species

4.2.7.4.5.1. Impacts Common to All Alternatives

Overall, impacts from fish and wildlife management would be similar to those already discussed under the Integrated Vegetation and Fish and Wildlife sections. Introductions, reintroductions, and augmentation of special status wildlife species, including desert tortoise and bighorn sheep, would allow for management flexibility to help maintain or restore healthy, genetically viable, and well-distributed populations. This could help reach the recovery criteria for delisting federally listed species and help keep BLM sensitive species from being proposed for listing in the future. Control of non-native, nuisance, and overpopulated species could help reduce the impacts that those species are having on special status species. For example, raven control may help reduce predation rates on immature desert tortoises.

Management actions such as avoidance and mitigation measures and project BMPs implemented to limit impacts on migratory birds, including raptors, in general would also help reduce impacts on special status migratory birds, including raptor species. For example, implementing ground-clearing time frame restrictions during the breeding bird season helps protect migratory bird nests/young, including special status species. New big game wildlife water developments would benefit bighorn sheep and potentially other special status species such as bats by providing more reliable water sources in currently occupied areas and allowing them to colonize new areas that were previously lacking adequate water sources. The expansion of these species into new areas, though, may lead to unintended impacts to other special status species such as trampling of desert tortoise habitat. Actions taken to modify and design water developments to reduce competition could help reduce impacts on bighorn sheep from competition with wild horses and burros for water sources.

4.2.7.4.5.2. Alternative 1

Management direction to protect natural and artificial water sources would benefit bighorn sheep and other special status species that can be scared off from the water source by human activity within one half mile of the water source. This management direction contradicts water source protection management directions in other sections, thus maintaining all of these directions would continue to cause management confusion. Alternative 1 does not contain many of the management directions proposed in the other alternatives that could benefit special status species and would not provide as wide a range of benefits to special status species compared to the other alternatives.

4.2.7.4.5.3. Alternative 2

Management direction to have half-mile avoidance buffers around natural water and artificial water sources, while not totally eliminating the chances for disturbance, would provide the highest level of protection for bighorn and other special status species compared to the other alternatives. These species rely on these water sources for survival and may be scared off by nearby human activity.

4.2.7.4.5.4. Alternative 3

Management direction would provide a one quarter mile avoidance area for BLM-authorized actions around natural water sources and call for impacts to be minimized within one quarter mile

of artificial water sources. This still provides some protection for special status species using the water sources, but not as much as in Alternative 2.

4.2.7.4.5.5. Alternative 4

Management direction would provide for a one quarter mile avoidance area around natural water sources only. There would be no management direction to avoid BLM-authorized actions near artificial water sources. This could lead to additional impacts to bighorn sheep and other special status species compared to the 1998 RMP by not providing any protections around artificial water sources, which are often the only reliable and consistent year-round water sources available over large areas. Abandonment of these water sources due to high levels of human activity nearby could reduce population viability in these water limited areas.

4.2.7.4.6. Special Status Species Impacts on Special Status Species

4.2.7.4.6.1. Impacts Common to All Alternatives

Special status species management directions are designed to protect and work toward recovering federally listed species and prevent future listing of BLM sensitive species as required under BLM Manual 6840. Management actions taken to protect or improve habitat for specific species, such as desert tortoise, are assumed to also benefit other special status species that may occur in the same area. Analyzing proposed projects for their potential impacts to bighorn sheep and modifying them, requiring minimization and mitigation measures, or not approving them due to the level of potential impact will help limit impacts to bighorn and help meet the goals of BLM's Rangewide Plan for bighorn sheep. Entering into conservation agreements for sensitive species, such as the existing Conservation Agreement and Strategy for the Relict Leopard Frog, would identify and allow collaborative and cooperative actions between agencies to help manage and improve the population status of at-risk species to keep them from being listed in the future. While the ultimate disposition of the DTCC management area varies between alternatives, each option is still geared to protect wild desert tortoises and other special status species that occur in the area.

4.2.7.4.6.2. Alternative 1

Management directions to manage and improve special status species habitats along the Virgin River, Muddy River, and Meadow Valley Wash, as well as around Ash Meadows and the Moapa National Wildlife Refuge, would help manage and improve habitats for numerous special status species such as the listed and sensitive fish, riparian birds, and the Ash Meadows species. This alternative would not provide management direction, though, to manage and improve populations and habitats of special status species that occur elsewhere in the planning area such as the gypsum or sand endemic plants, springsnails, dune beetles, or upland wildlife species. Alternative 1 would also not contain some of the other management directions proposed in the other alternatives that would also benefit special status species such as protecting important corridors or requiring no net unmitigated loss.

4.2.7.4.6.3. Alternative 2

Management directions to manage, protect, and improve habitats that cover all of the special status species including riparian, aquatic, upland, and Ash Meadows species could lead to a broader range of actions designed to benefit a wider range of special status species compared

to Alternative 1. For the listed species, management of their habitats would be designed to help work toward species recovery goals if possible. Management and protection of important corridors for listed species would also benefit the species at a larger landscape scale and help work toward meeting recovery goals. These corridors are important for migratory movements and maintaining or increasing genetic connectivity between populations. It also allows for movement of individuals to new suitable habitat areas as they are displaced by disruptive activities in their current area. In the long term, it may also allow species to move to new areas in response to climate change if their current habitats become unsuitable. The management of areas of ecological importance in Nye County, including land-use restrictions, could provide some protection from ground-disturbing activities to special status species including the desert tortoise, chuckwalla, Mojave Desert sidewinder, desert glossy snake, Nevada shovel-nosed snake, and bighorn sheep.

Although some BLM actions will likely result in the loss of some sensitive species habitats and individuals, requiring no net unmitigated loss of habitat for BLM sensitive species would help reduce the overall impacts of permitted actions by requiring the improvement of habitat or reduction of impacts in other areas. This will benefit the species' overall viability and help reduce the likelihood that sensitive species will be listed in the future. This would especially help sensitive species that occur in habitats different from listed species and thus don't benefit if mitigation is done only for the listed species as is often the current practice.

4.2.7.4.6.4. Alternative 3

Impacts under Alternative 3 would be similar to those under Alternative 2 except that there would be no lands managed as areas of ecological importance in Nye County. This could lead to impacts to special status species, including the desert tortoise, if projects are approved in these areas that would not be approved under Alternative 2.

4.2.7.4.6.5. Alternative 4

Impacts under Alternative 4 would be similar to those under Alternatives 2 and 3 except that it would only require that impacts from permitted actions on sensitive species be minimized. Minimization and mitigation could still be performed on a case-by-case basis, but it is assumed that not all impacts would be mitigated. Similar to Alternative 3, there would be no areas managed as areas of ecological importance in Nye County.

4.2.7.4.7. Wild Horse and Burro Impacts on Special Status Species

4.2.7.4.7.1. Impacts Common to All Alternatives

The impacts from wild horse and burro management directions would be similar to those already discussed in the Integrated Vegetation and Fish and Wildlife sections. Exotic, non-native species are among the most widespread and serious threats to the integrity of native wildlife populations because they invade and degrade native ecosystems. Wild horses and burros can compete with bighorn sheep for water sources, as well as forage. The construction of water sources specifically for wild horses and burros and the design of water sources to reduce competition could help limit this impact. The construction of water sources for wild horses and burros, though, could increase their populations or let them inhabit areas where they do not currently occur. This could lead to an increase in competition for forage with bighorn sheep and other special status

species. Desert tortoises and other special status species may also be trampled by horses and burros and/or have burrows collapsed.

Wild horses and burros can also impact riparian areas by eating and trampling the vegetation and other aquatic resources, increasing soil erosion and altering flow patterns, and degrading water quality through urine and feces and increased soil sedimentation. These riparian areas are important habitats for many special status species in the planning area such as springsnails, relict leopard frog, and numerous fish. For example, historically, wild horses altered spring morphology within the Ash Meadows area and impacted endemic sensitive plant and snail populations. Due to the restricted nature of these riparian habitats in the planning area and the inability of many of the species to move to a new area, any impacts to the habitats can have major impacts to the species' viability. There are a number of existing and proposed ACECs in which herd management areas overlap, and there is the potential for sensitive species occupying these areas to be negatively impacted by wild horses and burros.

4.2.7.4.7.2. Alternative 1

Managing Gold Butte Part A ACEC, which is designated desert tortoise critical habitat, for zero wild horses and burros would help limit the impacts to tortoise and other special status species in this area.

4.2.7.4.7.3. Alternative 2

Similar to Alternative 1, Gold Butte Part A ACEC would be managed for zero wild horses and burros.

4.2.7.4.7.4. Alternative 3

Impacts under Alternative 3 would be similar to Alternative 2.

4.2.7.4.7.5. Alternative 4

Alternative 4 would not have management direction to manage Gold Butte Part A ACEC for zero wild horses and burros. Under the ACEC section though, Gold Butte Part A ACEC would still have management direction to pursue reverting the area from a herd management area into a herd area. Depending on if and when that is done, the special status species in this area, including the desert tortoise, could be impacted if horses or burros move into the area and are not removed before they start impacting the habitat.

4.2.7.4.8. Cave and Karst Management Impacts on Special Status Species

4.2.7.4.8.1. Impacts Common to All Alternatives

Impacts from cave and karst management directions on special status species would be similar to those already discussed under the Integrated Vegetation and Fish and Wildlife sections. Caves are especially important to many of the sensitive bat species because of their importance as roost sites. Uncontrolled public use of caves can lead to disruption of roosting bats and damage to the cave causing it to become unsuitable as a roost site. Currently, Nevada has a number of bats on the sensitive species list that also are protected by the state. With the spread of white-nose

syndrome, these bat species are increasingly at risk of significant population declines and potential for federal listing. Gates can help limit impacts to the interior of caves while still allowing bats the opportunity to enter and exit the cave. The placement of projects such as towers or wind turbines near caves can lead to increased mortality of bats due to collisions with the structures and/or barotrauma as they are leaving or returning to the cave. Towers can also be perch sites for raptors that prey on bats as they leave and return to the cave.

4.2.7.4.8.2. Alternative 1

Management direction designates significant caves as ROW avoidance areas, but it does not provide any distance criteria. This could lead to ROWs and thus towers or other structures being approved near important bat roost caves.

4.2.7.4.8.3. Alternative 2

Providing a one half mile ROW avoidance buffer around significant caves could help reduce mortality due to raptors or collisions with vertical structures and wires as bats are entering or leaving the cave.

4.2.7.4.8.4. Alternative 3

Providing a one quarter mile ROW avoidance buffer around significant caves could lead to developments closer to caves than in Alternative 2, which may increase the risk of mortality for bats compared to Alternative 2. The designation of a defined buffer is an improvement over Alternative 1, which does not define a buffer distance.

4.2.7.4.8.5. Alternative 4

Alternative 4 would allow ROWs near caves unless they compromise sensitive resource values that could include roosting bats. Similar to Alternative 1, though, no buffer distance is defined that would guide how far to move a ROW if bats are present.

4.2.7.4.9. Wildland Fire Management Impacts on Special Status Species

4.2.7.4.9.1. Impacts Common to All Alternatives

Overall, the impacts of fire management on special status species would be similar to those already discussed in the Integrated Vegetation and Fish and Wildlife sections. Fire frequency in the planning area has increased with the proliferation of introduced plants, particularly invasive species, which provide fuel for fires. Fires cause direct mortality to special status species, including desert tortoises, when they are burned or inhale lethal amounts of smoke. This can happen both in and out of burrows. Fires are likely most hazardous to desert tortoises during the active season for tortoises. Indirect effects of fire include the removal of dry and some living forage plants, facilitation of the proliferation of non-native grasses, habitat fragmentation, and overall change in vegetation type.

Management direction emphasizing fire suppression and protection of ACECs would benefit numerous special status species. Many of the ACECs are designated to protect special status species as relevance and importance (R&I) values. Most of these species occur in habitats that

are not fire adapted, thus unmanaged wildfires can cause large and long-term impacts to these populations. Special status species populations outside of ACECs and other areas set aside for protection, such as wilderness areas, are often subject to numerous impacts from other activities such as development, mining, and recreation. Thus, impacts from catastrophic fires within ACECs can have major impacts on the overall viability of a species. ACECs are also often where management actions are taken to mitigate for impacts to special status species from management actions elsewhere. Wildland fires, if unmanaged in ACECs, can effectively negate these mitigation actions. Emergency stabilization and rehabilitation activities, such as erosion control measures and reseeding, performed following fires could facilitate restoration of burned habitats, benefiting special status species that use these areas.

4.2.7.4.9.2. Alternative 1

Alternative 1 would not contain all of the management directions proposed in the other alternatives that may provide a benefit to special status species.

4.2.7.4.9.3. Alternative 2

Management directions would emphasize fire suppression in desert tortoise ACECs and at wetlands and riparian areas. The desert tortoise ACECs encompass most of the desert tortoise critical habitat within the district. Wildfires in 2005 burned large portions of three of the ACECs. Due to the slow recovery of desert tortoise habitat from fire, any future catastrophic wildland fires in any of the ACECs could have major impacts on the population viability of tortoises within the area. Protecting wetlands and riparian areas from unwanted fires can also reduce impacts to many special status species due to the restricted nature of these habitats and the inability of many of the species that use these habitats to move to other areas to temporarily escape the fire. Resource advisors could help reduce impacts from fire suppression actions by providing input on where and how to implement the actions so that they have the least amount of impact to special status species if possible.

4.2.7.4.9.4. Alternatives 3 and 4

Impacts under Alternatives 3 and 4 would be similar to Alternative 2.

4.2.7.4.10. Cultural Resources Impacts on Special Status Species

4.2.7.4.10.1. Impacts Common to All Alternatives

Authorized excavation of cultural sites localities could result in localized loss of special status species habitat but the impacts are assumed to be negligible given the limited footprint of such actions on the landscape. The possibility of increased human presence around cultural sites managed for public recreational use could displace special status wildlife species or lead to trampling of special status plants depending on the location and level of human presence associated with the site. Cultural resource management guidance prohibiting surface disturbance near some archaeological sites would indirectly protect special status species habitat in those areas. Management to protect traditional areas and traditional cultural properties (TCPs), including Gold Butte, a portion of which is designated desert tortoise critical habitat, would also help protect special status species that occur in those areas through limitations on the type of

activities that could occur. Cultural site monitoring could also inform management of impacts that are also affecting special status species.

4.2.7.4.10.2. Alternative 1

There are no additional impacts identified for Alternative 1.

4.2.7.4.10.3. Alternative 2

Management direction to preserve the Old Spanish Trail, specifically the portion in the California Wash area, would also benefit three-corner milkvetch. Excluding surface-disturbing activities within 500 feet of cultural sites in ACECs would also protect special status species and their habitats in the buffer zone.

4.2.7.4.10.4. Alternative 3

Impacts would be similar to Alternative 2 except that the exclusion zone around cultural sites within ACECs would be only 100 feet. This would protect less special status species habitats but surface-disturbing activities are limited within ACECs in general so this smaller buffer is not expected to cause any additional negative impacts any special status species.

4.2.7.4.10.5. Alternative 4

Impacts under Alternative 4 would be similar to those under Alternative 3.

4.2.7.4.11. Paleontological Resources Impacts on Special Status Species

4.2.7.4.11.1. Impacts Common to All Alternatives

Data recovery efforts and studies of paleontological resources could result in localized impacts to special status species due to increased human presence and surface disturbance during excavation, but impacts are assumed to be negligible to minor based on the limited footprint of paleontological resources within the district.

4.2.7.4.11.2. Alternative 1

Protecting the Arrow Canyon Bird Track site would also help protect special status species, such as chuckwalla, within the vicinity of the site.

4.2.7.4.11.3. Alternative 2

Protecting vertebrate paleontological sites, including precluding activities at Tertiary-aged trackways and the Upper Las Vegas Wash, along with only allowing permitted collection in other areas, would also protect special status species that occur in those areas. This is especially true at the Upper Las Vegas Wash, which also contains large populations of Las Vegas bearpoppy and Las Vegas buckwheat. Developing on-site interpretation, though, could lead to increased visitation, which could lead to localized impacts to special status species around these interpretive sites.

4.2.7.4.11.4. Alternative 3

Impacts would be similar to those in Alternative 2. Alternative 3 would not have specific management direction to preclude activities in Tertiary-aged trackways or the Upper Las Vegas Wash. This could lead to impacts to special status species in these areas if surface-disturbing activities are permitted.

4.2.7.4.11.5. Alternative 4

Alternative 4 would permit surface-disturbing activities in areas with paleontological resources after the sites have been inventoried and data has been collected. This would not provide protection of special status species in the long-term because it would still allow the site to be disturbed.

4.2.7.4.12. Visual Resource Management Impacts on Special Status Species

4.2.7.4.12.1. Impacts Common to All Alternatives

Impacts from visual resources management (VRM) on special status species would be similar to those already discussed in the Integrated Vegetation and Fish and Wildlife sections. In general, the designation of areas as VRM Class I or II would limit the types of developments that could occur in those areas, which would limit potential impacts to special status species.

4.2.7.4.12.2. Alternative 1

Alternative 1 would designate fewer acres as Class I and II compared to Alternatives 2 and 3. It would also designate fewer acres of Class II compared to Alternative 4 but the same amount of acres of Class I. Alternative 1 would designate more acres as Class III and fewer acres of Class IV compared to the other alternatives.

4.2.7.4.12.3. Alternative 2

Alternative 2 would designate the most acres of Class I compared to the other alternatives and more acres of Class II compared to Alternatives 1 and 4 but fewer than in Alternative 3. It would designate more acres of Class III compared to Alternatives 3 and 4 and fewer than in Alternative 4. It would also designate fewer acres of Class IV compared to Alternatives 3 and 4 but more than in Alternative 1. Overall, Alternative 2 would designate the most acres of Class I and II and thus provide the most protection for special status species.

4.2.7.4.12.4. Alternative 3

Alternative 3 would designate the same amount of Class I as Alternatives 1 and 4 but fewer than in Alternative 2. It would designate more acres of Class II than the other alternatives. Alternative 3 would designate fewer acres of Class III and more acres of Class IV compared to Alternatives 1 and 2.

4.2.7.4.12.5. Alternative 4

Alternative 4 would designate the same amount of Class I as Alternatives 1 and 3 but fewer than in Alternative 2. It would designate fewer acres of Class II than Alternatives 2 and 3 but more than in Alternative 1. Alternative 4 would designate fewer acres of Class III and more acres of Class IV compared to the other alternatives. Overall, Alternative 4 would provide the least benefit to special status species.

4.2.7.4.13. Lands with Wilderness Characteristics Impacts on Special Status Species

4.2.7.4.13.1. Impacts Common to All Alternatives

Because no lands with wilderness characteristics exist in Alternative 1, there are no impacts common to all alternatives.

4.2.7.4.13.2. Alternative 1

No areas would be designated as lands with wilderness characteristics and thus there would be no benefits to special status species from this designation anywhere in the district.

4.2.7.4.13.3. Alternative 2

Alternative 2 would manage 241,389 acres as lands with wilderness characteristics. Actions to preserve wilderness characteristics in these areas would also help protect numerous special status species, both plants and wildlife, by limiting surface-disturbing and disruptive activities. The closure of the areas to motorized and mechanized travel, the exclusion of ROWs, and the closure to mining and NSO for oil and gas would further limit impacts to special status species and help previously disturbed areas start to recover.

The Resting Springs lands with wilderness characteristics would help provide protection for desert tortoise habitat, the Ash Meadows gumplant, and the spring-loving centaury, as well as potentially other special status species. The McCullough Mountains and Highland Range lands with wilderness characteristics would provide protection for desert tortoise habitat, bighorn sheep, and yellow and rosy two-tone beardtongue, as well as potentially other special status species. The Ireteba Peaks and Spirit Mountain lands with wilderness characteristics would provide protection for desert tortoise critical habitat, bighorn sheep, Gila monster, rosy two-tone beardtongue, and other species. The Muddy Mountains lands with wilderness characteristics would provide protection for desert tortoise, bighorn sheep, Gila Monster, Las Vegas bearpoppy, Las Vegas buckwheat, and silverleaf sunray as well as other species. The Arrow Canyon lands with wilderness characteristics would provide protection for desert tortoise critical habitat and bighorn sheep, as well as other species. Whitney Pockets West, Black Ridge, Billy Goat Peak, Lime Canyon, Temple Mesa, and Garrettt Buttes lands with wilderness characteristics would provide protection for desert tortoise and bighorn sheep, as well as other species. In addition, the Lime Canyon lands with widlerness characteristics would provide protection for Las Vegas bearpoppy and Billy Goat Peak lands with wilderness characteristics would provide protection for Las Vegas buckwheat and three-corner milkvetch.

4.2.7.4.13.4. Alternative 3

The impacts under Alternative 3 would be similar to those under Alternative 2 except that fewer acres would be managed as lands with wilderness characteristics. This includes the Arrow Canyon, Lime Canyon, Garrett Buttes, Ireteba Peaks, and Spirit Mountain lands with wilderness characteristics, as well as a smaller area for the Muddy Mountains lands with wilderness characteristics. These areas would protect fewer special status species compared to Alternative 2. In addition, motorized and mechanized travel would be limited to designated trails and the areas would be ROW avoidance areas instead of exclusion areas. Thus impacts to special status species from designated OHV routes such as mortality and habitat fragmentation could still occur. ROWs could still be approved in the areas that could cause habitat loss and fragmentation.

4.2.7.4.13.5. Alternative 4

The impacts under Alternative 4 would be similar to those under Alternative 3 except that fewer acres would be managed as lands with wilderness characteristics including the Lime Canyon, Garrett Buttes, and Arrow Canyon lands with wilderness characteristics. Thus even fewer special status species would benefit from management of lands with wilderness characteristics compared to Alternatives 2 and 3.

4.2.7.5. Resource Uses

4.2.7.5.1. Forestry and Woodland Products Impacts on Special Status Species

4.2.7.5.1.1. Impacts Common to All Alternatives

Managing woodlands and conifer forests for all aged stands with good understory will benefit special status species, such as southwestern willow flycatcher, yellow-billed cuckoo, pinyon jay, ferruginous hawk, Lewis's woodpecker, and tree roosting bats, by providing a wider range of woodland and forest structural habitats compared to single-aged stands. Applying restrictions for special status species on firewood cutting in designated areas would help limit impacts to those species from firewood cutting activities.

4.2.7.5.1.2. Alternative 1

Allowing the harvesting of dead and down or marked "green" mesquite and acacia, even in approved areas, may impact special status species that use these habitats, such as Bendire's thrasher and LeConte's thrasher, due to human presence and habitat disturbance.

4.2.7.5.1.3. Alternative 2

Prohibiting the collection of live, dead, or down mesquite and acacia throughout the planning area would help protect special status species from impacts during collection activities.

4.2.7.5.1.4. Alternative 3

Impacts from Alternative 3 would be similar to those under Alternative 2 except that personal collection of dead and down mesquite acacia for on-site recreational campfires would be allowed

in areas open to firewood gathering. This could cause localized impacts to special status species due to habitat disturbance. Species already disturbed by the presence of campers in the area, though, would not be expected to be disturbed further by on-site collection activities.

4.2.7.5.1.5. Alternative 4

Impacts from Alternative 4 would be similar to Alternative 3.

4.2.7.5.2. Livestock Grazing Impacts on Special Status Species

4.2.7.5.2.1. Impacts Common to All Alternatives

In general, impacts from grazing on special status species are similar to those discussed in the Integrated Vegetation and Fish and Wildlife sections. Grazing increases the spread of non-native or invasive species and can impact riparian areas and decrease stream stability and increase erosion and sedimentation. Cattle and horses can out-compete bighorn sheep for forage and water. They can also cause impacts to desert tortoise by trampling individuals, collapsing burrows, destroying vegetation, altering soils, and competing for forage. Grazing can affect soils by increasing soil compaction and decreasing infiltration rate, the capacity of the soil to absorb water. A lower infiltration rate means less water will be available for plants and more surface erosion may occur. Soil compaction affects vegetation by reducing water absorption (thereby availability to plants) and making it more difficult for plants to spread their roots. If allowed access to natural water sources, grazing can impact listed and sensitive aquatic species through trampling species, increased erosion and sedimentation, removal of native riparian vegetation, and wastes that degrade water quality. This can have a major impact on the quantity of sensitive species and quality of their habitats.

4.2.7.5.2.2. Alternative 1

Under Alternative 1, all currently open allotments would remain open. This includes currently open but inactive allotments. From 1998 to 2006, the Clark County Multiple Species Habitat Conservation Plan, in partnership with the Nature Conservancy, purchased the base property and water rights associated with more than 16 allotments from willing sellers as mitigation for desert tortoise and other species covered under the plan. Following the purchase, the new owners (Clark County) relinquished the grazing permits and preferences associated with the allotments. Leaving these allotments open leaves open the chance that they may be grazed in the future, which would reintroduce the associated impacts into these areas. This would diminish or negate this mitigation action taken by Clark County for its impacts on desert tortoise and other sensitive species. Reopening the inactive Jean allotment, combined with the currently active Hidden Valley allotment, would also result in grazing pressures over all known Clark County populations of the white-margined penstemon. Alternative 1 would still contain a reference to an old biological opinion for desert tortoise, which could cause management issues in the future as new biological opinions are issued with potentially different prescriptions.

4.2.7.5.2.3. Alternative 2

Under Alternative 2, all allotments, including the three currently active allotments and also those bought out by the Clark County MSHCP, would be closed to future grazing. This would provide

the most protection for special status species that occur in these areas by eliminating grazing as a potential impact throughout the planning area.

4.2.7.5.2.4. Alternative 3

Under Alternative 3, all currently inactive allotments, including those bought out by the Clark County MSHCP, would be closed to future grazing. The three currently active allotments within the district would remain open. The Hidden Valley allotment does contain populations of white-margined penstemon, as well as desert tortoise and bighorn sheep habitat. The Lower Mormon Mesa allotment contains populations of three-corner milkvetch and Beaver Dam breadroot, as well as desert tortoise habitat. These species, as well as other special status species that may occur in these areas, would continue to be impacted by grazing in the allotments. The Flat Top Mesa allotment contains desert tortoise habitat, but this allotment is grazed by horse and cattle in very low numbers, so grazing impacts are assumed to be low in the allotment. This could change if the number of animals grazed increases in the future.

4.2.7.5.2.5. Alternative 4

Under Alternative 4, impacts from the Hidden Valley, Lower Mormon Mesa, and Flat Top Mesa allotments would be similar to those under Alternative 3. Alternative 4 would also keep the Wheeler Wash and Muddy River allotments open. These allotments are currently inactive, but leaving them open could lead to the reintroduction of grazing impacts into these areas. The Wheeler Wash has habitat for desert tortoise and bighorn sheep, springs containing sensitive springsnail species, and populations of halfring milkvetch, cloakey buckwheat, and Death Valley beardtongue. The Muddy River allotment has populations of three-corner milkvetch and Beaver Dam breadroot, habitats for desert tortoise and bighorn sheep, and habitats for federally listed fish and riparian bird species. The impacts to special status aquatic and riparian species in these two allotments could be major due to limited water sources in these areas which could lead to heavy use of these limited areas by cattle, especially during the hot summer months. This concentrated use would lead to a disproportionate level of impact in these sensitive areas compared to the size of the allotment as a whole.

4.2.7.5.3. Minerals Impacts on Special Status Species

4.2.7.5.3.1. Overall Minerals Impacts on Special Status Species

4.2.7.5.3.1.1. Impacts Common to All Alternatives

In general, impacts from minerals management on special status species are similar to those already discussed under the Integrated Vegetation and Fish and Wildlife sections. The requirement of validity exams on existing mining claims in tortoise ACECs would benefit desert tortoise and other special status species that occur in the same areas by limiting surface-disturbing activities to only those claims actually containing valid minable amounts of minerals. Closing the Ash Meadows ACEC to fluid mineral activities would provide some protection to the many listed and sensitive species that are endemic to the area. Closing riparian and spring areas to solid mineral leasing would provide some protection to the special status fish, aquatic invertebrates, and riparian birds, as well as other special status species such as bighorn sheep that may use the riparian areas and springs as a source of water or cover.

New sites and associated impacts on special status species would be analyzed under NEPA and ESA requirements. Necessary mitigation and stipulations would be applied to reasonably protect affected resources. Proposed use and occupancy applications would be reviewed prior to approval to ensure that these activities are in compliance with law, regulation and policy. Compliance inspections involving all mineral use activities would be conducted. Reclamation or rehabilitation of mineral operations would be required before closure and could include recontouring, stabilization, revegetation and removal of facilities. Due to the specialized habitat requirements of many special status species, reclamation of mineral operations may not result in species being able to recolonize the area.

4.2.7.5.3.1.2. Alternative 1

The majority of the planning area is currently designated as no surface occupancy (NSO) for fluid minerals, which would eliminate the potential for surface-disturbing activities and thus impacts to most special status species from fluid mineral exploration and development. There is still the potential that aquatic and riparian species may be impacted if there are changes to water levels or quality due to subsurface fluid minerals exploration and development. Areas currently open to fluid minerals exploration and development occur mostly in or near already disturbed areas or marginal habitats and thus activities are not expected to lead to further impacts to special status species. Areas designated as controlled surface use (CSU) include Amargosa Mesquite, Gold Butte Part B, and Gold Butte Part C ACECs. These areas do contain special status species including desert tortoise, bighorn sheep, and sensitive bird species. Use restrictions in these areas would help reduce impacts to these species, but impacts could still occur due to increased human presence and collisions with vehicles and equipment.

For locatable, saleable, and solid leasable minerals, approximately two-thirds of the district is currently designated as open, and around one-third as either closed or pursue withdrawal. This leaves more of the planning open to these types of activities compared to the other alternatives and thus could lead to more impacts to special status species.

4.2.7.5.3.1.3. Alternative 2

Closing most of the planning area to fluid minerals would eliminate this activity as a potential source of impact to special status species throughout most of the district. This includes closing all areas within the hydrographic basins that encompass or are up-gradient of Devil's Hole and the Muddy River. This would provide protection to the federally listed and sensitive aquatic species in these areas, such as the Devil's Hole pupfish and Moapa Dace, from the potential impacts of fluid mineral extraction including lowering of the groundwater table and groundwater pollution. The Rainbows Gardens ACEC would be designated as NSO which help protect special status species such as Las Vegas bearpoppy and sticky ringstem from surface-disturbing activities associated with fluid mineral exploration and development. Small areas around Logandale and the Sandy Valley area would be open to fluid mineral leasing and development. These areas may contain special status species such as Pahrump Valley buckwheat and three-corner milkvetch that could be impacted from fluid minerals exploration and development. These impacts would be identified and potentially mitigated when project applications are reviewed during the NEPA and ESA processes.

Alternative 2 has the lowest number of acres open for locatable, saleable, and solid leasable minerals compared to the other alternatives. Thus it would provide the highest level of protection for special status species compared to the other alternatives.

4.2.7.5.3.1.4. Alternative 3

Alternative 3 would designate approximately half the planning area as open for fluid mineral leasing and development and also more areas designated as CSU compared to Alternative 2. This could lead to increased impacts to special status species due to fluid mineral exploration and development compared to Alternative 2. Impacts would still be identified and potentially mitigated when project applications are reviewed during the NEPA and ESA compliance process. Alternative 3 would leave open portions of the hydrographic basins that encompass or are up-gradient of Devil's Hole and the Muddy River. This could lead to impacts to federally listed and sensitive aquatic species if fluid mineral extraction leads to a lowering of the groundwater table and/or groundwater pollution. These potential impacts to the groundwater could lead to the loss or degradation of the spring and surface water habitats of these aquatic species.

Alternative 3 has more acres open for saleable and solid leasable minerals compared Alternative 2 but fewer compared to Alternatives 1 and 4. Alternative 3 has more acres open for locatable minerals compared to Alternatives 2 and 4 but fewer then Alternative 1. Thus it would provide less protection for special status species when compared to Alternative 2 but relatively more protection compared to Alternatives 1 and 4.

4.2.7.5.3.1.5. Alternative 4

Alternative 4 would designate over half of the planning area as open for fluid mineral leasing and development and also more areas designated as CSU compared to Alternative 3. This could lead to increased impacts to special status species due to fluid mineral exploration and development compared to Alternatives 2 and 3. Impacts would still be identified and potentially mitigated when project applications are reviewed during the NEPA and ESA compliance process. Similar to Alternative 3, Alternative 4 would leave open portions of the hydrographic basins that encompass or are up-gradient of Devil's Hole and the Muddy River. This could lead to impacts to federally listed and sensitive aquatic species if fluid mineral extraction leads to a lowering of the groundwater table and/or groundwater pollution. These potential impacts to the groundwater could lead to the loss or degradation of the spring and surface water habitats of these aquatic species.

Alternative 4 has more acres open for saleable and solid leasable minerals compared Alternatives 2 and 4 but fewer compared to Alternative 1. Alternative 4 has more acres open for locatable minerals compared to Alternative 2 but fewer then Alternatives 1 and 3. Thus it would provide relatively less protection for special status species when compared to Alternatives 2 and 3 but relatively more protection compared to Alternative 1.

4.2.7.5.3.2. Fluid Leasable Minerals Impacts on Special Status Species

4.2.7.5.3.2.1. Impacts Common to All Alternatives

See above discussion on impacts from minerals actions in general.

4.2.7.5.3.3. Solid Leasable Minerals Impacts on Special Status Species

4.2.7.5.3.3.1. Impacts Common to All Alternatives

See above discussion on impacts from minerals actions in general.

4.2.7.5.3.4. Locatable Minerals Impacts on Special Status Species

4.2.7.5.3.4.1. Impacts Common to All Alternatives

See above discussion on impacts from minerals actions in general.

4.2.7.5.3.5. Saleable Minerals Impacts on Special Status Species

4.2.7.5.3.5.1. Impacts Common to All Alternatives

See above discussion on impacts from minerals actions in general.

4.2.7.5.4. Recreation Impacts on Special Status Species

4.2.7.5.4.1. Impacts Common to All Alternatives

In general, impacts from recreation management on special status species are similar to those already discussed under the Integrated Vegetation and Fish and Wildlife sections. Unlike permitted activities (e.g., mineral exploration and development, ROWs, special recreation permits (SRPs), and forestry and woodland harvest) that are subject to site-specific environmental review and monitoring, dispersed casual recreation and OHV activity would not have reviews for potential impacts to special status species before each use, which could result in effects to special status species as dispersed use increases over time. Although damage to special status species and their habitats would continue to be monitored, impacts from dispersed casual use would not be apparent until after the damage has occurred, which could then be appropriately mitigated to the extent practical and feasible through such things as restoration and area closures. Larger scale visitation, such as commercial, competitive, organized groups, and other activities requiring a SRP could have greater impacts, but these impacts would be analyzed during the permitting process and could be minimized through use restrictions and mitigation measures.

Constructing new trails and recreation facilities, which would be subject to site-specific NEPA and ESA review, could introduce new areas of surface disturbance and concentrate human presence, depending on the location of the trails/facilities, in sensitive special status species habitat. This could lead to decreases in special status species populations or cause special status species displacement and provide avenues for the spread of noxious weeds, which could result in modification of a special status species forage base. Motorized recreational use would have greater effects than non-motorized use. Users could introduce noise that could disturb species during sensitive periods, which could indirectly affect reproduction or cause species to abandon areas.

The alternatives differ in the number of acres designated as SRMAs or ERMAs. The possibility of increased human presence in SRMAs, concentrating around staging areas, trails, and other developed recreation sites, could result in trampling, collection, and other disturbance to special status species depending on the location and level of human presence associated with the site. Mitigation (e.g., timing, location, and group size limits) would be identified during site-specific NEPA analysis, thus reducing the potential for impacts. Increasing management presence in SRMAs could decrease impacts from dispersed recreation activities. Implementation plans for each SRMA could include minimization and mitigation measures to reduce impacts to special status species. The ERMA designation may lead to less recreation pressures compared to SRMAs

but may actually lead to more impacts to special status species due to less management oversight that could help avoid or mitigate potential impacts.

Not allowing speed-based recreational events in the ACECs that overlap desert tortoise critical habitat would eliminate this activity as a potential source of disturbance. These high-speed events can cause direct mortality to individual desert tortoises and other special status species that are trying to cross the course during the race. These events can also lead to habitat disturbance when vehicles lose control and go off the course. There are federally listed/BLM sensitive species in some areas where these species have the potential to be impacted. Impacts would be identified and potentially mitigated when project applications are reviewed during the NEPA and ESA compliance process. Speed-based events may still take place in other areas but would be reviewed during the permitting process to identify any potential impacts to special status species. The use of seasonal restrictions and other minimization and mitigation measures could help reduce the likelihood of impacts to special status species but some impacts, mostly to species habitats, would still be expected. Permit stipulations on speed-based events normally require the proponent to restore areas disturbed during the event.

4.2.7.5.4.2. Alternative 1

Alternative 1 would not contain management directions requiring camping or parking in designated or previously disturbed areas only. Allowing dispersed camping or parking could result in trampling and removal of special status plant species and likely would result in minor localized harassment of special status species wildlife due to human presence and disruptive activities. For federally listed species, harassment of the species still counts as a “take” under ESA.

In addition to not allowing speed-based events in the desert tortoise critical habitat ACECs, Alternative 1 also does not allow speed-based events in the other ACECs. This would help protect special status species that occur in these other ACECs from this type of disturbance. It also does not allow speed-based events in the McCullough Pass (pass through McCullough Range between Eldorado and Ivanpah valleys traversed by major transmission lines), which is desert tortoise critical habitat but not within an ACEC. Alternative 1 does allow speed-based events in the Nelson Hills/Eldorado Valley portion of desert tortoise critical habitat that is not within an ACEC. These events are limited by number of races a year and number of vehicles per event. They are also limited to the winter months when tortoises are less active and only on existing roads and trails to help minimize potential impacts. These events could still lead to impacts to tortoises if they are still active due to unseasonably warm temperatures or if vehicles stray off the course and disturb habitat. Alternative 1 defines the tortoise active season as March 1 through October 31. This time period includes the hot summer months when tortoises are not normally very active but would protect tortoises if they are active due to unseasonably moderate temperatures.

Alternative 1 would allow non-speed events including events in the desert tortoise critical habitat ACECs and other ACECs. These non-speed events do not have the potential to cause as much disturbance as speed events but can still lead to impacts to special status species. The assumption is that vehicles traveling less than 25 mph will be able to avoid species crossing the course. Not all individuals may be seen in time to be avoided though, which could lead to some injuries or mortality. Seasonal restrictions and limits on the number of events in desert tortoise critical habitat ACECs would help limit these possible impacts by avoiding the most active seasons when tortoises or other species are more likely to be on the course. These large events could lead to impacts to species habitat due to entrants, event staff, or spectators straying outside of designated, previously disturbed zones. The allowance of non-speed events in other ACECs to possibly use

dry washes could, depending on the type of vegetation in the wash, lead to impacts to special status species that preferentially use these habitats such as Gila monsters.

4.2.7.5.4.3. Alternative 2

Requiring that vehicles be parked in designated areas or within previously disturbed areas would help limit potential impacts to special status species. Vehicle parking areas can be similar to roads in terms of the level of disturbance. Parking areas also become sources of trash, which can lead to localized increases in scavengers such as ravens which also prey on hatchling desert tortoises and potentially other special status species. Allowing camping only in designated or previously disturbed areas would also help limit impacts to special status species. The longer duration human presence associated with camping may displace some special status species such as bighorn sheep that are wary of people. Camping can also lead to more accumulation of partially eaten food, human and animal wastes, and trash that may attract scavengers. Visitors may also prefer to establish campsites near riparian areas or near mesquite/acacia groves due to the cover the vegetation provides. These areas are also important cover and water sources for many special status species such as riparian birds and bighorn sheep.

Alternative 2 would define a narrower desert tortoise active season compared to Alternative 1. This narrower window better reflects that tortoises are less active during the hot summer months. Events permitted during the summer could still lead to impacts if tortoises are still active due to unseasonably moderate temperatures. Speed-based events would be allowed in some of the proposed ACECs, which could lead to impacts to special status species. The events would still have to go through the permitting process, and mitigation measures could be required to reduce the potential impacts to species. Speed-based events would not be permitted in desert tortoise critical habitat in McCullough Pass, which would be designated an ACEC under Alternative 2, or the Nelson Hills area that would not be within an ACEC. This would eliminate this type of impact to special status species that may occur in those areas including desert tortoise and bighorn sheep.

Alternative 2 would also allow non-speed events. In the desert tortoise critical habitat ACECs, restrictions would be placed on the number and types of non-speed competitive events, commercial tours, and organized groups that could operate in the areas in the active and inactive season. Ongoing motorized tours would be allowed only on main routes in the Gold Butte Part A ACEC and not allowed in the others. The main routes within Gold Butte Part A already receive heavy recreational use, and these tours are not expected to increase impacts on special status species compared to current levels. Even though these events are non-speed, there may still be some impacts to species if they are not seen crossing roads or if the tours involve dispersed use off designated routes that could lead to habitat disturbance. Permit levels would be lower during the tortoise active season, which would help reduce potential impacts when tortoises are more likely to be on roads.

4.2.7.5.4.4. Alternative 3

Under Alternative 3, more of the proposed ACECs would allow speed-based events. Alternative 3 would also allow speed-based events in desert tortoise habitat in McCullough Pass, which would be designated an ACEC under Alternative 3, and the Nelson Hills area that would not be within an ACEC. These events would be limited in number and restricted to the winter months when tortoises are not as active. There still may be impacts to tortoise and other special status species, such as bighorn sheep, from these events if species are active due to unseasonably warm temperatures or if vehicles stray off course and disturb habitat. Species, such as bighorn sheep,

may also be temporarily displaced during the events, but due to the limited number of events that would be permitted each year, they would not be expected to permanently abandon the area. Alternative 3 would also permit more non-speed events in desert tortoise critical habitat ACECs in the tortoise active season compared to Alternatives 1 and 2. This could lead to more impacts to desert tortoise and other special status species if the recreational users are not able to avoid individuals crossing the tour routes. In addition, the increased human presence due to more tours may impact secretive species such as bighorn sheep.

4.2.7.5.4.5. Alternative 4

Impacts from Alternative 4 would be similar to those discussed under Alternatives 2 and 3. Similar to Alternative 3, Alternative 4 would allow speed-based events in the McCullough Pass and Nelson Hills areas of desert tortoise habitat, both of which would not be an ACEC under Alternative 4. The difference between the two alternatives is that Alternative 4 would have a wider seasonal window when events would be permitted. This wider window increases the chances that tortoises and other species may be active during the event and thus potentially impacted. Alternative 4 would also permit more non-speed events in desert tortoise critical habitat ACECs in the tortoise active and inactive seasons compared to the other alternatives. This could lead to more impacts to desert tortoises and other special status species if the recreational users are not able to avoid individuals crossing the tour routes and may also impact secretive species due to an increased human presence due to more tours per day.

4.2.7.5.5. Travel and Transportation Impacts on Special Status Species

4.2.7.5.5.1. Impacts Common to All Alternatives

The general impacts from transportation management on special status species are similar to those already discussed in the Integrated Vegetation and Fish and Wildlife sections. Several dry lake beds would be designated as open areas in all alternatives. Several special status species, including desert tortoises, occur in habitats surrounding the lake beds and may occasionally travel onto the lake beds and thus could be impacted by vehicles traveling on the lake bed. Nellis Dunes also would be designated an open area in all alternatives. Several special status species, including sidewinder, Mojave shovel-nosed snake, and three-corner milkvetch, may occur in habitats surrounding or on the periphery of Nellis Dunes. Individuals may be impacted by vehicles traveling on the dunes or by vehicles that accidentally or purposely travel beyond the open area. Impacts to special status species from these open areas are assumed to be negligible to minor, impacting only a few individuals of a species.

Under all four alternatives, wilderness areas and the Hidden Valley ACEC would be closed to motorized vehicles. Wilderness areas are closed to motorized and mechanized vehicles by the Wilderness Act itself, and the closure is a benefit to any special status species that may occur in wilderness areas. Most of the Hidden Valley ACEC is part of the Muddy Mountains Wilderness Area. The portion outside of the wilderness area is habitat for bighorn sheep, which would benefit from the closure designation.

4.2.7.5.5.2. Alternative 1

Besides wilderness areas and the Hidden Valley ACEC, the Las Vegas Valley SRMA and approximately 200 acres of beetle habitat at Big Dune are also designated as closed areas.

The closure of the Las Vegas Valley SRMA would help reduce impacts from OHV use on the remaining populations of special status species around the outskirts of Las Vegas Valley including desert tortoise, Las Vegas buckwheat, Las Vegas bearpoppy, and yellow two-tone beardtongue. These populations have already been heavily impacted due to development in the valley, which has eliminated large areas of suitable habitats. Closure of beetle habitat next to Big Dune would help reduce impacts from vehicles on the four rare locally endemic beetle species, as well as special status species such as the sidewinder and Nevada shovel-nosed snake. Beetles that occur around Lava Dune would not be protected because there would be no ACEC. In addition, the full distribution of the beetles around Big Dune is not fully known, thus areas outside of the identified closure may contain beetles that would not be protected.

4.2.7.5.5.3. Alternative 2

In addition to wilderness areas, the Hidden Valley ACEC, and the Las Vegas Valley SRMA (discussed in Alternative 1), several other areas would be designated as closed to motor vehicles. Closure of 233 acres of beetle habitat within the Big Dune ACEC would benefit the rare dune beetles and other species as discussed under Alternative 1. It would also close more acres and more of the known habitat around Big Dune compared to Alternative 1. Closure of the Lava Dune ACEC will also help protect the rare dune species and other special status species that may occur near the dunes. Closure of the Mt. Schrader ACEC would help protect a small area that may contain bighorn sheep and desert tortoise habitat.

Closure of Hiko Spring and Carson Slough, based on a wild and scenic river tentative classification of wild, would help special status species that may live in or use these riparian areas. This includes species such as Ash Meadows gumplant, spring-loving centaury, and Tecopa bird's beak that occur along the Carson Slough. Closure of lands with wilderness characteristics would also help limit impacts to special status species in these areas. These areas adjoin or are near currently designated wilderness and wilderness study areas. This would effectively increase the amount of area closed to vehicle travel already provided by wilderness areas, which would provide an even greater benefit to special status species in these areas.

All other areas not designated as open or closed would be limited to designated trails. Managing OHV use throughout the majority of the planning area as limited to designated routes could help minimize surface disturbances, injury, and mortality to special status species and their habitats. OHV use on designated routes could still result in the displacement of special status species through the human presence, noise, dust, and other disruptive activities. Taking into account special status species while making route designations would help reduce potential impacts by closing routes that cause adverse impacts to species and by using route configurations to guide people away from sensitive populations and habitats. The ability to immediately close routes that are adversely impacting special status species may also help limit the severity of the impacts depending on the effectiveness of the closure order.

4.2.7.5.5.4. Alternative 3

Impacts under Alternative 3 would be similar to those under Alternative 2 except that lands with wilderness characteristics would not be closed to vehicle travel. Vehicles would be limited to designated routes in lands with wilderness characteristics under this alternative, and potential impacts to special status species in these areas could be minimized through proper route designations. In addition, only 119 acres of beetle habitat at Big Dune would be closed to vehicle

travel and more acres would be designated as open compared to Alternative 2. This could lead to greater impacts to the beetles and their habitat at Big Dune compared to Alternative 2.

4.2.7.5.5.5. Alternative 4

Under Alternative 4, only wilderness areas, the Hidden Valley ACEC, and 86 acres at Big Dune would be closed to vehicles. In addition, more acres would be designated as open to vehicle travel at Big Dune. Thus a lower level of protection would not be provided to the Big Dune and Lava Dune areas compared to Alternatives 2 and 3, which could lead to major impacts to the rare beetles if future routes are improperly designated. Some of these endemic beetles already warrant listing under the ESA, and additional potential impacts could lead to emergency listing and/or make recovery more difficult.

4.2.7.5.6. Lands and Realty Impacts on Special Status Species

In general, impacts to special status species from lands and realty management directions would be similar to those discussed in the Integrated Vegetation and Fish and Wildlife sections. Impacts include injury and mortality to special status species, species displacement, decreased reproductive success, loss of habitat, habitat degradation, habitat fragmentation, and loss of connectivity. Because special status species are rare or have more restricted distributions, the severity of impacts on special status species due to lands actions could be higher compared to general wildlife and plant species. Elimination of sensitive species and/or their habitats, could contribute to the need to list the species, if impacts are not properly minimized or mitigated. Also, some of these species are slow to reach reproductive status and/or have low reproductive rates or success. Impacts to special status species would still be analyzed during the NEPA and ESA processes prior to individual project approval, and these impacts could be minimized or mitigated.

4.2.7.5.6.1. Land Tenure (Disposals and Acquisitions) Impacts on Special Status Species

4.2.7.5.6.1.1. Impacts Common to All Alternatives

Potential impacts from land disposals include loss of habitat and individuals, habitat degradation, habitat fragmentation and loss of connectivity, and species displacement. Once lands are disposed of by BLM and transferred into private ownership, requirements to consult with the U.S. Fish and Wildlife Service on potential impacts to federally listed species would be up to the private landowners under Section 10 of the ESA. Under all alternatives, lands could be acquired to help protect special status species. This could help increase the size or number of populations of special status species under federal control and could consolidate parcels and help reduce habitat fragmentation.

4.2.7.5.6.1.2. Alternative 1

Alternative 1 would carry forward all of the lands eligible for disposal under the 1998 RMP. These parcels contain desert tortoise habitat and habitats for other special status species. Many of the parcels are located within or next to existing developed lands. Disposal of lands in the Amargosa Valley could lead to additional groundwater withdrawals from private water wells. This could lead to declines in the water table in the area, which could have major impacts on the endemic federally

listed Ash Meadows species. These species are highly dependent on springs, seeps, and shallow water tables for their survival. Any declines in water availability, even minor changes, could lead to major changes to the habitat suitability for the species. Because these species are found only in the Ash Meadows region, any declines in habitat suitability could lead to significant declines in population sizes for the species, making recovery less likely for the species. This is especially true for Devil's Hole pupfish, which only occurs in Devil's Hole and has no potential for being delisted.

Disposal of lands in the southern part of Pahrump Valley may lead to loss a portion of the Pahrump Valley buckwheat population in the area. Disposal of lands around Sandy Valley could also lead to loss of the remaining Pahrump Valley buckwheat population in that area. Thus these two disposal areas could lead to the partial loss of two of the three known main locations where the Pahrump Valley buckwheat is known to exist. Disposal of lands in the Apex area could lead to some loss of Las Vegas bearpoppy and silverleaf sunray individuals. Disposals in the Goodsprings area and the Valley West parcels may lead to loss of some yellow two-tone beardtongue individuals. Disposals in the Nelson area may lead to loss of some rosy two-tone beardtongue individuals.

Disposals in the Moapa-Glendale area could lead to groundwater withdrawals from private wells, which could impact the local water table. Changes in the water table in this area could have impacts to the special status fish that occur in the Muddy River. It could also lead to declines in the quality of riparian vegetation that is important to the listed riparian birds such as the southwestern willow flycatcher. Water table changes could also impact down gradient springs which may contain special status species. The Moapa-Glendale area also contains populations of three-corner milkvetch, sticky buckwheat, sticky ringstem, and other special status plants that may be impacted by future development of disposed parcels. The Nelson disposal contains habitat for several special status species including rosy two-tone beardtongue, bighorn sheep, and desert tortoise.

4.2.7.5.6.1.3. Alternative 2

Alternative 2 would greatly reduce the number of acres identified for potential disposal. This would reduce the number of acres and thus special status species and habitats that could be lost due to disposal and resulting development actions. Amargosa Valley would not be designated as a disposal area, which would reduce the chances of increased water withdrawals in the basin. The 3 Kids Mine would be a new proposed disposal area. This is a previous mining operation and thus the area is highly disturbed and is assumed to not contain suitable habitat for special status species.

Alternative 2 would greatly reduce the size of the Moapa-Glendale disposal area compared to the other alternatives. It would remove from disposal most of the area potentially having habitat for the sand-loving special status plants such as three-corner milkvetch. It would also reduce the amount of land that could potentially lead to additional water withdrawals. Water withdrawals could still occur on the remaining disposal lands, and thus the potential impacts from these withdrawals discussed under Alternative 1 could still occur. Alternative 2 would also reduce the size of the Sandy Valley disposal area due to the proposed Sandy Valley ACEC. Thus the majority of the known locations of Pahrump Valley buckwheat on BLM land in the Sandy Valley area would remain in federal ownership. Because these parcels are or could become fully surrounded by development, there could still be impacts to the plants due to dispersed, casual use from the neighboring private property.

Last Chance Range, Belle Vista, and Nye County 1 and 2 would be newly identified disposals in Nye County. The Belle Vista area is already heavily disturbed due to recreational shooting and thus only provides minimal habitat suitability for species such as desert tortoise. Putting this

parcel under Nye County control could also lead to more oversight of activities on this parcel and help contain them to the already disturbed area instead of spreading into currently undisturbed habitat. The Last Chance Range parcel does contain habitat for desert tortoise and other special status species but is surrounded on three sides by rural private residences. Nye County 1 is just south of the Cind-R-Lite mine and is already somewhat disturbed. However, it is next to Lava Dune which is habitat for the endemic dune beetles, and it is not known what the impacts are on these species from the cinder that blows onto the dune area. The Nye County 2 parcel surrounds the U.S. Ecology site and does contain habitat for desert tortoise and other special status species.

4.2.7.5.6.1.4. Alternative 3

In Clark County, Alternative 3 would have the same disposal areas as in Alternative 1 with the addition of the 3 Kids Mine, City of Las Vegas, Crescent Peak, Lone Mountain, North Las Vegas, Republic Services, and Sloan Hills parcels along with the expansion of the Mesquite Bunkerville parcel. The Moapa Glendale, Nelson, and Laughlin parcels would be reduced in size compared to Alternative 1. Reducing the Moapa Glendale parcel would reduce the amount of land that could potentially lead to additional water withdrawals. Water withdrawals could still occur on the remaining disposal area, and thus the potential impacts from these withdrawals discussed under Alternative 1 could still occur. In addition, a portion of the Moapa Glendale disposal would still overlap habitat for threecorner milkvetch, sticky buckwheat, and Beaverdam breadroot.

The 3 Kids Mine, as discussed in Alternative 2, is a previous mining operation and is heavily disturbed. The Crescent Peak parcel is next to an existing mine but does contain habitat for bighorn sheep. The Lone Mountain parcel contains habitat for desert tortoise, bighorn sheep, and other special status wildlife species, as well as known locations of yellow two-tone penstemon. The City of Las Vegas parcel contains habitats for desert tortoise and other special status wildlife. The North Las Vegas disposal contains habitat for desert tortoise and Las Vegas bearpoppy as well as other special status species but some of the area is already disturbed due to material pits. The Republic Services parcel is next to an existing landfill. It does contain habitat for bighorn sheep and desert tortoise. The Sloan Hills parcel contains habitat for desert tortoise, bighorn sheep, and other special status species. This parcel, though, is surrounded by the existing SNPLMA disposal boundary and thus will likely become surrounded by development in the future. Thus, even without disposal, this parcel would likely lose any value as special status species habitat in the future when it becomes isolated by surrounding development and impacted from dispersed use from the developments.

In Nye County, Alternative 3 would contain approximately the same amount of acres for disposal compared to Alternative 1 but in a different arrangement. Some of the existing disposal parcels around Pahrump would be removed but the Southern Pahrump/Off the Grid, Southern Pahrump Connection, and Pahrump East disposal parcels would be added. These parcels contain habitat for desert tortoise and other special status species. Some of the parcels on the southern end of the town of Pahrump still contain habitat for Pahrump Valley buckwheat but not as much compared to Alternative 1. The Pahrump East parcel would constrict the east-west connectivity of desert tortoise habitat between State Route 160 and the Spring Mountains to around one half mile, which is below the U.S. Fish and Wildlife Service recommended minimum width of 1.4 miles (U.S. Fish and Wildlife Service, 2013).

The Last Chance Basin parcel contains desert tortoise habitat and may also lead to impacts to bighorn sheep that live in the Last Chance Range around the parcel. Depending on its configuration, development in the parcel could also impact tortoise habitat connectivity in the

area, as it is within the tortoise connectivity corridor. Nye County has proposed a landfill in the Last Chance Basin parcel and landfills not only result in loss of habitat within the footprint of the project but can also result in increased populations of scavengers, such as ravens and coyotes, and the introduction of toxic chemicals into the surrounding environment. Increased populations of ravens and coyotes can lead to impacts to tortoises in the surrounding area beyond the footprint of the landfill itself. It is assumed, though, that any future landfill would be required to meet federal and state regulations which are designed to greatly reduce or eliminate potential impacts such as introduction of toxic chemicals into the surrounding area.

The Amargosa Valley disposal would be somewhat smaller compared to Alternative 1 and not include most of the portion of Alternative 1 area that is within 10 miles of Devil's Hole. As in Alternative 1, minor to moderate changes in water availability due to increased groundwater pumping could lead to major adverse impacts to habitat suitability for numerous Ash Meadows species including the Devil's Hole pupfish. These impacts could be somewhat reduced by potentially not pumping water as close to Ash Meadows and Devil's Hole as would be possible under Alternative 1. The Last Chance Range, Belle Vista, and Nye County 1 and 2 disposals, discussed in Alternative 2, would also be proposed in Alternative 3. The Last Chance Range disposal would be increased to include two additional parcels near the edge of rural development. Both parcels contain desert tortoise connectivity habitat. The Von Schmidt and Stateline 13 disposal areas are already in partially disturbed habitats, although they area adjacent to undisturbed habitat for sensitive species. The South Beatty Parcel, Mercury, Belle Vista, and Highway 95/160 Intersection parcels also contain desert tortoise habitat. The Highway 95/160 Intersection parcel surrounds the intersection of the two highways where it is assumed desert tortoises in the area have already been impacted due to mortality from vehicles. Similarly, the Mercury parcel is between Highway 95 and a utility corridor. The Highway 95/160 Intersection, Belle Vista, and Mercury Tech Park disposal also have the potential to impact desert tortoise connectivity and higher value habitats as they are within the tortoise connectivity corridor and would further restrict movement for the species in these areas.

4.2.7.5.6.1.5. Alternative 4

Alternative 4 would contain all of the disposal areas from Alternative 1 and Alternative 3 as well as new disposal areas. Some of the disposal areas would be a different size compared to the other alternatives. In total, Alternative 4 would contain the greatest number of acres identified for disposal and thus could lead to the most impacts to special status species. In Clark County, the Army National Guard disposal would be identified in addition to all of the disposal areas identified in Alternative 3. The Army National Guard disposal is actually several parcels near the Las Vegas Valley and may contain desert tortoise habitat or habitats for other special status species. The North Las Vegas parcel would be larger in Alternative 4 compared to Alternative 3.

In Nye County, Alternative 4 would include all of the disposals identified in Alternative 3, many of which would increase in size compared to Alternative 3. This increased size could lead to the loss of additional special status species habitat compared to Alternative 3 and have much greater impacts of sensitive species populations. The Pahrump disposal would be larger in Alternative 4 compared to Alternatives 2 and 3 but smaller than in Alternative 1. Due to the location and increased size of Lathrop Wells, Highway 95/160 Intersection, Mercury, Pahrump East, Southern Pahrump/Off the Grid, and Southern Pahrump Connection parcels, these disposals could lead to a reduction of desert tortoise connectivity if the entire parcels are developed. The increased size of the Pahrump East disposal would further constrict the tortoise connectivity through the area

below the U.S. Fish and Wildlife Service recommended width compared to Alternative 3. The eastern portion of the increased Nye County 1 disposal could impact dune beetle habitat.

Alternative 4 would also create and additional disposal area compared to Alternative 3. The Pahrump Stateline disposal could potentially impact a large area of Pahrump Valley buckwheat habitat, and have major impacts to this sensitive species. This disposal, combined with the other disposals in southern Pahrump valley and the potential disposal of buckwheat habitat in Sandy Valley could lead the loss of a large portion two of the three known locations of the species in Nevada. This would leave the Stewart Valley population as the only mostly intact population. Removal of the Pahrump Stateline disposal parcel from federal ownership has potential to violate policy set forth in BLM Manual 6840 for sensitive species as it may contribute to the need to federally list the Pahrump Valley buckwheat, based on the small and isolated existing populations.

4.2.7.5.6.2. Land-Use Authorizations (Right-of-Ways, Leases, Permits) Impacts on Special Status Species

4.2.7.5.6.2.1. Impacts Common to All Alternatives

Land-use authorizations (LUAs), similar to disposals, can lead to loss or degradation of special status species habitat. In addition to loss of habitat, linear ROWs such as power lines, can impact special status species such as desert tortoise by fragmenting their habitat. Power lines can also cause mortality to special status birds through electrocution and collision. Power line and communication towers can provide perches or nest sites for raptors and ravens that prey on desert tortoises and other special status species. New access roads associated with LUAs can lead to new recreational OHV use in areas where roads previously didn't exist. This can lead to increased mortality to species such as desert tortoise due to collisions with vehicles.

4.2.7.5.6.2.2. Alternative 1

Alternative 1 would have the fewest acres designated as avoidance or exclusion for LUAs and could lead to the most impacts to special status species of all the alternatives from this type of activity. Avoiding ROWs within one-quarter mile of caves would help limits impact to special status bats that roost in caves. Bats can collide with vertical structures near caves as they leave and return to the cave. Vertical structures can also provide perches for raptors that prey on bats as they are leaving and returning to the cave.

4.2.7.5.6.2.3. Alternative 2

Alternative 2 would have the most acres designated as avoidance or exclusion for LUAs and thus would lead to the fewest impacts to special status species of all the alternatives from this type of activity. A one half mile avoidance buffer for ROWs near caves would provide more protection to bats compared to Alternative 1.

4.2.7.5.6.2.4. Alternative 3

Alternative 3 would have the fewer acres designated as avoidance or exclusion for LUAs compared to Alternative 2 but more than Alternatives 1 and 4. Similar to Alternative 1, Alternative 3 would create a one quarter mile avoidance buffer for ROWs near caves.

4.2.7.5.6.2.5. Alternative 4

Alternative 4 would have the fewer acres designated as avoidance or exclusion for LUAs compared to Alternatives 2 and 3 but more than Alternatives 1. Alternative 4 would allow ROWs near caves unless they compromise sensitive resources, which would include special status bat species. There would be no minimum buffer required, though, compared to the other alternatives which could lead to ROWs being permitted closer to caves than could occur in the other alternatives.

4.2.7.5.6.3. Renewable Energy Impacts on Special Status Species

4.2.7.5.6.3.1. Impacts Common to All Alternatives

In general, impacts to special status species from renewable energy projects would be similar to those discussed in the Integrated Vegetation and Fish and Wildlife sections. Solar projects, due to their size and the siting of projects in relatively flat valley areas, can have major impacts to some special status species. Sites suitable for solar projects also often provide habitat for desert scrub species such as desert tortoise, shovel-nosed snake, glossy snake, and sidewinder. Projects sited in narrow valleys or in valleys with other developments or other barriers can severely reduce habitat connectivity or reduce corridors for movement for the desert tortoise and other species. This habitat loss/fragmentation can negatively affect genetic viability of special status species. Depending on the technology used, solar projects can require large quantities of water which may impact local water tables if groundwater is used. In areas such as the Amargosa Valley or near the Muddy River, these groundwater withdrawals can have large impacts to species dependent on riparian areas, springs, seeps, or shallow water tables for survival. Impacts associated with solar projects where desert tortoise are present also may involve translocating the species due to the large footprint of the project, which increases the amount of stressors for the species and the need to adapt to new surroundings. Mortality to desert tortoises has been documented resulting from translocation however, monitoring and bmp's can minimize this risk. Migratory birds that are also BLM sensitive/federally listed, have also been documented to be impacted (through mortality/injury) by solar projects. The associated infrastructure for these facilities may also contribute to impacts to sensitive species. Although there would be impacts to sensitive species in the development of SEZs, if properly planned, these SEZs have the potential to concentrate renewable energy projects into one restricted area, greatly reducing overall fragmentation of the landscape. Making towers, ponds and panels less attractive or accessible to birds may also help mitigate mortality/injury events to some sensitive species.

Wind projects can have impacts on special status species through habitat loss and fragmentation and increased human presence. Mountain ranges that are often the preferred option for siting wind turbines are also habitat for bighorn sheep within the planning area. The wind turbines can also have impacts on special status birds, especially raptors, and bats that collide with the turbine blades. Even if they don't collide with the turbines themselves, bats are also susceptible to barotrauma when they get close to the spinning blades due to the differences in air pressure that damage their lungs, resulting in mortality. These impacts are even greater if the turbines are sited near bat roost sites such as caves or major migratory corridors for birds. The lights associated with the facilities may attract insects at night, which could in turn attract bats that feed on the insects. This may bring the bats in close proximity to the turbines, increasing the risk for collisions or barotrauma. Road networks associated with wind projects could result in habitat fragmentation and increased vehicle traffic that could lead to mortality and help spread invasive

species. Wind projects can also impact desert tortoises by removing and fragmenting habitat. The associated infrastructure for these facilities also contribute to impacts to sensitive species.

4.2.7.5.6.3.2. Alternative 1

Alternative 1 would have the most acres open for solar development either through solar energy zones or variance areas. Thus it could lead to the most impacts to species such as desert tortoise compared to the other alternatives if having more acres available leads to more large-scale solar projects. Solar projects requiring groundwater approved in the Amargosa Valley or Moapa could have impacts to special status species in those areas that are dependent on consistent water table levels. Some of the areas open for solar development under this alternative have been identified by the U.S. Fish and Wildlife Service as important areas for desert tortoise connectivity such as Bird Spring Valley, the north slope of the Spring Mountains, and the Dry Lake Valley/California Wash area. Solar projects around Stewart Valley, southern Pahrump Valley, and Sandy Valley could impact Pahrump Valley buckwheat. Solar projects in the California Wash/Dry Lake Valley area or on Mormon Mesa could impact three-corner milkvetch, sticky buckwheat, and Beaver Dam breadroot. Solar projects in the Bitter Springs area could potentially impact Las Vegas buckwheat and Las Vegas bearpoppy populations in the area.

Under Alternative 1, approximately two-thirds of the planning area would be open for wind projects. This could lead to major impacts to special status bird and bat species if numerous wind projects are approved throughout the planning area. Alternative 1 would not use the avoidance designation that would be used in the other alternatives. Thus areas would be designated as either open or excluded for wind, and Alternative 1 would have more open areas than the other alternatives.

4.2.7.5.6.3.3. Alternative 2

Alternative 2 would have the least number of acres open for solar developments compared to the other alternatives. It would limit the number of potential large scale solar projects that could be built that would impact species such as desert tortoise. Portions of the California Wash, northern slope of the Spring Mountains, and Bird Spring Valley would be designated as solar exclusion areas which would help protect habitat for desert tortoise connectivity in these areas. Most of the southern portion of Pahrump valley would also be a solar exclusion area and thus eliminate solar as a potential threat to Pahrump Valley buckwheat in this area. Most of the Moapa area, which contains special status riparian species, would also be excluded from solar. Exclusion areas in Dry Lake Valley, California Wash, and Mormon Mesa areas would provide some protection to the three-corner milkvetch, sticky buckwheat, and Beaver Dam breadroot populations in these areas. The Bitter Springs area would also be an exclusion zone which would help protect Las Vegas bearpoppy and Las Vegas buckwheat populations. Amargosa Valley would still be available for solar developments and could have impacts on the Ash Meadows special status species if the projects result in groundwater withdrawals that cause a lowering of the water table.

Alternative 2 would have the highest number of exclusion acres and the fewest acres designated as either open or avoidance for wind compared to the other alternatives. The majority of the acres that would be available for wind projects would be avoidance areas, which would reduce the likelihood of wind projects being sited in these areas.

4.2.7.5.6.3.4. Alternative 3

Alternative 3 would have more acres open for solar compared to Alternative 2 but less than Alternatives 1 or 4. Although smaller than in Alternative 2, Alternative 3 would still have exclusion zones between Ash Meadows and the Last Change Range, the north slope of the Spring Mountains, and the California Wash area which would help protect important desert tortoise connectivity corridors. The area between the Spring Mountains and the Last Chance Range would designated as a variance zone. Large projects in this area could lead to a loss of connectivity between these areas for bighorn sheep. Exclusion areas in the California Wash and Mormon Mesa areas would help protect three-corner milkvetch, sticky buckwheat, and Beaver Dam breadroot populations. Excluding the Bitter Springs area would help protect populations of Las Vegas Buckwheat and Las Vegas bearpoppy. Alternative 3 would make an even greater area around Ash Meadows available for solar projects which could lead to moderate to major impacts to the Ash Meadows special status species, including Devil's Hole pupfish, if the projects cause a lowering of the water table through groundwater withdrawals. Similar to Alternative 1, Alternative 3 would designate the Stewart Valley, southern Pahrump Valley, and Sandy Valley areas as variance zones for solar could lead to impacts to Pahrump Valley buckwheat populations. The Mercury SEZ is within the desert tortoise connectivity corridor, although this SEZ is not as large as the others in Alt 3 and is already up against the existing highway.

Alternative 3 would have more areas designated as wind energy exclusion zones compared to Alternatives 1 and 4 but fewer than in Alternative 2. Similar to Alternative 2, most of the areas available for wind projects would be designated as avoidance areas.

4.2.7.5.6.3.5. Alternative 4

Alternative 4 would designate more areas open for solar compared to Alternatives 2 and 3. Alternative 4 would still designate the Bird Spring Valley as an exclusion zone which would protect this important desert tortoise connectivity area but other areas identified by the U.S. Fish and Wildlife Service as important for connectivity for desert tortoise would remain open. Similar to Alternatives 2 and 3, Alternative 4 would also designate the Bitter Springs area as an exclusion zone. Similar to Alternative 3, more area around Ash Meadows would be open to solar compared to Alternative 1. Alternative 4 would designate more solar energy zones compared to the other alternatives, and these SEZs are also proposed to be much larger in size for the most part. The SEZs would focus solar developments in these areas and thus could limit the number of areas impacted by solar projects in the district as a whole. These SEZs, though, could increase the amount of impacts at the local scale by impacting larger contiguous parcels of land compared to more dispersed projects. Multiple projects in one area increases the chance for loss of habitat connectivity between neighboring habitats.

Alternative 4 would have the fewest number of acres designated as exclusion for wind compared to the other alternatives. Compared to Alternative 1 though, Alternative 4 would designate the majority of the available acres as avoidance areas rather than open areas which would reduce the chances of projects being approved in these areas compared to the open areas.

4.2.7.5.6.4. Utility Corridors Impacts on Special Status Species

4.2.7.5.6.4.1. Impacts Common to All Alternatives

The designation of utility corridors could help reduce overall impacts to special status species by reducing the number of access roads needed and focusing disturbance in specific areas instead of spread across the landscape. This would help reduce overall habitat fragmentation across the landscape, although impacts would still exist to species affected. Many of the proposed corridors already include existing utility ROWs and infrastructure. Impacts in corridors from new power lines could be reduced by requiring the use of the same access road for multiple projects thus limiting new surface disturbance to new spur roads and pole footprints. Impacts could also be reduced by limiting use of access roads to administrative use only.

4.2.7.5.6.4.2. Alternative 1

Under Alternative 1, the corridor through Rainbow Gardens would be 1,400 feet wide. New utility lines through this area have the potential to impact Las Vegas bearpoppy, silverleaf sunray, and sticky ringstem through loss of habitat. This would be the smallest corridor width of all the alternatives and thus would lead to the least amount of impacts to the special status plants because the narrower width would allow fewer utility lines compared to the other alternatives. Most of the corridors under Alternative 1 already have some power lines in them. Thus, additional utilities in these corridors are not expected to have a major impact on special status species in these areas.

The designated corridor that runs south of Ash Meadows and through the southern portion of Pahrump Valley does not have any existing utility lines. This corridor passes through habitats for the Ash Meadows listed and sensitive species, habitat for Pahrump Valley buckwheat, and habitat for desert tortoise and other upland special status species. If utility lines are developed through this corridor, it could lead to loss of habitat for these species and the introduction of roads through areas where currently few roads exist. Portions of the West Wide Energy Corridor are also undeveloped, including portions that go through mostly roadless desert tortoise habitat and habitat for white margined penstemon.

4.2.7.5.6.4.3. Alternative 2

The corridor width through Rainbow Gardens would increase to 3,500 feet. This increased width could lead to more utility lines being built through this area, which would lead to additional impacts to the special status plants that occur in this area due to loss of habitat. Alternative 2 would have the fewest number of designated corridors compared to the other alternatives. Corridor widths would also be narrower compared to Alternatives 3 and 4. Alternative 2 would retain the existing Alternative 1 corridor that runs south of Ash Meadows and through the southern portion of Pahrump Valley. Development in this corridor could lead to impacts to special status species as discussed under Alternative 1. The proposed corridor and the West Wide Energy Corridor running north of Stump Springs are currently undeveloped and cross relatively roadless desert tortoise habitat.

4.2.7.5.6.4.4. Alternative 3

Similar to Alternative 2, the size of the corridor through Rainbow Gardens would be increased to 3,500 feet, which could lead to more impacts to Las Vegas bearpoppy, silverleaf sunray, and

sticky ringstem in this area. Alternative 3 would have more corridors, and corridor widths would be expanded compared to Alternatives 1 and 2. Increased corridor widths through desert tortoise critical habitat could lead to additional loss of critical habitat and increased OHV use in these areas.

Similar to Alternative 2, the Alternative 1 corridor south of Ash Meadows would be dropped. The corridor north of Stump Springs would follow the existing power lines north of State Route 160 as opposed to going through the middle of the valley south of the highway, which is currently mostly undisturbed desert tortoise habitat. Siting new utilities next to the existing lines would help limit habitat fragmentation in the area. The new corridor through the California Wash area may lead to minor impacts to three-corner milkvetch.

4.2.7.5.6.4.5. Alternative 4

Similar to Alternatives 2 and 3, Alternative 4 would increase the size of the corridor through Rainbow Gardens to 3,500 feet which could lead to more impacts to the special status plants in this area. Compared to Alternative 3, Alternative 4 adds some additional corridors and increases the corridor widths to 5,280 feet wide, including corridors that run through desert tortoise critical habitat. A corridor would be added that runs through the southern portion of Pahrump Valley, which could potentially result in loss of Pahrump Valley buckwheat habitat. This corridor also passes through the middle of the relatively undisturbed habitat north of Stump Springs and south of State Route 160.

4.2.7.6. Special Designations

4.2.7.6.1. Areas of Critical Environmental Concern Impacts on Special Status Species

4.2.7.6.1.1. Impacts Common to All Alternatives

Special management areas such as ACECs result in protection of special status species and long-term improvement or at least maintenance of habitat quality because of numerous use restrictions. This is especially true for species that meet relevance and importance (R&I) criteria and thus receive management focus in an ACEC. ACEC management could reduce or eliminate surface disturbance and other disruptive activities. Use restrictions in ACECs could include ROW exclusion or avoidance, closure or limits to mineral exploration, limits to or exclusion of certain types of recreation use such as high-speed events, limits of travel to designated routes, and closure to grazing. All of these restrictions would help protect special status species and their habitats to various degrees. Actions to protect and restore habitat for species meeting R&I in ACECs would also protect and improve habitats for other special status species. ACECs can play an important role in providing and protecting connectivity between habitats for numerous species.

The main difference between the alternatives is the number and size of ACECs proposed for designation and thus the number of acres of special status species habitat potentially protected. Use restrictions and some management directions for special status species also can vary between alternatives for some ACECs. The more restrictive the management directions, the more potential protection provided to the special status species that occur in the ACEC.

4.2.7.6.1.2. Alternative 1

There would be 23 ACECs totaling 1,014,301 acres in Alternative 1. The majority of the acreage (868,542 acres) is accounted by six ACECs (Coyote Springs, Gold Butte Part A, Gold Butte Part B, Ivanpah Valley, Mormon Mesa, Piute/Eldorado), which were designated to protect desert tortoise as an R&I value. All of these areas except for Gold Butte Part B and Ivanpah Valley overlap U.S. Fish and Wildlife Service designated critical habitat for the tortoise. Managing these areas to protect desert tortoise would also benefit other special status species that may occur in the areas such as burrowing owl, Gila monster, Las Vegas buckwheat, Las Vegas bearpoppy, and many others. Gold Butte Part B also provides protection for the relict leopard frog, which has been introduced into some of the springs in the area.

Ash Meadows ACEC provides protection for the suite of endemic species found in the area. It also provides a protective buffer around the U.S. Fish and Wildlife Service managed Ash Meadows National Wildlife Refuge and the National Park Service-managed Devil's Hole, which contain the main populations of the Ash Meadows special status species. The Amargosa Mesquite ACEC is designated to protect the mesquite bosques as important migratory bird habitat. This would benefit some of the sensitive bird species such as loggerhead shrike and other species that may use the mesquite trees as cover. Big Dune ACEC is designated to provide protection for the four sensitive beetle species endemic to Big Dune and Lave Dune. Gold Butte Part C and the River Mountains ACECs were designated to protect bighorn sheep. Rainbow Gardens ACEC was designated to protect Las Vegas bearpoppy and Las Vegas buckwheat. Providing protection to the gypsum habitats of these species also helps protect sticky ringstem and silverleaf sunray in the area. The Virgin River ACEC was designated to protect two listed fish species, southwestern willow flycatcher, and riparian habitat. Protecting riparian habitat, including habitat for the flycatcher, would also help protect habitat for the yellow-billed cuckoo and Yuma clapper rail. The riparian area also provides habitat for other special status species as a source of cover and water. Protection of the other ACECs, although not designated specifically to protect a special status species, may also provide protection to some species that do occur in the areas.

4.2.7.6.1.3. Alternative 2

Alternative 2 would protect more areas (44) and more acres through ACEC designations compared to Alternative 1. Alternative 2 would also provide the most restrictive management directions compared to the other alternatives and thus would provide the most protection for special status species.

For existing ACECs, Alternative 2 would increase the size of the Amargosa Mesquite, Ash Meadows, Gold Butte Part A, Piute/Eldorado, and Virgin River ACECs. Alternative 2 would also add additional special status species to the R&I values for some existing ACECs, and thus these species would be become part of the management focus for these areas. These additions include relict leopard frog for the Gold Butte Part A and Rock Spring ACECs, bighorn sheep for Piute/Eldorado, and desert tortoise for Keyhole Canyon.

Bird Spring Valley ACEC would be designated to protect desert tortoise, burrowing owl, and yellow two-tone beardtongue. Although not in designated critical habitat, this area contains a large population of desert tortoise and has been identified as an important connectivity area by the U.S. Fish and Wildlife Service (Averill-Murray et al, 2013). The ACEC would provide connectivity between tortoise populations in the Ivanpah Valley of California and the Las Vegas Valley. It also contains some of the best remaining populations of yellow two-tone beardtongue

managed by the BLM Las Vegas Field Office and provides habitat connectivity to adjacent populations on land managed by the BLM Red Rock Canyon National Conservation Area.

The Bitter Springs and Gale Hills ACECs would be designated to protect Las Vegas bearpoppy and Las Vegas buckwheat. Bitter Springs ACEC would be designated to also protect sticky ringstem and bighorn sheep. These areas contain large, relatively unfragmented populations of the gypsum endemic plants. They would also provide habitat connectivity with populations of the plants managed by the National Park Service at Lake Mead National Recreation Area and by the state at Valley of Fire State Park. In addition to the Bitter Springs ACEC, the Muddy Mountains ACEC would also be designated to protect bighorn sheep. These combined areas, in combination with the Muddy Mountains Wilderness, contain one of the largest bighorn sheep herds in the region. Protecting the areas would provide bighorn with relatively undeveloped movement corridors between the Muddy Mountains Wilderness and neighboring ranges managed by the NPS and the state of Nevada.

The California Wash, Logandale, and Mesa Milkvetch ACECs would be designated to protect threecorner milkvetch. These areas have relatively unfragemented populations of threecorner milkvetch. Grapevine Spring ACEC would be designated to protect two springsnails. This area was previously a private parcel that was acquired by the BLM specifically for protection of the springsnails. The springsnails have very restricted ranges, and the spring is one of the few springs in the planning area known to contain these species. Grapevine Spring is within a herd management area, and wild horses and burros would not be excluded from the area under the RMP. Horses and burros can have major impacts to springs as discussed in the Wild Horse and Burro section, and not excluding them may result in the degradation of the springsnail habitat that the ACEC was meant to protect.

The Upper Las Vegas Wash ACEC would be designated to protect LeConte's thrasher. This area, based on surveys, contains some of the highest population levels of LeConte's thrasher within Clark County. Protecting the hydrologic integrity of the Upper Las Vegas Wash would also help protect the Las Vegas buckwheat and Las Vegas bearpoppy, which occur in the wash downstream of the ACEC within the CTA. Changes in the hydrology in the upper portion of the wash may change erosion patterns and flood dynamics within the CTA, which could alter the habitat for these two sensitive species.

The Hiko Wash and Moapa Mesquite ACECs would be designated to protect migratory bird and riparian habitat. These areas have substantial riparian vegetation, a very limited habitat type in the planning area, which provides important habitat for migratory birds and can provide cover and water to species such as bighorn sheep. The Pahrump Valley and Stewart Valley ACECs would also be designated to protect mesquite woodland habitats important for migratory birds. In addition to the mesquite woodlands, these two ACECs along with the Sandy Valley ACEC would be designated to protect the Pahrump Valley buckwheat. This rare species has a very narrow distribution, and the three ACECs would help protect a large portion of its known distribution in Clark and Nye Counties and help reduce the chances of future listing under ESA. Due to the proximity of developments, especially in the Sandy Valley area, there may still be impacts to the plant from dispersed, casual use even with the management protections provided by an ACEC designation.

Perkins Ranch and Stuart Ranch ACECs would be designated to protect habitat for special status fish species, southwestern willow flycatcher, and riparian habitat. Stuart Ranch ACEC would also protect desert tortoise because this area is part of the larger Mormon Mesa tortoise critical habitat

unit. Both are previous private parcels that the BLM acquired specifically to protect sensitive resources. Both ACECs help protect perennial rivers that contain listed and sensitive fish species. They also both protect riparian vegetation, including mesquite, cottonwood and willow, which is an important but restricted habitat within the planning area. Both areas are also potential reintroduction areas for the relict leopard frog.

The Jean Lake and Specter Hills ACECs would be designated to protect the white-margined penstemon. This rare species has a very restricted distribution, and these two ACECs would help protect portions of the disjunct populations in both Clark and Nye counties. Lava Dune ACEC would be designated to protect the four sensitive beetle species. These beetles are endemic to Big Dune and Lava Dune but are currently only protected by an ACEC at Big Dune. Due to their very restricted distribution, protection of populations at both dune systems would help provide more long-term protection of the beetles in case of a catastrophic event, such as fire, that could destroy most of their habitat at one of the dunes.

Removal of the Arden Historic Sites and Crescent Townsites ACECs under Alternative 2 is not expected to have a negative impact on any special status species. These ACECs were originally designated to protect historic railroad and mining sites and not any special status species. There may be some special status species that occur in these areas that have benefited in the past from the ACEC designations, and these individuals may be impacted if future habitat disturbance is approved once the ACECs are eliminated. The number of individuals potentially impacted is assumed to be low and thus won't adversely impact the species as a whole.

4.2.7.6.1.4. Alternative 3

Under Alternative 3, 41 ACECs would be designated. Compared to Alternative 2, the California Wash, Logandale, and Sandy Valley ACECs would not be designated. Thus the three-corner milkvetch populations in the first two areas and the Pahrump Valley buckwheat population in the Sandy Valley areas would not receive the protection provided by an ACEC. This would leave the Mesa Milkvetch ACEC as the only ACEC under Alternative 3 designated to protect three-corner milkvetch, and its size would be reduced to accommodate land disposals. Thus, Alternative 3 would offer only a small amount of protection for three-corner milkvetch, which could lead to major impacts to the species if it is impacted in the areas not receiving protection.

In addition to not designating the Sandy Valley ACEC, the sizes of the Pahrump Valley and Stewart Valley ACECs would be reduced which would reduce the amount of Pahrump Valley buckwheat and mesquite habitat protected compared to Alternative 2. In addition, the Pahrump Valley ACEC would not include Pahrump Valley buckwheat as an R&I value under Alternative 3. Thus, while it would still encompass some of the buckwheat population in the area, management of the ACEC would not be focused on protection of the species which could lead to additional impacts to the species even within the ACEC boundary. Because the Stewart Valley and Pahrump Valley areas contain larger and less fragmented populations of Pahrump Valley buckwheat, reduction in the amount of protection in these areas for the species could potentially lead to greater impacts to the species as a whole compared to not designating the Sandy Valley ACEC.

The Ash Meadows, Big Dune, Bird Spring Valley, Gold Butte Part A, Grapevine Spring, Moapa Mesquite, Pahrump Valley, Stewart Valley, and Virgin River ACECs would all be smaller in Alternative 3 compared to Alternative 2. Thus they would not protect as much special status species habitat when compared to Alternative 2. Big Dune ACEC under Alternative 3 would even be smaller than the current ACEC size in Alternative 1. It would still protect the main beetle

habitat in the area but would provide less overall protection to other special status species that may occur in the area or beetle habitat that occurs outside of the core area. The reduction in the size of the Bird Spring Valley ACEC would remove the southern portion down to the state line. This would not provide as much protection for desert tortoise connectivity between California and the Las Vegas Valley compared to Alternative 2. It still protects the high tortoise densities within Bird Spring Valley itself. Reductions in the sizes of Ash Meadows, Gold Butte Part A, Moapa Mesquite, and Virgin River ACECs would be relatively minor and would still protect the majority of the special status species habitat in the areas.

Alternative 3 would have relatively less restrictive management prescriptions for such things as minerals and ROWs in the proposed ACECs compared to Alternative 2 including allowing speed-based recreation events in more of the ACECs. This could lead to some impacts to special status species and their habitats in the ACECs if more projects are approved due to these less restrictive prescriptions. These projects would still have to go through the NEPA and ESA processes and any impacts to special status species, especially species for which the ACEC was designated to protect, would be identified.

4.2.7.6.1.5. Alternative 4

Compared to Alternative 2 and 3, Alternative 4 would add only the Jean Lake, Perkins Ranch, Stuart Ranch, and Grapevine Spring ACECs. Similar to Alternatives 2 and 3, Alternative 4 would also drop the Arden Historic Sites and Crescent Townsites ACECs. The Perkins Ranch, Stuart Ranch, and Grapevine Springs ACECs, as discussed under Alternative 2, are small parcels acquired by the BLM specifically to protect the resources on the parcels. These are relatively small parcels and thus their protection would only provide protection to the few special status species that use the riparian and spring habitats on the parcels. The Jean Lake ACEC would provide protection to a portion of the white-margined penstemon population in Clark County. Compared to Alternatives 2 and 3, fewer special status species and populations would be provided protection from an ACEC designation. The Big Dune ACEC would only provide protection of a small portion of habitat in Alternative 1, putting endemic dune species at risk, as Lava Dune ACEC would not be added in this Alternative as well.

4.2.7.6.2. National Trails Impacts on Special Status Species

4.2.7.6.2.1. Impacts Common to All Alternatives

See Cultural Resources for impacts to special status species.

4.2.7.6.3. Wild and Scenic Rivers Impacts on Special Status Species

4.2.7.6.3.1. Impacts Common to All Alternatives

Because no river segments are proposed to be determined to be suitable for wild and scenic rivers designation under Alternative 4, there are no impacts to special status species common to all alternatives.

4.2.7.6.3.2. Alternative 1

Managing eligible river segments to protect their outstandingly remarkable values (ORVs) and free-flowing nature would provide direct protection to special status species that occur in or utilize the river segments. This includes the listed and sensitive fish species that occur along the Virgin River, Muddy River, and Meadow Valley Wash. It also includes the listed riparian bird species. Protecting the Carson Slough would help protect populations of the spring-loving centaury, Ash Meadows gumplant, and Tecopa bird's beak that occur in the marshy soils around the slough. Protecting the river segments would also benefit other special status species that use the segments for cover or water during various times of the year.

4.2.7.6.3.3. Alternative 2

Impacts from Alternative 2 would be similar to those under Alternative 1 except that the river segments would actually be determined to be suitable for designation. Management direction to close the suitable rivers to mining, no surface occupancy for oil and gas, closing Wild river segments to OHV use, excluding ROWs on Wild and Scenic river segments, and avoiding ROWs on Recreational river segments would all help protect special status species populations that live in or use the river corridors some time during the year.

4.2.7.6.3.4. Alternative 3

Under Alternative 3, only Meadow Valley Wash would be determined suitable with a tentative classification of Recreational. This would benefit the two sensitive fish species that occur in Meadow Valley Wash along with other special status species that may use the river for cover or water such as raptors, bats, and bighorn sheep. This alternative would not provide additional protection for species along the other river segments.

4.2.7.6.3.5. Alternative 4

Under Alternative 4, all currently eligible river segments would be determined not suitable and thus special status species along these segments would no longer be afforded protected under interim management under the Wild and Scenic Rivers Act.

4.2.7.6.4. Wilderness Impacts on Special Status Species

4.2.7.6.4.1. Impacts Common to All Alternatives

Impacts from wilderness management directions on special status species would be similar to those already discussed under the Integrated Vegetation and Fish and Wildlife sections. While wilderness areas weren't designated specifically to protect listed or sensitive species, wilderness management would provide a high level of protection from disturbance to those species that coincidentally occur in the wilderness areas. Most of the wilderness areas designated in the planning area, though, encompass higher elevation mountainous terrain. Because most of the special status species in the planning area occur in lower elevation desert scrub or riparian areas, most only minimally benefit from wilderness designation if at all. Bighorn sheep, which occur in rugged mountainous terrain, do occur in many designated wilderness areas in the planning area

and benefit from wilderness management. Bats may also roost and hibernate in rocky cracks and crevices, as well as caves that may occur in wilderness areas.

4.2.7.6.4.2. Alternative 1

Alternative 1 has no management actions for wilderness. Wilderness areas would still provide protection for special status species due to limits on activities spelled out in the Wilderness Act itself.

4.2.7.6.4.3. Alternative 2

Attaining no net unmitigated loss of wilderness benchmark conditions could include mitigation for impacts to special status species populations which would benefit these populations. Limiting access points into wilderness areas could reduce impacts to special status species due to human presence in other parts of the wilderness but could increase impacts due to concentrated use at the limited access points depending on visitation levels. Cooperative research on wilderness resources could include research on special status species, which would help increase knowledge about special status species populations and better inform future management. Developing wilderness management plans could help identify needs in each wilderness to help protect and improve special status species habitats.

4.2.7.6.4.4. Alternative 3

Impacts under Alternative 3 would be similar to Alternative 2.

4.2.7.6.4.5. Alternative 4

Impacts under Alternative 4 would be similar to those under Alternative 2 except that there would be no requirement for no net unmitigated loss of wilderness benchmark conditions. Mitigation for impacts to special status species could still occur on a case-by-case basis but it is assumed that some impacts to special status species would not be mitigated.

4.2.7.6.5. Wilderness Study Areas Impacts on Special Status Species

4.2.7.6.5.1. Impacts Common to All Alternatives

Impacts from wilderness study area management directions on special status species would be similar to those already discussed under the Integrated Vegetation and Fish and Wildlife sections. Similar to wilderness areas, wilderness study areas (WSA) are mostly in mountainous terrain and their management does not provide much benefit to the majority of special status species in the planning area. Those that do occur in the WSAs, such as bighorn sheep and bats, would benefit from management directions to limit impacts.

4.2.7.6.5.2. Alternative 1

There were no unique impacts identified for Alternative 1.

4.2.7.6.5.3. Alternative 2

Attaining no net unmitigated loss of wilderness characteristics in WSAs could include mitigation for impacts to special status species populations which would benefit these populations.

4.2.7.6.5.4. Alternative 3

Impacts under Alternative 3 would be similar to those under Alternative 2.

4.2.7.6.5.5. Alternative 4

Alternative 4 would have no requirement to attain no net unmitigated loss of wilderness characteristics. Mitigation for impacts to special status species could still occur on a case-by-case basis, but it is assumed that some impacts to special status species would not be mitigated.

4.2.7.7. Cumulative Impacts on Special Status Species

4.2.7.7.1. Past and Present Actions/Impacts

Similar to general fish, wildlife, and vegetation communities, special status species and their habitats have been negatively impacted by lands and realty actions, minerals exploration and extraction, renewable energy development, livestock grazing, wild horses and burros, wildfires, and OHV use. During the NEPA process, the BLM has used project specific mitigation measures, stipulations, BMPs, and SOPs to minimize impacts from authorized activities.

4.2.7.7.2. Reasonable Foreseeable Actions

Reasonably foreseeable impacts for special status species would be similar to those described under the Fish and Wildlife and Integrated Vegetation sections.

4.2.7.7.3. Cumulative Impact

4.2.7.7.3.1. Impacts Common to All Alternatives

Special status would still be managed under BLM Manual 6840 and under ESA for federally listed, proposed and candidate species. Potential impacts to special status species from future BLM actions would be analyzed during the NEPA process, and mitigation could be required to help avoid, minimize and reduce impacts. The level of mitigation required may vary under the different alternatives. The U.S. Fish and Wildlife Service would still review potential impacts to federally listed species and may also require mitigation measures to offset impacts of take. Mitigation actions taken by other agencies, including actions taken as part of habitat conservation plans (HCPs), may also benefit or reduce impacts to special status species. Recovery actions for federally listed, proposed and candidate species would take place under all the alternatives. New species listings would require the BLM to reconsider the decisions created from this plan because the consultations and relative impacts may no longer be appropriate if status of a species has changed. Climate change may alter special status species distributions, as well as their habitats and thus make protective land allocations such as ACECs less or more valuable for species protection.

Broad-ranging special status species, such as the desert tortoise, would experience some level of habitat loss and fragmentation under all of the alternatives. The severity of this would vary based on the number of acres potentially lost or fragmented , as well as their location.

4.2.7.7.3.2. Alternative 1

Management directions for special status, wildlife, and integrated vegetation do not reflect current resource knowledge and therefore do not provide as much benefit compared to other alternatives. Over time, there is expected to be more unmitigated cumulative impacts to special status species compared to other alternatives.

The majority of desert tortoise critical habitat within the planning area is currently designated as ACECs. This provides some protection to desert tortoise and other special status species such as sidewinders and shovel-nosed snakes. These ACECs do experience impacts from mostly recreational OHV use and utility corridors. Outside of the ACECs, desert tortoise habitat could still be impacted from disposals, renewable energy, mineral development, OHV use, and other activities. These activities, especially land disposals and renewable energy developments, may lead to the loss of connectivity between relatively undisturbed habitats. Thus, even though desert tortoises are mostly protected within the ACECs, loss of connectivity at the landscape scale may lead to loss of genetic diversity over time, which may reduce overall population viability.

Several other special status species occur in currently existing ACECs. This includes the Ash Meadows species in Ash Meadows ACEC, listed fish and riparian birds in Virgin River ACEC, and bighorn sheep in River Mountains ACEC, and several other ACECs. These ACECs, in addition to lands managed for protection by other agencies, cover large portions of these species distributions within the planning area and thus help protect these species from most types of impacts. Bighorn sheep also benefit by the designation of the wilderness areas within the planning area. The ability of bighorn sheep would be impacted, though, by developments and other barriers between occupied mountain ranges.

Las Vegas bearpoppy and other gypsum plants are provided some protection by Rainbow Gardens ACEC, Coyote Springs ACEC, and Gold Butte ACECs. These areas only protect a portion of their overall habitat within the planning area. Without protection, other areas could be impacted resulting in loss of these populations. This would have the cumulative effect of reducing their overall population size, distribution, and genetic diversity. The dune beetles would be protected at Big Dune ACEC but not at Lava Dune. Impacts to the Lava Dune populations could result in loss of half the known populations of these species and thus half the genetic diversity.

Other special status species, especially the sand-loving plants, are not provided protection by ACECs and are thus most susceptible to major cumulative impacts. These species are also not federally listed and thus do not benefit from consultation with U.S. Fish and Wildlife Service under the ESA. Lack of protection by ACECs or other protective land use allocations combined with impacts from land disposals, renewable energy development, minerals development, OHV use, grazing, wild horses and burros, wildland fire, and invasive species could lead to the future listing of some of the BLM sensitive species such as Pahrump Valley buckwheat, white margined penstemon, three corner milkvetch, springsnails and dune beetle species.

4.2.7.7.3.3. Alternative 2

Alternative 2 would provide the most protection for special status species. Management directions for special status, wildlife, and integrated vegetation would reflect current resource knowledge and therefore provide more benefit compared to other alternatives. No net unmitigated loss of ecosystem services and special status species habitats would help reduce cumulative impacts these species. Alternative 2 would create the most new ACECs and provide the most protective management directions that benefit special status species. These additional ACECs would protect additional acres for species only partially protected under Alternative 1. In addition, ACECs would be designated to protect habitat for species such as the sand-loving plants that are currently not protected by existing ACECs. Alternative 2 would also put the most limits on disposals, renewable energy developments, and mineral developments. Limits on these types of large-scale projects would help protect landscape connectivity for many special status species. Desert tortoise connectivity would be provided some protection through new ACECs, as well as the designation of more exclusion areas for solar and fewer parcels for disposal compared to Alternative 1.

4.2.7.7.3.4. Alternative 3

Alternative 3 would have similar management directions as Alternative 2 for special status, wildlife, and integrated vegetation including requiring no net unmitigated loss of ecosystem services and special status species habitats. These management directions would help reduce cumulative impacts on special status species compared to Alternative 1. Alternative 3 would create the most of the same new ACECs as Alternative 2 except for California Wash, Logandale, and Sandy Valley ACECs. Not designating these ACECs, which have populations of threecorner milkvetch and Pahrump Valley buckwheat, could result in more cumulative impacts to this species compared to Alternative 2. Alternative 3 would have more acres available for disposal and renewable energy development compared to Alternative 2, which could lead to more cumulative impacts from loss of habitat and connectivity for some species.

4.2.7.7.3.5. Alternative 4

Alternative 4 would not require no net unmitigated loss of ecosystem services or special status species habitats. Mitigation could still occur but it is assumed it would be at a lower level and thus would not help reduce cumulative impacts as much as in Alternatives 2 and 3. Only four new ACECs would be designated, including three small parcels. The small parcels are acquired lands that contain specials status aquatic species such as springsnails and fish. The other parcel would provide some protection for white-margined penstemon in Clark County. Fewer ACECs would mean fewer acres protected for special status species compared to Alternatives 2 and 3. Alternative 4 would have the most combined acres available for disposal, renewable energy development, mineral development, and utility corridors. This could lead to the most loss of habitat and connectivity for species compared to the other alternatives and thus the most cumulative impacts. Cumulative loss of habitats for species, such as Pahrump Valley buckwheat and threecorner milkvetch, may be to such an extent that it could lead to the U.S. Fish and Wildlife Service reviewing the status of the species.

4.2.8. Wild Horse and Burros

4.2.8.1. Summary

The Wild and Free-Roaming Horses and Burros Act of 1971 and BLM policy state that wild horse and burro populations will be managed as self-sustaining populations of healthy animals in balance with other uses and the productive capacity of their habitat. The goal is to protect, manage, and control healthy, self-sustaining wild horse and burro populations within established herd management areas (HMAs) at appropriate management levels (AMLs) in a manner designed to achieve and maintain a thriving natural ecological balance and multiple-use relationship on public lands.

Each alternative has a different emphasis, which is expected to result in different priorities for resource development. These priorities are expected to result in higher probabilities for adverse impacts on wild horse and burro populations and habitat resources under some of the alternatives:

- Alternative 1 represents current management under the guidance of the 1998 RMP.
- Alternative 2 is the most protective of natural resources because it involves the least new development, excludes potentially impactful uses, and prioritizes protection and restoration of resources when conflicts among uses occur.
- Alternative 3 represents a compromise between conservation and development. It attempts to balance appropriate multiple uses and manage for a healthy environment. It allows the greatest flexibility of potential management tools. Therefore, impacts on wild horses and burros under Alternative 3 are expected to be generally intermediate between Alternative 2 and Alternative 4.
- Alternative 4 generally prioritizes development of resources for economic return while relying on mitigation to reduce, rather than prevent, adverse impacts. Alternative 4 would likely have greater impacts on wild horses and burros than Alternatives 2 and 3.

4.2.8.2. Methods of Analysis

Indicators and Assumptions

This analysis is based on the following methods, knowledge of the local wild horse and burro herds, and the planning area.

A thriving, natural ecological balance exists when the cumulative impacts of approved multiple uses in a HMA do not cause unacceptable impacts on or deterioration of the rangeland resources or wild horse and burro herds. Balance among multiple uses exists when approved uses are compatible and no one use threatens or impairs the viability and sustainability of another use. The following conditions all contribute to the health and well-being of wild horse and burro herds within the planning area:

- Maintaining healthy, native plant communities.
- Improving range conditions.
- Maintaining or improving water sources.
- Preventing wild and domestic horses and burros from mixing.
- Eliminating barriers to movement.
- Limiting disturbance from people, vehicles, and development activity.

Wild horse and burro management is based on monitoring forage utilization, trends in rangeland conditions, climatic conditions, drought monitoring, population inventory and distribution, body

condition monitoring, actual use, and rangeland carrying capacity in balance with other uses. This data helps guide management of wild horses and burros, and those specific actions help prevent overpopulation, which could lead to overgrazing and rangeland deterioration, which in turn could lead to reduced body conditions and negative impacts to overall herd health.

This section identifies actions that may promote, aid, enhance, or impact wild horses and burros based on the alternatives proposed with this revision.

4.2.8.3. Qualitative Intensity Scale

- **Negligible:** No known or expected impacts to wild horses or burros. Any change would be undetectable. The impacted acres would be a minimal percent of the herd management area.
- **Minor:** Direct effects are apparent, measurable, small, localized, and contained within the footprint of the action. Indirect effects are undetectable. Small actions would affect a minor percentage of the herd management area.
- **Moderate:** Direct effects would be readily apparent and measurable over a larger area but are still mainly within the footprint of the action. Indirect effects are apparent and measurable but do not exceed much beyond the footprint of the action. Direct effects to wild horses and burros would be measureable and apparent.
- **Major:** Direct effects would be highly noticeable and extend well beyond the footprint of the action. Indirect affects would be readily apparent and measurable well beyond the footprint of the action. The amount of disturbance or impacts would greatly affect wild horses and burros, their habitat, and/or the herd management area.

4.2.8.4. Resources

4.2.8.4.1. Air Quality Impacts on Wild Horses and Burros

4.2.8.4.1.1. Impacts Common to All Alternatives

There would be negligible impacts to wild horses and burros resulting from air quality management actions.

4.2.8.4.1.2. Alternatives 1 through 4

There are no additional impacts to wild horses and burros.

4.2.8.4.2. Soil Resources Impacts on Wild Horses and Burros

4.2.8.4.2.1. Impacts Common to All Alternatives

There would be negligible negative impacts to wild horses and burros resulting from soil management actions. Within HMAs, healthy uplands, watersheds, and soils would likely increase the potential for forage production. Reducing erosion and maintaining or improving soils and vegetative cover and reclaiming disturbed areas could directly benefit wild horses and burros by increasing forage plants and maintaining or improving the plant communities within HMAs.

4.2.8.4.2.2. Alternatives 1 through 4

There are no additional impacts to wild horses and burros.

4.2.8.4.3. Water Resources Impacts on Wild Horses and Burros

4.2.8.4.3.1. Impacts Common to All Alternatives

There would be negligible negative impacts to wild horses and burros resulting from the water resource management actions. Protection of surface waters from point and nonpoint source pollution, maintaining the quality of water, and ensuring adequate available water would generally directly benefit wild horses and burros.

4.2.8.4.3.2. Alternatives 1 through 4

There are no additional impacts to wild horses and burros.

4.2.8.4.4. Integrated Vegetation Impacts on Wild Horses and Burros

4.2.8.4.4.1. Vegetation Impacts on Wild Horses and Burros

4.2.8.4.4.1.1. Impacts Common to All Alternatives

There would be negligible negative impacts to wild horses and burros resulting from integrated vegetation management. Within HMAs, healthy uplands, watersheds, and soils would likely increase the potential for increased forage and water production. Reducing erosion and maintaining or improving soils and vegetative cover and reclaiming disturbed areas could directly benefit wild horses and burros by increasing native forage plants, decreasing nonnative weeds, and maintaining or improving the plant communities.

Wild horses and burros will need to utilize vegetation, riparian areas, and critical waters within HMAs to maintain populations and healthy herds.

4.2.8.4.4.1.2. Alternatives 1 through 4

There are no additional impacts to wild horses and burros.

4.2.8.4.4.2. Riparian Areas and Wetlands Impacts on Wild Horses and Burros

4.2.8.4.4.2.1. Impacts Common to All Alternatives

There are no impacts common to all alternatives.

4.2.8.4.4.2.2. Alternatives 1 through 4

There are no additional impacts to wild horses and burros.

4.2.8.4.4.3. Weeds Impacts on Wild Horses and Burros

4.2.8.4.4.3.1. Impacts Common to All Alternatives

There are no impacts common to all alternatives.

4.2.8.4.4.3.2. Alternatives 1 through 4

There are no additional impacts to wild horses and burros.

4.2.8.4.4.4. Forests and Woodlands Impacts on Wild Horses and Burros

4.2.8.4.4.4.1. Impacts Common to All Alternatives

There are no impacts common to all alternatives.

4.2.8.4.4.4.2. Alternatives 1 through 4

There are no additional impacts to wild horses and burros.

4.2.8.4.5. Fish and Wildlife Impacts on Wild Horses and Burros

4.2.8.4.5.1. Impacts Common to All Alternatives

Impacts from fish and wildlife resource management actions could range from negligible to major. Managing wildlife habitats to provide sufficient forage and cover, limiting habitat fragmentation, and protecting natural waters and associated riparian areas could be beneficial to wild horses and burros by limiting the opportunity for disturbance and the potential for range degradation. Any actions, such as fencing or restricting wild horse and burro access to protect desert tortoise, pyrg, or other wildlife habitats within HMAs could be detrimental by restricting access to forage and/or water or by limiting their free-roaming nature. Habitat improvement or restoration projects may require removing wild horses and burros to protect areas being treated.

4.2.8.4.5.2. Alternatives 1 through 4

There are no additional impacts to wild horses and burros.

4.2.8.4.6. Special Status Species Impacts on Wild Horses and Burros

4.2.8.4.6.1. Impacts Common to All Alternatives

Impacts from special status species resource management actions could range from negligible to major. Zones of no surface occupancy, buffer zones, human activity restrictions, and areas of no surface disturbance could be beneficial to wild horses and burros by limiting the opportunity for disturbance and the potential for range degradation. Any actions, such as fencing or restricting wild horse and burro access to desert tortoise, pyrg or other wildlife habitats within HMAs could be detrimental by restricting access to forage and/or water or by limiting their free-roaming

nature. Habitat improvement or restoration projects may require removing wild horses and burros to protect areas being treated.

4.2.8.4.6.2. Alternatives 1 through 4

There are no additional impacts to wild horses and burros.

4.2.8.4.7. Wild Horse and Burro Impacts on Wild Horses and Burros

4.2.8.4.7.1. Impacts Common to All Alternatives

Maintaining an ecological balance and multiple-use relationship by managing wild horses and burros would help ensure healthier herds by preventing overpopulation that could lead to overgrazing ranges, damage to riparian areas, and increased competition with other wildlife. Managing wild horses and burros should also reduce the number of nuisance issues and accidents within the urban and HMA interface. Flexibility and numerical ranges in management options, and allowing adjustments based on monitoring data and observed conditions, would generally be better because wild horse and burro herds are dynamic units. Maintaining current memorandums of understanding (MOUs) and developing interagency MOUs would coordinate and standardize management to prevent individual management plans that are at odds with one another and reduce any possible interagency conflicts regarding proper management. This would also facilitate the dissemination of information and innovative management practices among agencies.

Maintaining dependable water sources would allow a more even distribution of wild horses and burros throughout HMAs and reduce the emergencies associated with drought conditions commonly occurring in the Mojave Desert.

Population growth suppression options, such as fertility control, vaccines, and sterilization, would slow overall herd population increases and potentially extend the time between gathers.

Protection from harm, harassment, feeding, and illegal capture would help preserve the herds and maintain their wild and free-roaming nature and behavior.

4.2.8.4.7.2. Alternative 1

There are no additional impacts to wild horses and burros.

4.2.8.4.7.3. Alternatives 2 through 4

Limiting or excluding surface-disturbing or distributive activities would help maintain the range conditions within the HMAs and decrease human interactions and disturbances to wild horses and burros.

4.2.8.4.8. Cave and Karst Management Impacts on Wild Horses and Burros

4.2.8.4.8.1. Impacts Common to All Alternatives

There would be negligible impacts to wild horses and burros resulting from cave and karst management actions.

4.2.8.4.8.2. Alternatives 1 through 4

There are no additional impacts to wild horses and burros.

4.2.8.4.9. Wildland Fire Management Impacts on Wild Horses and Burros

4.2.8.4.9.1. Impacts Common to All Alternatives

There could be minor to major negative impacts resulting from wildland fire management actions. These impacts would depend upon the location of certain management actions.

Protecting range improvements and natural resources and managing for healthy, productive, diverse, and resilient plant communities are beneficial to wild horses and burros by providing forage species diversity and improving forage opportunities.

4.2.8.4.9.2. Alternative 1

There are no additional impacts to wild horses and burros.

4.2.8.4.9.3. Alternatives 2 through 4

Fuel treatments could reduce the total forage available to sustain a healthy wild horse and burro population. The level of impact to the wild horses and burros would depend upon the location of these fuel treatments relative to the herd management areas and the wild horses and burros' primary (key forage) ranges within HMAs. Fuel treatments could also increase the available forage for wild horses and burros, as well increase potential for attracting wild horses and burros closer to urban areas when fuel reduction is done in HMAs close to occupied human areas.

4.2.8.4.10. Cultural Resources Impacts on Wild Horses and Burros

4.2.8.4.10.1. Impacts Common to All Alternatives

There would be negligible impacts to wild horses and burros resulting from cultural resources management actions.

4.2.8.4.10.2. Alternatives 1 through 4

There are no additional impacts to wild horses and burros.

4.2.8.4.11. Paleontological Resources Impacts on Wild Horses and Burros

4.2.8.4.11.1. Impacts Common to All Alternatives

There would be negligible impacts to wild horses and burros resulting from paleontological resources management actions.

4.2.8.4.11.2. Alternatives 1 through 4

There are no additional impacts to wild horses and burros.

4.2.8.4.12. Visual Resource Management Impacts on Wild Horses and Burros

4.2.8.4.12.1. Impacts Common to All Alternatives

There would be negligible impacts to wild horses and burros resulting from visual resource management actions.

4.2.8.4.12.2. Alternatives 1 through 4

There are no additional impacts to wild horses and burros.

4.2.8.4.13. Lands with Wilderness Characteristics Impacts on Wild Horses and Burros

4.2.8.4.13.1. Impacts Common to All Alternatives

There would be negligible impacts to wild horses and burros resulting from management actions associated with lands with wilderness characteristics.

4.2.8.4.13.2. Alternatives 1 through 4

There are no additional impacts to wild horses and burros.

4.2.8.5. Resource Uses

4.2.8.5.1. Forestry and Woodland Products Impacts on Wild Horses and Burros

4.2.8.5.1.1. Impacts Common to All Alternatives

There would be negligible impacts to wild horses and burros resulting from forestry and woodland product management.

4.2.8.5.1.2. Alternatives 1 through 4

There are no additional impacts to wild horses and burros.

4.2.8.5.2. Livestock Grazing Impacts on Wild Horses and Burros

4.2.8.5.2.1. Impacts Common to All Alternatives

There would be negligible to major negative impacts from livestock grazing management actions. Not allowing wild horses and burros to mix with their domestic counterparts could directly contribute to the health of wild herds by reducing the spread of disease and competition for forage and water. Monitoring range conditions could be beneficial to wild horses and burros if it results in healthier rangeland vegetative communities and increased forage opportunities. Range improvements, such as water developments, if maintained and functional, would directly benefit wild horses and burros by providing additional water sources; however, it may concentrate wild horse and burro use in sensitive areas. Some improvements, such as fencing, would have negative effects by excluding forage and limiting the free-roaming nature of wild horses and burros.

Forage adjustments could reduce AMLs, which could be detrimental to wild horse and burro herds, which need minimum numbers of animals to maintain genetic diversity.

Protecting existing or developing new water sources would be beneficial to wild horses and burros by ensuring availability of water as long as the sources are accessible. Generally, any increase in livestock grazing in areas inhabited by wild horses and burros would decrease the amount of forage and water available to wild horses and burros. Livestock management would increase the opportunity for disturbance. Fencing to control livestock would directly impair the free-roaming nature of wild horses and burros.

If these water developments are located in herd management areas, they may concentrate wild horse and burro use in a sensitive area. They could also create a potentially harmful situation if the wild horses and burros become reliant on a water development that is not functioning year-round.

4.2.8.5.2.2. Alternatives 1, 3, and 4

Alternatives 1, 3, and 4 would impact wild horses and burros. The Mount Stirling and Wheeler Wash allotments are located in the Johnnie and Wheeler Pass herd management areas. To manage either allotment, additional fencing would be required to keep the domestic livestock within the open grazing allotment. That additional fencing would restrict the wild, free-roaming nature and ability of the wild horses and burros in those HMAs. These allotment locations would also affect the normal herd distribution and movement due to the allotments' locations in the primary (key forage) range of the HMAs.

If necessary to provide habitat for wild horses and burros, to implement herd management actions, or to protect wild horses and burros from disease, harassment or injury, the authorized officer may close areas of the public lands to grazing use by all or a particular kind of livestock (43 CFR 4710.5(a)).

Domestic horses and burros may not graze under permits or leases within HMA boundaries (43 CFR 4710.5(b)). Introducing domestic horses or burros into herd management areas could potentially expose wild horses and burros to diseases.

4.2.8.5.2.3. Alternative 2

There are no additional impacts to wild horses and burros.

4.2.8.5.3. Minerals Impacts on Wild Horses and Burros

4.2.8.5.3.1. Fluid Leasable Minerals Impacts on Wild Horses and Burros

4.2.8.5.3.1.1. Impacts Common to All Alternatives

There would be negligible to potentially major negative impacts to wild horses and burros resulting from minerals management actions, depending upon the location and extent of the mineral exploration and development. Mineral exploration and development could temporarily or permanently remove rangeland and forage areas for wild horses and burros. Activities associated with exploration and extraction could disrupt herd dynamics and increase the potential for humans to disturb herds. Loss of rangeland and forage could be mitigated by post-mining reclamation. Roads associated with mineral exploration and development would remove rangeland until they were reclaimed and would increase opportunities for human interaction with the wild horses and burros. Withdrawal or closure of areas for mineral development would reduce the potential for human-herd interaction and rangeland and forage loss. Protection of wild horses and burros and the HMAs through mitigation measures, standard operating procedures, and best management practices would be beneficial to wild horses and burros by maintaining the rangeland and forage and reducing disturbances to wild horses and burros.

Fluid Leasable: Portions of the HMAs would be open or have controlled surface use.

4.2.8.5.3.1.2. Alternatives 1 through 4

There are no additional impacts to wild horses and burros.

4.2.8.5.3.2. Solid Leasable Minerals Impacts on Wild Horses and Burros

4.2.8.5.3.2.1. Impacts Common to All Alternatives

There would be negligible to potentially major negative impacts to wild horses and burros resulting from minerals management actions, depending upon the location and extent of the mineral exploration and development. Mineral exploration and development could temporarily or permanently remove rangeland and forage areas for wild horses and burros. Activities associated with exploration and extraction could disrupt herd dynamics and increase the potential for humans to disturb herds. Loss of rangeland and forage could be mitigated by post-mining reclamation. Roads associated with mineral exploration and development would remove rangeland until they were reclaimed and would increase opportunities for human interaction with the wild horses and burros. Withdrawal or closure of areas for mineral development would reduce the potential for human-herd interaction and rangeland and forage loss. Protection of wild horses and burros and the HMAs through mitigation measures, standard operating procedures, and best management practices would be beneficial to wild horses and burros by maintaining the rangeland and forage and reducing disturbances to wild horses and burros.

Solid Leasable: Portions of the HMAs would be open to solid leaseables.

4.2.8.5.3.2.2. Alternatives 1 through 4

There are no additional impacts to wild horses and burros.

4.2.8.5.3.3. Locatable Minerals Impacts on Wild Horses and Burros

4.2.8.5.3.3.1. Impacts Common to All Alternatives

There would be negligible to potentially major negative impacts to wild horses and burros resulting from minerals management actions, depending upon the location and extent of the mineral exploration and development. Mineral exploration and development could temporarily or permanently remove rangeland and forage areas for wild horses and burros. Activities associated with exploration and extraction could disrupt herd dynamics and increase the potential for humans to disturb herds. Loss of rangeland and forage could be mitigated by post-mining reclamation. Roads associated with mineral exploration and development would remove rangeland until they were reclaimed and would increase opportunities for human interaction with the wild horses and burros. Withdrawal or closure of areas for mineral development would reduce the potential for human-herd interaction and rangeland and forage loss. Protection of wild horses and burros and the HMAs through mitigation measures, standard operating procedures, and best management practices would be beneficial to wild horses and burros by maintaining the rangeland and forage and reducing disturbances to wild horses and burros.

Locatable: Portions of the HMAs would be open to locatables.

4.2.8.5.3.3.2. Alternatives 1 through 4

There are no additional impacts to wild horses and burros.

4.2.8.5.3.4. Saleable Minerals Impacts on Wild Horses and Burros

4.2.8.5.3.4.1. Impacts Common to All Alternatives

There would be negligible to potentially major negative impacts to wild horses and burros resulting from minerals management actions, depending upon the location and extent of the mineral exploration and development. Mineral exploration and development could temporarily or permanently remove rangeland and forage areas for wild horses and burros. Activities associated with exploration and extraction could disrupt herd dynamics and increase the potential for humans to disturb herds. Loss of rangeland and forage could be mitigated by post-mining reclamation. Roads associated with mineral exploration and development would remove rangeland until they were reclaimed and would increase opportunities for human interaction with the wild horses and burros. Withdrawal or closure of areas for mineral development would reduce the potential for human-herd interaction and rangeland and forage loss. Protection of wild horses and burros and the HMAs through mitigation measures, standard operating procedures, and best management practices would be beneficial to wild horses and burros by maintaining the rangeland and forage and reducing disturbances to wild horses and burros.

Saleable: Portions of the HMAs would be open to saleables.

4.2.8.5.3.4.2. Alternatives 1 through 4

There are no additional impacts to wild horses and burros.

4.2.8.5.4. Recreation Impacts on Wild Horses and Burros

4.2.8.5.4.1. Impacts Common to All Alternatives

There are no impacts common to all alternatives.

4.2.8.5.4.2. Alternatives 1 through 4

There are no additional impacts to wild horses and burros.

4.2.8.5.5. Travel and Transportation Impacts on Wild Horses and Burros

4.2.8.5.5.1. Impacts Common to All Alternatives

There would be negligible negative impacts to wild horses and burros resulting from travel and transportation management actions. Route designations would positively benefit wild horses and burros by limiting adverse effects from various vehicles and human disturbances by specifying what portions of the planning area are open, closed, or limited to a specific type of motorized or mechanized vehicle.

Maintaining access throughout HMAs is critical to monitoring and managing wild horses and burros.

4.2.8.5.5.2. Alternatives 1 through 4

There are no additional impacts to wild horses and burros.

4.2.8.5.6. Lands and Realty Impacts on Wild Horses and Burros

4.2.8.5.6.1. Land Tenure (Disposals and Acquisitions) Impacts on Wild Horses and Burros

4.2.8.5.6.1.1. Impacts Common to All Alternatives

There would be negligible to major negative impacts to wild horses and burros resulting from lands and realty management actions under any of the alternatives, depending upon the locations of certain actions. Maintaining BLM ownership or control of lands would be beneficial to wild horses and burros because the agency could continue management of the rangeland resources necessary to maintain rangeland and herd health and control habitat and range fragmentation by rights-of-way that would not be possible if the lands are in private ownership. Land disposal could directly impact wild horses and burros by reducing the available areas they could inhabit. Land disposals and rights-of-ways could also decrease the number of acres available for wild horses and burros to roam and forage; this reduction could lead to a significant reduction in the primary forage areas of HMAs. Land disposals could increase the possibility of development and increased human activity in or near HMAs. This is especially a concern in the planning area because of the current urban interface and nuisance issues within certain portions of HMAs.

4.2.8.5.6.1.2. Alternative 2

Alternative 2 designates the least amount of HMA land for disposal. This would have the least impact on wild horse and burro herds.

4.2.8.5.6.1.3. Alternative 4

Alternative 4 designates the most HMA lands for disposal. This would impact wild horse and burros as identified in Impacts Common to All Alternatives.

4.2.8.5.6.2. Land-Use Authorizations (Right-of-Ways, Leases, Permits) Impacts on Wild Horses and Burros

4.2.8.5.6.2.1. Impacts Common to All Alternatives

Case-by-case analysis of land-use authorizations could be beneficial to wild horse and burro herds by limiting forage loss in their primary (key forage) ranges, decreasing human activity, and other potentially beneficial mitigation or stipulation measures.

4.2.8.5.6.2.2. Alternatives 1 through 4

There are no additional impacts to wild horses and burros.

4.2.8.5.6.3. Renewable Energy Impacts on Wild Horses and Burros

4.2.8.5.6.3.1. Impacts Common to All Alternatives

Solar exclusion areas, wind exclusion areas, land-use restrictions, identifying solar energy zones, and case-by-case analysis could be beneficial to wild horse and burro herds by limiting forage loss in their primary (key forage) ranges, decreasing human activity, and other potentially beneficial mitigation or stipulation measures.

4.2.8.5.6.3.2. Alternatives 1, 3, and 4

These alternatives all designate portions of the herd management areas and the wild horses and burros' primary (key forage) ranges as avoidance/variance areas for solar and wind development.

4.2.8.5.6.3.3. Alternative 2

In Alternative 2, herd management areas are excluded from solar development. This alternative would benefit wild horses and burros the most by preserving the available forage, limiting habitat fragmentation, and allowing for normal herd movement and distribution.

4.2.8.5.6.4. Utility Corridors Impacts on Wild Horses and Burros

4.2.8.5.6.4.1. Impacts Common to All Alternatives

Corridor development and associated rights-of-ways would decrease the number of acres available for the wild horses and burros to roam and forage. This reduction could lead to a significant reduction in the primary forage areas of the HMAs, especially the Johnnie HMA. Corridor development could increase the possibility of development and increased human activity in or near HMAs with the development of additional service roads and infrastructure. This is especially a concern in the planning area because of the current urban interface and issues within portions of the HMAs.

4.2.8.5.6.4.2. Alternatives 1 through 4

There are no additional impacts to wild horses and burros.

4.2.8.6. Special Designations

4.2.8.6.1. Areas of Critical Environmental Concern Impacts on Wild Horses and Burros

4.2.8.6.1.1. Impacts Common to All Alternatives

Zones of no surface occupancy, buffer zones, human activity restrictions, and areas of no surface disturbance could be beneficial to wild horses and burros by limiting the opportunity for disturbance and the potential for range degradation. Any actions, such as fencing or restricting wild horse and burro access to desert tortoise, pyrg, or other wildlife habitats, could be detrimental by restricting access to forage and/or water or by limiting their free-roaming nature. Habitat improvement and restoration projects may require removing wild horses and burros to protect areas treated.

4.2.8.6.1.2. Alternatives 1 through 4

There are no additional impacts to wild horses and burros.

4.2.8.6.2. National Trails Impacts on Wild Horses and Burros

4.2.8.6.2.1. Impacts Common to All Alternatives

See Cultural Resources for impacts to wild horses and burros.

4.2.8.6.3. Wild and Scenic Rivers Impacts on Wild Horses and Burros

4.2.8.6.3.1. Impacts Common to All Alternatives

There would be negligible impacts to wild horses and burros resulting from wild and scenic rivers management..

4.2.8.6.3.2. Alternatives 1 through 4

There are no additional impacts to wild horses and burros.

4.2.8.6.4. Wilderness Impacts on Wild Horses and Burros

4.2.8.6.4.1. Impacts Common to All Alternatives

There are no impacts common to all alternatives.

4.2.8.6.4.2. Alternatives 1 through 4

There are no additional impacts to wild horses and burros.

4.2.8.6.5. Wilderness Study Areas Impacts on Wild Horses and Burros

4.2.8.6.5.1. Impacts Common to All Alternatives

There would be negligible impacts to wild horses and burros resulting from management actions associated with wilderness study areas.

4.2.8.6.5.2. Alternatives 1 through 4

There are no additional impacts to wild horses and burros.

4.2.8.7. Cumulative Impacts on Wild Horses and Burros

4.2.8.7.1. Past and Present Actions/Impacts

ACEC protection, minerals exploration and extraction, renewable energy development, livestock grazing, and lands and realty actions including corridor placement and development, disposals, and other types of rights of ways, have previously and currently impacted wild horses and burros resulting in forage opportunities lost, increasing barriers to their free-roaming movement, and more disturbances. Some of these activities have fragmented HMAs with additional roads, fences, infrastructures, and increased human presence. Wild horses and burros in the planning area have also been impacted by actions on private land and land managed by other federal and state agencies. In some cases, these have led to nuisance issues and sometimes mortality of wild horses and burros as they have moved on to roadways and private lands.

Wildfires have burned portions of the HMAs within the planning area, causing wild horses and burros to relocate or concentrate in new areas. Wildfires also cause other wildlife to move and concentrate in certain portions of the HMAs that may increase the competition for forage and water resources. Many of these burn areas have been altered by the establishment and spread of weeds and loss of native forage. Emergency stabilization and rehabilitation efforts have been used to try to reduce wildfire impacts to all resources. Actions such as fire suppression, prescribed fire, weed treatments, seeding, fencing and use restrictions have had short-term negative impacts on wild horses and burros by limiting their movement in certain portions of the HMAs. The goal of

these actions has been to rehabilitate the burn areas and potentially restore the native vegetation, which would benefit wild horses and burros in the long term.

Some past and present BLM actions have benefitted wild horses and burros. For BLM-authorized activities that have gone through the NEPA process and mining notices, steps have been taken to try to reduce impacts to wild horses and burros through project-specific stipulations and mitigation measures, special recreation use permit stipulations, and standard operating procedures. Specific BLM activities benefitting wild horses and burros include installation of water development improvements to provide additional water storage for wild horse and burro and for other wildlife use. Small-scale gathers, which could include gathering an individual animal, have been done to capture wild horses and/or burros that have become nuisance animals and are at risk of being hit and killed on area highways. To maintain or improve range conditions, gathers are done periodically to maintain the wild horse and burro population at the appropriate management level. BLM has increased the opportunities for education and awareness regarding wild horses and burros and their management with signage and public outreach events.

4.2.8.7.2. Reasonable Foreseeable Actions

As the human population increases, it is anticipated that lands and realty actions, including corridor placement and development, disposals, and other types of rights of ways; ACEC protection; minerals exploration and extraction; renewable energy development; livestock grazing; and recreational activities would also increase. The increased urban interface will potentially increase the number of motor vehicle accidents and disturbance from people, vehicles, and development activity.

4.2.8.7.3. Cumulative Impact

4.2.8.7.3.1. Impacts Common to All Alternatives

Cumulative impacts on wild horses and burros are similar to the Impacts Common to All Alternatives. Wild horses and burros would directly benefit from actions to maintain forage opportunities, to reduce competition from domestic livestock, to prevent mixing of wild and domestic horses and burros, to improve range conditions, to maintain or improve water sources, and to eliminate barriers to their free-roaming movement. There would be indirect benefits from travel management, visitor education, and reduction of the potential for disturbance from people, vehicles, and development activity.

Managing and adjusting herd numbers based on monitoring and range carrying capacity would benefit wild horses and burros by preventing overpopulation, which could lead to overgrazing and range deterioration, which in turn could lead to impaired herd health.

Wild horses and burros are limited to the herd management areas that have been derived from the original herd areas delineated in the early 1970s. In the Southern Nevada District, there are five active herd management areas remaining from the original herd areas. The Nevada Wild Horse Range and the majority of the Red Rock HMA are covered under other RMPs.

The following list identifies the resources, resource uses, and special designations that are likely to impact wild horses and burros and their management.

Cumulatively there could be **minor** impacts to the wild burros and their management within the Gold Butte HMA:

- Minerals exploration
- ACEC protection

Cumulatively there could be **major** impacts to the wild horses and burros and their management within the Johnnie HMA:

- Corridors
- Land disposals
- Mineral exploration
- Renewable energy development
- ACEC protection

Cumulatively there could be **moderate** impacts to the wild horses and burros and their management within the Wheeler Pass HMA:

- Corridors
- Land disposals
- Mineral exploration
- Livestock grazing
- Renewable energy development

Cumulatively, there could be **moderate** impacts to the wild horses and burros and their management within the portions of the Red Rock HMA managed under this RMP:

- Corridors
- Land disposals
- Mineral exploration
- ACEC protection

4.2.9. Cave and Karst Resources

4.2.9.1. Summary

This section presents the potential impacts of the alternatives on cave and karst features in the planning area. A karst is a type of topography that is formed in soluble rock such as limestone, gypsum, and to a lesser extent, quartzite. This landform is present in the planning area to a moderate extent. Karst topography displays distinctive surface features such as sinkholes, while caves may form beneath the surface. Caves may be significant for their biotic, cultural, geologic, hydrologic, recreation, education, or scientific values. Known cave resources are relatively rare within the planning area, and systematic surveys have not yet been conducted for caves.

Impacts on cave and karst resources can occur from direct disturbance, and, as a consequence of access, that potentially results in overuse and vandalism. Management actions that reduce, restrict, monitor, or prohibit disturbance from actions such as surface development or intensive recreation use would reduce the potential for impacts to occur. In many cases, measures to protect other resource values result in management actions that provide protection for cave and karst resources.

Generally, impacts are greatest where cave locations are known to the public and where ease of access is high, typically near roads, OHV trails, and population centers.

4.2.9.2. Methods of Analysis

The analysis of direct and indirect effects is focused on known cave locations and distinctive karst features within the planning area. Similar effects would be anticipated to occur on undiscovered locations.

Direct impacts to cave resources and karst features result from management actions that physically alter, damage, or destroy cave and karst systems, including their associated geologic features and biotic communities.

Indirect impacts to cave and karst systems can result from actions that increase the accessibility of cave and karst areas, and therefore the probability of adverse impacts due to incompatible or excessive recreational use. Indirect impacts can also result from activities that can alter water quality (e.g., pesticide application, pollution) when degraded water infiltrates into groundwater, thereby possibly altering the chemical and biological environment of cave and karst systems. Moreover, as karst landforms are generally the result of water acting on weakly soluble bedrock and causing surface dissolution, modification to soils or watersheds may impact formation of cave and karst features.

Indirect impacts from environmental causes cannot be quantified due to the complexity of individual cave ecosystems and karst features, compounded by the lack of a complete inventory of such resources. Therefore, impacts on cave and karst resources are described in general qualitative terms across the alternatives rather than in specific detail. During implementation or project-specific planning, the BLM would evaluate proposed actions for site-specific effects on natural resources, including cave and karst resources, focusing on management actions that could disturb or damage soils, watersheds, outcrops, or structures at or near cave openings and karst features.

Assumptions

Impacts were assessed according to the following assumptions:

- Caves present unique geology and potential for distinctive cave resources including ecosystems that may not be duplicated elsewhere.
- Adverse impacts to cave and karst structure and integrity also would impact associated resources including the biological communities within the cave and any cultural, geologic, or paleontological resources that are present.
- Impacts are generally irretrievable and irreversible, although they only occur at the local scale, due to the sensitive and nonrenewable nature of cave systems and associated resources.
- Features located within gypsum and limestone are more susceptible to impacts than quartzite due to their geologic structure.
- Gypsum Cave is the most easily accessible, receives higher levels of visitation, and therefore is most at risk of adverse impacts from excessive and incompatible uses.
- Determination as significant would limit the distribution of cave location information in accordance with the Federal Cave Protection Act.
- Actions associated with other resources that minimize or eliminate surface-disturbing activities would be anticipated to have beneficial impacts on caves and karsts, where present.
- In general, the greatest potential impacts would result from actions that include large-scale disturbance of bedrock and recreational uses.
- Damage, theft, and vandalism are likely to increase with increased visitation.
- Educating the public increases support for protection of cave and karst resources.

4.2.9.3. Qualitative Intensity Scale

A range of qualitative terms have been used to gauge the intensity of each impact from one program area on another. Both positive and negative impacts are considered and, where necessary, the net impact of the two is discussed. The intensities of impacts are described using the following definitions:

- **Negligible:** The impact would not be detectable or measurable. There would be no appreciable change to cave and karst resources.
- **Minor:** The impact would be slightly detectable and measurable. There would be a slight change to cave and karst resources. There would be small or slightly noticeable changes in the BLM's ability to manage and protect cave and karst resources.
- **Moderate:** The impact would be very apparent and measurable. There would be a limited change to cave and karst resources. Changes in the ability of the BLM to manage and protect cave and karst resources would be very apparent.
- **Major:** The impact would be severe. There would be a substantial change to cave and karst resources. Changes in the BLM's ability to manage and protect cave and karst resources would be severe.

Short-Term Effects: The effect occurs only during or immediately after implementation of the alternative. For the purposes of this RMP, short-term effects would occur during the first five years.

Long-Term Effects: The effect could occur for an extended period after implementing the alternative. The effect could last several years or more and could be beneficial or adverse. For the purposes of this RMP, long-term effects would occur beyond the first five years and perhaps over the life of the RMP.

4.2.9.4. Resources

4.2.9.4.1. Air Quality Impacts on Cave and Karst Resources

4.2.9.4.1.1. Impacts Common to All Alternatives

Air quality protections would indirectly benefit cave resources and karst features by reducing air pollution that could alter water quality. Infiltration of degraded water into cave and karst systems could alter the chemical and biological environment of cave and karst systems.

4.2.9.4.1.2. Alternatives 1 through 4

There are no additional impacts to cave and karst resources.

4.2.9.4.2. Soil Resources Impacts on Cave and Karst Resources

4.2.9.4.2.1. Impacts Common to All Alternatives

Management actions are designed to improve or maintain soil quality, reduce wind and water erosion, and conserve soils. Soil and hydrologic protection and restoration measures would benefit cave resources and karst formations.

4.2.9.4.2.2. Alternatives 1 through 4

There are no additional impacts to cave and karst resources.

4.2.9.4.3. Water Resources Impacts on Cave and Karst Resources

4.2.9.4.3.1. Impacts Common to All Alternatives

Implementing best management practices to protect water quality and ensure that adequate water is available to meet management goals could provide some protection to features, characteristics, and values of cave and karst resources.

4.2.9.4.3.2. Alternatives 1 through 4

There are no additional impacts to cave and karst resources.

4.2.9.4.4. Integrated Vegetation Impacts on Cave and Karst Resources

4.2.9.4.4.1. Impacts Common to All Alternatives

Integrated vegetation includes general vegetation, riparian areas, wetlands, weeds, forests, and woodlands, and therefore analysis of impacts are described collectively. General management, including potential natural community and improving riparian and wetland proper functioning condition would improve long-term ecological health. Weed control measures would positively affect water quality and aquatic resources.

4.2.9.4.4.2. Alternatives 1 through 4

There are no additional impacts to cave and karst resources.

4.2.9.4.5. Fish and Wildlife Impacts on Cave and Karst Resources

4.2.9.4.5.1. Impacts Common to All Alternatives

The wildlife objectives stress the importance of natural ecological processes and functions in relation to land uses and discretionary actions. Implementing management actions to restore or improve wildlife habitats would benefit features, characteristics, and values of cave and karst resources, specifically species health and diversity. Management of ROWs and ROW corridors for siting and construction of communication towers could indirectly protect cave and karst resources.

4.2.9.4.5.2. Alternative 1

Alternative 1 contains contradictory water resource protection measures for other resources; impacts from surface disturbances would occur and vary. Alternative 1 does not contain many of the management actions proposed in the other alternatives that could impact cave and karst resources. These actions could still be carried out on a case-by-case basis.

4.2.9.4.5.3. Alternative 2

Avoiding authorized actions within one-half mile of natural waters and within one-quarter mile of artificial waters would help protect cave and karst resources by reducing surface-disturbing activities. Inventorying and monitoring wildlife populations and their habitats could contribute to increased understanding of cave and karst resources.

4.2.9.4.5.4. Alternative 3

Impacts under Alternative 3 would be similar to Alternative 2 except that there would be a smaller avoidance buffer around natural water sources in Alternative 3. The reduced buffer for natural waters could lead to some additional impacts to due to surface-disturbing activities.

4.2.9.4.5.5. Alternative 4

Impacts under Alternative 4 would be similar to Alternative 2 except that the avoidance buffer around natural water sources would be one quarter mile and there would be no buffer around artificial waters. The reduced buffer around natural waters could lead to additional impacts to due to surface-disturbing activities.

4.2.9.4.6. Special Status Species Impacts on Cave and Karst Resources

4.2.9.4.6.1. Impacts Common to All Alternatives

Maintaining or improving habitats for special status species could also provide long-term benefits to cave and karst resources. Restrictions on uses within special status species' habitats would also help reduce impacts on biotic components of caves and karsts.

4.2.9.4.6.2. Alternative 1

Alternative 1 would not contain some of the actions proposed under the other alternatives that could also positively impact caves and karsts. These actions could still be carried out on a case-by-case basis.

4.2.9.4.6.3. Alternatives 2 and 3

Managing and protecting important genetic and demographic corridors for listed and sensitive species would also benefit cave and karst resources. Mitigation performed as part of no net unmitigated loss of sensitive species habitats would likely benefit cave resources that provide seasonal or yearlong habitats for such species.

4.2.9.4.6.4. Alternative 4

Impacts under Alternative 4 would be similar to Alternative 2 except that impacts to sensitive species would only need to be minimized and would not have to meet the no net unmitigated standard. Minimization of impacts would not provide for the same level of mitigation.

4.2.9.4.7. Wild Horse and Burro Impacts on Cave and Karst Resources

4.2.9.4.7.1. Impacts Common to All Alternatives

There likely would be no impacts on cave and karst resources.

4.2.9.4.7.2. Alternatives 1 through 4

There are no additional impacts to cave and karst resources.

4.2.9.4.8. Cave and Karst Management Impacts on Cave and Karst Resources

4.2.9.4.8.1. Impacts Common to All Alternatives

Management actions designed to protect cave and karst resources include implementation of mitigation measures or use restrictions, restricting access to cave location data to bona fide scientific studies and experienced cavers, and limiting developments. Overall, these actions would serve to protect the features, values, and characteristics of cave and karst resources from increased visitation and surface disturbance. A special recreation permit for commercial groups, registration system, and gating and fencing of entrances could negatively impact primitive caving opportunities; however there would be long-term protection of cave and karst resources by using proactive management.

4.2.9.4.8.2. Alternative 1

Managing caves as ROW avoidance areas would help protect cave and karst resources; however, it is unclear as to how close a ROW can be placed near a cave or whether it is the cave entrance itself that is the avoidance area.

4.2.9.4.8.3. Alternative 2

Identifying significant caves would help prioritize protection and management. Restoration of damaged cave and karst systems and designating a one half mile buffer ROW avoidance area around significant caves would benefit said resources in the long term.

4.2.9.4.8.4. Alternative 3

Impacts would be similar to Alternative 2 except that ROW avoidance areas within one quarter mile of significant caves may provide slightly less protection of cave and karst resources than Alternative 2.

4.2.9.4.8.5. Alternative 4

Impacts would be similar to Alternative 2 except that allowing ROWs near cave sites would provide the least amount of protection of cave and karst resources.

4.2.9.4.9. Wildland Fire Management Impacts on Cave and Karst Resources

4.2.9.4.9.1. Impacts Common to All Alternatives

There likely would be negligible impacts on cave and karst resources resulting from wildland fire management actions. Wild and prescribed fires and fire suppression could result in denudation of vegetation around cave openings, increasing their visibility and associated risks of impacts from excessive or incompatible uses. Prescribed fire could have similar effects; however, these could be avoided or minimized through site-specific project plans.

4.2.9.4.9.2. Alternatives 1 through 4

There are no additional impacts to cave and karst resources.

4.2.9.4.10. Cultural Resources Impacts on Cave and Karst Resources

4.2.9.4.10.1. Impacts Common to All Alternatives

Authorized excavation of cultural sites localities could result in short-term impacts. Although activities would result in surface disturbance, the footprint would be limited in scope, and in the long-term, excavation could enhance scientific understanding. The possibility of increased human presence around cultural sites managed for public recreational use could diminish cave and karst resources depending on the current levels of visitation, location, and level of development associated with the site. Management to protect traditional areas would also help protect cave and karst values in those areas through limitations on the type of activities that could occur. Managing cultural resources for public values such as education also benefit caves and karsts by promoting awareness and conservation. Unless a cave contains cultural resources, there would likely be no impacts on cave and karst resources resulting from cultural resources management actions.

4.2.9.4.10.2. Alternative 1

No specific decisions to avoid impacts to eligible National Historic Trails would be identified. Activities could occur in these areas that could potentially impact cave and karst resources.

4.2.9.4.10.3. Alternative 2

A 500-foot exclusion buffer around cultural sites could help limit the types of activities that could potentially impact cave and karst resources.

4.2.9.4.10.4. Alternatives 3 and 4

A 100-foot exclusion buffer around cultural sites could help limit the types of activities that could potentially impact cave and karst resources.

4.2.9.4.11. Paleontological Resources Impacts on Cave and Karst Resources

4.2.9.4.11.1. Impacts Common to All Alternatives

Management actions designed to mitigate adverse effects to paleontological localities and study known sites could have varying degrees of localized impacts to cave and karst resources. Authorized studies could result in short-term impacts from surface disturbance, but the footprint would be limited in scope and there could be a long-term contribution to scientific understanding.

4.2.9.4.11.2. Alternative 1

No unique impacts were identified for Alternative 1.

4.2.9.4.11.3. Alternatives 2 through 4

Vertebrate paleontological localities would be protected in place and closed to unpermitted collection while developing interpretation and public access to resources. This management action could expose caves and karsts to potential impacts from authorized visitation.

4.2.9.4.12. Visual Resource Management Impacts on Cave and Karst Resources

4.2.9.4.12.1. Impacts Common to All Alternatives

Restrictions in VRM Classes I and II would provide more protection to cave and karst resources from development activities within these areas. VRM Classes I and II may increase the difficulty of accomplishing improvement actions; however, the long-term benefits to cave and karst resources from VRM Classes I and II designations should outweigh any localized restrictions on improvements. Surface-disturbing activities in areas designated as VRM Class III and especially Class IV would not be as limited, so these areas are expected to receive more negative impacts.

4.2.9.4.12.2. Alternatives 1 through 4

There are no additional impacts to cave and karst resources.

4.2.9.4.13. Lands with Wilderness Characteristics Impacts on Cave and Karst Resources

4.2.9.4.13.1. Impacts Common to All Alternatives

There would be no impacts common to all alternatives for lands with wilderness characteristics because no areas would be managed to protect and preserve wilderness characteristics outside designated wilderness and wilderness study areas in Alternative 1.

4.2.9.4.13.2. Alternative 1

No areas would be designated as lands with wilderness characteristics, so there would be no benefits to cave and karst resources.

4.2.9.4.13.3. Alternative 2

Alternative 2 would designate the most lands with wilderness characteristics. A lands with wilderness characteristics designation and the associated management prescriptions are designed to protect and preserve the wilderness characteristics of naturalness, outstanding opportunities for solitude or primitive, unconfined recreation, and supplemental values by excluding or limiting activities that may impact those characteristics. This alternative provides the most restrictive management prescription and therefore offers the most protection for cave and karst resources. Management actions include limiting surface-disturbing and disruptive activities such as closure to motorized and mechanized travel; excluding ROWs; and no surface occupancy for oil and gas. Limiting these activities would result in long-term positive impacts for cave and karst resources. Any permitted activities would be limited to those that preserve the natural and undeveloped character. Structures and facilities could be authorized if necessary to preserve or protect resources.

4.2.9.4.13.4. Alternative 3

Impacts from Alternative 3 would be similar toAlternative 2 except that fewer acres of lands with wilderness characteristics would be designated. Generally, caves and karsts would receive slightly less protection of their values due to management prescriptions that allow for more resource uses.

4.2.9.4.13.5. Alternative 4

Impacts under Alternative 4 would be similar to Alternative 3 except that fewer acres of lands with wilderness characteristics would be designated.

4.2.9.5. Resource Uses

4.2.9.5.1. Forestry and Woodland Products Impacts on Cave and Karst Resources

4.2.9.5.1.1. Impacts Common to All Alternatives

Firewood cutting and gathering could have negative impacts through removal of vegetation around cave openings, increasing their visibility and associated risks of impact from excessive or incompatible uses, though limiting cutting and gathering to designated areas would mitigate impacts.

4.2.9.5.1.2. Alternatives 1 through 4

There are no additional impacts to cave and karst resources.

4.2.9.5.2. Livestock Grazing Impacts on Cave and Karst Resources

4.2.9.5.2.1. Impacts Common to All Alternatives

Requiring salt and mineral supplements to be placed at least one mile from water would eliminate the likelihood for infiltration of degraded water that could alter the chemical and biological environment of cave and karst systems.

4.2.9.5.2.2. Alternatives 1 through 4

There are no additional impacts to cave and karst resources.

4.2.9.5.3. Minerals Impacts on Cave and Karst Resources

4.2.9.5.3.1. Impacts Common to All Alternatives

The minerals program includes fluid leasable, solid leasable, locatable, and saleable minerals, and therefore analysis of impacts are described collectively. Impacts could occur from saleable and locatable mineral development depending on the extent and depth of ground disturbance. Drilling activities could intersect with undiscovered caves.

Impacts from each alternative would vary based on the number of acres opened, closed, or withdrawn and based on special or standard stipulations or mitigation measures. Types of restrictions that can be applied, such as those on siting and operations, vary by the type of mineral activity and whether they are saleable, leasable, or locatable. Generally, greater restrictions on disturbances would result in fewer impacts to caves and karsts.

4.2.9.5.3.2. Alternatives 1 through 4

There are no additional impacts to cave and karst resources.

4.2.9.5.4. Recreation Impacts on Cave and Karst Resources

4.2.9.5.4.1. Impacts Common to All Alternatives

Impacts from recreation on cave and karst resources can vary based on the type and intensity of recreation use. Effects would also be greater in areas that receive frequent and/or intense recreation use. Under all alternatives, areas would be designated as special recreation management areas (SRMAs) or extensive recreation management areas (ERMAs). Designating an area as either a SRMA could lead to increased recreational development, recreation restrictions, and visitor use. A SRMA designation, though, could involve increased management oversight and planning efforts, thereby helping reduce impacts to cave and karst resources by careful siting of recreational developments and managing access points and recreation use. Areas allocated as ERMAs would be managed to provide unstructured recreational opportunities with few restrictions and minimal management oversight, thus primitive caving opportunities may be retained.

4.2.9.5.4.2. Alternatives 1 through 4

There are no additional impacts to cave and karst resources.

4.2.9.5.5. Travel and Transportation Impacts on Cave and Karst Resources

4.2.9.5.5.1. Impacts Common to All Alternatives

The alternatives differ in the number of acres designated as open, closed, and limited to designated. Most of the planning area would be designated as limited to designated routes in each alternative. Limiting vehicles to designated routes could help reduce impacts to cave and karst resources depending on the type, number, and location of designated routes.

4.2.9.5.5.2. Alternatives 1 through 4

There are no additional impacts to cave and karst resources.

4.2.9.5.6. Lands and Realty Impacts on Cave and Karst Resources

4.2.9.5.6.1. Impacts Common to All Alternatives

The lands and realty program includes land tenure (disposals, acquisitions, exchanges, withdrawals, and segregations), land-use authorizations (rights-of-way, permits, leases, and easements), renewable energy, and utility corridors. Cave and karst resources would be protected in areas identified with use restrictions. Lands actions such as disposals, ROWs, utility corridors, and renewable energy development can all result in surface disturbance that may lead to loss or degradation of cave and karst resources. The level of impact depends on the size of the parcels, location of parcels on the landscape and in relation to resources, and the ultimate disposition or type and level of landscape modification. Primitive caving opportunities would be foregone as lands are disposed from BLM jurisdiction. Conversely, land tenure adjustments such as acquisitions can benefit cave and karst resources through the addition of natural landscapes and areas for primitive recreation to BLM jurisdiction.

4.2.9.5.6.2. Alternatives 1 through 4

There are no additional impacts to cave and karst resources.

4.2.9.6. Special Designations

4.2.9.6.1. Areas of Critical Environmental Concern Impacts on Cave and Karst Resources

4.2.9.6.1.1. Impacts Common to All Alternatives

Generally, special management areas such as ACECs result in protection of cave and karst resources by limiting or excluding surface disturbances and motorized and mechanized use. Use restrictions in ACECs could include ROW exclusions or avoidance, closure or limits to mineral exploration, limits to or exclusion of certain types of recreation use, and limiting travel to designated routes. Furthermore, ACECs protect relevance and importance values, which may include cave and karst features, characteristics, and values. All these restrictions would help protect cave and karst resources to various degrees. The main difference between the alternatives is the number and size of ACECs proposed for designation and the number of acres potentially protected.

4.2.9.6.1.2. Alternatives 1 through 4

There are no additional impacts to cave and karst resources.

4.2.9.6.2. National Trails Impacts on Cave and Karst Resources

4.2.9.6.2.1. Impacts Common to All Alternatives

See Cultural Resources for impacts on cave and karst resources.

4.2.9.6.3. Wild and Scenic Rivers Impacts on Cave and Karst Resources

4.2.9.6.3.1. Impacts Common to All Alternatives

There likely would be no impacts on cave and karst resources resulting from wild and scenic river management. There are no documented cave or karst features along river segments.

4.2.9.6.3.2. Alternatives 1 through 4

There are no additional impacts to cave and karst resources.

4.2.9.6.4. Wilderness Impacts on Cave and Karst Resources

4.2.9.6.4.1. Impacts Common to All Alternatives

Wilderness designations provide the highest level of landscape protection by limiting most ground-disturbing activities, preserving opportunities for primitive recreation in an undeveloped setting. Preservation of natural processes and integrity within wilderness could protect features, values, and characteristics of cave and karst resources.

4.2.9.6.4.2. Alternative 1

Alternative 1 has no management actions for wilderness. Wilderness areas would still provide protection for caves and karsts due to limits on activities provided in laws, policies, and regulations.

4.2.9.6.4.3. Alternatives 2 and 3

Attaining no net unmitigated loss of wilderness benchmark conditions could include mitigation for impacts to cave and karst resources, which would be a benefit. Cooperative research on wilderness resources could include research on caves and karsts, which would help increase knowledge about said resource and better inform future management.

4.2.9.6.4.4. Alternative 4

Impacts under Alternative 4 would be similar to Alternative 2 except that there would be no requirement for no net unmitigated loss of wilderness benchmark conditions. Impacts to caves and karsts would not be mitigated.

4.2.9.6.5. Wilderness Study Areas Impacts on Cave and Karst Resources

4.2.9.6.5.1. Impacts Common to All Alternatives

Wilderness study areas provide areas of relatively undisturbed landscapes within the planning area. Management of wilderness study areas consistent with BLM policy, including limiting surface-disturbing activities and limiting motorized and mechanized vehicle access to designated routes, would protect cave and karst resources.

4.2.9.6.5.2. Alternatives 1 through 4

There are no additional impacts to cave and karst resources.

4.2.9.7. Cumulative Impacts on Cave and Karst Resources

4.2.9.7.1. Past and Present Actions/Impacts

There have been few known impacts from minerals, lands and realty, and renewable energy developments. Recreation use from caving has damaged some cave features due to removal or vandalism. OHV route designations have helped improve cave and karst resources by limiting

surface disturbance and incompatible uses. Special status species management and cultural resource management have included management actions that protect caves and karsts by restricting human access. Fire management has had no known effects on caves and karsts.

4.2.9.7.2. Reasonable Foreseeable Actions

Impacts would be similar to the past and present actions. Activities associated with minerals, lands and realty, and renewable energy developments would increase the number of facilities, roads, and other disturbances that may directly impact cave and karst resources. Based on implementation of land-use planning goals, objectives, and management actions, disturbance near these features would be limited. Special designations would restrict certain uses, reducing the potential for impacting cave and karst resources. Population growth in the Las Vegas area and the smaller communities is expected to result in increased recreational use that will affect the number and proximity of access routes and type and quality of recreation use.

Reasonable foreseeable future actions, including planning efforts to locate and develop mineral resources and establish ROW corridors and renewable energy development would have impacts on cave and karst resources. Impacts would be caused by surface disturbance from production, exploration, and exploration of drilling and mining facilities and development within ROWs and new renewable energy projects. Impacts would be similar to the past and present actions for minerals, lands and realty, and renewable energy developments. These activities would increase the number of facilities, roads, and other disturbances that affect cave and karst resources.

4.2.9.7.3. Cumulative Impact

4.2.9.7.3.1. Impacts Common to All Alternatives

Development actions within the planning area could produce long-term negligible cumulative impacts on cave and karst resources. The degree of impacts would be dependent on the location and number of acres disturbed and level of development near cave and karst resources. Increasing recreation use over time may lead to further damage to cave and karst features. These impacts would be reduced based on implementing public outreach and education, and other mitigation measures. With respect to effects on cave and karst resources, all of the alternatives are essentially equivalent.

4.2.10. Wildland Fire Management

4.2.10.1. Summary

This section analyzes the impacts of resource management actions on wildland fire ecology and management. Impacts would result from actions that would affect fire regime condition class (condition class), wildland fuels, ignitions or ignition sources, and affect fire response or hazardous fuel management and emergency stabilization and rehabilitation (ESR) activities.

Wildland fuel conditions fluctuate greatly within the planning area and are dependent on annual precipitation levels, ephemeral grasses, and the presence of invasive or noxious plant species. As a result, fire hazards or fire risk can also fluctuate. The expansion of invasive plant species can greatly increase the amount of fuel, the intensity and size of fires, and can shorten fire-return intervals. A factor contributing to increased desert wildfires is the establishment of invasive annual grass and expansion of an annual grass fire cycle that would result in increased condition class (see Chapter 3, Wildland Fire Ecology and Management, for more information).

The population in the greater Las Vegas metropolitan and rural areas has been increasing over the last decade. As a result, land use is changing and the wildland urban interface (WUI) footprint has increased through land disposals and development. Over 50 percent of all fires in the past decade within the planning area have been attributed to human causes. Historically, naturally caused fire, primarily lightning, accounts for the majority of the lands burned. Fire trespass activities are expected to continue, and human-caused fires would increase with potential for increased wildfire impacts within the planning area.

Fire trespass refers to the occurrence of unauthorized fire on agency-managed public lands where the source of ignition is tied to some type of human activity. BLM policy requires any wildland fire on agency-managed public lands to be investigated to determine origin, cause, and responsibility. The agency and its employees must pursue cost recovery or document why cost recovery has not been initiated.

Fire conditions can be present all year round, peaking during the summer and during the monsoon season when lightning is prevalent. Both human-caused and natural wildfire ignitions are exacerbated by invasive plant species that have continued to spread throughout the planning area, increasing fuel continuity and providing a receptive fuel bed for wildfires. Wildfires under these conditions are intense, fast-moving, and resist control efforts.

Large Fire Suppression Costs

Instruction Memorandum 2006-204 directs the BLM to conduct a comparison on the effects that plans would have on the cost of suppressing large wildland fires. The memorandum identifies activities that may affect the cost of fire suppression:

- Establishment of vegetation management objectives or treatments that leave land or resources at greater risk of damage from wildfire and therefore increase fire size and suppression costs.
- Restrictions on the application of allowing fire for resource benefit.
- Restrictions on suppression activities to meet other resource objectives.
- Actions that promote the expansion of invasive plants that alter fire regimes.
- Actions that may limit suppression access, such as road decommissioning to meet other resource objectives.

Historically, large fires were uncommon in planning area, but this has changed over the past decade. Large fires are infrequent in comparison to other ecoregions in Nevada; however, wildfire impacts can be severe and long term, resulting in increased impacts and costs over time.

Protecting priority wildlife habitats, watersheds, cultural resources, commercial and mineral developments, infrastructure, and WUI would affect fire suppression priorities by increasing demands on fire suppression resources, emergency stabilization and rehabilitation, and hazardous fuel or vegetation treatment activities. Conflicts could result when available firefighting resources become overextended or overtaxed. Overextended firefighting resources could also affect availability of firefighting resources locally, regionally, or nationally if they are diverted from other suppression efforts.

Limiting or prohibiting fuels reduction and vegetation treatments could result in increases in fire suppression costs, as well as losses in habitat value as vegetation types shift from the desired future condition. Non-surface-disturbing vegetation treatments and/or effective suppression followed by effective rehabilitation/restoration could reduce these impacts. Reactive fire management such as fire suppression and rehabilitation is usually more expensive and damaging than proactive fire, fuels, and vegetation management including prescribed burns, mechanical thinning, chemical treatment, and restoration. In general, fire suppression costs and risks to life and property should be less when wildfires occur where hazardous fuels have been treated compared to areas where fuels have not been treated.

Increased demands and costs for fire suppression resources and vegetation or fuel treatments are expected for all alternatives due to an increasing population, an expanding WUI, and the increased need for resource protection. Other factors expected for all alternatives are increased operating costs (fuel, personnel, equipment, and supplies) and additional developments outside the control of BLM managers. Shrinking or declining budgets would further limit fire management response and related activities. Condition class would increase in many alternatives, however, some alternatives would improve condition class.

4.2.10.2. Methods of Analysis

Indicators

- The amount of annual fuel loading, including ephemeral grasses or forbs, measured in pounds per acre or tons per acre.
- Increasing fire frequency or size where fires had been infrequent or small.
- The location, number, and frequency of human-caused wildfires.
- Changing land use and expanding WUI. This indicator considers growth and development in southern Nevada where WUI areas expand and wildland fire management becomes more complex as land use changes. For example, fire response requiring both wildland and structural firefighting resources would increase complexity.
- Changing fire regime condition class (FRCC), or condition class. Condition class considers changes in fire return interval and fire severity and is a measure of the degree of ecological departure from a reference condition.

Assumptions

- Population growth and development will result in increased land and resource use.
- A direct relationship exists between the density of human use and the frequency of human-ignited fires.

- The number of human-caused starts is dependent on access and development.
- Invasive or noxious plant species will contribute to increased fire frequency, size, and intensity.
- Visual resource management Classes I and II would restrict the location or the number of fuel treatments.
- Fuel reduction, ESR, and vegetation treatments will be effective.
- Wildfires in less fire adapted plant communities will increase and expand an annual grass fire cycle, shifting the vegetative communities from FRCC1 or FRCC2 to FRCC3.
- Wildland firefighting resources are always available to carry out a fire response.

Program areas with no impacts on wildland fire management

- Cave and karst management
- Paleontological resources

4.2.10.3. Qualitative Intensity Scale

A range of qualitative terms has been used to gauge the intensity of each impact from one program area on another. Both positive and negative impacts are considered and, where necessary, the net impact of the two is discussed. Both generalized and specific definitions for fire management and ecology impact intensities are summarized below.

- **Negligible:** General: No known or minimal impacts. Any change is undetectable and immeasurable. Specific: No direct and indirect impacts that cause an appreciable change in condition class, increase or decrease of wildfires, fire response, hazardous fuels management or ESR.
- **Minor:** General: Direct effects are apparent, measurable, small, localized, and contained within the area of concern. Indirect effects are undetectable. Specific: There would be a small, slightly noticeable change to the condition class, a small increase or decrease in wildfire occurrence and size, and small increases in fire response, hazardous fuel management, and ESR. Normal or slightly increased wildland fire management would be required.
- **Moderate:** General: Direct effects would be readily apparent and measurable over a larger area, but still mainly within specific areas of impact. Indirect effects are apparent and measurable, but do not exceed much beyond normal conditions. Specific: The impact would be very apparent and measurable. There would be a significant change to the condition class over large areas, and an increase or decrease of wildfire size and occurrence. Increased fire response, hazardous fuel management, and ESR would be needed to achieve management objectives. The use of standard operating procedures to manage wildfire to offset adverse impacts, including some increases to fire response when or where needed to reduce wildfire impacts could be extensive, but should be successful.
- **Major:** General: Direct effects would be highly noticeable and extend throughout the area. Indirect affects would be readily apparent and measurable well beyond the norm. Specific: The impact to the condition class would be a dramatic increase or decrease. There would be substantial increases or decreases in wildfire occurrence and size. Achieving desired future condition would depend on a positive or negative outcome and could require a substantial fire management. The increased use of standard operating procedures to manage extensive wildfire impacts could be necessary, and success would not be guaranteed.

4.2.10.4. Resources

4.2.10.4.1. Air Quality Impacts on Wildland Fire Management

4.2.10.4.1.1. Impacts Common to All Alternatives

Complying with air quality regulations, BLM policies, smoke management, and prescriptions could have a moderate direct impact to wildland fire decisions and activities by limiting management options and increasing costs. Fire response options could be limited, which could result in increased suppression costs. Prescribed fire activities could be terminated, delayed or altered based on coordination with state and other agencies on smoke management issues. Acres treated with prescribed fire may be reduced. Impacts to condition class would be indirect and minor relative to the scale of the planning area, but specific moderate indirect impacts could be possible at the local scale and depending on the management area. Increasing regulations or constraints could be a major direct impact further reducing or eliminating fire response options or prescribed fire programs.

4.2.10.4.1.2. Alternatives 1 through 4

There are no additional impacts on wildland fire management.

4.2.10.4.2. Soil Resources Impacts on Wildland Fire Management

4.2.10.4.2.1. Impacts Common to All Alternatives

Soil resource management prescriptions could limit actions or increase costs for hazardous fuel or vegetation treatments and result in minor direct impacts to fire management.

Disturbance and loss of soils or soil productivity could result in moderate indirect impacts as a result of increased noxious and invasive plant species, which could lead to increased wildfires and the expansion of an annual grass fire cycle.

Maintaining soils would be a moderate indirect benefit to wildland fire management by maintaining or improving condition class through helping to prevent or reduce invasive, burnable plant species.

Maintaining and improving watershed conditions would have a major direct benefit to wildland fire management by improving condition class, reducing hazardous fuels and restoring natural vegetation, which could decrease the frequency and severity of wildfires. Managing post-fire effects on soils would be a moderate direct increase to ESR treatments and related costs. Watersheds within the Colorado River drainage systems support WUI communities including the lower Virgin River and the greater Las Vegas metropolitan area.

4.2.10.4.2.2. Alternative 1

See Impacts Common to All Alternatives.

4.2.10.4.2.3. Alternative 2

Avoiding sensitive soil areas and suppressing in other locations could be a moderate direct impact to suppression efforts, possibly delaying or limiting fire response and increasing acres burned. However, many of these areas are natural barriers to fire spread. Where hazardous fuels such as invasive annual grass are present, fire spread would be possible and would require increased fire response and management. Specific impacts to condition class would vary on a case-by-case basis, but in general, condition class could improve.

Soil mitigation measures could have a major direct impact and would include post-fire rehabilitation, followed by ESR treatments as needed or appropriate. Specific direct impacts would depend on the scope and scale of the mitigation measures required. In general and in most cases, impacts would be expected to be minor and could improve condition class.

4.2.10.4.2.4. Alternative 3

Avoiding sensitive soil areas and suppressing in other locations could be a moderate direct impact to suppression efforts, possibly delaying or limiting fire response and increasing acres burned. However, many of these areas are natural barriers to fire spread. Where hazardous fuels such as invasive annual grass are present, fire spread would be possible and would require increased fire response and management. Specific impacts to condition class would vary on a case-by-case basis, but in general, condition class could improve.

Soil mitigation measures could have a major direct impact and would include post-fire rehabilitation, followed by ESR treatments as needed or appropriate. Specific direct impacts would depend on the scope and scale of the mitigation measures required. In general and in most cases, impacts would be expected to be minor and could improve condition class.

4.2.10.4.2.5. Alternative 4

Avoiding sensitive soil areas and suppressing in other locations could be a moderate direct impact to suppression efforts, possibly delaying or limiting fire response and increasing acres burned. However, many of these areas are natural barriers to fire spread. Where hazardous fuels such as invasive annual grass are present, fire spread would be possible and would require increased fire response and management. Specific impacts to condition class would vary on a case-by-case basis, but in general, condition class could improve.

Soil mitigation measures could have a major direct impact and would include post-fire rehabilitation, followed by ESR treatments as needed or appropriate. Specific direct impacts would depend on the scope and scale of the mitigation measures required. In general and in most cases, impacts would be expected to be minor and could improve condition class.

4.2.10.4.3. Water Resources Impacts on Wildland Fire Management

4.2.10.4.3.1. Impacts Common to All Alternatives

Emergency water use for fire suppression would be limited in some areas due to resource needs or requirements and could have a minor direct impact as it could reduce fire response effectiveness.

Alternative water sources would need to be obtained, increasing costs, and resulting in specific moderate impacts.

Limits on retardant use or other types of fire suppression chemicals would be determined by resource requirements and BLM policy and could result in moderate impacts. Limits to fire response options could result in specific major impacts due to decreased suppression effectiveness and could result in larger or more severe fires, increasing overall costs. Limits to vegetation treatments could result in moderate direct impacts by reducing treatment effectiveness and increasing costs. Impacts to condition class would be minor and indirect.

4.2.10.4.3.2. Alternatives 1 through 4

There are no additional impacts on wildland fire management.

4.2.10.4.4. Integrated Vegetation Impacts on Wildland Fire Management

4.2.10.4.4.1. Vegetation Impacts on Wildland Fire Management

4.2.10.4.4.1.1. Impacts Common to All Alternatives

Special requirements for seed or plant materials used in treatments could result in moderate direct impacts due to increased treatment costs but could have increased moderate direct benefits over time to condition class due to increased plant community resiliency.

Vegetation managed to achieve a desired plant community or potential natural community is compatible with objectives for maintaining or improving condition class and would provide a direct moderate benefit. Vegetation treatments that would improve or maintain condition class would have a direct moderate benefit to wildland fire management.

Continued monitoring and participation in cooperative research efforts would have a moderate direct benefit to wildland fire management by increasing knowledge of the role and impacts of fire in the Mojave ecosystem.

4.2.10.4.4.1.2. Alternative 1

Rehabilitation, reclamation, or revegetation of disturbed lands would have a moderate direct benefit to wildland fire management by improving condition class, promoting less burnable native species and decreasing burnable noxious or invasive plant species. Specific direct benefits could be major. Fire response would be more effective, wildfires would be smaller and less intense for most areas, and costs would likely decrease. Some management prescriptions could have a minor direct impact by increasing costs and limiting methods for suppression or fuels and ESR treatments where special requirements are in place. WUI protection may be in conflict or have competing priorities with some resource objectives. Hazardous fuel treatment for WUI protection could be incompatible with resource objectives due to removals or fuel reductions in mesquite and acacia woodlands in some areas. However, managing mesquite and acacia woodlands as healthy forests would have a moderate direct benefit by reducing wildfire risk, providing benefits to habitats, and improving condition class.

4.2.10.4.4.1.3. Alternative 2

Managing for no unmitigated net loss would be a major direct impact to wildland fire management because it would require substantially increased fire response, hazardous fuels management, and ESR. Wildfire impacts and fire severity in the Mojave region could result in unmitigated net loss and could exceed wildland fire management's capabilities or capacity in fire response, fuels management or ESR activities. This is because wildfire impacts may decrease native plant communities and reduce the ecosystem services they provide. Large or severe wildfires could cause short-term net loss of value in the planning area, and because recovery times can be long, recovery of loss could be delayed or take decades. No unmitigated net loss could result in negligible indirect impacts to condition class because an increase in one area would be balanced by a decrease, or improvement, in another area.

Protecting mesquite and acacia woodlands for their value as wildlife habitats from wildfire in Amargosa Valley, Meadow Valley Wash, Moapa Valley, Pahrump Valley, Stewart Valley, Hiko Wash, Paiute Wash, Crystal, Stump Springs, or any other areas identified as being of significant wildlife value would have a minor direct impact to wildland fire management.

Rehabilitation, reclamation, or revegetation of disturbed lands would have a moderate direct benefit to wildland fire management by improving condition class, promoting less burnable native species and decreasing burnable noxious or invasive plant species. Fire response would be more effective, wildfires would be smaller and less intense for most areas, and overall costs would likely decrease. Some management prescriptions could have minor direct impacts due to increased costs and limited methods for fuels and ESR treatments where special management requirements are in place.

WUI protection could be incompatible where removals or reductions of fuel in managing mesquite and acacia woodlands are limited for the purpose of maintaining wildlife habitats in some areas. However, managing mesquite and acacia woodlands as healthy forests would have a moderate direct benefit, which would improve condition class, reduce wildfire risk and provide benefits to habitats. Maintaining the resilience of native plant communities would have a direct moderate benefit to fire management by maintaining condition class, increasing fire response effectiveness, and reducing wildfire size, impacts, and costs.

4.2.10.4.4.1.4. Alternative 3

Rehabilitation, reclamation, or revegetation of disturbed lands would have a moderate direct benefit to wildland fire management by improving condition class, promoting less burnable native species, and decreasing burnable noxious or invasive plant species. Fire response would be more effective, wildfires would be smaller and less intense for most areas, and overall costs would likely decrease.

Some management prescriptions could result in minor direct impacts by increasing costs and limiting methods for fire response, fuels and ESR treatments where special requirements are in place. Depending on the vegetation community, where large or severe wildfires exceed the capacity of wildland fire management to maintain, protect, stabilize or rehabilitate them, wildfire impacts could decrease native plant communities and reduce the ecosystem services they provide. Also depending on the vegetation community, large or severe wildfires could cause short-term net loss of value in the planning area, and because recovery times can be long, recovery of loss could be delayed or take decades which would exceed the capabilities of the fire management

program. Minimizing and mitigating impacts of large wildfires would be costly and would be a direct major impact.

WUI protection could be incompatible where removals or reductions of fuel in managing mesquite and acacia woodlands are limited for the purpose of maintaining wildlife habitats in some areas. However, managing mesquite and acacia woodlands as healthy forests would have a moderate direct benefit and would improve condition class, reduce wildfire risk, and provide benefits to habitats. Maintaining the resilience of native plant communities would have a moderate direct benefit to fire management by maintaining condition class, increasing fire response effectiveness, and reducing wildfire size, impacts, and costs.

4.2.10.4.4.1.5. Alternative 4

Rehabilitation, reclamation or re-vegetation of disturbed lands would have a direct moderate benefit to wildland fire management by improving condition class, promoting less burnable native species, and decreasing burnable noxious or invasive plant species. Fire response would be more effective, wildfires would be smaller and less intense for most areas, and costs would likely decrease.

Some management prescriptions could result in minor direct impacts due to increased costs and limited methods for fuels and ESR treatments where special requirements are in place. Post-wildfire ESR and restoration treatments would be a moderate direct impact with indirect benefits as they would address the loss of native plant communities and the ecosystem services they provide on a case-by-case basis. Impacts from large or severe wildfires could result in major indirect impacts because wildfires could result in unmitigated loss of value in the planning area in the short term. Major direct impacts could be due to managing for no net unmitigated loss. Long-term recovery and mitigation to loss would depend on the post-fire environment and opportunities for increasing values in the burned areas or in other areas within the planning area. Minimizing or mitigating loss due to large wildfires would be costly.

WUI protection could be incompatible where removals or reductions of fuel in managing mesquite and acacia woodlands are limited for the purpose of maintaining wildlife habitats in some areas. However, managing mesquite and acacia woodlands as healthy forests would have a moderate direct benefit and would improve condition class, reduce wildfire risk and provide benefits to habitats. Maintaining the resilience of native plant communities would have a direct moderate benefit to fire management by maintaining condition class, increasing fire response effectiveness, and reducing wildfire size, impacts, and costs.

4.2.10.4.4.2. Riparian Areas and Wetlands Impacts on Wildland Fire Management

4.2.10.4.4.2.1. Impacts Common to All Alternatives

Improving riparian areas and riparian function would be a direct major benefit to wildland fire management. Tamarisk has been a primary hazardous fuel and wildfire problem in watersheds and riparian areas throughout the planning area. Improving riparian conditions and function will help promote natural vegetation that is less fire prone, resulting is less severe wildfires and reducing wildfire risk to WUI watersheds and communities, including the Lower Virgin River watershed and the greater Las Vegas metropolitan area. Riparian treatments would improve condition class.

4.2.10.4.4.2.2. Alternative 1

See Impacts Common to All Alternatives.

4.2.10.4.4.2.3. Alternative 2

Managing for no unmitigated loss would have a moderate direct impact due to increased impacts on wildland fire management by increasing the need for response, fuels management, and ESR activities. Reducing wildfire impacts would require increased wildland fire management for fire response. ESR activities are not always funded. Short-term, localized suppression, ESR, and fuels management effects are possible. Increased requirements for BMPs, SOPs, and use of additional methods based on management requirements would have a minor direct impact and would increase wildland fire management costs. Restoring or rehabilitating habitats at the small scale and watershed level would benefit wildland fire management by improving condition class, reducing burnable areas and fire severity.

Increased riparian protection and vegetation management would have a moderate direct impact because it requires increased fire management and costs. Wildland fire management would be subject to certain constraints or limitations which could impact fire response especially during multi-fire days or where fire fighting resources are in short supply or national or regional fires are competing for resources. Overextended firefighting resources would affect availability of firefighting resources locally, regionally, or nationally if they were diverted from other suppression efforts. Managing habitats as healthy landscapes, ranges, or forests could improve condition class, reduce wildfire impacts, and decrease fire response needs.

See the Fish and Wildlife section for additional information.

4.2.10.4.4.2.4. Alternatives 3 and 4

See Fish and Wildlife in this section.

4.2.10.4.4.3. Weeds Impacts on Wildland Fire Management

4.2.10.4.4.3.1. Impacts Common to All Alternatives

Integrated weeds management would provide both major direct and indirect benefits to wildland fire management by improving condition class and preventing or treating noxious or invasive species that can burn in wildfires. Early detection and rapid response (EDRR) is a key management strategy to address new invasive or noxious species, such as green fountain grass, before these species become fire/fuels problems.

Many of the wildfire and hazardous fuels problems in the planning area are primarily due to invasive or noxious weed species such as tamarisk, invasive annual grasses, or other similar species. Integrated vegetation and weed management techniques or methods are needed to manage hazardous fuel issues throughout the planning area. Weeds are known to thrive in burned areas. Invasive annual grass directly contributes to the invasive annual grass fire cycle. Tamarisk is a hazardous fuel in riparian areas.

Increased requirements for fuels or vegetation treatments such as weed monitoring and follow-up weed treatments would have a minor direct impact due to increased costs to wildland fire

management. However, over the long-term, decreased weeds and hazardous fuels would benefit fire management by improving or maintaining condition class, and decreasing wildfire size and intensity.

Utilizing BMPs, SOPs, and management requirements for wildfire suppression activities, would increase minor direct impacts on wildland fire management. Follow-up weed treatments for ESR and related vegetation treatments would increase costs. Constraints on fire retardants due to weed concerns could result in direct major impacts to fire response and result in increased fire size. Any retardant impacts would be localized, and overall benefits would include decreased wildfire impacts by reducing fire size and severity.

Addressing weed impacts for large burned areas or severe wildfires could be a direct major impact and could be cost-prohibitive in some cases depending on post-fire effects and available funding. However, leaving weeds unchecked could result in decreased condition class, a decrease in native species productivity, an increase of hazardous fuels, and an increase in damaging or costly wildfires. Reducing and managing weeds within the planning area would reduce the overall impacts of wildfire and promote natural vegetation, which is generally less of a fire risk. In general, weeds treatments would improve condition class and would provide a major direct benefit.

4.2.10.4.4.3.2. Alternatives 1 through 4

There are no additional impacts on wildland fire management.

4.2.10.4.4.4. Forests and Woodlands Impacts on Wildland Fire Management

4.2.10.4.4.4.1. Impacts Common to All Alternatives

Maintaining woodland and conifer forest where possible for all aged stands, with an understory vegetation forage valued at moderate or better would result in minor direct impacts due to increased fire management and costs. Stands where fire has been excluded, have accumulated fuels, or are in poor condition would be subject to stand replacing fire and would increase the need for fire response and fuels management. Stand replacement wildfire could create even aged stands by eliminating all age classes. Healthy stands are subject to less or normal stand replacement fire and would require less fire management and related costs. Maintaining all aged stands could result in moderate direct impacts on wildland fire management activities due to the need of introducing fire or allowing fire to take its natural role in the ecosystem where resource objectives would be met, in protecting stands from catastrophic fire, and treating stands to reduce hazardous fuels to increase resiliency.

Monitoring forest health and assessing fire regimes would provide a minor direct benefit in helping to meet management prescriptions and desired future conditions for fire ecology. Timely treatments to restore natural conditions and reduce fuels in areas would improve forest health issues, including wildfire impacts and would have a moderate direct benefit to wildland fire management. Pest control treatments would reduce infestations and subsequently reduce dead fuel loadings, which would reduce wildfire size, intensity, severity, and overall would require less fire management.

Other potential impacts could include elevating the priority for suppression of wildfire in forest and woodland habitats, which could increase the demand for fire suppression resources. Protecting healthy woodlands would require fuel breaks and vegetation treatments to protect

stands. Prescribed fire would promote forest and woodland health and reduce the amount of dead fuel, thus reducing fire intensity and severity in some cases. Developing management actions to improve forest and woodland health would, in the long term, reduce the amount of dead fuel in these areas and reduce impacts on wildland fire management.

If management for allowing natural fire for resource benefit would not be implemented, then consequently fuels buildup and a decline in stand health could occur. In woodlands, reducing hazardous fuels would reduce fire risk, severity, and intensity and would improve fire response options.

Removing dead trees would improve public and firefighter safety as falling dead trees are one of the most common causes of injury during fire operations.

In woodlands, achieving stand health and structure objectives could be a moderate direct benefit due to improved condition class, reduced hazardous fuel continuity, and reduced wildfire size, severity, and intensity. Allowing natural fire regimes to return to the landscape could improve condition class in areas and where prescribed fire and chemical fuel treatments would not be used. Recognizing stand encroachment as a natural process could increase pinyon/juniper, thereby increasing fuel loads. Protecting relict stands or identified climate change refugias could increase the suppression priority for those areas and increase direct impacts on wildland fire management.

See Resource Uses, Forestry and Woodland Products, for more information.

4.2.10.4.4.4.2. Alternatives 1 through 4

There are no additional impacts on wildland fire management.

4.2.10.4.5. Fish and Wildlife Impacts on Wildland Fire Management

4.2.10.4.5.1. Impacts Common to All Alternatives

Changing or increased habitat protection needs could result in major direct impacts and related costs due to the need for increased fire response, hazardous fuel management, and ESR.

4.2.10.4.5.2. Alternative 1

Protecting important resting/nesting habitats, such as riparian areas and mesquite/acacia woodlands, from wildfire impacts would result in moderate direct impacts due to increased wildland fire management and fire response.

Protecting artificial and natural waters that provide benefit to wildlife within the buffer of one quarter mile from wildfire impacts would result in moderate direct impacts due to increased wildland fire management and fire response. Limitations for fire management such as fire response, ESR, or fuels management could result in minor direct impacts due to increased costs.

Additional guzzlers would have a minor direct impact due to increased wildland fire management during a fire response, including ESR and fuels treatment activities as needed.

Protecting key nesting areas, migration routes, important prey base areas, and concentration areas for birds of prey on public lands from wildfire impacts would result in minor direct impacts and would require increased wildland fire management and fire response.

Improvements such as restoring or rehabilitating habitat at the small-scale and the landscape levels would provide major direct and indirect benefits to wildland fire management and could result in improved condition class and smaller, less severe fires.

4.2.10.4.5.3. Alternative 2

Protecting wildlife habitat and landscape connectivity between functioning habitats from wildfire would have a moderate direct impact due to increased fire management costs. Fire suppression, ESR, hazardous fuels, or related treatments would be utilized to limit fragmentation and protect landscape connectivity between landscapes.

Avoiding fire response within one half mile of natural waters and associated riparian areas or one quarter mile of artificial water sources would have a moderate direct impact and could impede suppression activities, increase fire size, and increase potential wildfire impacts. Avoiding vegetation treatments including hazardous fuels and ESR within one half mile of natural waters and associated riparian areas or one quarter mile of artificial water sources could be a specific major direct impact and could decrease protection and benefits to habitat while increasing wildfire impacts.

Additional guzzlers would have a minor direct impact due to increased wildland fire management during a fire response, including ESR and fuels treatment activities as needed.

Protecting water developments or wildlife escape structures from wildfire could be a minor direct impact and would increase impacts on wildland fire management. Water developments would require increased fire response including ESR and fuels treatments as needed on a case-by-case basis.

Managing wildlife mortality and reproductive success could have a major direct and indirect impacts as wildfire could cause wildlife mortality and could impact reproductive success. Reducing wildfire impacts would require increased wildland fire management and response. Increased management requirements could result in minor direct impacts due to increased costs to wildland fire management.

Reducing wildfire impacts to birds and their nests including raptors would have a moderate direct impact and would require increases for fire response and hazardous fuel management. Increased management requirements could result in minor direct impacts due to increased costs.

Habitat protection and improvements could have a moderate indirect benefit where reducing burned areas, burn severity, and restoring or rehabilitating habitats at the small-scale and the landscape levels could improve condition class.

Increased wildlife, habitat protection and vegetation management could have a major direct impact as it would require increased fire management and related costs. Wildland fire management could be subject to certain constraints or limitations that could impact fire response, especially during multi-fire days or where firefighting resources are in short supply or national or regional fires are competing for resources. Overextended firefighting resources would affect availability of firefighting resources locally, regionally, or nationally if they are diverted from other suppression efforts. Managing habitats as healthy landscapes, ranges, or forests could have a major direct and indirect benefits by reducing wildfire impacts, decreasing fire response needs, and improving condition class.

4.2.10.4.5.4. Alternative 3

Protecting forage and cover that could support healthy and diverse populations from wildfire impacts would result in moderate direct impacts. Promoting and maintaining sufficient forage to support a healthy, diverse population that could be subject to wildfire impacts could have an indirect moderate impact and depend on the need for increased fire response, ESR, and hazardous fuel and vegetation treatments. Protecting wildlife habitats and landscape connectivity between functioning habitats would have a moderate direct impact due to increased needs for wildland fire management. Fire suppression, ESR, hazardous fuels, or related treatments can limit fragmentation and protect landscape connectivity between landscapes.

Avoiding fire response within one quarter mile of natural waters and associated riparian areas or minimizing activities within one quarter mile of artificial water sources would have a moderate direct impact as this could impede suppression activities, increase fire size, and increase potential wildfire impacts. Avoiding vegetation treatments including hazardous fuels and ESR within one quarter mile of natural waters and associated riparian areas or minimizing activities within one quarter mile of artificial water sources could have a major direct impact due to increased potential wildfire impacts and decreased protection and benefits to habitats.

Additional guzzlers would have a minor direct impact due to increased wildland fire management during a fire response, including ESR and fuels treatment activities as needed.

Protecting water developments or wildlife escape structures from wildfire could be a minor direct impact and would increase impacts on wildland fire management. Water developments would require increased fire response, including ESR and fuels treatments as needed on a case-by-case basis.

Managing wildlife mortality and reproductive success could have major direct and indirect impacts as wildfire could cause wildlife mortality and impact reproductive success. Reducing wildfire impacts would require increased wildland fire management. Increased management requirements could result in minor direct impacts due to increased costs to wildland fire management.

Reducing wildfire impacts to birds and their nests including raptors would have a moderate direct impact and would require increases for fire response and hazardous fuel management. Increased management requirements could result in minor direct impacts due to increased costs.

Habitat protection and improvements could have a moderate indirect benefit where reducing burned areas, burn severity, and restoring or rehabilitating habitats at the small-scale and the landscape levels could improve condition class.

Increased wildlife and habitat protection and vegetation management could have a major direct impact as it would require increased fire management and related costs. Wildland fire management could be subject to certain constraints or limitations that could impact fire response, especially during multi-fire days or where firefighting resources are in short supply or national or regional fires are competing for resources. Overextended firefighting resources would affect availability of firefighting resources locally, regionally, or nationally if they were diverted from other suppression efforts. Managing habitats as healthy landscapes, ranges, or forests could have major direct and indirect benefits by reducing wildfire impacts, decreasing fire response needs, and improving condition class.

4.2.10.4.5.5. Alternative 4

Protecting forage and cover that could support healthy and diverse populations from wildfire impacts would be a direct moderate impact and would require increased fire management. Promoting and maintaining sufficient forage to support a healthy, diverse population could result in moderate direct impacts due to increased need for fire response, ESR, and hazardous fuel and vegetation treatments.

Protecting wildlife habitats and landscape connectivity between functioning habitats would have a moderate direct impact and would increase wildland fire management. Fire suppression, ESR, hazardous fuels, or related treatments could limit fragmentation and protect landscape connectivity between landscapes.

Avoiding fire response within one quarter mile of natural waters and associated riparian areas would have a moderate direct impact as this could impede suppression activities, increase fire size, and increase potential wildfire impacts. Avoiding vegetation treatments, including hazardous fuels and ESR, within one half mile of natural waters and associated riparian areas could have a major direct impact due to increased potential wildfire impacts and decreased protection and benefits to habitats.

Additional guzzlers would have a minor direct impact due to increased wildland fire management during a fire response including ESR and fuels treatment activities as needed.

Protecting water developments or wildlife escape structures from wildfire could be a minor direct impact and would increase impacts on wildland fire management. Water developments would require increased fire response including ESR and fuels treatments as needed on a case-by-case basis.

Managing wildlife mortality and reproductive success could have a major direct and indirect impacts as wildfire could cause wildlife mortality and could impact reproductive success. Reducing wildfire impacts would require increased wildland fire management. Increased management requirements could result in minor direct impacts due to increased costs to wildland fire management.

Reducing wildfire impacts to birds and their nests including raptors would have a moderate direct impact and would require increases for fire response and hazardous fuel management. Increased management requirements could result in minor direct impacts due to increased costs.

Habitat protection and improvements could have a moderate indirect benefit where reducing burned areas, burn severity, and restoring or rehabilitating habitats at the small-scale and the landscape levels could improve condition class.

Increased wildlife and habitat protection and vegetation management could have major direct and indirect impacts as it would require increased fire management and related costs. Wildland fire management could be subject to certain constraints or limitations that could impact fire response, especially during multi-fire days or where firefighting resources are in short supply or national or regional fires are competing for resources. Overextended firefighting resources would affect availability of firefighting resources locally, regionally, or nationally if they were diverted from other suppression efforts. Managing habitats as healthy landscapes, ranges, or forests could have major direct and indirect benefits by reducing wildfire impacts, decreasing fire response needs, and improving condition class.

4.2.10.4.6. Special Status Species Impacts on Wildland Fire Management

4.2.10.4.6.1. Impacts Common to All Alternatives

Response to wildfires would be to prioritize special status species habitats for fire suppression, including the desert tortoise and other special status or species endemic to the planning area. Preventing direct loss of habitats and individuals would be a major direct impact to wildland fire management because of the need to reduce short- and long-term impacts to preserve native vegetation and habitat diversity. Increased management requirements could result in minor direct impacts due to increased costs. Increased hazardous fuels and vegetation treatments would be needed according to special status designations and associated habitats.

Vegetation communities in the planning area are predominantly Mojave Desert types and generally do not respond well to wildfires. As a result, both natural and human-caused fires would be suppressed in the planning area where wildfire impacts to special status species are a concern. Various resource management objectives would result in fire suppression activities to limit long-term effects as defined in the management actions below. A few areas may meet the criteria for utilizing integrated vegetation and hazardous fuels techniques to meet resource objectives. These objectives include:

- Improve vegetation, wildlife habitats, or watershed conditions.
- Reduce hazardous fuels.
- Reduce the negative effects of wildfires.
- Meet other resource objectives.

Areas that could meet these criteria include desert tortoise habitat, the Lower Virgin River watershed, and areas that have previously burned or are adjacent to previously burned areas. Certain management requirements could result in minor direct impacts due to increased treatment costs.

4.2.10.4.6.2. Alternative 1

Improving approximately 400 acres of aquatic and riparian habitats on the Virgin River, Muddy River, and Meadow Valley Wash from its existing poor-to-fair condition to good-or-better condition by replacing tamarisk with native species would be a specific moderate direct benefit to wildland fire management by improving condition class, promoting less burnable native plant species and reducing wildfire risk.

Maintaining or improving approximately 37,152 acres of spring, wet meadow, and desert habitats in the Ash Meadows ACEC to potential natural community or desired plant community would have a moderate direct benefit to wildland fire management by improving condition class, promoting less burnable native plant species, and reducing wildfire risk.

Managing the Desert Tortoise Conservation Center (DTCC) Management Area (11,014 acres) to support desert tortoise research and other research associated with the Mojave Desert ecosystem would have a specific minor direct impact due to increased fire protection and fire response needs.

Expanding the existing facilities at the DTCC Management Area as necessary to accommodate future research and educational needs and would result in specific minor increased impacts due to increased fire protection and fire response needs.

4.2.10.4.6.3. Alternative 2

Protecting riparian habitats from wildfire impacts where invasive, noxious, or burnable fuels such as tamarisk are present would have a minor direct impact as fire management has many of these areas under treatment. Managing, protecting, restoring, and/or improving riparian habitats to provide diverse native vegetation, including multiple age classes of cottonwood/willow, to meet recovery criteria for federally listed riparian birds and to promote diversity and ecosystem health would have a major direct benefit to wildland fire management by improving condition class and decreasing wildfire risk.

Protecting springs, wet meadows, and desert habitats within the Ash Meadows area from wildfire impacts would be an minor direct impact. Managing, protecting, restoring, and/or improving springs, wet meadows, and desert habitats within the Ash Meadows area to potential natural community or desired plant community to meet recovery criteria for federally listed invertebrate, fish, and plant species and to promote diversity and ecosystem health would have moderate direct and indirect benefits by improving condition class and reducing wildfire risk.

Protecting upland desert habitats from wildfire impacts would have a moderate direct impact that could have specific major indirect impacts dependent on vegetation conditions and invasive annual grass. Managing, protecting, restoring, and/or improving upland desert habitats to meet recovery criteria for the federally listed desert tortoise and to promote diversity and ecosystem health would have a major direct benefit to wildland fire management by improving condition class and reducing wildfire risk.

Protecting special status species habitats from wildfire impacts could have a major direct impact. Managing and improving special status species habitats by utilizing habitat improvement techniques would result in moderate indirect benefits to wildland fire management where condition class is improved and wildfire risk is reduced.

Protecting the Desert Tortoise Conservation Center Management Area as part of the Bird Springs ACEC would be subject to management requirements, require increased wildland fire management and protection, and result in specific minor direct impacts.

4.2.10.4.6.4. Alternative 3

Protecting riparian habitats from wildfire impacts where invasive, noxious, or burnable fuels such as tamarisk are present would have a minor direct impact as fire management has many of these areas under treatment. Managing, protecting, restoring, and/or improving riparian habitats to provide diverse native vegetation, including multiple age classes of cottonwood/willow, to meet recovery criteria for federally listed riparian birds and to promote diversity and ecosystem health would have major direct and indirect benefits to wildland fire management by improving condition class and decreasing wildfire risk.

Protecting springs, wet meadows, and desert habitats within the Ash Meadows area from wildfire impacts would be an minor direct impact. Managing, protecting, restoring, and/or improving springs, wet meadows, and desert habitats within the Ash Meadows area to potential natural community or desired plant community to meet recovery criteria for federally listed invertebrate, fish, and plant species and to promote diversity and ecosystem health would have a moderate direct benefit by improving condition class and reducing wildfire risk.

Protecting upland desert habitats from wildfire impacts would have a moderate direct impact that could have specific major indirect impacts dependent on vegetation conditions and invasive annual grass. Managing, protecting, restoring, and/or improving upland desert habitats to meet recovery criteria for the federally listed desert tortoise and to promote diversity and ecosystem health would have a major direct benefit to wildland fire management by improving condition class and reducing wildfire risk.

Protecting special status species habitats from wildfire impacts could have a major direct impact. Managing and improving special status species habitats by utilizing habitat improvement techniques would result in moderate indirect benefits to wildland fire management where condition class is improved and wildfire risk is reduced.

Protecting the Desert Tortoise Conservation Center Management Area (11,014 acres) to support desert tortoise research and other research associated with the Mojave Desert ecosystem until it is withdrawn would have a specific minor direct impact as it would require increased fire management. Disposing of the Desert Tortoise Conservation Center Management Area per L&R-02 could be a minor direct benefit where the BLM no longer has direct jurisdictional responsibility for wildland fire management.

4.2.10.4.6.5. Alternative 4

Protecting riparian habitats from wildfire impacts where invasive, noxious, or burnable fuels such as tamarisk are present would have a minor direct impact as fire management has many of these areas under treatment. Managing, protecting, restoring, and/or improving riparian habitats to provide diverse native vegetation, including multiple age classes of cottonwood/willow, to meet recovery criteria for federally listed riparian birds and to promote diversity and ecosystem health would have major direct and indirect benefits to wildland fire management by improving condition class and decreasing wildfire risk.

Protecting springs, wet meadows, and desert habitats within the Ash Meadows area from wildfire impacts would be an minor direct impact. Managing, protecting, restoring, and/or improving springs, wet meadows, and desert habitats within the Ash Meadows area to potential natural community or desired plant community to meet recovery criteria for federally listed invertebrate, fish, and plant species and to promote diversity and ecosystem health would have a moderate direct benefit by improving condition class and reducing wildfire risk.

Protecting upland desert habitats from wildfire impacts would have a moderate direct impact that could have specific major indirect impacts dependent on vegetation conditions and invasive annual grass. Managing, protecting, restoring, and/or improving upland desert habitats to meet recovery criteria for the federally listed desert tortoise and to promote diversity and ecosystem health would have a major direct benefit to wildland fire management by improving condition class and reducing wildfire risk.

Protecting special status species habitats from wildfire impacts could have a major direct impact. Managing and improving special status species habitats by utilizing habitat improvement techniques would result in moderate indirect benefits to wildland fire management where condition class is improved and wildfire risk is reduced.

Managing the Desert Tortoise Conservation Center Management Area (11,014 acres) to support desert tortoise research and other research associated with the Mojave Desert ecosystem until it is withdrawn would result in specific minor direct impacts due to increased wildland fire

management, fire protection, and fire response needs, including related activities such as ESR or hazardous fuel management, increasing overall management costs. Disposing of the Desert Tortoise Conservation Center Management Area per L&R-02 could be a specific minor direct benefit where the BLM no longer has direct jurisdictional responsibility for wildland fire management.

4.2.10.4.7. Wild Horse and Burro Impacts on Wildland Fire Management

4.2.10.4.7.1. Impacts Common to All Alternatives

Maintaining forage, healthy range, and minimizing wildfire impacts would have a direct moderate benefit. Protecting range improvements and natural resources from the impacts of wildfire would have a moderate direct impact. Increased protection and fire response needs would increase costs. Hazardous fuel treatments or other vegetation treatments that would reduce wildfire risks could be needed. Post-fire ESR activities and treatments would be needed to address wildfire impacts to wild horses and burros and HMAs. Managing for healthy, productive, diverse, and resilient plant communities that are beneficial to wild horses and burros by providing forage species diversity and improving forage opportunities would have a moderate direct benefit wildland fire management by improving condition class and reducing wildfire risk.

See Fire Management and Integrated Vegetation in this section for more information.

4.2.10.4.7.2. Alternatives 1 through 4

There are no additional impacts on wildland fire management.

4.2.10.4.8. Cave and Karst Management Impacts on Wildland Fire Management

4.2.10.4.8.1. Impacts Common to All Alternatives

There are no impacts on wildland fire management.

4.2.10.4.8.2. Alternatives 1 through 4

There are no additional impacts on wildland fire management.

4.2.10.4.9. Wildland Fire Management Impacts on Wildland Fire Management

4.2.10.4.9.1. Impacts Common to All Alternatives

Wildland fire management plays a critical role in resource protection and managing wildfire risk within the planning area. Wildland fire as an ecological process, and its relation to condition class varies throughout the planning area by vegetation community. The Mojave Desert has both non-fire adapted vegetation and highly fire adapted invasive vegetation such as cheatgrass and red brome. Wildfire impacts would vary depending on fire size, intensity, and severity and could increase or decrease condition class. Wildfire impacts in desert plant communities that are poorly

adapted to fire would have major indirect impacts because wildfire would remove native plants and could increase the potential for invasion or invader expansion. Further, post-fire recovery times could be very long, and in some cases, wildfire impacts could be irreparable and result in net value loss.

Fire suppression would reduce the size of fires within the planning area, reduce wildfire impacts, and maintain condition class. The use of resource advisors and minimum impact suppression tactics would reduce unanticipated effects on other resources during fire suppression in areas with special designations, resources, or species of concern.

Natural fire regimes and condition class could be maintained in some areas, where fire historically has played a natural role, by protecting, restoring, or enhancing vegetation communities that are closer to historical species and density. Allowing fire to take its natural role in the ecosystem would reduce fuel loads and would require less suppression. However, changing ecological and climatological conditions that change condition class or promote changes in species composition or the expansion of invasive and noxious plant species, including an annual grass fire cycle, could increase wildfire size and severity, increasing wildfire impacts over time. Areas or plant communities where fire has played a natural role in the ecosystem could be subject to larger, more severe wildfires where fuels have increased or invasive plant species are present. Further research would be needed to improve knowledge and understanding of the historic and future ecological role of fire within the planning area.

Enforcement, public education efforts, community assistance, and the use of restrictions and closures when warranted could reduce the number of human-caused wildfires and maintain condition class. In the long term, this could reduce the number of acres burned by human-caused fires. Prevention, education, outreach, mitigation, and community assistance activities would have a major indirect benefit by reducing the number of human-caused starts which would help maintain condition class for the lands within the planning area.

Reducing hazardous fuels in WUI would reduce wildfire risk, maintain or improve condition class, provide major direct and indirect benefits through improved public safety and property protection, increase firefighter safety, and increase opportunities for fire response and a potential to reduce fire suppression costs. Over the long term, use of fuel treatment tools would improve public safety, would reduce property losses, and would improve vegetative health and condition class. Fuels treatment activities would reduce the size and severity of wildfires within the planning area and would improve the condition class rating for lands within the planning area.

ESR treatments such as seeding would deter the establishment and spread of cheatgrass or red brome, which would help re-establish the natural fire regime and reduce fire severity in those areas. Rehabilitating degraded rangeland could improve condition class by promoting revegetation and soil stabilization.

Decisions and actions implemented in response to wildland fires are based on ecological, social, and legal consequences; the circumstances under which a fire occurs; the likely consequences on firefighter and public safety and welfare; natural and cultural resources; and values to be protected. Wildfires ignore jurisdictional boundaries. Continued or increased collaboration with local, state, and federal partners in wildland fire management would be a benefit by increasing fire detection and response capabilities, increasing fire resiliency by reducing or managing hazardous fuels, and overall maintaining or increasing wildland fire management's capacity to meet goals and objectives within the planning area and in southern Nevada.

Wildland fire response within the planning area, depending on the location, can generally be characterized as complex due to WUI and the abundance of special status species or resources sensitive to the effects of wildfire. Utilizing resource advisors and a decision support process would focus efforts where needed most. The decision support process includes the fire management plan suppression objectives and strategies that are carried forward to the Wildland Fire Decision Support System (WFDSS). WFDSS would help ensure that a fire response met resource objectives. Compliance with interagency standards and policy guidance, including WFDSS, would focus fire response efforts on decisions and/or actions that would have the greatest chance for success, least cost, and would provide for public and firefighter safety. Continuing to update fire management strategies annually would ensure that fire management resources are used optimally and efficiently to meet fire management objectives.

Alternative 1 reflects previous management direction. Alternatives 2 through 4 are generally the same and update management direction, policy, and strategies to current levels.

4.2.10.4.9.2. Alternative 1

Prescribed burning for resource enhancement purposes would be allowed only on 163,482 acres in the Ash Meadows/Amargosa Flat area, the Gold Butte grazing allotment, the Virgin River floodplains, and South McCullough Mountains could provide moderate direct and indirect benefits but could also increase costs in terms increased annual grass invasion and a shift in the fire regime and condition class. In some cases, this strategy could be in conflict with other resource management prescriptions or management requirements, especially where prescribed fire would be controversial or could result in undesirable impacts.

Prescribed burning for fire fuels hazard reduction purposes would be allowed only on 95,516 acres in the Spring Mountains, South McCullough Mountains, and Virgin Mountains could provide moderate direct and indirect benefits but could also increase costs in terms increased annual grass invasion and a shift in the fire regime and condition class. In some cases, this strategy could be in conflict with other resource management prescriptions or management requirements, especially where prescribed fire would be controversial or could result in undesirable impacts.

A programmatic fire burn plan and an environmental assessment would be prepared for each resource enhancement area prior to the authorization of any prescribed burning. This would increase costs in the short-term but would provide potential long-term benefits by streamlining the planning and implementation process. Subsequent prescribed burns would be authorized without further environmental documentation, provided that terms and conditions of the programmatic burn plan and the environmental assessment are met and the authorized officer manager concurs.

4.2.10.4.9.3. Alternative 2

This alternative represents a more comprehensive wildland fire management strategy and reflects current fire management levels. It updates policy and direction and impacts would be negligible as it is representative of current levels. Public and firefighter safety would be clearly identified as a critical priority and would continue to be a major direct benefit. Fire management units would be adopted. Wildfire risks and hazardous fuels issues and needs would be identified across the entire planning area. The prevention program would be identified as a critical management component. The relationship of integrated weed management to hazardous fuels management would be refined. FRCC and WFDSS would be adopted. Increased fire management and associated costs would be needed where increased protection and land treatments are needed. Two-year temporary

fire closures could be implemented for all fires. Most new increases or impacts would come from other resources, changes in condition class, or increases in WUI or human-caused fires. The fire management plan would be updated accordingly and further refine management direction.

4.2.10.4.9.4. Alternative 3

This alternative represents a more comprehensive wildland fire management strategy and reflects current fire management levels. It updates policy and direction, and impacts would be negligible as it is representative of current levels. Public and firefighter safety would be clearly identified as a critical priority and would continue to be a major direct benefit. Fire management units are adopted. Wildfire risks and hazardous fuels issues and needs are identified across the entire planning area. The prevention program is identified. The relationship of integrated weed management to hazardous fuels management is refined. FRCC and WFDSS are adopted. Increased fire management and associated costs would be needed where increased protection and land treatments are needed. Temporary fire closures could be implemented on a case-by-case basis. Most new increases or impacts would come from other resources, changes in condition class, or increases in WUI or human-caused fires. The fire management plan would be updated accordingly and further refine management direction.

4.2.10.4.9.5. Alternative 4

This alternative represents a more comprehensive wildland fire management strategy and reflects current fire management levels. It updates policy and direction and impacts would be negligible as it is representative of current levels. Public and firefighter safety would be clearly identified as a critical priority and would continue to be a major direct benefit. Fire management units would be adopted. Wildfire risks and hazardous fuels issues and needs would be identified across the entire planning area. The prevention program would be identified as a critical management component. The relationship of integrated weed management to hazardous fuels management would be refined. FRCC and WFDSS would be adopted. Increased fire management and associated costs would be needed where increased protection and land treatments are needed. Temporary fire closures could be implemented on a case-by-case basis. Most new increases or impacts would come from other resources, changes in condition class, or increases in WUI or human-caused fires. The fire management plan would be updated accordingly and further refine management direction.

4.2.10.4.10. Cultural Resources Impacts on Wildland Fire Management

4.2.10.4.10.1. Impacts Common to All Alternatives

Protecting cultural resources directly and indirectly from wildfire impacts would be minor. Protection could address thermal impacts, combustion, loss of vegetation, degraded soil conditions, smoke staining, or spalling. Increased hazardous fuel or vegetation treatments would be needed where accumulations of hazardous fuels and wildfire risk threaten cultural resources. Impacts to condition class would likely be negligible.

Cultural resource management could have a moderate direct impact to suppression tactics by prioritizing protection of cultural resources over other resources. Heavy equipment or retardant use could be prohibited in culturally sensitive areas. Mitigation measures to protect cultural resources from wildland fire may require more firefighter resources to install sprinkler systems,

wrap buildings, or install fuel breaks. Archaeologists or resource advisors would be needed for wildfires occurring in historic districts or other identified sensitive areas.

Post-fire ESR activities would be needed to stabilize or protect sensitive cultural resources. Implementation of fire rehabilitation or vegetation treatments could be delayed until cultural resource inventories are completed.

Fuel or vegetation treatments could be restricted in culturally sensitive areas. Decreased ability to manage hazardous fuels could lead to hazardous fuel buildup and increased fire intensities during a wildfire that could impact cultural resources.

Protecting historic landscapes with visual resource management (VRM) Class I or II would have the effects described under visual resources management. Developing a cultural resources sensitivity model could improve fire suppression by identifying sensitive areas to be avoided during suppression of wildland fires before suppression is needed.

Identifying, protecting, and preserving cultural resources to ensure they are available for appropriate use by present and future generations would be a minor indirect impact but could have a major specific impact where wildfire directly threatens a resource.

Reducing imminent threats from natural or human-caused deterioration and resolving potential conflicts with other resource uses could have moderate direct and indirect impacts where wildfire is a concern. All other cases would have negligible impacts.

4.2.10.4.10.2. Alternatives 1 through 4

There are no additional impacts on wildland fire management.

4.2.10.4.11. Paleontological Resources Impacts on Wildland Fire Management

4.2.10.4.11.1. Impacts Common to All Alternatives

There are no impacts on wildland fire management.

4.2.10.4.11.2. Alternatives 1 through 4

There are no additional impacts on wildland fire management.

4.2.10.4.12. Visual Resource Management Impacts on Wildland Fire Management

4.2.10.4.12.1. Impacts Common to All Alternatives

Protecting VRM Classes I and II from wildfire impacts could have moderate direct or indirect impacts in some cases or when large areas are burned. Minimizing blackened areas, the loss of vegetation, soil erosion, and changes in species composition would require increased fire response and post-fire management under ESR. Hazardous fuel or vegetation treatments could be needed in some cases. For large areas or where post-fire recovery is slow or negligible, these

conditions could persist for long periods of time and costs could be prohibitive or outside the scope of fire management. Where vegetation is more adapted to fire or is compatible with resource objectives, impacts to Classes I and II would depend on the related land classification and management prescriptions (i.e. a wilderness area where fire is managed as a natural part of the ecosystem) and could indirectly decrease impacts on wildland fire management where the condition class is improved.

Class I and II designations require the highest level of restoration and reclamation when activities that disturb the visual landscape occur. Wildland fire management activities could be required to increase restoration and reclamation to restore the scenic quality, which would increase costs. Managing to meet VRM classes and protect the visual integrity of national historic trail resources may elevate suppression operations priorities in VRM Classes I and II and historic or culturally sensitive resource areas.

Class I and II areas could limit fuel and ESR activities or treatments in some areas, such as reducing fuels through prescribed fire, cutting or chipping or installing fences or flood control structures. Limitations would include blending disturbance lines or relocating projects to areas having fewer visual impacts. Limitations could reduce treatment effectiveness or increase costs. In general, moderate direct and indirect impacts would be expected. VRM indirect impacts to condition class would be expected to be negligible or specific to fire management activities.

Overall and in general, impacts would scale and depend upon VRM designations. Reductions in VRM class designation would decrease impacts where increases in VRM Classes I and II would increase impacts. Any benefits to fire management would be negligible.

4.2.10.4.12.2. Alternatives 1 through 4

There are no additional impacts on wildland fire management.

4.2.10.4.13. Lands with Wilderness Characteristics Impacts on Wildland Fire Management

4.2.10.4.13.1. Impacts Common to All Alternatives

Protecting, preserving, and maintaining wilderness characteristics from the impacts of wildfire would have minor direct and indirect impacts. Natural fire regimes could be maintained in some areas, where fire historically has played a natural role, by protecting, restoring, or enhancing vegetation communities that are closer to historical species and density, enhancing the condition class. Allowing fire to take its natural role in the ecosystem would reduce fuel loads and would require less suppression and ESR. Maintaining or improving condition class would be a common goal.

Areas where changing ecological and climatological conditions that promote changes in species composition or the expansion of invasive and noxious plant species, including an annual grass fire cycle, could increase wildfire size and severity, increasing wildfire impacts over time and requiring increased fire management. Areas or plant communities where fire played a natural role in the ecosystem could be subject to larger more severe wildfires where fuels have increased or invasive plant species are present. Limited or a lack of protection for wilderness characteristics would not limit activities that increase the potential for nonnative plant establishment and spread. In the long term, increases in invasive or noxious plant species would likely lead to increases in

fuel levels, intensity, fire size, severity, and decreased fire-return intervals, which could have a moderate to major indirect impacts.

Suppression, fuels, and ESR activities could be limited in wilderness study areas (WSAs) based on possible restrictions on access and use of mechanized or heavy equipment. Wilderness and WSA management may restrict suppression tactics by limiting or restricting the use of power equipment within the wilderness or WSA. Fires may become more intense and spread beyond the wilderness or WSA, causing more acres to burn. For VRM Classes I and II, effects are the same as those described under visual resources management. Limitations and increased designations could increase wildland fire management costs.

4.2.10.4.13.2. Alternative 1

There are no additional impacts to wildland fire management.

4.2.10.4.13.3. Alternative 2

This alternative has increased designations that would impact wildland fire management. Utilizing minimum impact suppression techniques for fire suppression operations in wilderness or WSAs is a standard operating procedure for fire response but could limit fire response options and increase fire size and intensity under certain conditions. In general, this would be a moderate impact.

Allowing fire management actions in conformity with the fire management plan so long as it is consistent with improving or maintaining the area's wilderness characteristics would also require conformity with the respective wilderness management plans. Areas that contain special status species or other sensitive resources and have specific fire response requirements could have conflicting fire management direction, especially where limits to fire response could increase fire size and intensity. For example, fire response in desert tortoise habitat requires an immediate full suppression response to keep wildfires as small as possible.

Closures to motor vehicles and mechanical transport could impact wildland fire management by limiting access, increasing response times, and increasing suppression resource needs and costs. Potential benefits for closures would be decreased human-caused starts and a reduction in the spread of invasive or noxious plant species, resulting in less hazardous fuels.

4.2.10.4.13.4. Alternative 3

This alternative has a moderate increase in designations that would impact wildland fire management. Utilizing minimum impact suppression techniques for fire suppression operations in wilderness or WSAs is a standard operating procedure for fire response but could limit fire response options and could increase fire size and intensity under certain conditions. In general, this would be a minor impact.

Allowing fire management actions in conformity with the fire management plan so long as it is consistent with improving or maintaining the area's wilderness characteristics would also require conformity with the respective wilderness management plans. Areas that contain special status species or other sensitive resources and have specific fire response requirements could have conflicting fire management direction, especially where limits to fire response could increase fire size and intensity. For example, fire response in desert tortoise habitat requires an immediate full suppression response to keep wildfires as small as possible.

Developing and maintaining recreation facilities only when compatible with maintaining wilderness characteristics would increase fire management by increasing fire protection needs for those facilities and would have a specific minor impact.

Limiting access to designated routes for motor vehicles and mechanical transport would have minimal impacts and could provide an indirect benefit to wildland fire management and fire response. Human-caused fires would be possible but would be reduced because access would be limited to designated routes.

4.2.10.4.13.5. Alternative 4

This alternative has fewer designations that would impact wildland fire management. Utilizing minimum impact suppression techniques for fire suppression operations in wilderness or WSAs is a standard operating procedure for fire response but could limit fire response options and could increase fire size and intensity under certain conditions. In general, impacts would be negligible.

Allowing fire management actions in conformity with the fire management plan so long as it is consistent with improving or maintaining the area's wilderness characteristics would also require conformity with the respective wilderness management plans. Areas that contain special status species or other sensitive resources and have specific fire response requirements could have conflicting fire management direction, especially where limits to fire response could increase fire size and intensity. For example, fire response in desert tortoise habitat requires an immediate full suppression response to keep wildfires as small as possible.

Developing and maintaining recreation facilities only when compatible with maintaining wilderness characteristics would increase fire management by increasing fire protection needs for those facilities and would have a specific minor impact.

Limiting access to designated routes for motor vehicles and mechanical transport would have minimal impacts and provide indirect benefits to wildland fire management and fire response. Human-caused fires would be possible but would be reduced because access would be limited to designated routes. Allowing commercial services for OHV tours on designated routes could increase human-caused fires and increase wildland fire management and related costs.

4.2.10.5. Resource Uses

4.2.10.5.1. Forestry and Woodland Products Impacts on Wildland Fire Management

4.2.10.5.1.1. Impacts Common to All Alternatives

Firewood gathering is a type of biomass utilization that would benefit the public and could be useful in reducing hazardous fuels. Direct and indirect effects of woodcutting and firewood gathering are possible, including increased human-caused fires. These activities would result in minor direct and indirect impacts as they would require increased enforcement and management. Improving or maintaining condition class would be a common goal.

See Resources, Forest and Woodlands for more information.

4.2.10.5.1.2. Alternative 1

Allowing the harvest of dead and/or down wood would decrease wildfire risk by reducing hazardous fuels and wildfire intensity. Some hazardous fuels would be generated by this activity, which would require removal or treatment. Cutting green trees would generate slash increasing hazardous fuels and would require removal or treatment. These activities could have a minor indirect impact due to increased fire management and associated costs.

4.2.10.5.1.3. Alternative 2

Prohibiting commercial harvest and personal use of mesquite and acacia woodlands, including live, dead standing, or dead and down mesquite and acacia woodlands could reduce or eliminate human-caused fires and associated impacts related to these activities, but in general, impacts would be negligible. Prohibiting commercial harvest and personal use of mesquite and acacia woodlands, including live, dead standing, or dead and down could mean increased fuel accumulations over time, which would increase fire hazards and stand-replacing fires. Increased fire management, activities, and treatments would be required to manage stand health and protect resources and communities. Natural fire could be utilized in some cases; however, where potential fire impacts are possible to other sensitive or adjacent resources, fire management action would be fire suppression and hazardous fuel reduction to protect and maintain stand health and structure.

4.2.10.5.1.4. Alternative 3

Prohibiting commercial harvest of mesquite and acacia woodlands, including live, dead standing, or dead and down would be a minor benefit and could reduce human-caused fires and associated impacts related to these activities. Prohibiting commercial harvest of mesquite and acacia woodlands, including live, dead standing, or dead and down could mean increased fuel accumulations over time, which would increase fire hazards and stand-replacing fires. Increased fire management, activities, and treatments would be required to manage stand health and protect resources and communities. Natural fire could be utilized in some cases; however, where potential fire impacts are possible to other sensitive or adjacent resources, fire management actions would include fire suppression and hazardous fuel reduction to protect and maintain stand health and structure. In general, impacts would be expected to be minor.

Allowing personal use of other dead and down mesquite and acacia woodlands for on-site recreational campfires, except in areas closed to firewood gathering and subject to seasonal fire restrictions, would benefit the public and could be useful in reducing hazardous fuels. Direct and indirect effects of woodcutting and firewood gathering are possible including increased human-caused fires due to these activities. Fire restrictions would minimize human-caused fire. These activities would require increased enforcement and management.

4.2.10.5.1.5. Alternative 4

Prohibiting commercial harvest of mesquite and acacia woodlands, including live, dead standing, or dead and down would provide a minor benefit in reducing human-caused fires and associated impacts related to these activities. Prohibiting commercial harvest of mesquite and acacia woodlands, including live, dead standing, or dead and down could mean increased fuel accumulations over time, which would increase fire hazards and stand-replacing fires. Increased fire management, activities, and treatments would be required to manage stand health and

protect resources and communities. Natural fire could be utilized in some cases; however, where potential fire impacts are possible to other sensitive or adjacent resources, fire management actions would be fire suppression and hazardous fuel reduction to protect and maintain stand health and structure. In general, impacts would be expected to be minor.

Allowing personal use of other dead and down mesquite and acacia woodlands for on-site recreational campfires, except in areas closed to firewood gathering and subject to seasonal fire restrictions, would benefit the public and could be useful in reducing hazardous fuels. Direct and indirect effects of woodcutting and firewood gathering are possible, including increased human-caused fires due to these activities. Fire restrictions would minimize human-caused fire. These activities would require increased enforcement and management.

4.2.10.5.2. Livestock Grazing Impacts on Wildland Fire Management

4.2.10.5.2.1. Impacts Common to All Alternatives

Managing allotments to meet land health standards would provide moderate direct and indirect benefits by improving condition class. Re-establishing rangeland vegetation post-fire to provide long-term benefits for grazing would require increased ESR.

Closing areas to livestock grazing that have been rehabilitated after a fire would help ensure the establishment of seeded vegetation and would improve rehabilitation and benefit ESR. These benefits would also improve the condition class in the long term.

Moderate indirect impacts would be expected where livestock spread weeds and increase invasive grass fuels, which could increase wildfire frequency, size, and intensity.

See Integrated Vegetation and Wildland Fire Management in this section for more information.

4.2.10.5.2.2. Alternatives 1 through 4

There are no additional impacts on wildland fire management.

4.2.10.5.3. Minerals Impacts on Wildland Fire Management

4.2.10.5.3.1. Fluid Leasable Minerals Impacts on Wildland Fire Management

4.2.10.5.3.1.1. Impacts Common to All Alternatives

Construction of infrastructure or related facilities would have a specific minor direct impact due to increased suppression priorities to provide for public safety and property protection. Mineral development and associated roads could increase the spread of invasive plant species and the potential for human-caused fires, but could also provide improved access for fire response. Impacts to condition class would be specific to impacts to vegetation.

4.2.10.5.3.1.2. Alternatives 1 through 4

There are no additional impacts on wildland fire management.

4.2.10.5.3.2. Solid Leasable Minerals Impacts on Wildland Fire Management

4.2.10.5.3.2.1. Impacts Common to All Alternatives

Construction of infrastructure or related facilities would have a specific minor direct impact due to increased suppression priorities to provide for public safety and property protection. Mineral development and associated roads could increase the spread of invasive plant species and the potential for human-caused fires, but could also provide improved access for fire response. Impacts to condition class would be specific to impacts to vegetation.

4.2.10.5.3.2.2. Alternatives 1 through 4

There are no additional impacts on wildland fire management.

4.2.10.5.3.3. Locatable Minerals Impacts on Wildland Fire Management

4.2.10.5.3.3.1. Impacts Common to All Alternatives

Construction of infrastructure or related facilities would have a specific minor direct impact due to increased suppression priorities to provide for public safety and property protection. Mineral development and associated roads could increase the spread of invasive plant species and the potential for human-caused fires, but could also provide improved access for fire response. Impacts to condition class would be specific to impacts to vegetation.

4.2.10.5.3.3.2. Alternatives 1 through 4

There are no additional impacts on wildland fire management.

4.2.10.5.3.4. Saleable Minerals Impacts on Wildland Fire Management

4.2.10.5.3.4.1. Impacts Common to All Alternatives

Construction of infrastructure or related facilities would have a specific minor direct impact due to increased suppression priorities to provide for public safety and property protection. Mineral development and associated roads could increase the spread of invasive plant species and the potential for human-caused fires, but could also provide improved access for fire response. Impacts to condition class would be specific to impacts to vegetation.

4.2.10.5.3.4.2. Alternatives 1 through 4

There are no additional impacts on wildland fire management.

4.2.10.5.4. Recreation Impacts on Wildland Fire Management

4.2.10.5.4.1. Impacts Common to All Alternatives

Some human-caused fires can be attributed to recreational activities such as shooting or camping (campfires). Increased recreational use has been commensurate with the population growth in

the greater Las Vegas metropolitan and rural areas over the last decade. More than 50 percent of all fires within the planning area in the last decade were attributed to human causes. Fire trespass activities are expected to continue, and human-caused fires could increase. In general, increased recreational activities and access could result in moderate to major direct impacts as fire conditions can be present year round. Recreation management prescriptions or requirements do not provide for any management direction, control or regulatory requirements to prevent human caused wildfires specific or related to recreational activities. Any such controls are wholly dependent on inference and reliance upon other programs and their management direction specific to wildland fire management.

Providing for recreation may increase the use of public lands and consequently the risk of human-caused fires. Recreation developments such as campgrounds would provide infrastructure and could increase public use, which could increase suppression priorities and demand for fire fighting resources. Protecting recreation areas and associated infrastructure would elevate fire suppression priorities and demand for fire resources in these areas.

While establishing and regulating camping or campgrounds including the enforcement of annual fire restrictions is likely to reduce the number of fires caused by campfires, shooting caused fires are more problematic. Target shooting is very popular in Southern Nevada. Targeting shooting can occur anywhere in the planning area where it is not prohibited. There are no designated shooting areas. Shooting is a known to cause fires, in particular steel core ammunition has been linked to fire starts. Further, the use of exploding targets, which can also start fires, has increased in popularity. Shooting caused fires can occur throughout the planning area at all times of the year. Areas that are used regularly for target shooting tend to burn repeatedly. Trash accumulation in these areas is common. The trash is typically comprised of items or objects that have been used for target practice and left of site. Some of these items may contain combustible or hazardous materials and when ignited by a wildfire can present a safety risk to fire fighters. Where vegetation is sparse, it is not uncommon for fires to burn almost exclusively in these trash debris fields. Vehicle trespass or other forms of trespass can also be common in these areas. This type of use would result in direct and indirect impacts and increased costs to fire management. Increased fire response, enforcement, fire prevention, outreach and education would be required. Repeat fires would impact condition class.

Allowing recreational activities that include the possession of fireworks and the use/discharge of explosives of any kind, incendiary or chemical devices, pyrotechnic devices, or exploding targets would increase human-caused fires. Allowing the discharge of any firearms, fireworks, or projectiles in certain areas would increase human-caused fires. Allowing the use of steel core/jacket ammunition would increase human-caused fires. Management actions or prescriptions that do not regulate or control these types of recreational activities would result in increased human caused fires which would have moderate to major direct impacts and could have a major specific direct and indirect impacts to areas where special status species are present.

Protecting special recreation management areas (SRMAs) and infrastructure could result in specific minor direct and indirect impacts due to increased need for fire protection and strategically placed fuel breaks. Increased SRMA designations would require increased fire management and related costs. Increased extensive recreation management areas (ERMA) could require increased fire management and related costs and would vary across the planning area. Increased recreation activities could increase the spread of weeds and invasive species, which would increase hazardous fuels and wildfire frequency, intensities, and size and could impact condition class.

High-speed races and OHV use could increase the spread of weeds and invasive species, which would increase hazardous fuels and wildfire frequency, intensities, and size. This would lead to increased fire management and related costs. High-speed races and OHV activities could cause wildfires that could result in specific moderate direct impacts. The fire risk for these activities would be high during the fire season or where burnable vegetation is prevalent or continuous. The fire risk for these activities would be less outside of the normal fire season and where fuels such as invasive annual grass are less abundant or less continuous. Minimization and mitigation measures, environmental compliance, enforcement, best management practices, fire or area restrictions, fire prevention measures, emergency access, and hazardous fuel or vegetation treatments could reduce fire risk for these activities and would be needed in some areas. For casual OHV use or related activities, public outreach, education, and the enforcement of spark arrestors could decrease human-caused fires. Increased outreach, education, and enforcement would be a benefit to wildland fire management.

Impacts from travel management for recreational use to wildland fire management are expected to be minor to moderate. Closures or other limitations could limit access and fire response, but impacts are expected to be minor. Increases in trails, roads, or routes would increase access and would be a benefit. Trails, roads, or routes could also be utilized or enhanced as fuel breaks or barriers to fire spread in some areas, and would be a benefit.

Promoting public health and safety through interpretation, facility development, and visitor management could include outreach and education on wildfire safety and fire prevention which would benefit wildland fire management. Increased public education would increase public awareness and could help prevent human-caused fires.

Managing recreational uses to protect resources would directly and indirectly benefit wildland fire management and reduce costs. Benefits would be reductions in the spread of weeds or invasive species and decreased human-caused fires. Decreased human-caused fires would mean less suppression and ESR activities, decreasing wildfire management and related costs. Impacts to condition class would be specific to impacts to vegetation and related to human caused fires.

See Wildland Fire Management and Travel and Transportation management in this section for more information.

4.2.10.5.4.2. Alternative 1

In this alternative, management prescriptions are minimal, and opportunities for public education and outreach would remain at current levels. Area closures to shooting would remain at current levels. Human-caused fires could increase under this alternative and could result in moderate direct impacts due to increases in fire response. Increased special designations could increase fire management and related costs, but increases due to designations would be less than Alternatives 2 or 3, and impacts would likely be negligible.

4.2.10.5.4.3. Alternative 2

Management prescriptions are increased, and opportunities for public education and outreach would increase. Management prescriptions for shooting are increased and could decrease shooting-caused fires. Problematic shooting sites or areas closed by an authorized officer would provide direct and indirect moderate benefits to wildland fire management. Increased special designations would increase fire management and related costs.

Camping only in designated areas could reduce human-caused fires where camping had been dispersed and would result in minor to moderate direct benefits.

All special recreation permits (SRPs) issued for motorized, mechanized, and equestrian use will be limited to designated routes, which could reduce human-caused fires and result in a moderate direct benefit by controlling access, establishing management requirements, and encouraging best management practices.

In summary, human-caused fires could increase under this alternative, but there are increased opportunities to reduce or prevent human-caused fires, which would result in moderate direct and indirect benefits.

4.2.10.5.4.4. Alternative 3

Management prescriptions are increased, and opportunities for public education and outreach would increase. Management prescriptions for shooting are less than Alternative 2 but more than Alternative 1. Increases in shooting-caused fires could result moderate direct and indirect impacts depending on the respective field office's management prescriptions. Problematic shooting sites or areas closed by an authorized officer would provide direct and indirect moderate benefits to wildland fire management. Increased special designations would increase fire management and related costs, but it would be less than Alternative 2.

Camping only in designated areas could reduce human-caused fires where camping had been dispersed and would result in minor to moderate direct benefits.

All SRPs issued for motorized, mechanized, and equestrian use will be limited to designated routes could reduce human-caused fires by controlling access, establishing management requirements, and encouraging best management practices.

In summary, human-caused fires could increase under this alternative, but there are increased opportunities to reduce or prevent human-caused fires, which could result in moderate direct benefits. Shooting caused fires could increase under this alternative with minor to moderate direct and indirect impacts.

4.2.10.5.4.5. Alternative 4

Management prescriptions are increased, and opportunities for public education and outreach would increase. Management prescriptions for shooting are less than Alternative 1, 2, and 3, provide no specific closures, and would result in increased shooting caused fires. Problematic shooting sites or areas closed by an authorized officer would provide direct and indirect moderate benefits to wildland fire management. Increased special designations would increase fire management and related costs but would be less than Alternatives 2 and 3. No new impacts specific from recreation to wildland fire management would be expected for areas managed as public lands not designated as recreation management areas.

Camping only in designated areas could reduce human-caused fires where camping had been dispersed.

All SRPs issued for motorized, mechanized, and equestrian use will be limited to designated routes, which could reduce human-caused fires by controlling access, establishing management requirements, and encouraging best management practices.

In summary, human-caused fires could increase under this alternative, but there are increased opportunities to reduce or prevent human-caused fires, which could result in a moderate direct benefits. Shooting caused fires would increase under this alternative and could result in moderate to major direct and indirect impacts, especially in areas where special status species are present.

4.2.10.5.5. Travel and Transportation Impacts on Wildland Fire Management

4.2.10.5.5.1. Impacts Common to All Alternatives

Transportation and access management affects wildland fire in several ways: Providing access for fire suppression, providing an avenue for noxious weed and invasive plant spread, and providing access for increased human activities, which can lead to human-caused fires. Administrative uses of vehicles such as police, fire, or military actions are expressly defined as not being an off-road vehicle and are exempt from vehicle regulations 43 CFR 8342. Impacts to condition class would be specific to impacts to vegetation and related to human-caused fires.

Roads and trails that are maintained, repaired, or open for public use generally remain in a passable condition and would allow access for fire suppression resources or equipment. This improved access results in faster response times leading to reduced fire size. Roads or routes that are not maintained can become difficult to navigate or impassible due to washouts or other disturbances. Reduced or limited access of any kind would delay or prevent fire response by ground, increasing potential wildfire impacts and could be a moderate to major impact to wildland fire management.

Maintaining roads necessary for fire suppression would ensure adequate access and reasonable emergency response times. Trails, roads, or routes could be utilized or enhanced as fuel breaks or barriers to fire spread in some areas, which would increase fire response opportunities.

Roads and trails are one of the main vectors of weed spread and could lead to changes in condition class. Increased access could lead to increased spread of noxious and invasive plant species. Increased noxious or invasive plant species could increase the frequency, size, and intensity of wildfires, which would impact wildland fire management.

OHV use could increase the potential for human-caused fires and would impact wildland fire management. Increases in trails, roads, or routes would increase access. Increased access or OHV use could increase human-caused fires. For OHV use or related activities, public outreach, education, and the enforcement of spark arrestors or other requirements, rules or restrictions could decrease human-caused fires (see Recreation in this section for more information).

Closure decisions or other limitations could reduce access and decrease the spread of noxious or invasive species, reducing wildfire risks and human-caused fires. Closure decisions or other limitations could limit access in some cases for fire fighting resources, but direct and indirect impacts are expected to be minor to moderate. Further analysis would be needed for new or additional comprehensive travel management planning.

See Recreation and Wildland Fire Management in this section for more information.

4.2.10.5.5.2. Alternatives 1 through 4

There are no additional impacts on wildland fire management.

4.2.10.5.6. Lands and Realty Impacts on Wildland Fire Management

4.2.10.5.6.1. Land Tenure (Disposals and Acquisitions) Impacts on Wildland Fire Management

4.2.10.5.6.1.1. Impacts Common to All Alternatives

Land tenure adjustments changing public lands into private lands would be a moderate indirect impact due expanding WUI areas and increased needs for fire response and hazardous fuel management. Demands on ESR and fire prevention would also increase. The population in the greater Las Vegas metropolitan and rural areas has been increasing over the last decade. As a result, land use is changing and the WUI footprint has increased through land disposal and development. More than 50 percent of all fires within the planning area in the last decade were attributed to human causes. Trespass activities are expected to continue, and human-caused fires could increase.

Ownership adjustments that improve manageability and ensure public access could increase fire management efficiency in most cases.

Disposal of public lands to other ownership could create more WUI, adding to fire suppression, fuel treatment, and community assistance priorities. Decreasing or adjusting land base could increase or decrease the need for wildland fire management. For instance, wildfire problems and boundary issues could be reduced or resolved or could shift to new areas. Where the BLM no longer retains ownership, the BLM would no longer have direct jurisdictional control for wildfire response. However, the BLM could continue to respond to wildfires on lands that had belonged to the BLM where wildfire agreements are in place with the receiving jurisdiction(s) that have fire protection responsibility (usually state, county, or municipal, depending on the location). This could increase wildland fire management, administration, and related costs. In all cases, fire prevention and community assistance would increase.

As urbanization and industrial uses increase, impacts on wildland fire management would decrease and impacts to structure fire would increase. However, fire response could include both wildland and structural fire fighting resources in WUI areas, increasing wildfire complexity with direct and indirect impacts to both structure fire and wildland fire. Increased complexity would increase overall fire management and related costs. Increases in WUI could have a major direct impact to fire prevention, community assistance, and hazardous fuel management. Increases in WUI could require increased cooperation and collaboration, which would require increased administration.

Developed lands that utilize xeriscaping or similar non-burnable landscaping techniques and utilize construction or development that is non-combustible would have less wildfire risk. Lands that are managed for hazardous fuels, including weeds and invasive species, would have less wildfire risk. Lands managed for land health and native flora and fauna would have fewer wildfire risks and could improve condition class in most cases. Overall, reductions in wildfire risk would benefit wildland fire management. In general, impacts to condition class would be specific to impacts to vegetation and related to human-caused fires and changing land use.

See Wildland Fire Management in this section for more information.

4.2.10.5.6.1.2. Alternatives 1 through 4

There are no additional impacts on wildland fire management.

4.2.10.5.6.2. Land-Use Authorizations (Right-of-Ways, Leases, Permits) Impacts on Wildland Fire Management

4.2.10.5.6.2.1. Impacts Common to All Alternatives

Communication facilities or complexes would require increased fire suppression and fuels management where hazardous fuels are present. Impacts would be expected to be minor.

Underground utilities would be less of a hazard to firefighters than overhead and above-ground utilities.

Impacts on fire and fuels from land-use authorizations would be increased where increased fire suppression and fuels management would be needed. Impacts to condition class would be specific to impacts to vegetation.

4.2.10.5.6.2.2. Alternatives 1 through 4

There are no additional impacts on wildland fire management.

4.2.10.5.6.3. Renewable Energy Impacts on Wildland Fire Management

4.2.10.5.6.3.1. Impacts Common to All Alternatives

Impacts would vary according to the size, location, and type of renewable energy development, facility, or related infrastructure. Renewable energy developments would increase WUI. Many of these developments are industrial in nature and could require a structural fire response for fires as wildland firefighters are only trained and equipped to fight vegetation fires. Under these conditions, fire response complexity and cost would go up and result in minor to moderate impacts. Impacts to condition class would be specific to impacts to vegetation.

Structural fire responsibility would be outside the purview or control of the BLM and would depend on how the facility or development manages or prevents fire. Generally, emergency structure fire response would fall to the appropriate jurisdiction with the capacity to handle the level of fire response needed. Rural fire departments may or may not have the capacity, equipment, or training to respond structure-type fires at these facilities. In some cases, emergency structure fire response would need to come from professional full-time fire departments that have the appropriate training and equipment such as fire departments in Henderson or Las Vegas. Often renewable energy facilities or developments include fire protection measures such as emergency fire water, fire pumps, or other fire protection measures or equipment needed to prevent or suppress fires. Any fire response could take time depending on the fire fighting resource and where it is coming from.

Structure-type fires could spread to adjacent BLM lands and become wildfires. Wildfires entering WUI could impact renewable energy facilities and cause structure-type fires. Because these developments or facilities can be long term (up to 50 years in some cases), wildfire and hazardous

fuels management considerations would need to be included in planning and development and in environmental compliance. Facilities or developments can be required to produce fire management plans that are subject to review and approval by BLM managers. Fuel breaks may be implemented to protect facilities, infrastructure or developments, as well as BLM lands. Through this process, wildfire concerns and impacts could be mitigated and reduced, which would have a moderate direct benefit over time in reducing wildland fire management and related costs over the long term.

An increased road network in and around the perimeter of renewable energy developments could lead to nonnative plant establishment but would increase access for fire response and work as a fuel break.

Wildfire risk would depend on local factors, fuel loading and continuity, and the availability of fire fighting resources. Vegetation in or around these facilities is often removed or managed at zero levels. Lack of vegetation management in the long term could lead to increased noxious and invasive species and could indirectly increase wildfire occurrence. See Wildland Fire Management in this section for more information.

4.2.10.5.6.3.2. Alternatives 1 through 4

There are no additional impacts on wildland fire management.

4.2.10.5.6.4. Utility Corridors Impacts on Wildland Fire Management

4.2.10.5.6.4.1. Impacts Common to All Alternatives

The impacts on fire and fuels from multiuse utility corridors would be similar to those discussed in previous sections. Utility-scale renewable energy sites and other land uses would indirectly impact fire and fuels in by increasing the potential for nonnative plant establishment and spread.

While corridors could serve as areas of nonnative plant establishment, associated roads may increase access to areas to where fire suppression is needed or work as fuel breaks. If fuel levels in corridors are maintained at low levels or zero levels, or comparable to natural conditions,, they could also be used as fire breaks during fire-suppression activities. Overhead utility lines and above-ground pipelines in corridors would continue to present hazards to firefighters during suppression operations in site-specific areas. Impacts on wildland fire management would vary from negligible to minor, throughout the planning area. In general, increased fire protection and fuels management would be needed. Impacts to condition class would be specific to impacts to vegetation.

4.2.10.5.6.4.2. Alternatives 1 through 4

There are no additional impacts on wildland fire management.

4.2.10.6. Special Designations

4.2.10.6.1. Areas of Critical Environmental Concern Impacts on Wildland Fire Management

4.2.10.6.1.1. Impacts Common to All Alternatives

ACECs could become priority fire suppression areas, increasing the demand for fire resources, ESR, and fuel treatments to protect ACEC values. Specific major impacts would be possible in desert tortoise ACECs where wildfire has been identified as a threat to the species and its habitat, and fire response requirements are substantially increased. Limitations or requirements could create minor to moderate impacts and increase wildland fire management and related costs. Specific impacts would vary based on the values to be protected. Maintaining or improving condition class would be a common goal.

See Wildland Fire Management, Cultural Resources Management, Fish and Wildlife, Special Status Species, and Integrated Vegetation in this section for more information.

4.2.10.6.1.2. Alternative 1

See Impacts Common to All Alternatives.

4.2.10.6.1.3. Alternative 2

Protecting relevant and important values within ACECs from irreparable wildfire damage could pose major impacts on wildland fire management due to increased needs for fire protection, hazardous fuel management, and ESR.

Ensuring or maintaining no net unmitigated loss of relevant and important values from wildfire within ACECs could be a major impact where increased wildland fire management is needed or required. There is a potential for wildfire to cause unmitigated net loss where wildfire impacts and fire severity could exceed wildland fire management's capabilities or capacity in fire response, fuel management or ESR activities. Specific major impacts would be possible in desert tortoise ACECs where wildfire has been identified as a threat to the species and its habitat and fire response requirements are substantially increased.

Prohibiting woodcutting and firewood gathering for commercial and personal use would be a minor impact as it would limit the use of hazardous fuels or activities fuels as firewood.

4.2.10.6.1.4. Alternative 3

Protecting relevant and important values within ACECs from irreparable wildfire damage could pose major impacts on wildland fire management due to increased needs for fire protection, hazardous fuel management, and ESR.

Ensuring or maintaining no net unmitigated loss of relevant and important values from wildfire within ACECs could be a major impact where increased wildland fire management is needed or required. There is a potential for wildfire to cause unmitigated net loss where wildfire impacts and fire severity could exceed wildland fire management's capabilities or capacity in fire response,

fuel management or ESR activities. Specific major impacts would be possible in desert tortoise ACECs where wildfire has been identified as a threat to the species and its habitat and fire response requirements are substantially increased.

Prohibiting woodcutting and firewood gathering for commercial and personal use would be a minor impact as it would limit the use of hazardous fuels or activities fuels as firewood.

4.2.10.6.1.5. Alternative 4

Protecting relevant and important values within ACECs from irreparable wildfire damage could pose major impacts on wildland fire management due to increased needs for fire protection, hazardous fuel management, and ESR. Specific major impacts would be possible in desert tortoise ACECs where wildfire has been identified as a threat to the species and its habitat and fire response requirements are substantially increased.

Prohibiting woodcutting and firewood gathering for commercial and personal use would be a minor impact as it would limit the use of hazardous fuels or activities fuels as firewood.

4.2.10.6.2. National Trails Impacts on Wildland Fire Management

4.2.10.6.2.1. Impacts Common to All Alternatives

National trails could increase the spread of invasive or noxious species, which could increase hazardous fuels and result in increased wildfires. Increased human-caused fires could be possible due to increased access. National trails could acts as a fuel break, or in some cases, strategically placed fuel treatments could be necessary to protect national trails. Impacts to condition class would be expected to be minor.

Management of national trails is similar to those described in the cultural resources section. Protecting the setting of National Historic Trails may restrict the number and locations of fuel treatments.

Management of national trails would be expected to have negligible impacts on fire management and would remain at current levels.

4.2.10.6.2.2. Alternatives 1 through 4

There are no additional impacts on wildland fire management.

4.2.10.6.3. Wild and Scenic Rivers Impacts on Wildland Fire Management

4.2.10.6.3.1. Impacts Common to All Alternatives

Impacts on wildland fire management would depend on the designation, constraints, and management requirements. Tamarisk, or salt cedar, is an invasive and noxious species that is also a hazardous fuel. Tamarisk is found in many river corridors, springs, and riparian areas in the planning area. These areas intersect or include sensitive species habitats and overlap wild and scenic river (WSR) areas. The planning area has a history of wildfires in tamarisk, and treatments have been carried out in the past by wildland fire, weeds, wildlife, and restoration management.

Limitations or constraints could impact wildland fire management where hazardous fuels and wildfire risk are present. Maintaining or improving condition class would be a common goal.

Management of wild and scenic rivers could result in moderate impacts due to restrictions on fire suppression or fuel management operations such as use of heavy equipment or retardant. Most constraints or impacts would come from the associated VRM Class I and II classification (see Visual Resource Management in this section for more information).

4.2.10.6.3.2. Alternatives 1 through 4

There are no additional impacts on wildland fire management.

4.2.10.6.4. Wilderness Impacts on Wildland Fire Management

4.2.10.6.4.1. Impacts Common to All Alternatives

Protecting, preserving, and maintaining wilderness could result in increased fire management, but expected impacts would be minor to moderate depending on the area. Natural fire regimes could be maintained in some areas where fire historically has played a natural role by protecting, restoring, or enhancing vegetation communities that are closer to historical species and density. Allowing fire to take its natural role in the ecosystem would reduce fuel loads and would require less suppression and ESR. Maintaining or improving condition class would be a common goal.

However, changing ecological and climatological conditions that promote changes in species composition or the expansion of invasive and noxious plant species, including an annual grass fire cycle, could be a major direct and indirect impact due to increased wildfire size and severity, and increased wildfire impacts over time. Areas or plant communities where fire has played a natural role in the ecosystem could be subject to larger, more severe wildfires where fuels have increased or burnable invasive plant species are present. Limited or a lack of protection for wilderness characteristics would not limit activities that increase the potential for non-native plant establishment and spread. In the long term, increases in invasive or noxious plant species would likely lead to increases in fuel levels, fire intensity, fire size, and decreased fire-return intervals. Such conditions could result in dramatic condition class changes.

Areas that contain special status species or other sensitive resources and have specific fire response requirements could have conflicting management direction in regards to wildfire, especially where limits to fire response could increase fire size and intensity. For example, fire response in desert tortoise habitat requires an immediate full suppression response to keep wildfires as small as possible.

Suppression, fuels, and ESR activities would be limited in wilderness because of restrictions on access and use of mechanized or heavy equipment, which could result in minor to moderate impacts, especially where wildfire could threaten wilderness values. Wilderness management would restrict suppression tactics by limiting or restricting the use of power equipment within the wilderness. Fires could become more intense and spread beyond the wilderness, causing more acres to burn. For VRM Classes I and II, effects are the same as those described under the Visual Resources Management section. Limitations and increased designations could result in moderate impacts due to increased wildland fire management costs.

4.2.10.6.4.2. Alternative 1

There are no additional impacts on wildland fire management.

4.2.10.6.4.3. Alternatives 2 through 4

Where wildfire could cause a net unmitigated decrease in the benchmark conditions, moderate direct and indirect impacts would be expected due to changes in condition class and increased fire management.

Allowing facilities adjacent to wilderness that would support management within wilderness would be a minor impact and could increase the need for fire protection and fuels management.

Limiting the number of access points to existing and future congressionally designated wilderness by designating roads, primitive roads, and trails through travel and transportation management could decrease access for fire fighting but could indirectly be a benefit due to decreased access, which could reduce the spread of weeds and human-caused fires.

4.2.10.6.5. Wilderness Study Areas Impacts on Wildland Fire Management

4.2.10.6.5.1. Impacts Common to All Alternatives

Protecting, preserving, and maintaining wilderness characteristics could result in increased fire management, but expected impacts would be minor to moderate depending on the area. Natural fire regimes could be maintained in some areas where fire historically has played a natural role, by protecting restoring, or enhancing vegetation communities that are closer to historical species and density. Allowing fire to take its natural role in the ecosystem would reduce fuel loads and would require less suppression and ESR. Maintaining or improving condition class would be a common goal.

However, changing ecological and climatological conditions that promote changes in species composition or the expansion of invasive and noxious plant species, including an annual grass fire cycle, could be a major direct and indirect impact due to increased wildfire size and severity, and increased wildfire impacts over time. Areas or plant communities where fire has played a natural role in the ecosystem could be subject to larger more severe wildfires where fuels have increased or burnable invasive plant species are present. Limited or a lack of protection for wilderness characteristics would not limit activities that increase the potential for non-native plant establishment and spread. In the long term, increases in invasive or noxious plant species would likely lead to increases in fuel levels, fire intensity, fire size, and decreased fire-return intervals. Such conditions could result in dramatic condition class changes.

Areas that contain special status species or other sensitive resources and have specific fire response requirements could have conflicting management direction in regards to wildfire, especially where limits to fire response could increase fire size and intensity. For example, fire response in desert tortoise habitat requires an immediate full suppression response to keep wildfires as small as possible.

Suppression, fuels, and ESR activities would be limited in wilderness because of restrictions on access and use of mechanized or heavy equipment which could result in minor to moderate impacts, especially where wildfire could threaten wilderness values. Wilderness management

would restrict suppression tactics by limiting or restricting the use of power equipment within the wilderness. Fires could become more intense and spread beyond the wilderness, causing more acres to burn. For VRM Classes I and II, effects are the same as those described under visual resources management. Limitations and increased designations could result in moderate impacts due to increased wildland fire management costs.

4.2.10.6.5.2. Alternative 1

There are no additional impacts to wildland fire management.

4.2.10.6.5.3. Alternative 2

Where wildfire could cause a net unmitigated decrease in wilderness characteristics in wilderness study areas (WSAs), moderate direct and indirect impacts would be expected due to changes in condition class and increased fire management.

4.2.10.6.5.4. Alternative 3

Where wildfire could cause a net unmitigated decrease in wilderness characteristics in WSAs, moderate direct and indirect impacts would be expected due to changes in condition class and increased fire management.

4.2.10.6.5.5. Alternative 4

There are no additional impacts to wildland fire management.

4.2.10.7. Cumulative Impacts on Wildland Fire Management

4.2.10.7.1. Past and Present Actions/Impacts

Past and present actions/impacts that have affected fire management are as follows:

- Greater Las Vegas metropolitan area and rural areas have increased WUI.
- Human-caused fires have increased.
- Large wildfires burned extensive areas in 2005 and 2006.
- Invasive annual grass has resulted in an annual grass fire cycle.
- Invasive and noxious plant species are expanding.
- Fire Regime Condition Class is moving outside of reference conditions (FRCC1 to FRCC3).
- Wildland fire management and related activities have increased.
- A fire prevention program was initiated and is focusing on fire trespass and mitigation and education.
- Fuel management activities were initiated to reduce wildfire risk and protect WUI, watersheds, and habitats.
- Fuel management began utilizing integrated weed management techniques to manage hazardous fuels.
- Large-scale ESR actions were carried out in response to the 2005 and 2006 wildfires.
- BLM fire stations were constructed to meet the increasing wildfire response needs within the planning area.

4.2.10.7.2. Reasonable Foreseeable Actions

Present and reasonably foreseeable actions that would affect fire management are as follows:

- Increasing population growth.
- Increasing public use of public lands for recreation and commercial development.
- Increasing WUI.
- Increased invasive and noxious plant species.
- Increased human-caused fires and fire trespass.
- Increased wildfire suppression and ESR.
- Increased need for reducing wildfire risk through fuel and vegetation management.
- Shifting or changing condition class due to changing land use and climate change.

4.2.10.7.3. Cumulative Impact

4.2.10.7.3.1. Impacts Common to All Alternatives

There would be cumulative effects on fire management from the increased need to protect WUI and natural resources from human-caused and naturally occurring wildfires. Fire suppression priorities would be expected to increase and become more complex because WUI areas would expand, including development occurring on BLM and on adjacent lands. More commercial and public activities would occur within the planning area. Increasing population growth combined with the commensurate growth of recreation, commercial, mineral, and renewable energy development could increase the spread of invasive plant species and increase wildfires. Access for fire suppression operations in some areas would improve and in other areas access would decrease. Demand for fire suppression resources, fuel treatments, and ESR would increase.

Development would expand WUI and increase fire complexity and the need for a structure fire response in some cases. Fully urbanized lands would no longer require a wildland fire response. Expanding WUI could impose an economic burden on rural or municipal fire departments.

Wildfires are generally grouped into nine cause classes such as lightning, smoking, campfire, debris burning, or miscellaneous. Many of the human caused fires that have occurred in the planning area have been determined to be “miscellaneous” through origin and cause investigations. Common miscellaneous fires occurring in the planning area are shooting, fireworks, and wire burning. Many of the human caused fires can be addressed through targeted education and outreach, management or enforcement. However, in some cases solutions are more problematic.

Fire trespass activities reflect local economic conditions and land uses. Over the past decade, the Greater Metropolitan Las Vegas area has experienced an economic and housing boom as well as a severe economic downturn and housing crisis. The economic impacts affected people in different ways. While copper prices were very high, wire burning fires on BLM lands were frequent. When the housing bubble burst and people began losing their homes, foreclosures increased and trash dumping on BLM lands increased. Trash or debris fires also increased. As people were displaced or became homeless, the occurrence of escaped campfires increased. Similar direct and indirect impacts would be expected for the foreseeable future and cumulative impacts to fire management would scale in intensity according to the situation.

Historically, most human caused fires have been small because initial suppression actions were successful or because fuels were sparse. Lightning, or naturally caused fires account for most of

the acres burned within the planning area. Some areas are burned repeatedly. Repeat fires would cumulatively change condition class and would scale by fire size and/or severity. Years where annual grass fuels are continuous or where fires occur in areas with sensitive resources would result in increased impacts to fire management. Fire costs can escalate quickly and the cost of suppression and rehabilitation could be very high. As a result, due to the need to protect WUI and natural resources from wildfire, impacts to wildland fire management will vary according to management requirements or prescriptions, fuels, and wildfire risk.

Vegetation management (particularly fuel reduction) and ESR on public, privately owned, and other federal lands in and around the planning area would help to reduce wildfire risk and improve the condition class. Allowing natural fire to take its role in the ecosystem where it does not contribute to the spread of noxious or invasive plant species would also improve condition class in some cases. Conversely, wildfires burning outside historic conditions of could result in more severe fire effects. Wildfires burning in invasive annual grass could contribute to significant changes to condition class in many areas.

Climate change results in variability in temperature and precipitation and is known to influence the composition and structure of native plant communities. Increased temperature could increase wildfires. The increased length of the frost-free season would increase the length of the normal fire season. Wildfires are already possible year round but fire frequency and size would likely increase. Ephemeral grass fuel loading and the annual grass fire cycle are highly dependent on seasonal rainfall and other climatic conditions. The timing and seasonality of precipitation is correlated to wildfire risk where precipitation increases annual grass fuel loading and continuity. Upward trends in fall precipitation would likely increase annual grass fuels. Less fall/winter rainfall and more intense summer monsoon events could result in decreased annual grass fuels.

Changes in climate could shift or change vegetation. Changes in climate would impact condition class. Management direction or response to these changes would emphasize areas resistant to climate change. Specific moderate to major direct and indirect impacts to fire management would be possible for managing fire in these areas. In general, moderate to major cumulative impacts would be expected due to climate change.

Vegetation and its associated fire regimes have evolved over time and through varying climatological conditions. The analysis time frame of cumulative effects for the planning areas is relatively short in terms of the vegetation communities and related fire regimes. For example, there are blackbrush stands within the planning area that are estimated to be over 400 years old and these stands could be lost in a single wildfire.

Vegetation communities have been changing over the last decade and have been altered by wildfire. Large or severe fires in areas where wildfires had been historically infrequent and small are becoming more frequent. Low to moderate severity fires are also becoming more frequent. Cumulative wildfire impacts would result in the loss of many native plant communities and decreases in plant diversity at the landscape level. However, changes in condition class due to changes or varying climatic conditions would be exceeded or would be exacerbated by direct and indirect land use impacts, such as actions leading to the expansion of invasive plants (or effective treatments) and resultant wildfires including increases in human-caused fires.

4.2.10.7.3.2. Alternative 1

Increased use on BLM and adjacent lands would increase the likelihood of human-caused fires and could be a moderate to major direct impact. Development would increase the amount of WUI and the number of fires that are a priority for fire suppression. Impacts to condition class would be expected for areas adjacent to WUI.

4.2.10.7.3.3. Alternative 2

Reducing potential commercial, mineral, and energy development on BLM lands would likely increase the pressure for these activities to occur on lands not administered by BLM and could have indirect moderate impacts. Fire suppression operations could increase due to increases in priority suppression areas (wildlife, watershed priority areas, herd management areas, ACECs, wild and scenic rivers) to protect natural resources and to reduce wildfire risk due to increases in invasive and noxious plant species.. Fires on BLM lands would be more difficult to suppress, and this would likely result in additional acres burned over the long term. Condition class would respond to shifts in plant communities, land-use patterns, and fire regimes.

4.2.10.7.3.4. Alternative 3

Commercial, mineral, and renewable energy development would reflect growth and fire suppression priorities to protect infrastructure would be commensurate. Impacts could be minor to moderate, with specific major impacts possible where wildfire risk is increased due to invasive or noxious plant species. Rehabilitation of lands would increase as the potential for larger fires would increase. Potential for human-caused fire would increase because commercial, mineral development, recreation, and renewable energy development would increase access and result in the expansion of invasive and noxious species. Increased population and development would increase the potential for human-caused fires over time. Condition class would respond to shifts in plant communities, land-use patterns, and fire regimes.

4.2.10.7.3.5. Alternative 4

Emphasis on development and use of public lands would likely lead to additional priority fire suppression to protect infrastructure, which could be a major impact in WUI areas. Increased recreational activities and mineral and energy developments could result in major impacts in WUI or where special status species are present. Development could improve access for fire suppression on public and adjacent lands. Invasive and noxious plant species and human-caused fires would be expected to increase over time. Condition class would respond to shifts in plant communities, land-use patterns, and fire regimes.

4.2.11. Cultural Resources

4.2.11.1. Summary

Activities and management actions associated with surface and subsurface disturbance could affect or increase the risk of adverse effects on known and unknown cultural resources. These activities and management actions include development projects, recreational use/OHV travel, and fire management. The impacts created by ground-disturbing activities are known to accelerate natural processes such as erosion that expose vulnerable cultural resources to intense fire, open or close land to potentially incompatible uses, affect the visual, atmospheric, or aural setting of historic properties, traditional cultural properties (TCPs), sacred sites or national historic trails (NHTs), and remove or add land subject to federal resource protection.

The potential impacts on cultural resources that may result from the implementation of any of the alternatives are correlated with BLM's cultural resource management allocations, which integrate informational, heritage, and educational values:

- Conservation.
- Scientific research.
- Public use.

Protecting and conserving significant cultural resources is a goal common to all of the alternatives, and implementation of any of the alternatives will require determining the scientific and humanistic values of an archaeological or historical site under the National Historic Preservation Act (NHPA) and the Archaeological Protection Act (ARPA), as well as other legislation and guidance such as the Native American Graves Protection and Repatriation Act (NAGPRA), the American Indian Religious Freedom Act (AIRFA), and Executive Orders 13175 and 13007.

The alternatives discussed in Chapter 2 (p. 60), in terms of cultural resources, differ mainly in the number of potential acres that may be disposed or made available for minerals and energy development. Because much of the planning area has not been surveyed for cultural resources significant under Section 106 of the NHPA of 1966, and potentially thousands of undiscovered or unrecorded sites eligible to the National Register of Historic Places (NRHP) have yet to be documented, planned actions will require further site-specific consideration under Section 106 and future tribal consultation. As a result, under all of the alternatives, it is expected that there will be cultural resource impacts, including Alternative 1, that represent the status quo and current management direction.

Of the action alternatives, Alternative 2 places the greatest emphasis on resource preservation through higher restrictions on incompatible actions and would provide the most protection to significant cultural resources. Alternative 4 provides the greatest amount of development and acres for land disposal and places a greater emphasis on conservation/mitigation, which would provide the least amount of preservation of cultural resources. Alternative 3 is a compromise between Alternatives 2 and 4, allowing for a relatively moderate amount of development while emphasizing preservation and conservation. In all cases, management actions include stipulations designed to avoid, reduce, or mitigate adverse effects to significant cultural sites in varying degrees. Impacts on TCPs, sacred sites, historic trails, and some other cultural resource sites that are significant for reasons other than data potential may be difficult or impossible to mitigate.

The primary indicators for assessing the condition of and monitoring the trend of effects on cultural resources eligible for listing on the NRHP, NHT, or areas of importance to Native Americans include the following:

- Acres and relative depth of ground-disturbing activities or removal of structural features permitted and the potential for affecting known or unknown intact cultural resources or areas of importance to Native American or other traditional communities.
- Increased access to or activity in areas where resources are present or anticipated.
- Actions that create the potential for an adverse effect to cultural resources through increased erosion or other natural processes.
- Actions that alter the visual, aural, or atmospheric setting of cultural resources, TCPs, and NHTs.
- Acres of land that would be removed from federal cultural resource protections or loss of federal stewardship of lands.

4.2.11.2. Methods of Analysis

Under the present statewide BLM-Nevada SHPO Protocol Agreement, impacts to cultural resources are determined by applying the "Criteria of Effect," as defined in 36 CFR 800.5a: "An adverse effect is found when an action may alter the characteristics of a historic property that qualify it for inclusion in the National Register of Historic Places in a manner that would diminish the integrity of the property's location, design, setting, workmanship, feeling, or association. Adverse effects may include reasonably foreseeable effects caused by the action that may occur later in time, be farther removed in distance, or be cumulative." The criteria of adverse effect provides a framework for identifying and determining the context and intensity of potential impacts on other categories of cultural resources, as well, if these are present. An assessment of effects involving Native American or other traditional community, cultural, or religious practices or resources will require focused consultation with the affected group.

4.2.11.3. Qualitative Intensity Scale

In this analysis, the criteria of adverse effects is applied on a broad scale to all known or anticipated cultural resources or cultural resource types. Analysis is based on knowledge of the resource base of the project area and the level of impacts (or risk of impacts) on cultural resources associated with the plan objective or management action. In most instances, impacts are assessed qualitatively using the best professional judgment of the preparers and BLM cultural resource specialists and conform to the qualitative intensity scale used throughout this document; e.g. negligible (no known impacts), minor and moderate (the potential for both positive and negative impacts exist, although they would extend mainly throughout the project area), and major (adverse impacts).

Most of the actions proposed would be federal undertakings subject to case-by-case site- and project-specific Section 106 review, effects analyses, and mitigation development (including the development of memoranda) to minimize or resolve adverse impacts to cultural resources. This analysis focuses on defining those impacts that may result from actions or planning direction that either be identified as below the threshold of an adverse effect; that is, a No Adverse Effect determination, versus an Adverse Effect determination. The following assumptions regarding the resource base and management practices were considered in relation to the analysis:

- Much of the planning area has not been inventoried for cultural resources, but the archaeological surveys preformed for the development of the Las Vegas Valley Boundary Disposal EIS,

and additional surveys in the Virgin River and Gold Butte areas have provided a substantial amount of information concerning the potential location for archaeological sites. While there is potential that more cultural resources may be located in areas that have not been subject to survey, the presence and significance of these resources cannot be confirmed or quantified.

- TCPs are places associated with the cultural practices or beliefs of a living community. These cultural resource sites are rooted in the community's history and are important in maintaining cultural identity. Contemporary Native American groups maintain social and cultural ties to the land and resources in the planning area. Maintaining access to and reducing impacts to these places is a responsibility of the BLM.
- In the absence of archaeological survey information, the number of acres affected and the intensity of the proposed activity is assumed to broadly correlate to the potential number of cultural resource sites that may be affected and the potential severity of the impacts. In areas that have been highly disturbed or recently developed, it is expected that these areas are less likely to include intact cultural resources.
- The importance of a cultural property often depends on the physical, chemical, functional, and aesthetic characteristics of the property. Natural weathering, decay, vandalism, and construction can remove elements that originally were part of a cultural property. This loss affects the completeness and accuracy of the information used by scientists and recreation interpreters and influences the importance of the property for traditional uses.
- Activities such as human visitation, recreation, vehicle use, grazing, fire, and non-fire vegetation treatments increase the rate of deterioration through natural processes. While the effect of a few incidents may be negligible, the effect of repeated uses or visits over time could increase the intensity of impacts due to natural processes.
- Effective scientific use of a cultural property depends on the vertical and horizontal relationships among the elements of the property and the context of the property itself. Even partial displacement of original relationships lowers the reliability, or may completely negate the significance, of such relationships in reconstructing the activities and sequence of events that occurred at the site.
- Intrusions to or alterations to a cultural property or to its setting may affect the integrity of the property. Structural additions, graffiti, and surrounding audio or visual intrusions may be inconsistent with the original cultural resource values and may affect the scientific or aesthetic importance of the property. Traditional uses of cultural properties can be impacted by modern intrusions that are out of character with the values (e.g., sacred or ceremonial) ascribed to the resource.
- Intrusions to the visual, atmospheric, or aural setting of cultural resources, especially cultural landscapes associated with national historic trails, can extend a considerable distance from the location of the resource, usually a minimum of one-half mile.
- Many cultural resources are situated on or just below the ground surface and are susceptible to impacts from vehicle use, vegetation removal and treatments, animal trampling, fire, and all forms of ground disturbance.
- Vandalism or unauthorized collecting or excavation can destroy a cultural resource in a single incident. Exposure of cultural resources, dissemination of resource locations, and access to areas where cultural resources are present can increase the risk of vandalism or unauthorized collection of materials.
- Population growth, urban encroachment, and development on adjacent lands can increase the risk of impacts on BLM-managed cultural resources through recreation, visitation, vandalism, and changes in setting.
- Federal and BLM requirements of consultation, a site-specific inventory, and an evaluation and impact analysis through the Section 106 process provide a systematic and proactive means of

addressing direct impacts on cultural resources from authorized undertakings, projects, and actions. Nearly all implementation actions would be subject to further cultural resource review, and the Section 106 process would be completed before site-specific projects are authorized. If adverse effects are found, mitigation measures, including avoidance, would be implemented to minimize the effects. Formal agreement documents may be used in completing the Section 106 process for broad implementation actions.

- Cultural resources are nonrenewable. While impacts on many cultural resources may be mitigated through data recovery and other means, impacts on TCPs, national historic trails, and some other cultural resource types are difficult or impossible to mitigate unless the sites and associated settings are avoided, though off-site mitigation may also provide opportunities for further research and interpretation of archaeological sites.
- Site monitoring and Section 110 (proactive) surveys not related to project development, site stabilization, public interpretation, and other proactive management activities will continue.
- As additional surveys are completed, more cultural resource sites in the planning area will be identified and evaluated. The data will be used to develop a predictive/sensitivity model for the planning area, as 16 percent of the entire district has been archaeologically surveyed, mostly in the Gold Butte region and the Las Vegas Valley, which is highly urbanized. Knowledge of these resources would aid in their protection from inadvertent impacts, add to the understanding of cultural resources, and could increase the BLM's workload in site protection, monitoring, and data recovery.

4.2.11.4. Resources

4.2.11.4.1. Air Quality Impacts on Cultural Resources

4.2.11.4.1.1. Impacts Common to All Alternatives

It is anticipated that few minor to moderate impacts to cultural resources may result from air quality management. Airborne particulates and emissions can impact the visual and atmospheric setting of cultural resources, including NHTs, rock art sites, and TCPs in areas where these resources are present. All alternatives include general provisions to reduce and control airborne particulates and emissions. The impacts from all the alternatives on cultural resources are similar, and activities authorized on BLM-administered lands will incorporate best management practices to reduce effects, as appropriate, to cultural resources.

4.2.11.4.1.2. Alternatives 1 through 4

There are no additional impacts to cultural resources.

4.2.11.4.2. Soil Resources Impacts on Cultural Resources

4.2.11.4.2.1. Impacts Common to All Alternatives

Because many cultural resource sites are situated on or just below the ground surface, they are susceptible to damage and destruction from ground disturbance and erosion. Damage can include modification of site spatial relationships and displacement and damage of artifacts, features, and midden deposits. This can result in the loss of information relevant to the site function, dates of use, past environments, and other important research questions. Measures under all of the

alternatives limiting soil erosion and managing ground-disturbing activities will help protect these cultural resources. Restoration actions that would have a No Adverse Effect determination would be preferable, including reclamation measures that may also preserve or restore the setting of cultural resources.

In general, the protection of cultural resources from soil erosion, compaction, and ground-disturbing activities or activities that may be associated with reclamation activities could be as great under any of the action alternatives. For example, ground-disturbing activities that would result in the removal of desert pavement would be less protective of archaeological sites against increased erosion in affected areas. Reducing erosion to cultural sites would be a benefit and have a positive impact on cultural sites.

4.2.11.4.2.2. Alternative 1

There are no additional impacts to cultural resources.

4.2.11.4.2.3. Alternative 2

Although it is anticipated that the impacts will range from minor to moderate, but will be short in terms of duration, Alternatives 2 through 4 will require the highest level of stipulations and mitigations for soil-disturbing activities, reclamation, and erosion controls to decrease the risk of impacts to cultural resources from erosion and ground-disturbing impacts. In areas where rehabilitation techniques could disturb cultural sites, including previously disturbed areas, moderate to severe adverse impacts may result from the exposure of buried cultural remains and deposits.

4.2.11.4.2.4. Alternatives 3 and 4

There are no additional impacts to cultural resources.

4.2.11.4.3. Water Resources Impacts on Cultural Resources

4.2.11.4.3.1. Impacts Common to All Alternatives

Appropriation activities may not affect cultural sites, but actions to develop wells, acquire water sources, and modify springs include risks of disturbance to cultural resources through ground-disturbing activities, changes in access, visibility, and setting of water features, as well as changes to the water features themselves. Because there is generally the potential for cultural sites to occur where natural flows have historically occurred, actions under all the alternatives potentially could adversely affect (major effect) prehistoric and historic cultural resources. The impacts from all proposed new water uses and determinations will be assessed with the goal of managing cultural sites, if present, to minimize negative effects and avoid conflicts with other resource management objectives whenever possible. If culturally significant water features or tribal values are determined to be present, the BLM would seek to mitigate any adverse impacts through consultation with the Nevada SHPO and the affected groups.

4.2.11.4.3.2. Alternatives 1 through 4

There are no additional impacts to cultural resources.

4.2.11.4.4. Integrated Vegetation Impacts on Cultural Resources

4.2.11.4.4.1. Vegetation Impacts on Cultural Resources

4.2.11.4.4.1.1. Impacts Common to All Alternatives

Maintaining and restoring vegetation cover on rangelands will help protect cultural resource sites that are situated on or just below the ground surface and are susceptible to damage and destruction from ground disturbance, erosion, and increased wildland fire. Measures to rest land, restrict grazing, fence sensitive areas, and disperse impacts from riparian areas would also protect cultural sites from ground disturbance. Restoring desired native species may include plants used or valued by tribal users and help retain historic settings. On a case-by-case basis, assess the potential for salvage and/or the harvesting of desert vegetation where ground-disturbing activities may be authorized and have limited effects to cultural resources. Continuation of livestock grazing and future rangeland improvements could have the potential to moderately affect more than 1,000 NRHP listed and/or eligible sites. To determine the extent of disturbance in the current grazing allotments, particularly in the Muddy Mountains and McCullough Mountains, site condition assessments should be made of known archaeological sites.

4.2.11.4.4.1.2. Alternatives 1 through 4

There are no additional impacts to cultural resources.

4.2.11.4.4.2. Riparian Areas and Wetlands Impacts on Cultural Resources

4.2.11.4.4.2.1. Impacts Common to All Alternatives

Restrictive buffers around streams and water bodies, and closures to prevent actions that would degrade riparian conditions could indirectly protect cultural resources. In addition, restoration activities might enhance archaeological site preservation and protect natural features important to contemporary Native Americans.

4.2.11.4.4.2.2. Alternative 1

Not allowing competitive off-road vehicle events within one quarter mile of natural water sources and associated riparian areas would have a positive effect on cultural resources. This alternative would facilitate a reduction in soil erosion, enhanced site preservation, and the protection of culturally important natural resources and water features. In addition, where livestock may be used to maintain a static or upward trend in key forage species, the likelihood for sub-surface adverse effects would be diminished by historic disturbance. Where riparian areas may be given priority as potentially downward trending areas, in terms of overall function, measures such as fencing or the use of alternative water sources also would have a positive effect on cultural resources.

4.2.11.4.4.2.3. Alternative 2

Because wetlands and riparian areas would remain under federal administration, and there would not be an unmitigated loss of wetlands or riparian communities within the planning area, there would be a positive impact on cultural resources, where present. If mitigation activities occur

so that there would be a minimization of loss to native plant communities, these undertakings could affect cultural resources as a result of ground-disturbing activities. Setting additional goals and implementing best management practices for improving riparian/wetland areas and addressing non-grazing impacts would provide long-term protection to cultural resources by reducing the potential for erosion of archaeological sites and enhancing natural resources that may be culturally significant. Overall, it is anticipated that these actions would have minor to moderate effects to cultural resources.

4.2.11.4.4.2.4. Alternative 3

There are no additional impacts to cultural resources.

4.2.11.4.4.2.5. Alternative 4

Alternative 4 has the greatest potential for impacting cultural resources due to a loss of wetland/riparian communities, future treatments, construction of structures, alternative water developments, exclusion fencing, vegetation manipulation, and changes to settings. The impacts to cultural resources will have to be determined on a case-by-case basis, but the impacts could range from minor to moderate effects.

4.2.11.4.4.3. Weeds Impacts on Cultural Resources

4.2.11.4.4.3.1. Impacts Common to All Alternatives

In the long term, treating weeds may indirectly reduce the risk on cultural resources from wildland fire and suppression, reduce erosion to archaeological sites, and help restore the setting of cultural landscapes. Chemical treatments may affect or target culturally important resources or have negative health effects on tribal users. Treatments also may result in changes to setting and temporary loss of access or availability of certain areas for cultural practices during treatment, such as in the Arrow Canyon vicinity.

4.2.11.4.4.3.2. Alternative 1

The use of integrated weed management techniques to control and eradicate tamarisk through measures such as burning, chemical, biological, or mechanical treatments, and the rehabilitation of treated areas by re-vegetation with native plant species may have impacts on cultural resources. Mitigation of major negative effects may require avoidance or following project-specific stipulations that will ensure a minimization of harm to cultural resources, particularly rock art sites where burning may occur and herbicides may be aerially applied.

4.2.11.4.4.3.3. Alternative 2

All undertakings under Alternative 2 will conform to a weed management plan, which will identify best management practices to prevent the spread of weeds and will be compatible with cultural resource objectives involving ground-disturbance greater than one acre. Mitigation of negative effects may require avoidance or following project-specific stipulations that will ensure a minimization of harm to cultural resources, particularly rock art sites where burning may occur and herbicides may be aerially applied. These impacts may consist of disturbing tangible cultural values considered important to Native Americans and other interested parties, and as a result, the

development of any management plans should be undertaken in consultation with the tribes to determine the impact of the undertaking to these values, as well as identify areas that have not been documented as culturally important to the tribes and other interested parties.

4.2.11.4.4.3.4. Alternative 3

All undertakings under Alternative 3 will conform to a weed management plan. The impacts are similar to those identified in Alternative 2 but will involve ground disturbance greater than five acres and have minor to moderate effects.

4.2.11.4.4.3.5. Alternative 4

All undertakings under Alternative 4 will conform to a weed management plan. The impacts are similar to those identified in Alternative 2 but will involve ground disturbance greater than 10 acres and have minor to moderate effects.

4.2.11.4.4.4. Forests and Woodlands Impacts on Cultural Resources

4.2.11.4.4.4.1. Impacts Common to All Alternatives

Forest vegetation treatment methods can impact cultural resources through ground disturbance, erosion, fire, changes in setting, increased access, visibility, and activity in the vicinity of cultural resources. A reduction of woodlands, as well as rehabilitation and reclamation activities to restore/revegetate, may adversely affect cultural resources that may be present. These impacts may consist of disturbing tangible cultural values considered important to Native Americans and other interested parties, such as pine-nut gathering areas. As a result, in advance of any future woodland management plans and future undertakings that may constitute a major impact — that is, an adverse effect to areas of concern to tribes in addition to consultation with the Nevada SHPO — efforts should be undertaken to identify areas that have not been documented as culturally important.

4.2.11.4.4.4.2. Alternative 1

There are no additional impacts to cultural resources.

4.2.11.4.4.4.3. Alternative 2

Additional actions and cooperative research efforts to advance woodland and vegetation management in the Mojave ecoregion, including monitoring vegetation changes that will contribute to regional information and updating best management practices and standard operating procedures, are not likely to adversely affect cultural resources (negligible to minor impacts), but where research may affect cultural resources, it should be developed consistent with other BLM field offices in the Mojave Region and the BLM-Nevada State Protocol Agreement.

4.2.11.4.4.4.4. Alternatives 3 and 4

There are no additional impacts to cultural resources.

4.2.11.4.5. Fish and Wildlife Impacts on Cultural Resources

4.2.11.4.5.1. Impacts Common to All Alternatives

General improvements to land health, aquatic habitats, and restrictions to natural waters that provide a benefit to wildlife could increase soil stability, provide vegetative cover, and reduce ground disturbance, thereby improving protection of surface cultural resources. Maintaining and improving habitat for waterfowl, fish, and other wildlife may also preserve opportunities to maintain traditional uses associated with native wildlife. Actions to protect water features could include risks of direct disturbance or alteration to cultural resources through ground-disturbing activities, construction, fencing, increased access, visibility, and activity. In addition to these potential activities, guzzlers may also be installed. A case-by-case review would be required to determine the effect on cultural resources, if found to be present. It is anticipated that these actions would have minor to moderate effects to cultural resources.

Under Alternatives 2 through 4, it would be required on a case-by-case basis to determine whether adverse impacts to cultural resources could be the result of the implementation of the Nevada Department of Wildlife's Wildlife Action Plan, or whether other actions could potentially conflict with cultural resource management objectives, creating more than an anticipated minor to moderate effect.

4.2.11.4.5.2. Alternative 1

Maintain and improve new water developments for livestock and wild horses and burros to reduce conflicts with bighorn sheep and other wildlife, including improving springs and seeps in the following areas: Arrow Canyon, Elbow Ridge South Spring, Bird Spring Range, Gold Butte, Virgin Mountain, Muddy Mountains, Spring Range, Eldorado/Newberry Range, Last Chance Range, Bare Mountains, McCullough Range, Highland Range, and Crescent Peak. Where possible, water would be provided for wildlife at the source, and if new data indicates that improvements are needed in other areas, these types of activities would not be limited to the foregoing areas. These actions would require a case-by-case determination of impacts and could potentially have a moderate to major effect on cultural resources.

4.2.11.4.5.3. Alternative 2

Impacts are similar to those described under Impacts Common to All Alternatives, excluding the specific areas of Alternative 1. The protection of natural waters would be accomplished by providing a minimum buffer of one half mile for permitted activities, and protection of artificial waters would be accomplished by providing a minimum buffer of one quarter mile for permitted activities. Together these would have a greater positive impact on cultural resources than Alternative 1.

4.2.11.4.5.4. Alternative 3

Impacts are similar to those described under Impacts Common to All Alternatives, excluding the specific areas of Alternative 1. The protection of natural waters and associated riparian areas would be accomplished by providing a minimum buffer of one quarter mile for permitted activities, and impacts on artificial waters would be accomplished by providing a minimum buffer of one quarter mile for permitted activities on a case-by-case basis. This would protect cultural

resources and artificial and natural waters better than Alternative 1, but it would not have as many positive impacts as Alternative 2.

4.2.11.4.5.5. Alternative 4

Impacts are similar to those described in Alternative 1, excluding the specific areas of Alternative 1, and addresses the avoidance of BLM-authorized activities within one quarter mile of natural waters and associated riparian areas.

4.2.11.4.6. Special Status Species Impacts on Cultural Resources

4.2.11.4.6.1. Impacts Common to All Alternatives

Measures to protect special status fish, wildlife, and wildlife habitats include a variety of activities that may directly and indirectly reduce the potential for disturbance of cultural resources, vandalism, and unauthorized collecting through restrictions, closures, etc. These measures also could reduce visual interference and noise, preserving the setting of the cultural resources. However, some actions, such as the installation of bat gates, could affect the visual setting and access to caves that are culturally important or TCPs.

4.2.11.4.6.2. Alternative 1

The improvement of 400 acres of aquatic and riparian habitats on the Virgin River, Muddy River, and in Meadow Valley Wash by replacing tamarisk with native plant species could potentially have a major effect (an adverse effect) to NRHP-listed and/or eligible sites, depending the level of disturbance. Additional improvements on spring, wet meadow, and desert habitats in the Ash Meadow ACEC and other undertakings in the Moapa National Wildlife Refuge, which may affect groundwater levels or spring flows depending on the scope and level of proposed disturbance, could potentially have adverse effects to cultural resources. The management of the Desert Tortoise Conservation Center (DTCC) Management Area to support regional ecosystem research, and the expansion of the facilities within the DTCC Management Area, also would require, on a case-by-case basis, an evaluation of any cultural resources that may be present and an assessment of the impacts of these actions on cultural resources, which are expected to range from minor to major impacts.

4.2.11.4.6.3. Alternative 2

Impacts are similar to those identified under Impacts Common to All Alternatives except that under Alternative 2, the DTCC Management Area would become part of the Bird Spring ACEC and be managed for the conservation of the values of the ACEC as a whole, including the management and conservation of cultural resources.

4.2.11.4.6.4. Alternatives 3 and 4

Impacts are similar to those identified under Impacts Common to All Alternatives except that under Alternatives 3 and 4, the DTCC Management Area would remain under BLM administration until it is withdrawn. The disposal of lands to non-federal entities would permanently remove federal protections for all cultural resources present and would have an adverse impact to NRHP-listed and/or eligible properties. These effects could be mitigated

through data collection; e.g. research through excavation. Defining exclusion and avoidance areas could be another strategy that may reduce the potential for adverse effects to cultural resources. Similar to all realty actions where there has not been a previous review, this action would be subject to further Section 106 review under the BLM-Nevada SHPO Protocol Agreement to determine the presence of any historic properties and assess the impacts of the undertaking.

4.2.11.4.7. Wild Horse and Burro Impacts on Cultural Resources

4.2.11.4.7.1. Impacts Common to All Alternatives

Ongoing effects of wild horses and burros on cultural resources are similar to those for livestock grazing. Grazing and trampling reduces vegetative cover and disturbs the soil, which accelerates erosion and weathering. Cultural resources are directly impacted by the modification, displacement, and loss of artifacts, features, and middens. This results in the loss of valuable cultural resource information regarding site function, date of use, subsistence, past environments, and other research questions. Impacts can be intensified when animals are concentrated near water sources where cultural resources are likely to be present. Maintaining herd management areas could also affect cultural resources by concentrating impacts in defined areas while reducing impacts in other areas, such as the development and maintenance of dependable water sources. It will be necessary to perform, on a case-by-case basis, an evaluation to determine whether major (adverse effects) to cultural resources could be the result of the implementation of any the alternatives in relation to water development projects, as ground disturbance associated with grazing could have a direct effect on the physical integrity and setting of some cultural resources.

4.2.11.4.7.2. Alternatives 1 through 4

There are no additional impacts to cultural resources.

4.2.11.4.8. Cave and Karst Management Impacts on Cultural Resources

4.2.11.4.8.1. Impacts Common to All Alternatives

Caves and karsts are often the location of cultural resources and places that are important to Native Americans. Protecting caves and karsts is complementary to other cultural resource management goals if access for traditional uses is maintained and interpretation does not lead to use impacts from visitation or vandalism. Avoiding publicizing locations of caves such as Firebrand and Gypsum Cave could also protect cultural resources from vandalism and over-visitation and limit public interference with tribal uses.

4.2.11.4.8.2. Alternatives 1 through 4

There are no additional impacts to cultural resources.

4.2.11.4.9. Wildland Fire Management Impacts on Cultural Resources

4.2.11.4.9.1. Impacts Common to All Alternatives

Fire management decisions would primarily have direct and indirect effects that vary in kind over the short and long term. Prescribed burn treatments, including associated pre-burn vegetation treatments such as herbicides, and post-burn rehabilitation activities can have a negative impact on cultural resources by damaging or destroying combustible artifacts and features, damaging artifacts, features, rock art sites through surface disturbance, altering the provenience of artifacts through surface disturbance, and altering the accuracy of scientific tests (e.g., radiocarbon, obsidian hydration, and residue analysis). These direct effects are the same over both the short and long terms. Furthermore, there may be additional negative impacts (minor to moderate) to cultural resources in the short-term due to increased erosion, which can displace artifacts and reduce their research value. Increased visibility of archaeological sites also can result in increased looting, vandalism, or artifact collection, which reduces the scientific value of the resource. All prescribed fire and associated activities that may have the potential to adversely affect cultural resources are subject to review under Section 106 of the NHPA and the BLM-Nevada SHPO Protocol Agreement prior to implementation. Such review requires the identification of NRHP-listed and eligible cultural resources within the treatment area; evaluation of those resources for NRHP eligibility; development and agreement of mitigation measures to ameliorate potential moderate impacts; and consultation with the Nevada SHPO, affected stakeholders, and affected federally recognized tribes.

Overall, fires tend to have negative impacts on cultural resources, though they can involve limited positive effects. Reduction of surface cover through prescribed fire burns can have a positive effect on the knowledge of cultural resources within a given area by exposing previously unidentified cultural resource sites that were obscured by vegetation. The exposure of such sites allows for increased knowledge regarding the overall archaeological record within the planning area and more thorough identification of prehistoric and historic land-use patterns.

Under the current management situation, as well as Alternatives 2 through 4, wildland fires would be suppressed, which would reduce the potential for adverse effects to cultural resources. The risk to cultural resources is greatest because the locations of cultural resources are often unknown and cannot be avoided during the fire and fire suppression. Conversely, restrictions and minimum impact suppression tactics should be implemented to avoid or to reduce adverse impacts to known sensitive cultural resources. Also, avoiding the use of retardant over areas where rock art sites are known and the use of fire breaks to avoid and protect known cultural resources could also reduce long-term, irreversible damage to sensitive sites. Overall, the impacts on cultural resources are anticipated to range from minor to moderate, and if mitigation is needed, this will follow standard stipulations.

4.2.11.4.9.2. Alternative 1

Prescribed fires may occur on 163,482 acres in the Ash Meadows/Amargosa Flat area, the Virgin River floodplains, and the South McCullough Mountains (per the 1998 RMP), as well as prescribed burns for fuel reduction in the Spring Mountains. These may be allowed where there is an existing previous environmental documentation for each resource enhancement and fuels reduction area, including associated activities that may have the potential to adversely affect

cultural resources. All actions will continue to be subject to review under Section 106 of the NHPA and the BLM-Nevada SHPO Protocol Agreement prior to implementation.

4.2.11.4.9.3. Alternative 2

Impacts are similar to those described under Impacts Common to All Alternatives, except that under Alternative 2, desert tortoise habitat will be excluded. Under Alternatives 3 and 4, the impacts from prescribed fires for resource enhancement purposes will be evaluated on a case-by case basis, as for each of the alternatives. Resource protection to rock art sites specifically is recommended in areas identified for fuel reduction management, such as in Arrow Canyon, known for its high density of rock art sites important to the local tribes. Potential adverse effects of wildland fire to cultural resources also may continue to be avoided if cultural resource considerations are incorporated into fire management planning objectives, priorities, and actions. Also, fire suppression priority areas would be identified for ACECs and culturally sensitive areas.

Current management emphasizes full suppression of wildfires, which reduces the potential for impacts to cultural resources from wildland fire. Suppression, however, can include ground-disturbing activities that can directly impact cultural resources. Where there may be insufficient resources for full suppression of wildfires, the BLM could prioritize suppression, perhaps resulting in impacts on cultural resources that may have otherwise been avoided.

4.2.11.4.9.4. Alternatives 3 through 4

There are no additional impacts to cultural resources.

4.2.11.4.10. Cultural Resources Impacts on Cultural Resources

4.2.11.4.10.1. Impacts Common to All Alternatives

Cultural resource decisions under the various alternatives include releasing cultural resource sites designated for conservation as a prescribed management use; pursing management directions that address management for scientific/research values and uses; emphasizing provisions for public uses that include interpretation measures; establishing priorities for activity planning and determining best management “use” potentials of various types of sites; establishing direct site protection, such as use of surveillance equipment to monitor sensitive cultural areas and TCPs; and developing data-sharing agreements with affected federally recognized tribes.

Each of the action alternatives places a greater degree of proactive management actions carried out in accordance with Section 110 of NHPA. This emphasis on an identification of the various management prescriptions in relation to cultural resources will improve scientific and public uses of the cultural resources located within the planning area, as well identify potential areas where more meaningful mitigation might occur to resolve adverse impacts as a result of undertakings located elsewhere.

To release cultural resources allocated for “management for conservation for future use,” whether this would be for scientific or public uses, would first require the development of a Memorandum of Agreement with the Nevada SHPO and affected tribes. The Advisory Council on Historic Preservation should be invited to comment on the agreement, as this change in management direction could constitute an adverse effect. The Memorandum of Agreement also requires the

development of a historic treatment plan, which will detail the level of intensive documentation necessary to retrieve the information, including physical remains of the property, from any of the sites selected.

Sites that will continue to be managed for conservation include rock shelters, rock art, prehistoric and historic structural remains, mining sites, and historic roads/trails that are situated in areas that do not receive high, intensive recreational use. The level of impact from this management direction, however, could be subject to possible changes in land use, such as where legal, valid, and existing rights may create the need for future mitigation to resolve adverse effects to cultural resources resulting from surface-disturbing activities.

Archaeological and historical research projects would be consistent with scientific use allocations. Scientific research would contribute significantly to local and regional knowledge of human prehistory and history. Research would also allow for developing or furthering the goals of existing partnerships to train students and provide for volunteer-assisted research. The information gained through research projects would be useful, not only for scientists and students, but also for public education and interpretive planning.

Non-invasive methods of research and site documentation, such as surveying, mapping, photography, and remote sensing, would have little effect on cultural resources beyond a temporary increase in foot traffic and footprints. Scientific excavations would disturb cultural deposits and could disturb buried human remains and associated items. But, excavations provide important data as no other means can. To limit undue disturbances, the highest priority for research projects would be assigned to sites threatened by vandalism or other types of disturbance, as well as sites determined to be suitable for interpretive development. BLM would require proper research designs and permits in advance of all research projects of this nature.

Scientific uses (research) could conflict with traditional uses, and many Native Americans might object to research at sites that are not threatened by imminent damage. Before issuing a permit for surface-disturbing research, BLM will seek input from affected tribes concerning research designs and treatment plans. Tribes will be allowed to participate in research projects, which would benefit from their cultural perspectives. Other benefits could include enhanced knowledge of tribal history and the opportunity to include Native American perspectives in interpretive planning.

Sites selected for public uses will include rock shelters, rock art locales, prehistoric and historic structural remains, mining sites, and historic roads/trails, and will be sites located in areas projected to receive intensive recreational uses. The benefits that would be derived through public use, as well as greater support for the protection and responsible stewardship of these resources, would fulfill public education mandates under NHPA and ARPA. By continuing to establish partnerships with universities, museums, nonprofit archaeological and historic preservation organizations, government agencies, tribes, and community group opportunities for cost-sharing and public participation in monitoring, protection, research, and education would help increase the public's understanding of the multiple values and irreplaceable nature of cultural resources.

Under all alternatives, specific sites would be allocated to public use to allow visitors to enjoy, appreciate, and learn about cultural resources. Interpretive efforts would be coordinated with the recreation program staff, and, where suitable, with cultural heritage tourism programs managed by local communities and government agencies. Efforts would be made to develop public use opportunities at accessible sites near recreational facilities.

Public use of archaeological sites, however, entails potential problems and benefits. Prehistoric and historic sites hold great fascination for many people, and there is a high public demand for opportunities to visit and learn about these sites. Cultural heritage tourism is one of the fastest-growing sectors of the tourism industry. Opportunities to visit cultural sites allow people to enjoy these resources and to learn about prehistoric people, archaeology, history, Native American cultures, cultural values, scientific methods, and the interrelationships between people and the natural environments in which they lived. Public use also provides an excellent opportunity to convey a sense of common heritage with the shared responsibility of stewardship.

Sites that are developed and publicized for public use will undoubtedly be exposed to visitor-caused damage from surface disturbance and erosion, destabilization, other damage to structures and features, trash dumping, multiple trailing, and theft of artifacts. Additionally, visitors tend to alter the spatial distributions of artifacts by picking them up and depositing them into piles. Rock art could be damaged by climbing, touching, or applying foreign substances, including painted or pecked graffiti, or theft. The presence of responsible visitors, though, would likely discourage major incidents of vandalism or theft.

BLM would use site-selection criteria and protective measures to mitigate the impacts of public use. Most sites that are allocated to public use would be accessible sites that are already well known and visited by the public. Without BLM's authorization, many of these sites have been publicized in newspapers, magazines, books, and websites. Remote, undisturbed sites would not be allocated to public use. Sites with high traditional values to Native American tribes also would not be designated for interpretation. Sites considered for public use will be evaluated based on ease of access, projected future impacts that may result from recreational uses, current condition and need to remain in conservation status, ability of the area to withstand visitation, etc.

Site mapping and documentation would be implemented to obtain scientific data and the information needed to develop protective measures and interpretive plans. Documentation would also provide a baseline condition assessment for monitoring and managing changes resulting from visitor use over time. All public use sites would be systematically monitored to evaluate any changes resulting from visitation. Ongoing damage could lead to use restrictions, new protective measures, or suspension of the site's public use status.

Not all public use sites would be open to commercial tours. Applications for special recreation permits would be evaluated on a case by-case basis. Commercial tour operators would be required to adhere to site-specific stipulations, for example, that could restrict access to certain areas or limit the sizes of tour groups. They would be required to help monitor damage to the sites. In developing stipulations for commercial tours, BLM may consider adopting measures contained in the Sloan Canyon and Red Rock Canyon RMPs to manage tour operators to archaeological sites.

Physical and administrative measures will be implemented to protect cultural resources to stop, limit, or repair damage from vandalism, erosion, and other disturbances. Signs placed to inform the public about prohibitions under ARPA would help protect threatened sites by providing relevant information and alert visitors that sites are being monitored by BLM staff and volunteers (site stewards). Through the development of programs with BLM law enforcement, the use of surveillance equipment to monitor cultural resources should also be implemented in areas of high site sensitivity. If monitoring results indicate a need for further protection, the construction or installation of physical barriers may also be implemented, as appropriate.

4.2.11.4.10.2. Alternative 1

Throughout the planning area, the following site types are managed for information potential: roasting pits; campsites; artifact scatters, including historic trash scatters; and rock feature sites. These kinds of sites will be subject to data recovery efforts through research designs to attempt to mitigate adverse effects to cultural resources from proposed federal undertakings. Sites identified for study under Section 110 will use proactive research designs. The research designs may be initiated by BLM or independent researchers. All research will be subject to the approval of BLM and SHPO concurrence. Representative samples of each site type will be preserved for conservation purposes. In addition, the cultural resources on 1,500 acres of public lands in the Virgin River Anasazi prehistoric/archaeological district will be managed for data potential. While data recovery is an adverse effect to cultural resources, the effect of the management direction overall will be moderate; e.g. the direct impacts would be readily apparent and measurable but restricted to relatively small areas within the planning area.

The following sites would be managed for conservation potential: rock shelters, rock art locales, prehistoric and historic remains, mining sites, and historic roads/trails. The management of all these site types will be in areas that do not receive intensive recreational uses. This will include managing 11,759 acres of public lands for scientific uses and historic importance in various locations: Red Rock Spring, Stump Spring, Hidden Valley district, the Arden historic sites, the Crescent and Gold Butte mining town sites, and the South Virgin Peak Ridge district. The impacts from this management direction will be moderate, as direct effects would be readily apparent and measurable but constrained to relatively small areas within the planning area.

Manage 3,660 acres of public lands in the Arrow Canyon Rock Art District, Keyhole Canyon, Frenchman Mine, and Gypsum Cave for public values, which will include sociocultural, educational, and recreational uses. The effect of this management direction could be moderate; direct effects would be readily apparent and measurable but constrained to relatively small areas within the planning area. However, it should be noted that Gypsum Cave and Arrow Canyon are sites that possess strong traditional Native American values, and though localized, the effects would be major and require significant mitigation prior to implementation.

Manage cultural resources on approximately 200,000 acres of traditional lifeway areas for sociological values by providing for the protection and preservation of these areas. This would be accomplished by inviting Native American traditional cultural groups to share information with BLM concerning the sensitivity and location of traditional lifeway areas. Once identified, these areas would not be available for disposal. It is anticipated that the impact of this management direction could be moderate in scope, as improving, maintaining, and/or preserving cultural resource values in some areas may necessitate major mitigation measures.

4.2.11.4.10.3. Alternative 2

Manage the following sites for conservation potential: rock shelters, rock art locales, prehistoric and historic remains, mining sites, and historic roads/trails. The management of all these site types will be in areas that do not receive intensive recreational uses. Surface disturbance and other disruptive activities that would affect the character of these kinds of sites would not be allowed within 500 feet in any of the ACECs that possess cultural values. It is anticipated that the impact of this management direction could be moderate in scope, as improving, maintaining, and/or preserving cultural resource values in some areas may necessitate mitigation measures, as the

cultural resource management objectives may be in conflict with the management objectives of other resources.

Under Alternatives 2 through 4, the potential to affect cultural resources would preserve the high-value trace and viewshed of the Old Spanish Trail (OST), especially in the Mormon Mesa area. Exchange or disposal of lands and subsequent landscape changes would permanently remove federal protections for any NHT segments. Defining exclusion and avoidance areas reduces the potential for impacts to NHT segments, could affect the visual setting of the historic trails, and would be protective of trail resources and the trail setting. Impacts to cultural resources from all lands and realty actions would be subject to further review, though it is expected that designated NHT areas on Mormon Mesa would limit OHV use to existing roads, and some segments of the OST would be closed to OHV use. The impact of this management direction could be moderate in scope, as improving, maintaining, and/or preserving cultural resource values in some areas may necessitate major mitigation measures.

The following site types would be managed for scientific use: roasting pit, campsite, artifact scatter, rock feature, structural remains, rock art, and historic trash scatters. These sites would be subject to the following management directions:

- Mitigate via avoidance or data recovery adverse effects to cultural resources resulting from surface-disturbing activities.
- Meet BLM's responsibilities under NHPA as addressed in the BLM-Nevada SHPO Protocol Agreement and as addressed under BLM's National Programmatic Agreement.
- Study known cultural sites that are not expected to incur impacts from federal actions using proactive research deigns per Section 110 of NHPA.
- Research designs may be initiated by BLM or independent researchers subject to BLM approval and SHPO concurrence.
- Representative samples of each site type will also be preserved for conservation purposes.
- Manage the cultural resources on 1,500 acres of public lands in the Virgin River Anasazi prehistoric/archaeological district for scientific and historic information.

In sum, the impact from the management direction overall will be moderate; e.g. the direct effects would be readily apparent and measurable but restricted to relatively small areas within the planning area.

Manage cultural resources for public values to include sociocultural, educational, and recreational uses in Keyhole Canyon, Stuart Ranch, the Gold Butte townsite, Whitney Pocket, and along portions of NHTs that exist in the planning area. This will entail determining unevaluated portions of national historic trails in the planning area for NRHP eligibility and to avoid effects to trails as necessary. Where impacts may be unavoidable, BLM will develop historic treatment plans to resolve effects under appropriate memoranda, with SHPO concurrence and stakeholder involvement. It is anticipated that the impact from this management direction could be moderate in scope as improving, maintaining and/or preserving cultural resource values in some areas may necessitate mitigation measures.

4.2.11.4.10.4. Alternative 3

Manage the following sites for conservation potential: rock shelters, rock art locales, prehistoric and historic remains, mining sites, and historic roads/trails. The management of all these site types will be in areas that do not receive intensive recreational uses. Surface disturbance and other disruptive activities that would affect the character of these kinds of sites would not be allowed

within 100 feet in any of the ACECs that possess cultural values. It is anticipated that the impact from this management direction could be moderate in scope, as improving, maintaining, and/or preserving cultural resource values in some areas may necessitate mitigation measures, as the cultural resource management objectives may be in conflict with the management objectives of other resources. This alternative would provide less protection to cultural resources than Alternative 2.

4.2.11.4.10.5. Alternative 4

There are no additional impacts to cultural resources.

4.2.11.4.11. Paleontological Resources Impacts on Cultural Resources

4.2.11.4.11.1. Impacts Common to All Alternatives

Identification and protection measures for paleontological resources may also lead to the identification and protection of cultural resources. Scientific study of these resources may provide additional information on paleo-environments and other research questions relevant to the cultural resources in the planning area. There are no overt effects expected to occur under any of the proposed alternatives; all actions would require review on a case-by case basis.

4.2.11.4.11.2. Alternatives 1 through 4

There are no additional impacts to cultural resources.

4.2.11.4.12. Visual Resource Management Impacts on Cultural Resources

4.2.11.4.12.1. Impacts Common to All Alternatives

VRM Class I and II designations protect cultural resources where visual setting is a contributor to the significance of the property or the traditional use. Use of the visual resource contrast rating system during project planning could reduce the impact of visual intrusions to cultural resources, especially national historic trails. Visual intrusion on the setting of cultural resources must be considered in the Section 106 process and tribal consultation, regardless of VRM designation. Risk of impacts on cultural resources in VRM Class I areas could also be indirectly reduced where designations limit surface-disturbing activities in these areas.

4.2.11.4.12.2. Alternatives 1 through 3

There are no additional impacts to cultural resources.

4.2.11.4.12.3. Alternative 4

Shooting, camping, off-road races, designation of special recreation management areas, managing travel in Gold Butte, and extensive recreation management areas, as these relate to any of the potential impacts for all of the proposed alternatives, could range from moderate to high, as maintaining and/or preserving cultural resource values in some areas may necessitate land exclusions and/or more direct mitigation measures. Under Alternatives 2 through 4, where

off-road vehicles would cause considerable adverse effects to cultural resources, avoiding/closing the affected areas, or until mitigation measures may be implemented, would be a beneficial effect.

4.2.11.4.13. Lands with Wilderness Characteristics Impacts on Cultural Resources

4.2.11.4.13.1. Impacts Common to All Alternatives

Managing WSAs to maintain wilderness characteristics would restrict surface-disturbing activities and would indirectly reduce the potential for direct disturbance of cultural resources, alterations to visual and aural setting, and access leading to vandalism and unauthorized collecting. Culturally important species and areas that are culturally significant to tribes may be protected, but there may also be a loss of access to TCPs. If Congress releases the WSAs and they are not located within a designated ACEC, the risk of impacts on cultural resources from future surface-disturbing activities and other incompatible uses would increase. Effects are similar to those identified for all alternatives.

Within designated wilderness areas, prohibitions of motorized and mechanical use, as well as restrictions on development will continue to protect/preserve cultural resources. Mitigation, if required to maintain a no net loss, may include off-site mitigation to cultural resources. The development of wilderness plans, which will occur separate from lands and realty actions, should address the potential for moderate cultural resource mitigation, particularly where cultural resources may be removed.

In advance of any future management plans and undertakings that may affect cultural resources, areas that may be of concern to the tribes should be identified in addition to any consultations with the Nevada SHPO that may be necessary to resolve adverse effects to cultural resources.

4.2.11.4.13.2. Alternatives 1 through 4

There are no additional impacts to cultural resources.

4.2.11.5. Resource Uses

4.2.11.5.1. Forestry and Woodland Products Impacts on Cultural Resources

4.2.11.5.1.1. Impacts Common to All Alternatives

Forest vegetation treatment methods can impact cultural resources through ground disturbance, erosion, fire, changes in setting, increased access, visibility, and activity in the vicinity of cultural resources. A reduction of woodlands, as well as rehabilitation and reclamation activities to restore/revegetate, may adversely affect cultural resources that may be present. These impacts may consist of disturbing tangible cultural values considered important to Native Americans and other interested parties, such as pine nut gathering areas. As a result, in advance of any future woodland management plans and future undertakings that may constitute a major impact — that is, an adverse effect to areas of concern to tribes, in addition to consultation with the Nevada SHPO — the plans should identify areas that have not been documented as culturally important.

4.2.11.5.1.2. Alternative 1

There are no additional impacts to cultural resources.

4.2.11.5.1.3. Alternative 2

Additional actions and cooperative research efforts to advance woodland and vegetation management in the Mojave ecoregion, including monitoring vegetation changes that will contribute to regional information and updating best management practices and standard operating procedures, are not likely to adversely affect cultural resources (negligible to minor impacts), but where research may affect cultural resources, it should be developed consistent with other BLM field offices in the Mojave Region and the BLM-Nevada State Protocol Agreement.

4.2.11.5.1.4. Alternatives 3 through 4

There are no additional impacts to cultural resources.

4.2.11.5.2. Livestock Grazing Impacts on Cultural Resources

4.2.11.5.2.1. Impacts Common to All Alternatives

Livestock grazing is associated with ongoing impacts on cultural resources located on or near the ground surface. Improper grazing and trampling reduces vegetative cover and disturbs the soil, which accelerates erosion and weathering. Cultural resources are directly impacted by the modification, displacement, and loss of artifacts, features, and middens, resulting in loss of valuable cultural resource information regarding site function, date of use, subsistence, past environments, and other research questions. Trampling and grazing can also impact TCPs, traditional use areas, and culturally important plants from the actions of livestock. Since cultural resources are often associated with permanent and intermittent water sources, and these areas are attractive to livestock, impacts on cultural resources are most likely to occur in these areas. Animals also seek shade in rock shelters and can damage cultural resource sites that are often present at those locations. Actions under all alternatives to protect springs and wetland riparian areas from livestock grazing would help protect water features and sources that may be culturally important to tribes and reduce the risk of direct disturbance and erosion of any cultural resources present. Actions that improve rangeland health and allotment closures would reduce the potential impacts to cultural resources from direct disturbance, erosion, and wildland fire.

4.2.11.5.2.2. Alternative 1

Impacts would be similar to those identified for all alternatives, except that there would be less protection afforded to cultural resources due to the greater of number of allotments that would not be closed to livestock grazing; e.g. Hidden Valley, Mount Sterling, Lower Mormon Mesa, Roach Lake, White Basin, Wheeler Wash, Flat Top Mesa, and Jean Lake (a portion within the tortoise ACEC of the Jean Lake allotment would be closed). All disposal areas would be closed to livestock grazing.

In addition, under the 1998 RMP, livestock grazing and rangeland improvements would continue to affect potentially more than a thousand NRHP-listed or eligible sites. Effects would include trampling of sites by cattle, surface disturbance from vehicles used by permittees, and possible

destruction of sites from improvement construction. The integrity of archaeological districts in the Muddy Mountains and the McCullough Mountains could be compromised.

4.2.11.5.2.3. Alternative 2

All livestock grazing allotments in the planning area would be closed.

4.2.11.5.2.4. Alternative 3

The following allotments would be closed to livestock grazing: Roach Lake, White Basin, Mesa Cliff, Muddy River, Wheeler Wash, Arrow Canyon, Arrow Canyon in Battleship Wash, and Jean Lake. The following allotments would be available to livestock grazing: Hidden Valley, Lower Mormon Mesa, and Flat Top Mesa.

4.2.11.5.2.5. Alternative 4

The following allotments would be closed to livestock grazing: Roach Lake, White Basin, Mesa Cliff, Arrow Canyon in Battleship Wash, and Jean Lake. The following allotments would be available to livestock grazing: Hidden Valley, Lower Mormon Mesa, Flat Top Mesa, Muddy River, and Wheeler Wash.

It is anticipated that opening lands for development may create a moderate impact on cultural resources as the impacts may generally be located across the landscape.

4.2.11.5.3. Minerals Impacts on Cultural Resources

4.2.11.5.3.1. Fluid Leasable Minerals Impacts on Cultural Resources

4.2.11.5.3.1.1. Impacts Common to All Alternatives

Permitting mineral sales and locatable mining in the vicinity of unique geologic resources could impact the physical integrity and setting of Native American sacred sites and TCPs, the setting of national historic trails, and the setting and physical integrity of affected archaeological sites. Alternatives that provide lesser degrees of protection could lead to adverse effects to cultural resources.

Discretionary mineral exploration and development activities are subject to further cultural resource review at each stage of development either through the Section 106 process, mine regulations, or permitting stipulations. Non-discretionary mining notices are not federal undertakings, but 43 CFR 3809 specifically provides for the protection of cultural properties by prohibiting mining operators on claims of any size from knowingly disturbing or damaging them. However, mining notices must be reviewed within 15 days, and it may be difficult to determine the presence of resources in areas that have not been surveyed. Potential impacts that would be addressed include ground disturbance, erosion, intrusions to setting, access leading to unauthorized collection or vandalism, and interference with traditional cultural uses and access.

Restricting minerals activities that would affect NRHP-listed or eligible cultural sites or require additional mitigations would maintain protection for cultural resources. Mineral withdrawals for

preserving natural resources would provide additional indirect protection for cultural resources and TCPs from ground disturbance and setting alteration.

Provisions for concurrent and interim reclamation would reduce the amount of land disturbed at any one time, reducing the duration of alterations to setting and the potential for impacts due to erosion of cultural sites. Ongoing effects to cultural resources in the vicinity of existing mines and drilling locations would continue.

4.2.11.5.3.1.2. Alternative 1

Under the 1998 RMP, the encouragement of fluid, locatable, saleable, and non-energy leasable mineral development within the planning area would have the continued potential to affect thousands of NRHP-listed or eligible sites. The 1998 RMP cites that 7,500 eligible sites could be affected. Continuing effects could include total disturbance of properties during seismic testing and open pit mining, opening of previously inaccessible areas, and the direct and purposeful mining of historic sites.

Managing lands that would allow mineral exploration and development and have been released by Congress could have moderate effects to cultural resources, as these may be located throughout the planning area.

Allowing fluid mineral leases on 1,909,351 acres outside of disposal and administrative areas and ACECs could have moderate effects to cultural resources, as these may be located across the planning area. There would be a moderate effect from allowing fluid mineral leasing subject to no surface occupancy stipulations within areas having important cultural, geological, and riparian resources and on lands released from wilderness review.

4.2.11.5.3.1.3. Alternative 2

Allowing fluid mineral leases could have direct effects to cultural resources. On a case-by-case basis, the effects will have to be determined and could range from minor to moderate effects across the planning area.

4.2.11.5.3.1.4. Alternatives 3 through 4

There are no additional impacts to cultural resources.

4.2.11.5.3.2. Solid Leasable Minerals Impacts on Cultural Resources

4.2.11.5.3.2.1. Impacts Common to All Alternatives

The impacts from solid leasable minerals would be similar to those discussed in the Impacts Common to All Alternatives section of fluid leasable minerals section.

4.2.11.5.3.2.2. Alternative 1

Allowing solid mineral leasing on lands outside identified disposal and administrative areas and outside of ACECs may have a moderate effect on cultural resources as opening lands that were previously closed to development could create more applications for development.

4.2.11.5.3.2.3. Alternative 2

An estimated 1,182,976 acres would remain open for mining after withdrawal for military uses, industrial sites, ACECs (including WSAs), SRMAs, and power sites. In addition, the management of solid mineral leasing shown on Map 2.6.2.3 - 14, including opening 1,269,276 acres, and managing fluid mineral leases shown on Map 2.6.2.3 - 21 would have moderate effects to cultural resources.

4.2.11.5.3.2.4. Alternatives 3 and 4

All proposed management activities under Alternatives 3 and 4 have the potential to create moderate impacts on cultural resources and may require mitigation.

4.2.11.5.3.3. Locatable Minerals Impacts on Cultural Resources

4.2.11.5.3.3.1. Impacts Common to All Alternatives

Managing lands that have been released from withdrawal or special designation that would allow for mineral exploration and development could have moderate effects to cultural resources, as these may be located across the planning area.

Other impacts would be similar to those discussed above in the Impacts Common to All in the fluid leasable minerals section.

All actions will continue to be subject to review and under Section 106 of the NHPA and the BLM-Nevada SHPO Protocol Agreement prior to implementation.

4.2.11.5.3.3.2. Alternatives 1 through 4

There are no additional impacts to cultural resources.

4.2.11.5.3.4. Saleable Minerals Impacts on Cultural Resources

4.2.11.5.3.4.1. Impacts Common to All Alternatives

Impacts would be similar to those discussed above in the Impacts Common to All in the fluid leasable minerals section.

All actions will continue to be subject to review and under Section 106 of the NHPA and the BLM-Nevada SHPO Protocol Agreement prior to implementation.

4.2.11.5.3.4.2. Alternative 1

Allow saleable mineral disposal outside of the DTCC, Nellis Dunes SRMA, and riparian zones, with two exceptions: highway maintenance in desert tortoise management ACECs and for Government Wash Community Pit on the east edge of the Rainbow Gardens ACEC. The Gold Butte, Coyote Springs, Mormon Mesa, and Piute/Eldorado desert tortoise ACECs would remain open to the issuance of free-use permits within one half mile to either side of the state highway

and county roads. Under this alternative, mitigation of cultural resources may be required, causing a moderate effect.

Effects would be similar as those discussed above in the fluid mineral section concerning effects common to all alternatives.

4.2.11.5.3.4.3. Alternatives 2 through 4

Effects would be similar as those discussed above in the fluid mineral section concerning effects common to all alternatives.

4.2.11.5.4. Recreation Impacts on Cultural Resources

4.2.11.5.4.1. Impacts Common to All Alternatives

Recreational use and access can impact cultural resources through direct disturbance, altered surface water drainage, erosion, intrusions to setting, and access leading to unauthorized collection or vandalism. The potential for impacts to cultural resources increases as population and recreational use increases or is concentrated. The effect of repeated uses or visits over time increases the intensity of impacts due to natural processes. Interpretation and public education help to reduce the potential for impacts from widespread overuse. Updating the transportation plan and conducting site-specific NEPA analysis would require further review of the potential impacts to cultural resources, TCPs, and trail segments.

Restricting vehicle use to existing routes would reduce the risk of disturbing cultural resources located off travel routes and would reduce some impacts to setting. Enforcing travel routes is difficult, and unauthorized user-created trails would continue to occur, potentially impacting cultural resources. Closure of areas to OHV use provides the most protection for cultural resources, if access for cultural purposes can be maintained.

All alternatives include the following measures designed to avoid impacting cultural resources:

- Maintaining and enhancing interpretive programs for cultural sites.
- Pursuing partnerships and agency coordination for interpretive sites.
- Ensuring that construction is compatible with landscape settings.
- Minimizing adverse effects on cultural resources through use closures, restrictions, and permit stipulations.
- Mitigation measures, including the development of off-site mitigation plans.

Notably shooting, camping, off-road races, designation of SRMAs, managing travel in Gold Butte, and ERMAs, as these relate to any of the potential effects for all of the proposed alternatives, could range from moderate to high, as maintaining and/or preservation cultural resource values in some areas may necessitate land exclusions and/or more direct mitigation measures. Under Alternatives 2 through 4, where off-road vehicles will cause considerable adverse impacts to cultural resources, avoiding/closing the affected areas, or until mitigation measures may be implemented, would have a beneficial effect.

4.2.11.5.4.2. Alternatives 1 through 4

There are no additional impacts to cultural resources.

4.2.11.5.5. Travel and Transportation Impacts on Cultural Resources

4.2.11.5.5.1. Impacts Common to All Alternatives

Avoiding duplication of roads that have common destinations would reduce the risk of impacts to cultural resources from ground disturbance and access leading to unauthorized collection or vandalism. Road maintenance such as plowing can disturb the physical integrity of cultural resources in road corridors where inventories are incomplete. However, maintenance can also prevent erosion and braiding and other processes that may threaten the integrity of cultural resources on or near roads. Roads can alter the visual setting of cultural resources, but they can also facilitate access to any TCPs present for cultural uses. Impacts from OHV travel designations are discussed under Recreation management above; however, under Alternatives 2 through 4, where off-road vehicles will cause considerable adverse impacts to cultural resources, specifically closing the affected areas or avoiding affected areas until mitigation measures may be implemented would have a beneficial impact.

4.2.11.5.5.2. Alternatives 1 through 4

Within the areas identified as limited to designated routes, impacts to cultural resources as previously discussed would continue to occur. The extent and occurrence of these impacts would be restricted to those resources that directly intersect a route or are within close enough proximity whereby ease of access would increase the potential for adverse impacts e.g., within the stopping, parking and camping distance or from dispersed public use/looting. Until route designations have been completed through implementation-level planning, it is unknown which routes will be designated; therefore these impacts cannot currently be quantified and would be addressed as part of the analysis supporting the implementation plan.

4.2.11.5.6. Lands and Realty Impacts on Cultural Resources

All alternatives include provisions to retain and acquire lands that contain significant cultural resources, to maintain access to resources, and to reduce unauthorized uses. The acquisition of new land and the management of disposal areas could provide long-term federal protection to cultural resources included in areas revised for ACECs and for other uses. Except as cited in the 1998 RMP, designated ROW avoidance areas could potentially have a beneficial impact to cultural resources, particularly on caves of high cultural importance and sensitive cultural corridors. A case-by-case review would be required to determine the effect to cultural resources under all of the proposed alternatives. It is anticipated that these actions could have minor to high effects on cultural resources. It is expected that mitigation of adverse effects to cultural resources may be mitigated through data recovery and documentation. Off-site research may be implemented to mitigate adverse impacts once areas of high research value may be identified, particularly where the visual or indirect effects to a specific area may not be directly mitigated. All National Historic Trails segments would be retained in compliance with Section 203(a) of FLPMA.

Exchanges, disposals, and subsequent landscape changes could also result in impacts to the setting of cultural resources. Defining exclusion and avoidance areas reduces the potential for impacts on cultural resources resulting from discretionary actions at those locations.

4.2.11.5.6.1. Land Tenure (Disposals and Acquisitions) Impacts on Cultural Resources

4.2.11.5.6.1.1. Impacts Common to All Alternatives

All actions will continue to be subject to review and under Section 106 of the NHPA and the BLM-Nevada SHPO Protocol Agreement prior to implementation.

Impacts would be similar as those discussed above concerning effects common to all lands and realty alternatives and may range from minor to major.

4.2.11.5.6.1.2. Alternatives 1 through 4

There are no additional impacts to cultural resources.

4.2.11.5.6.2. Land-Use Authorizations (Right-of-Ways, Leases, Permits) Impacts on Cultural Resources

4.2.11.5.6.2.1. Impacts Common to All Alternatives

All actions will continue to be subject to review and under Section 106 of the NHPA and the BLM-Nevada SHPO Protocol Agreement prior to implementation.

Impacts would be similar to those discussed above concerning effects common to all lands and realty alternatives.

4.2.11.5.6.2.2. Alternatives 1 through 4

There are no additional impacts to cultural resources.

4.2.11.5.6.3. Renewable Energy Impacts on Cultural Resources

4.2.11.5.6.3.1. Impacts Common to All Alternatives

Under all of the proposed alternatives, renewable energy exploration and development such as solar and wind would be subject to further cultural resource review at each stage of development. In conformance with the BLM-Nevada SHPO Protocol Agreement, the BLM would meet its Section 106 responsibilities, and similar to all actions that may adversely affect areas important to the tribes, BLM will coordinate/consult with tribal governments and other tribal entities to identify potential impacts that might occur as a result of ground-disturbing activities, erosion, intrusions to setting, and access. A major consideration would be the siting of wind energy facilities, which could affect the visual setting of TCPs, historic trails, and other cultural resources.

On a case-by-case basis, all permits would be subject to stipulations, restrictions, and mitigation measures, which would reduce the potential for adverse impacts to cultural resources and TCPs. Increasing exclusion and avoidance zones from current levels would minimize potential impacts to cultural resources. Overall, it is anticipated that the impacts from these actions will range from moderate to major.

4.2.11.5.6.3.2. Alternatives 1 through 4

There are no additional impacts to cultural resources.

4.2.11.5.6.4. Utility Corridors Impacts on Cultural Resources

4.2.11.5.6.4.1. Impacts Common to All Alternatives

All actions will continue to be subject to review and under Section 106 of the NHPA and the BLM-Nevada SHPO Protocol Agreement prior to implementation.

Impacts would be similar to those discussed above concerning effects common to all renewable energy and lands and realty alternatives.

4.2.11.5.6.4.2. Alternatives 1 through 4

There are no additional impacts to cultural resources.

4.2.11.6. Special Designations

4.2.11.6.1. Areas of Critical Environmental Concern Impacts on Cultural Resources

4.2.11.6.1.1. Impacts Common to All Alternatives

Managing lands as ACECs could directly or indirectly provide long-term protection of cultural resources by restricting incompatible uses. Protecting cultural and natural resource values in ACECs would also decrease the risk of impacts on identified or unidentified cultural resources present. Under all of the alternatives, the risk of impacts to cultural resources would be reduced in these areas by restricting other actions. By designating additional ACECs, there would be fewer risks of impacts on cultural resources within designated lands from ground-disturbing activities, erosion, intrusions to setting, and access that would lead to unauthorized collection or vandalism. The creation of the Spirit Mountain ACEC would provide additional protection for a recognized location important for contemporary Native American traditional and religious uses.

4.2.11.6.1.2. Alternatives 1 through 4

There are no additional impacts to cultural resources.

4.2.11.6.2. National Trails Impacts on Cultural Resources

4.2.11.6.2.1. Impacts Common to All Alternatives

Impacts from national trails are discussed in the Cultural Resources section.

4.2.11.6.2.2. Alternatives 1 through 4

There are no additional impacts to cultural resources.

4.2.11.6.3. Wild and Scenic Rivers Impacts on Cultural Resources

4.2.11.6.3.1. Impacts Common to All Alternatives

The designation of seven segments of rivers to be managed as wild and scenic rivers, through improvements to maintain and/or preserve resource values, could have minor to moderate effects to cultural resources. The restriction of incompatible uses along the eligible segments would also contribute to protection/preservation of cultural resources. A case-by-case review would be required to determine the effect on cultural resources under all of the proposed alternatives and the level of mitigation, including avoidance, that might be necessary.

4.2.11.6.3.2. Alternatives 1 through 4

There are no additional impacts to cultural resources.

4.2.11.6.4. Wilderness Impacts on Cultural Resources

4.2.11.6.4.1. Impacts Common to All Alternatives

Managing to protect wilderness characteristics would further restrict surface-disturbing activities and would reduce the potential for direct disturbance of cultural resources. Managing to maintain wilderness characteristics and priority habitats would also reduce the potential for indirect impacts on the visual and aural setting of cultural resources and would reduce the potential for impacts due to public access from overuse, vandalism, and unauthorized collecting. Culturally important species and areas that are culturally significant to tribes may be protected.

4.2.11.6.4.2. Alternatives 1 through 4

There are no additional impacts to cultural resources.

4.2.11.6.5. Wilderness Study Areas Impacts on Cultural Resources

4.2.11.6.5.1. Impacts Common to All Alternatives

If Congress releases the wilderness study areas and they are not located within a designated ACEC, the risk of impacts on cultural resources from future surface-disturbing activities and other incompatible uses might increase.

4.2.11.6.5.2. Alternatives 1 through 4

There are no additional impacts to cultural resources.

4.2.11.7. Cumulative Impacts on Cultural Resources

4.2.11.7.1. Past and Present Actions/Impacts

There are not any impacts expected to occur under any of the alternatives that relate to the past. Present and future actions would be considered on a case-by-case basis.

4.2.11.7.2. Reasonable Foreseeable Actions

As the population continues to grow, there will be increased pressure on the preservation of cultural resources. Any reasonably foreseeable impacts will be addressed through action-specific future environmental documents.

4.2.11.7.3. Cumulative Impact

4.2.11.7.3.1. Impacts Common to All Alternatives

All alternatives include some level of development, recreation, and the potential affect to significant cultural resources.

4.2.11.7.3.2. Alternative 1

Alternative 1 would have the least amount of acres with protective land-use designations such as ACECs and lands with wilderness characteristics. It would have the most or second most acres combined that are designated for disposal or open for solar and wind, minerals, grazing, and OHV use. Over time, it is expected that there would be more unmitigated cumulative impacts to cultural resources compared to other alternatives.

4.2.11.7.3.3. Alternative 2

Increased regulation and increased protection of other resources would result in less area subject to surface-disturbing activities and activities that result in increasing potential for erosion. These changes would result in less general damage to cultural resources and increased protection of identified resources. Cultural resources in existing wilderness areas would continue to be at low risk of inadvertent damage since these areas are closed to roads. Similarly, in areas that are rarely visited, impacts to cultural resources are expected to be minimal. Throughout the planning area, the potential for such impacts is normally considered low.

Alternative 2 would designate the most acres with protective land-use designations such as ACECs and lands with wilderness characteristics. It would have the least number of acres combined that are designated for disposal or open for solar and wind, minerals, grazing, and OHV use. Over time, it is expected that there would be less unmitigated cumulative impacts to cultural resources under Alternative 2 compared to other alternatives.

4.2.11.7.3.4. Alternative 3

Alternative 3 would have similar management directions for cultural resources as Alternative 2. It would designate two fewer ACECs, and other ACECs would be smaller than under Alternative

2. Fewer acres would be designated as lands with wilderness characteristics compared to Alternative 2. In addition, it would have more acres combined that are designated for disposal or open for solar and wind, minerals, grazing, and OHV use compared to Alternative 2. Over time, it is expected that there would be more unmitigated cumulative impacts to cultural resources compared to Alternative 2 but less than in Alternatives 1 and 4.

4.2.11.7.3.5. Alternative 4

Alternative 4 would designate four additional ACECs and some acres as lands with wilderness characteristics and thus would have more acres set aside for cultural resource protection compared to Alternative 1 but less than Alternatives 2 and 3. It would have the most or second most acres combined that are designated for disposal or open for solar and wind, minerals, grazing, and OHV use. Thus, over time, it is expected that there would be more unmitigated cumulative impacts to cultural resources compared to Alternatives 2 and 3.

4.2.12. Paleontological Resources

4.2.12.1. Summary

Effects to paleontological resources include impacts to resources such as petrified wood and fossils. BLM manages paleontological resources for scientific, educational, and recreational values and to ensure that impacts are mitigated. Effects to paleontological resources occur by erosion, OHVs, excavation, theft, vandalism, and surface-disturbing activities, such as trampling by animals and humans. Experience has shown that impacts to paleontological resources often increase due to high visitation and that damage, theft, and vandalism are usually concentrated near roads and trails.

The assessment of effects to paleontological resources is addressed under FLPMA, NEPA, and federal regulations. Pursuant to FLPMA, the BLM has regulations that provide additional protection that prohibit the removal of any scientific resource or natural object without authorization. There are exceptions to this prohibition for small quantities of common invertebrate fossils and petrified wood. Though the planning area has not been systematically surveyed for paleontological resources, the potential for paleontological resources does exist, albeit normally low, and these resources could be affected by surface disturbance.

4.2.12.2. Methods of Analysis

The following assumptions and management practices for paleontological resources were considered in relation to the following:

- The greatest potential for impacts could result from actions that include direct large-scale disturbance of bedrock, weathered bedrock, or unconsolidated alluvial deposits that may include fossils of more recent geologic age.
- All authorized surface-disturbing activities include assessment of paleontological resources in the planning area and sufficient mitigation to reduce impacts on those resources.
- Documentation and potential excavation could allow research and interpretive uses.
- While paleontological resources are often discovered through exposure by erosion, exposed fossils or scientifically important paleontological resources can be damaged by wind and water erosion. Other sources of damage include animal and human intrusion, natural deterioration, and development and maintenance activities.
- Increased access associated with new development and increased recreation use may lead to increased access to paleontological sites.
- Vandalism and unauthorized collecting can destroy a feature or remove it from its context and availability for scientific study.

As additional surveys are completed, more resource sites in the planning area will be identified and evaluated. Knowledge of these resources will aid in the protection from inadvertent impacts, add to the understanding of paleontological resources, and could increase the BLM's responsibility for site protection, monitoring, excavation, and interpretation.

Public education increases public appreciation and awareness of the need for protection, but publication of specific locations may lead to increased visitation.

4.2.12.3. Qualitative Intensity Scale

Based on knowledge of the resource base of the planning area and the potential level of impacts (or risk of impacts) to paleontological resources that may be associated with the plan objectives and management actions, effects will be assessed on a case-by-case project-specific basis. This analysis of the alternatives is based on the best professional judgment of the preparers and conforms to the qualitative intensity scale used throughout this document; e.g. negligible (no known impacts), minor and moderate (the potential for both positive and negative effects exist, though it would extend mainly throughout the project area), and major (adverse effects).

4.2.12.4. Resources

4.2.12.4.1. Air Quality Impacts on Paleontological Resources

4.2.12.4.1.1. Impacts Common to All Alternatives

It is anticipated that few minor to moderate impacts to paleontological resources may result from air quality objectives or actions under any of the alternatives. All of the alternatives include general provisions to reduce and control airborne particulates and emissions. The effects of all of the alternatives on paleontological resources are similar, and activities authorized on BLM-administered lands will incorporate best management practices to reduce effects, as appropriate, to this resource.

4.2.12.4.1.2. Alternatives 1 through 4

There are no additional impacts to paleontological resources.

4.2.12.4.2. Soil Resources Impacts on Paleontological Resources

4.2.12.4.2.1. Impacts Common to All Alternatives

Because many paleontological sites are situated on or just below the ground surface, they are susceptible to damage and destruction from ground disturbance and erosion. Measures under all of the alternatives limiting soil erosion and managing ground-disturbing activities will help protect paleontological resources. In general, the protection of paleontological resources from soil erosion, compaction, and ground-disturbing activities and reducing erosion to paleontological sites would be a benefit, which would have a positive effect on known paleontological sites.

Although it is anticipated that the effects will range from minor to moderate, but will be short in terms of duration, Alternatives 2 through 4 will require the highest level of stipulations and mitigations for soil-disturbing activities and erosion controls, which may decrease the risk of impacts to paleontological resources.

4.2.12.4.2.2. Alternatives 1 through 4

There are no additional impacts to paleontological resources.

4.2.12.4.3. Water Resources Impacts on Paleontological Resources

4.2.12.4.3.1. Impacts Common to All Alternatives

Actions to develop wells, acquire water sources, and modify springs include risks of disturbance to paleontological resources through ground-disturbing activities, changes in access, visibility, and setting of water features, as well as changes to the water features themselves. Current management prescriptions to improve soil stability, increase vegetation, and reduce erosion could potentially have a beneficial effect on paleontological resources.

4.2.12.4.3.2. Alternatives 1 through 4

There are no additional impacts to paleontological resources.

4.2.12.4.4. Integrated Vegetation Impacts on Paleontological Resources

4.2.12.4.4.1. Vegetation Impacts on Paleontological Resources

4.2.12.4.4.1.1. Impacts Common to All Alternatives

Forest vegetation treatment methods could impact paleontological resources through ground disturbance, erosion, fire, changes in setting, increased access, visibility, and activity in the vicinity of paleontological resources. These effects may consist of disturbing tangible paleontological remains of high scientific value and should not be undertaken in areas that are known to contain paleontological resources without first documenting these areas.

4.2.12.4.4.1.2. Alternatives 1 through 4

There are no additional impacts to paleontological resources.

4.2.12.4.4.2. Riparian Areas and Wetlands Impacts on Paleontological Resources

4.2.12.4.4.2.1. Impacts Common to All Alternatives

No major effects are anticipated due to riparian and wetlands management.

4.2.12.4.4.2.2. Alternative 1

Not allowing competitive off-road vehicle events within one-quarter mile of natural water sources and associated riparian areas could have a positive effect on paleontological resources. In addition, it is anticipated that there could be a reduction in soil erosion, which could aid in the protection of paleontological sites.

4.2.12.4.4.2.3. Alternative 2

If mitigation activities occur, these actions could affect paleontological resources as a result of ground-disturbing activities. Setting goals and implementing best management practices could

provide long-term protection to paleontological resources by reducing the potential for erosion. It is anticipated that mitigation actions would have minor effects to paleontological resources.

4.2.12.4.4.2.4. Alternative 3

Effects under Alternative 3 would be similar to Alternative 2.

4.2.12.4.4.2.5. Alternative 4

Alternative 4 has the greatest potential for impacting paleontological resources due to construction of structures, alternative water developments, exclusion fencing, and changes to physical environment. Impacts on paleontological resources will be determined on a case-by-case basis and could potentially range from minor to moderate effects.

4.2.12.4.4.3. Weeds Impacts on Paleontological Resources

4.2.12.4.4.3.1. Impacts Common to All Alternatives

Treating weeds may indirectly reduce the risk from wildland fire and suppression and reduce erosion. However, the use of integrated weed management techniques to control and eradicate tamarisk, including burning, chemical, biological, or mechanical treatments, may have impacts on paleontological resources. The mitigation of negative effects may require avoidance or following project-specific stipulations that will ensure a minimization of harm to paleontological resources.

4.2.12.4.4.3.2. Alternatives 1 through 4

There are no additional impacts to paleontological resources.

4.2.12.4.4.4. Forests and Woodlands Impacts on Paleontological Resources

4.2.12.4.4.4.1. Impacts Common to All Alternatives

Forest vegetation treatment methods could impact paleontological resources through ground disturbance, erosion, fire, changes in setting, increased access, visibility, and activity in the vicinity of paleontological resources. These impacts may consist of disturbing tangible paleontological remains of high scientific value and should not be undertaken in areas that are known to contain paleontological resources without first documenting these areas. Mitigation measures should be implemented where appropriate and necessary.

4.2.12.4.4.4.2. Alternatives 1 through 4

There are no additional impacts to paleontological resources.

4.2.12.4.5. Fish and Wildlife Impacts on Paleontological Resources

4.2.12.4.5.1. Impacts Common to All Alternatives

Actions to protect water features could include risks of direct disturbance or alteration to paleontological resources through ground-disturbing activities, construction, fencing, increased access, visibility, and activity. A case-by-case review will be required to determine the effects to paleontological resources if they are present. It is anticipated that actions considered under any of the alternatives could have negligible to moderate effects.

Impacts are similar to those described above, excluding the specific areas of Alternative 1, and the protection of natural waters would be accomplished by providing a minimum buffer of one-half mile for permitted activities, and protection of artificial waters would be accomplished by providing a minimum buffer of one-quarter mile for permitted activities. Together these would have a more positive effect on paleontological resources than Alternative 1. Also, under Alternatives 2 through 4, it would be required on a case-by-case basis to determine whether adverse effects to paleontological resources could be the result of the implementation of the Nevada Department of Wildlife's Wildlife Action Plan or that other actions could potentially conflict with paleontological resource management objectives, creating more than an anticipated minor to moderate effect.

4.2.12.4.5.2. Alternatives 1 through 4

There are no additional impacts to paleontological resources.

4.2.12.4.6. Special Status Species Impacts on Paleontological Resources

4.2.12.4.6.1. Impacts Common to All Alternatives

Measures to protect special status fish, wildlife, and wildlife habitats include a variety of activities that may directly and indirectly produce the potential for disturbance of paleontological resources, vandalism, and unauthorized collecting through restrictions, closures, etc. These actions could include disturbance or alteration to paleontological resources through ground-disturbing activities, construction, fencing, increased access, visibility, and activity. A case-by-case review will be required to determine the effects to paleontological resources, if found to be present. It is anticipated that actions considered under any of the alternatives could have negligible to moderate effects.

4.2.12.4.6.2. Alternatives 1 through 4

There are no additional impacts to paleontological resources.

4.2.12.4.7. Wild Horse and Burro Impacts on Paleontological Resources

4.2.12.4.7.1. Impacts Common to All Alternatives

Impacts from wild horses and burros on paleontological resources are similar to those for livestock grazing. Grazing and trampling reduce vegetative cover and disturb the soil, which accelerates

erosion and weathering. It will be necessary to perform, on a case-by-case basis, an evaluation to determine whether impacts to paleontological resources could be the result of the implementation of any the alternatives in relation to water development projects, including ground-disturbance actions that could have a direct effect on paleontological resources.

4.2.12.4.7.2. Alternatives 1 through 4

There are no additional impacts to paleontological resources.

4.2.12.4.8. Cave and Karst Management Impacts on Paleontological Resources

4.2.12.4.8.1. Impacts Common to All Alternatives

Caves and karsts are often the location of paleontological resources. Protecting caves and karsts is complementary to other resource management goals, such as biological and cultural. Not publicizing locations of caves that contain paleontological resources would be one strategy to protect paleontological resources from vandalism and limit visitation.

4.2.12.4.8.2. Alternatives 1 through 4

There are no additional impacts to paleontological resources.

4.2.12.4.9. Wildland Fire Management Impacts on Paleontological Resources

4.2.12.4.9.1. Impacts Common to All Alternatives

Prescribed burns, including associated pre-burn vegetation treatments and post-burn rehabilitation activities, could have a negative impact (minor to moderate) on paleontological resources through the use of heavy equipment and mechanical thinning of trees and ground cover, which could increase erosion. Increased visibility also could result in increased vandalism or unauthorized collection, which reduces the scientific value of the resource. All prescribed fire and associated activities that may have the potential to adversely affect paleontological resources will be subject to review on a case-by-case basis.

4.2.12.4.9.2. Alternatives 1 through 4

There are no additional impacts to paleontological resources.

4.2.12.4.10. Cultural Resources Impacts on Paleontological Resources

4.2.12.4.10.1. Impacts Common to All Alternatives

Actions taken to protect cultural resources would likely help preserve paleontological sites because this resource also may be present below the surface. Where public access is developed to cultural sites, unknown paleontological resources could be inadvertently unearthed or otherwise disturbed by earth-moving activities. Thus, identification and protection measures for paleontological resources may also lead to the identification and protection of cultural resources and vice versa.

While the scientific study of both resources potentially can provide additional information concerning paleo-environments and other research questions relevant to the prehistory of the planning area, it is expected that there will not be any adverse effects to paleontological resources under any of the proposed alternatives. All actions would require review on a case-by case basis.

4.2.12.4.10.2. Alternatives 1 through 4

There are no additional impacts to paleontological resources.

4.2.12.4.11. Paleontological Resources Impacts on Paleontological Resources

4.2.12.4.11.1. Impacts Common to All Alternatives

Scientific research would contribute significantly to local and regional knowledge of prehistory and paleontology. Research would allow for the development of goals that potentially could strengthen partnerships, as well as train students and provide for volunteer-assisted research. The information gained through research projects would be useful, not only for scientists and students, but also for public education and interpretive planning. Lastly, scientific research will further the mandates of PRPA by allowing the BLM to manage paleontological resources using scientific principles and expertise.

4.2.12.4.11.2. Alternatives 1 through 4

There are no additional impacts to paleontological resources.

4.2.12.4.12. Visual Resource Management Impacts on Paleontological Resources

4.2.12.4.12.1. Impacts Common to All Alternatives

There are no impacts common to all alternatives.

4.2.12.4.12.2. Alternatives 1 through 4

There are no additional impacts to paleontological resources.

4.2.12.4.13. Lands with Wilderness Characteristics Impacts on Paleontological Resources

4.2.12.4.13.1. Impacts Common to All Alternatives

Managing wilderness study areas (WSAs) to maintain wilderness characteristics would restrict surface-disturbing activities and would indirectly reduce the potential for direct disturbance of paleontological resources. If Congress releases the WSAs and these are not located within a designated ACEC, the risk of impacts on paleontological resources from future surface-disturbing activities and other incompatible uses could increase. A case-by-case review would be required to determine the impacts to paleontological resources under all of the proposed alternatives and

the level of mitigation, including avoidance, that might be necessary. It is anticipated that the impacts from any management actions could range from negligible to moderate. Prohibitions on motorized and mechanical use, including restrictions on development, in designated wilderness areas restrictions will continue to protect/preserve paleontological resources.

4.2.12.4.13.2. Alternatives 1 through 4

There are no additional impacts to paleontological resources.

4.2.12.5. Resource Uses

4.2.12.5.1. Forestry and Woodland Products Impacts on Paleontological Resources

4.2.12.5.1.1. Impacts Common to All Alternatives

Forest vegetation treatment methods could impact paleontological resources through ground disturbance, erosion, fire, changes in setting, increased access, visibility, and activity in the vicinity of paleontological resources. These effects may consist of disturbing tangible paleontological remains of high scientific value and should not be undertaken in areas that are known to contain paleontological resources without first documenting these areas and implementing mitigation measures where appropriate and necessary.

4.2.12.5.1.2. Alternatives 1 through 4

There are no additional impacts to paleontological resources.

4.2.12.5.2. Livestock Grazing Impacts on Paleontological Resources

4.2.12.5.2.1. Impacts Common to All Alternatives

Livestock grazing can lead to impacts on paleontological resources located on or near the ground surface. Grazing and trampling reduces vegetative cover and disturbs the soil, which accelerates erosion and weathering. Actions that improve rangeland health and allotment closures would reduce the potential impacts to paleontological resources from direct disturbance and erosion. However, it also is anticipated that opening lands for development may create a minor to moderate effect to paleontological resources, as the impacts may be generally located across the landscape.

4.2.12.5.2.2. Alternative 1

Impacts would be similar to those identified for all alternatives, except that less protection may be afforded to undocumented paleontological resources due to the greater number of allotments that would not be closed to livestock grazing; e.g. Hidden Valley, Mount Sterling, Lower Mormon Mesa, Roach Lake, White Basin, Wheeler Wash, Flat Top Mesa, and Jean Lake (note that a portion within the tortoise ACEC of the Jean Lake allotment would be closed).

4.2.12.5.2.3. Alternatives 2 through 4

There are no additional impacts to paleontological resources.

4.2.12.5.3. Minerals Impacts on Paleontological Resources

4.2.12.5.3.1. Fluid Leasable Minerals Impacts on Paleontological Resources

4.2.12.5.3.1.1. Impacts Common to All Alternatives

Permitting mineral sales and mining in the vicinity of unique geologic resources could lead to adverse impacts to paleontological resources. Discretionary mineral exploration and development activities would be subject to paleontological resource review through the NEPA process, mine regulations, or permitting stipulations.

However, non-discretionary mining notices are not federal undertakings. But, 43 CFR 3809 specifically provides for the protection of paleontological properties by prohibiting mining operators on claims of any size from knowingly disturbing or damaging them. Mining notices must be reviewed within 15 days, and it may be difficult to determine the presence of resources in areas that have not been surveyed. Potential impacts that would be addressed include ground disturbance, erosion, and unauthorized collection or vandalism.

Allowing fluid mineral leases could have direct impacts on paleontological resources. The impacts will have to be determined on a case-by-case basis and could range from minor to moderate.

4.2.12.5.3.1.2. Alternatives 1 through 4

There are no additional impacts to paleontological resources.

4.2.12.5.3.2. Solid Leasable Minerals Impacts on Paleontological Resources

4.2.12.5.3.2.1. Impacts Common to All Alternatives

Impacts would be similar to fluid leasable minerals.

4.2.12.5.3.2.2. Alternatives 1 through 4

There are no additional impacts to paleontological resources.

4.2.12.5.3.3. Locatable Minerals Impacts on Paleontological Resources

4.2.12.5.3.3.1. Impacts Common to All Alternatives

Permitting mineral sales and locatable mining in the vicinity of unique geologic resources could lead to adverse impacts to paleontological resources. Discretionary mineral exploration and development activities would be subject to paleontological resource review through the NEPA process, mine regulations, or permitting stipulations. The effects will have to be determined on a case-by-case basis and could range from minor to moderate.

4.2.12.5.3.3.2. Alternatives 1 through 4

There are no additional impacts to paleontological resources.

4.2.12.5.3.4. Saleable Minerals Impacts on Paleontological Resources

4.2.12.5.3.4.1. Impacts Common to All Alternatives

Permitting mineral sales and locatable mining in the vicinity of unique geologic resources could lead to adverse impacts to paleontological resources. Discretionary mineral exploration and development activities would be subject to paleontological resource review through the NEPA process, mine regulations, or permitting stipulations. The effects will have to be determined on a case-by-case basis and could range from minor to moderate.

4.2.12.5.3.4.2. Alternatives 1 through 4

There are no additional impacts to paleontological resources.

4.2.12.5.4. Recreation Impacts on Paleontological Resources

4.2.12.5.4.1. Impacts Common to All Alternatives

Recreational use and access can impact paleontological resources through direct disturbance, erosion, and access leading to unauthorized collection or vandalism. The potential for impacts to paleontological resources increases as population and recreational use increases. Restricting vehicle use to existing routes would reduce the risk of disturbing paleontological resources. Closing areas to OHV use provides the most protection for paleontological resources if access for paleontological purposes can be maintained.

All alternatives would include the following measures designed to avoid impacting paleontological resources:

- Maintaining and enhancing interpretive programs at appropriate paleontological sites.
- Pursuing partnerships and agency coordination for interpretive sites.
- Minimizing adverse effects to paleontological resources through use closures, restrictions, permit stipulations, and mitigation measures.

4.2.12.5.4.2. Alternatives 1 through 4

There are no additional impacts to paleontological resources.

4.2.12.5.5. Travel and Transportation Impacts on Paleontological Resources

4.2.12.5.5.1. Impacts Common to All Alternatives

Avoiding duplication of roads that have common destinations would reduce risks of impacts from ground disturbance and access leading to unauthorized collection or vandalism. Road maintenance such as plowing could disturb the physical integrity of paleontological resources on routes where paleontological surveys have not been completed. Maintenance could also

prevent erosion and braiding and other processes that may threaten paleontological resources near roads. Effects on paleontological resources from OHV travel could cause considerable adverse effects to paleontological resources. Avoidance, closing affected areas, or implementing mitigation measures would have a beneficial impact where paleontological resources are found in areas of high OHV use.

4.2.12.5.5.2. Alternatives 1 through 4

There are no additional impacts to paleontological resources.

4.2.12.5.6. Lands and Realty Impacts on Paleontological Resources

4.2.12.5.6.1. Land Tenure (Disposals and Acquisitions) Impacts on Paleontological Resources

4.2.12.5.6.1.1. Impacts Common to All Alternatives

Exchanges, disposal, and subsequent landscape changes could result in impacts to paleontological resources. Defining exclusion and avoidance areas will reduce the potential for impacts on paleontological resources. It is anticipated that most actions will have a negligible effect, and it is expected that the mitigation of adverse effects to paleontological resources may be accomplished through documentation and/or data recovery. A case-by-case review would be required to determine the impacts to paleontological resources under all of the proposed alternatives.

4.2.12.5.6.1.2. Alternatives 1 through 4

There are no additional impacts to paleontological resources.

4.2.12.5.6.2. Land-Use Authorizations (Right-of-Ways, Leases, Permits) Impacts on Paleontological Resources

4.2.12.5.6.2.1. Impacts Common to All Alternatives

Land-use authorizations, such as right-of-ways, leases, and development activities would be subject to paleontological resource review through the NEPA process and would be subject to permitting stipulations. The impacts from these actions will be determined on a case-by-case basis, which could range from negligible to moderate effects.

4.2.12.5.6.2.2. Alternatives 1 through 4

There are no additional impacts to paleontological resources.

4.2.12.5.6.3. Renewable Energy Impacts on Paleontological Resources

4.2.12.5.6.3.1. Impacts Common to All Alternatives

Under all of the proposed alternatives, renewable energy exploration and development such as solar and wind projects would be subject to paleontological resource review to identify potential

impacts that might occur as a result of ground-disturbing activities, erosion, and access. On a case-by-case basis, all actions would be subject to stipulations, restrictions, and mitigation measures that may reduce the potential for effects to paleontological resources. Potentially identifying exclusion and avoidance areas through the development of a paleontological sensitivity map could minimize impacts to paleontological resources. Overall, it is anticipated that the effects of these actions could range from moderate to major.

4.2.12.5.6.3.2. Alternatives 1 through 4

There are no additional impacts to paleontological resources.

4.2.12.5.6.4. Utility Corridors Impacts on Paleontological Resources

4.2.12.5.6.4.1. Impacts Common to All Alternatives

Development activities including improvements within utility corridors would be subject to paleontological resource review through the NEPA process. These kinds of actions would be subject to permitting stipulations, and the impacts would be determined on a case-by-case basis. It is expected that these kinds of actions could have negligible to moderate effects.

4.2.12.5.6.4.2. Alternatives 1 through 4

There are no additional impacts to paleontological resources.

4.2.12.6. Special Designations

4.2.12.6.1. Areas of Critical Environmental Concern Impacts on Paleontological Resources

4.2.12.6.1.1. Impacts Common to All Alternatives

Managing lands as ACECs could directly or indirectly provide long-term protection of paleontological resources by restricting incompatible uses. Protecting natural and cultural resource values in ACECs would decrease the risk of impacts on identified or unidentified paleontological resources. By designating additional ACECs, there would be fewer risks of impacts on paleontological resources within designated lands from ground-disturbing activities, erosion, and access.

4.2.12.6.1.2. Alternatives 1 through 4

There are no additional impacts to paleontological resources.

4.2.12.6.2. National Trails Impacts on Paleontological Resources

4.2.12.6.2.1. Impacts Common to All Alternatives

See the Cultural Resources section for impacts on paleontological resources.

4.2.12.6.3. Wild and Scenic Rivers Impacts on Paleontological Resources

4.2.12.6.3.1. Impacts Common to All Alternatives

The designation of seven river segments of rivers to be managed as wild and scenic rivers, through improvements to maintain, and/or preserve resources values could have a minor to moderate effects to paleontological resources. The restriction of incompatible uses along the eligible segments would contribute to protection/preservation of paleontological resources. Review would be required on a case-by-case basis to determine the effect to paleontological resources under all of the proposed alternatives and the level of mitigation, including avoidance, that might be necessary. It is anticipated that the impacts from these actions could range from moderate to major.

4.2.12.6.3.2. Alternatives 1 through 4

There are no additional impacts to paleontological resources.

4.2.12.6.4. Wilderness Impacts on Paleontological Resources

4.2.12.6.4.1. Impacts Common to All Alternatives

There are prohibitions on motorized and mechanical use, including restrictions on development, in designated wilderness areas. In areas allocated to maintain or enhance wilderness characteristics, impacts to potential paleontological resources would be reduced due to these restrictions and will continue to protect/preserve paleontological resources, as well as retain the primitive and natural characteristics.

4.2.12.6.4.2. Alternatives 1 through 4

There are no additional impacts to paleontological resources.

4.2.12.6.5. Wilderness Study Areas Impacts on Paleontological Resources

Managing wilderness study areas (WSAs) to maintain wilderness characteristics would restrict surface-disturbing activities and would indirectly reduce the potential for direct disturbance of paleontological resources. If Congress releases the WSAs and these are not located within a designated ACEC, the risk of impacts on paleontological resources from future surface-disturbing activities and other incompatible uses could increase. A case-by-case basis review would be required to determine the impacts on paleontological resources under all of the proposed alternatives and the level of mitigation, including avoidance, that might be necessary. It is anticipated the impacts from any management actions could range from negligible to moderate.

4.2.12.6.6. Alternatives 1 through 4

There are no additional impacts to paleontological resources.

4.2.12.7. Social and Economic Impacts on Paleontological Resources

4.2.12.7.1. Public Health and Safety

4.2.12.7.1.1. Impacts Common to All Alternatives

Safety and hazard reduction measures could be in conflict with paleontological resource management, such as actions related to closing abandoned mines and the cleanup of hazardous materials and waste. Where each of these activities may involve ground disturbance, on a case-by-case basis, these actions would be subject to stipulations, restrictions, and mitigation measures that would reduce the potential impacts to paleontological resources. It is anticipated the effects of any of the management actions under each of the alternatives could range from negligible to moderate.

4.2.12.8. Cumulative Impacts on Paleontological Resources

4.2.12.8.1. Past and Present Actions/Impacts

There are no impacts expected to occur under any of the alternatives that relate to the past. Present and future actions would be considered on a case-by-case basis.

4.2.12.8.2. Reasonable Foreseeable Actions

There are no reasonably foreseeable impacts expected to occur under any of the alternatives.

4.2.12.8.3. Cumulative Impact

4.2.12.8.3.1. Impacts Common to All Alternatives

Increased regulation and increased protection of other resources would result in less area subject to surface-disturbing activities and activities that result in increasing potential for erosion. These changes would result in less general damage to paleontological resources and increased protection of identified resources. Paleontological resources in existing wilderness areas would continue to be at low risk of inadvertent damage since these areas are closed to roads. Similarly, in areas that are rarely visited, impacts to paleontological resources are expected to be minimal. Throughout the planning area, the potential for such impacts is normally considered to be low. A sensitivity map is required to determine where paleontological resources may exist and could be affected by surface disturbance.

4.2.13. Visual Resources

4.2.13.1. Summary

This section presents potential impacts on visual resources, specifically the potential for management decisions to create visual changes in or contrasts from the existing landscape across alternatives. Visual resources generally are impacted by activities that introduce new visual elements into the landscape, changing the features that characterize the existing landscape (i.e., the form, line, color, and texture of the landform, water, vegetation, and structures). Generally, the greater the surface disturbance, the greater is the change to the landscape.

4.2.13.2. Methods of Analysis

Indicators

This impact analysis and these conclusions are based on the visual resource inventory (VRI), knowledge of resources and the planning area, review of existing literature, spatial and temporal analysis. Effects are quantified where possible. In the absence of quantitative data, professional judgment was used. Impacts are sometimes described using ranges of potential impacts or in qualitative terms, if appropriate.

Assumptions

The analysis is based on the following assumptions:

- The visual resources inventory classes represent the relative value of the visual resources.
- The majority of changes to the landscape would have long-term impacts.
- VRM classes are designated and managed only on public lands, but visual impact analysis may extend to private lands in connected actions or split-estate situations. All surface-disturbing activities, regardless of the chosen alternative or management action, would be subject to the VRM objectives of the area where those activities take place.
- New surface-disturbing activities would be subject to implementation-level NEPA analysis, including a VRM contrast rating. A contrast rating form would be required in Class I, II, and III and recommended in IV. Regardless of VRM class designation, a contrast rating form would be required in all situations when project proposals are located within highly sensitive areas or if the project has high visual impact.
- VRM classes (objectives) are prescriptive for all resources and uses. VRM classes would be adhered to through project design, mitigation, or avoidance. Activities proposed that would not initially meet VRM objectives for the area would be mitigated to the extent needed to meet the objectives. Proposed activities that could not be mitigated would not be authorized.
- Projects proposed in acres with VRM Class I and Class II objectives may be more difficult to design and located to meet visual objectives.
- The BLM will require mitigation measures to projects proposed in areas with VRM Class III and Class IV objectives (areas with visual objectives that allow for more landscape modification) to reduce impacts on visual resources.
- The VRI classes are generated by the VRI as assigned and represent the current visual resource condition of the existing landscape. VRM classes (I, II, III, and IV) are generated through decision-making in the RMP. Thus impacts to visual resources were estimated by evaluating the potential for VRM class designations to noticeably change existing landscapes. Landscape modifications and impacts on visual resources could occur under any VRM class.

The degree of impact would depend on the VRM class, the nature of the proposed project, and the observation point of the visitor.

All surface-disturbing activities, regardless of the alternative or management action, would be subject to the management objectives of the area within which the activity takes place. The visual resource contrast rating system is used to analyze the potential implementation level impacts of surface disturbance and the facility design and placement. Surface-disturbing activities and facilities would be designed to mitigate their visual impacts and conform to the area's designated VRM class objective.

4.2.13.3. Qualitative Intensity Scale

A range of qualitative terms have been used to gauge the intensity of each impact from one program area on another. Both positive and negative impacts are considered and, where necessary, the net impact of the two is discussed. The intensities of impacts are described using the following definitions:

- **Negligible:** No known impacts to resources. Any change is undetectable. Activities create very low visual contrast and preserve the existing character of the landscape. In VRM Class I there may be natural ecological changes, but the level of change to the characteristic landscape should be very low and must not attract attention.
- **Minor:** Direct effects are apparent and measurable but small and localized or contained within the footprint of the action. Visual contrast from activities may be visible but would retain the existing character of the landscape. In VRM Class II the level of change to the characteristic landscape would be low. Changes to the landscape would repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.
- **Moderate:** Direct effects would be readily apparent and measurable over a larger area but still mainly within the footprint of the action. Visual contrast from activities may be moderate. Changes in the landscape may attract the attention of a viewer from a distance but would still partially retain the existing character of the landscape. In VRM Class III, management activities will attract attention but would not dominate the view of the casual observer. Changes would repeat the basic elements found in the predominant natural features of the characteristic landscape.
- **Major:** Direct effects would be highly noticeable and extend well beyond the footprint of the action. Visual contrast from activities may be high. Changes in the landscape may dominate views, even from a distance. In VRM Class IV, management activities would require major modifications of the existing character of the landscape. The level of change to the characteristic landscape would be high, and management actions would dominate the view and be the major focus of viewer attention.
- **Short-term effect:** The effect occurs only during or immediately after implementation of the alternative. For the purposes of this RMP, short-term effects would occur during the first five years.
- **Long-term effect:** The effect could occur for an extended period after implementing the alternative. The effect could last several years or more and could be beneficial or adverse. For the purposes of this RMP, long-term effects would occur beyond the first five years and perhaps over the life of the RMP.

4.2.13.4. Resources

4.2.13.4.1. Air Quality Impacts on Visual Resource Management

4.2.13.4.1.1. Impacts Common to All Alternatives

There would be no impacts on VRM resulting from air quality management actions. Management actions are designed to meet air quality standards and will not alter the visual character of the landscape.

4.2.13.4.1.2. Alternatives 1 through 4

There are no additional impacts to visual resources management.

4.2.13.4.2. Soil Resources Impacts on Visual Resource Management

4.2.13.4.2.1. Impacts Common to All Alternatives

There would be a positive benefit on VRM resulting from soil management actions. Management actions are designed to improve or maintain soil quality, reduce wind and water erosion, and conserve soils. Restoration of disturbed and degraded sites would reduce visual contrast. Generally, impacts may be negligible to major depending on the type and extent of the management action.

4.2.13.4.2.2. Alternatives 1 through 4

There are no additional impacts to visual resources management.

4.2.13.4.3. Water Resources Impacts on Visual Resource Management

4.2.13.4.3.1. Impacts Common to All Alternatives

There would be a positive benefit on VRM resulting from water resource management actions under all alternatives. Management actions are designed to protect surface water and groundwater resources, which would preserve or improve the visual character of the landscape. Generally, impacts may be negligible to major depending on the type and extent of the management action.

4.2.13.4.3.2. Alternatives 1 through 4

There are no additional impacts to visual resources management.

4.2.13.4.4. Integrated Vegetation Impacts on Visual Resource Management

4.2.13.4.4.1. Impacts Common to All Alternatives

Integrated vegetation includes general vegetation, riparian areas, wetlands, weeds, forests, and woodlands, and analysis of impacts are described collectively. There would be a positive benefit

on visual resources resulting from integrated vegetation management because it would preserve or improve the visual character of the landscape. The number and extent of surface landscape modifications also decreases the seldom-seen zones and foreground and middleground views and negatively impacts sensitive areas. Therefore, restoration, revegetation, reclamation, or rehabilitation of surface disturbances (e.g., OHV routes) that change the basic elements of form, line, color, and texture of the existing natural landscape will improve the visual aesthetics by reducing contrast. Vegetation management actions would retain or improve the appearance of natural conditions within and around areas of high scenic value, such as wilderness and wilderness study areas. Generally, positive impacts may be negligible to major depending on the type and extent of the management action. Projects would be required to meet VRM class objectives, and impacts would vary based on the size and type of visual element introduced.

4.2.13.4.4.2. Alternative 1

This alternative would not contain many of the management actions found in the other alternatives that could benefit visual resources. These actions could still be carried out on a case-by-case basis.

4.2.13.4.4.3. Alternatives 2 and 3

Requiring no net unmitigated loss of vegetation communities and restoration efforts would mitigate for surface-disturbing activities that alter visual aesthetics.

4.2.13.4.4.4. Alternative 4

No net unmitigated loss would not be required. Surface disturbances resulting from projects that alter visual resources would be dealt with on a case-by-case basis.

4.2.13.4.5. Fish and Wildlife Impacts on Visual Resource Management

4.2.13.4.5.1. Impacts Common to All Alternatives

There would be negligible impacts to visual resources resulting from fish and wildlife management actions as all projects would be required to meet VRM class objectives. Impacts would vary based on the size and type of visual element introduced. Actions that would restore or improve natural landscape character through protection and enhancement of habitats and landscapes would result in a benefit to preserving the visual aesthetics. Modification, maintenance, and new construction of wildlife water developments (guzzlers) would be required to meet VRM class objectives, and impacts would vary based on the size and degree of surface disturbance.

4.2.13.4.5.2. Alternatives 1 through 4

There are no additional impacts to visual resources management.

4.2.13.4.6. Special Status Species Impacts on Visual Resource Management

4.2.13.4.6.1. Impacts Common to All Alternatives

There would be negligible positive impacts to visual resources from special status species management actions as all projects would be required to meet VRM class objectives. Actions that maintain or improve habitat and restrictions on uses tend to benefit the visual aesthetics by addressing surface-disturbing activities. The level of impacts would vary based on the size and degree of surface disturbance.

4.2.13.4.6.2. Alternative 1

Alternative 1 would not contain some of the actions proposed under the other alternatives that would benefit visual resources. These actions could still be carried out on a case-by-case basis.

4.2.13.4.6.3. Alternatives 2 through 4

Management actions to protect, restore, and improve habitats tend to benefit the visual aesthetics by reducing contrast and adding vegetation variety to the landscape, increasing interest and variety in form, line, color, and texture. Over the long term, actions designed to improve ecological conditions would create a mosaic within the landscape.

4.2.13.4.7. Wild Horse and Burro Impacts on Visual Resource Management

4.2.13.4.7.1. Impacts Common to All Alternatives

Wild horse and burro management actions involving installation of facilities (water developments, underpasses) and landform and vegetation disturbance needed to accommodate the facilities would impact visual resources by adding features not found in the natural landscape. Areas with Class I or II management objectives would be more sensitive to construction of new facilities. Projects would be required to meet VRM management class objectives, and impacts would vary based on the size and degree of surface disturbance.

4.2.13.4.7.2. Alternative 1

This alternative does not contain actions to manage site-type rights-of-ways or surface-disturbing activities within herd management areas (HMAs), so there would be no benefit in retaining the visual aesthetics of the area. The existing form, line, color, and texture of the landscape could occur to the extent that it meets the VRM class objectives. The alternative benefits visual resources in that there is no specific management action to allow the construction or maintenance of fences within HMAs, but this action could still be carried out on a case-by-case basis. Impacts would vary based on the size and type of visual element introduced.

4.2.13.4.7.3. Alternative 2

The exclusion of site-type ROWs of more than five acres and excluding new surface-disturbing activities would have a positive impact on visual resources by preserving the existing form, line,

color, and texture of the characteristic landscape. Construction of fences is an additional visual element that may impact visual resources to the extent that it meets the VRM class objectives.

4.2.13.4.7.4. Alternative 3

Impacts would be similar to those under Alternative 2 except that ROWs and other surface-disturbing activities would only be avoided and not excluded. Visual resources could still benefit because surface-disturbing activities could occur to the extent that it meets the VRM class objectives.

4.2.13.4.7.5. Alternative 4

As in Alternative 3, this alternative would avoid surface-disturbing activities. Additionally, Alternative 4 would allow site-type ROWs of more than 5 acres, thus providing less protection for visual resources due to changes in form, line, color, and texture of the characteristic landscape.

4.2.13.4.8. Cave and Karst Management Impacts on Visual Resource Management

4.2.13.4.8.1. Impacts Common to All Alternatives

There would be negligible impacts to visual resources resulting from developments designed to protect cave and karst resources. Projects would be required to meet VRM class objectives, and impacts would vary based on the size and type of visual element introduced.

4.2.13.4.8.2. Alternative 1

ROW avoidance areas for all significant cave resources and newly discovered caves would tend to preserve the visual aesthetic of the area by limiting changes to the existing form, line, color, and texture of the characteristic landscape. Restoration of altered or vandalized cave and karst systems would not occur, and there would be no benefit to improving the natural visual aesthetics.

4.2.13.4.8.3. Alternative 2

Restoring altered or vandalized cave and karst systems would benefit visual resources by returning the landscape to a more natural appearance. ROW avoidance areas within one half mile of significant caves may provide slightly less protection for visual resources than Alternative 1.

4.2.13.4.8.4. Alternative 3

Impacts would be similar to Alternative 2 except that ROW avoidance areas within one quarter mile of significant caves may provide slightly less protection for visual resources.

4.2.13.4.8.5. Alternative 4

Impacts would be similar to Alternative 2 except that allowing ROWs near caves sites would provide the least amount of visual resource protection as compared to the other alternatives.

4.2.13.4.9. Wildland Fire Management Impacts on Visual Resource Management

4.2.13.4.9.1. Impacts Common to All Alternatives

Fire (wild and prescribed) and fire suppression have many effects on the landscape, and thus its visual values. Fire would affect visual resources as form, line, color, and texture would change on the landscape and vary based on the size of the fire. Where the ecosystem is fire adapted, visual interest and appeal would benefit by creating natural openings, more vegetation variety, and more visual appeal. Conversely, fire can also result in the invasion of non-native plant species and conversion of the landscape with some vegetative variety to a monoculture of grasses, thereby resulting in less visual interest and appeal. Fire suppression would result in construction of fire lines that remove vegetation, creating noticeable lines and some disturbance to the landform. Depending on the vegetation community where the fire occurs, distance, and the observation point, the contrast may be easily seen or less noticeable. Use of fire retardant would result in impacts on the color of the vegetation, but this would fade over time. Stabilization and rehabilitation of disturbances would help to restore the natural landscape over time. Treatments of hazardous fuels and noxious weeds would create a more aesthetically pleasing landscape over time that more closely reflect the visual variety associated with the natural fire regime. However, in the short term, hazardous fuels reduction treatments (mechanical, chemical, or biological) could impact visual resources by reducing the visual variety of the landscape. Prescribed fire could have similar effects because these could be avoided or minimized through site-specific project plans. Because actions to protect resources and project-specific analyses would limit impacts of prescribed fire and other hazardous fuel treatments, short-term impacts from these fire management activities would be minimized or eliminated and there would be a long-term benefit of reducing the visual impacts of future catastrophic wildland fires.

4.2.13.4.9.2. Alternative 1

There are no specific management actions to address emergency stabilization and rehabilitation (ESR) activities involving erosion control or reseeding. This may result in a conversion of the landscape to a monoculture of grasses and diminished vegetative variety thereby reducing visual appeal. No hazardous fuels and weed management involving noxious or invasive species treatments would occur. In the long term, this would result in a less aesthetically pleasing landscape over time that less closely reflects the visual variety associated with the natural fire regime. In the short term, lack of treatments (mechanical, chemical, or biological) could impact visual resources by retaining the visual landscape character. Not allowing fuel breaks and prescribed fire could result in a long-term detriment to visual resources by increasing the visual impacts created by future catastrophic wildland fires.

4.2.13.4.9.3. Alternatives 2 through 4

This alternative would allow ESR activities such as erosion control and reseeding. This would benefit visual resources by aiding recovery to create a more natural-appearing landscape with increased vegetation variety. Hazardous fuels and weed management involving noxious or invasive species treatments would in the long term benefit visual resources by creating a more aesthetically pleasing landscape over time that more closely reflects the visual variety associated with the natural fire regime. In the short term, allowing treatments (mechanical, chemical,

or biological) could negatively impact visual resource by introducing elements that alter the characteristic landscape. Fuel breaks and prescribed fire would result in a long-term benefit to visual resources by decreasing the visual impacts created by future catastrophic fires.

4.2.13.4.10. Cultural Resources Impacts on Visual Resource Management

4.2.13.4.10.1. Impacts Common to All Alternatives

Generally, management of cultural resources through authorized-only excavation, prohibiting surface disturbances, and protecting traditional areas and traditional cultural properties would tend to protect the visual resources by limiting or preserving the existing aesthetic quality of the area. Impacts to visual resources resulting from developments designed to protect cultural resources and excavations would be required to meet VRM class objectives. Impacts would affect relatively small, localized areas and would vary based on surface disturbance, size, and type of visual element introduced. Impacts could be positive or negative and negligible. Additionally, no impacts to visual resources would occur from management of tribal uses.

4.2.13.4.10.2. Alternative 1

No specific decision to preserve the viewshed of the Old Spanish Trail would be identified. Activities could occur in the viewshed that could alter the scenic landscape along the OST.

4.2.13.4.10.3. Alternative 2

The management decision to preserve the viewshed of the Old Spanish Trail and ACECs by restricting or excluding surface-disturbing activities would tend to protect the visual aesthetic and character of the visual landscape more than Alternative 1.

4.2.13.4.10.4. Alternative 3

Impacts would be similar to Alternative 2 except that there would be a smaller exclusion zone around cultural sites within ACECs. Since surface-disturbing activities are already limited in ACECs, it is not expected to cause any additional negative impacts to visual resources.

4.2.13.4.10.5. Alternative 4

Impacts would be identical to Alternative 2.

4.2.13.4.11. Paleontological Resources Impacts on Visual Resource Management

4.2.13.4.11.1. Impacts Common to All Alternatives

Paleontological resource management actions would tend to protect visual resources by retaining the aesthetic quality of the area. Impacts to visual resources resulting from developments designed to protect paleontological resources, and excavations would be required to meet VRM class objectives. Impacts would affect relatively small, localized areas and would vary based

on surface disturbance, size, and type of visual element introduced. Impacts could be positive or negative and negligible.

4.2.13.4.11.2. Alternative 1

Management of the 40-acre paleontological trackway for conservation purposes would help maintain the existing visual condition of the landscape.

4.2.13.4.11.3. Alternatives 2 through 4

This alternative manages trackways and the Upper Las Vegas Wash for conservation purposes, thereby providing slightly more maintenance of existing visual resources than Alternative 1.

4.2.13.4.12. Visual Resource Management Impacts on Visual Resource Management

4.2.13.4.12.1. Impacts Common to All Alternatives

Management decisions that result in surface disturbance would have direct impacts on scenic quality by changing existing landscape characteristics. Similarly, decisions that reduce surface disturbance generally would decrease changes to the landscape or preserve scenic quality. The area of impact is not limited to the specific area of disturbance. Rather, the viewshed in which the disturbance occurs would be impacted. The severity of the impact, or the degree of change and contrast from the existing visual conditions generally would decrease as distance from the disturbance increases. In addition, the larger the disturbance, the more visible it would be from foreground and middle ground viewpoints, and thus the greater the impact on visual quality.

Setting VRM class designations would impact visual quality. Objectives for VRM Class I and II would provide for the least amount of landscape change and the highest level of visual resource protection, both short and long term. VRM Class I areas would provide the greatest protection to visual resources throughout the planning area by restricting surface disturbance and development. Class II would provide protection of visual qualities, retaining the existing character of the landscape. Projects would not be allowed in Class I or II unless they meet VRM objectives for the class, which could include mitigation.

VRM Class III and IV are less protective and would allow for more surface-disturbing impacts and landscape change. Class III would not emphasize protection of an unmodified landscape and visual resources. However, projects that do not conform to VRM Class III objectives will not be authorized until the project design is modified to conform. Class IV allow for major modifications of the landscape and may not protect scenic values. Adverse visual contrasts from projects located in VRM Class IV or are located in other VRM classes, but found to be in conformance will still be subject to mitigation to reduce adverse visual impact.

In some instances VRM classes may be designated to areas that would provide protections that may be either greater than or less than what would be commensurate with the VRI class values.

Generally, the objectives of VRM Class III would allow constructed facilities to attract the attention of the casual observer while VRM Class IV would allow facilities to not only attract attention, but also visually dominate the landscape. Even in these VRM classes, project designs

should be developed to try and mimic the form, line, color, and texture of the landscape as much as practical to minimize visual contrast. It is possible that visual character could degrade over time in these classes, and impacts could be moderate to high.

Managing lands for a lower class than its inventoried value could lead to the visual degradation of those lands. In the planning area, visual impacts could stem from valid existing rights associated with mining, land-use authorizations, and recreation facilities; however, these activities will be required to conform to the VRM objectives. After exhausting mitigation options, non-conforming situations may require an RMP amendment to authorize proposed actions; however, regional mitigation may be warranted as a means to offset unanticipated visual resource impacts. Impacts are indicated by comparing the proposed management classes with the inventory classes.

4.2.13.4.12.2. Alternative 1

Under Alternative 1, there would be less comprehensive visual resource management for the planning area that may reduce visual resource quality due to a lack of coordinated visual resource protection. Specifically, it lacks class designations for minerals and energy, recreation, and ROW corridors. These activities could occur to the extent that they meet the existing VRM class objectives. This alternative designates the least acreage as VRM Class I; specifically wilderness study areas (WSAs) would continue to be managed under that class. Congressionally designated wildernesses are managed to preserve the natural and undeveloped character and, according to national BLM policy, should be managed as Class I. Though wilderness would be administered as Class I accordingly, there would be an unresolved discrepancy between the land-use plan visual resource classes and BLM policy regarding current and future wilderness designation. Also, as there would be no management direction conditional upon the release of WSAs, it is likely that less restrictive class designations would be implemented and therefore negative impacts to visual resources would likely result.

4.2.13.4.12.3. Alternative 2

This alternative would result in the greatest protection of scenic quality. Class I designations include WSAs, wilderness, lands with wilderness characteristics (lands with wilderness characteristics), and a half-mile corridor for those wild and scenic rivers classified as wild. Management actions directed at future congressionally designated wilderness, release of WSAs, and lands with wilderness characteristics that no longer meet the size criteria would adjust to less restrictive class designations that would result in negative impacts to visual resources. Acres designated as VRM Class II are also greatest in this alternative. This includes areas that were classified as VRI II in the inventory that would be managed as such, several ACECs that were determined to have scenic relevance and importance (R&I) values, and a one mile buffer for two backcountry byways, and the Mojave Road Scenic Area. Additionally, wild and scenic rivers classified as scenic or recreational would receive protection within one quarter mile of each side of the river. Areas classified as VRI Class III in the inventory that are not otherwise specifically designated would be managed as VRM Class III in addition to ROW corridors and certain community pits. Two solar energy zones would be specifically designated as VRM Class IV, which, while resulting in high visual contrast, would overall be a benefit to visual resources by concentrating project development. Classifying ROW corridors, community pits, and solar energy zones (SEZs) as VRM Class III and IV, respectively, benefits visual resources as it affords consistency with their potential future use.

4.2.13.4.12.4. Alternative 3

Impacts are similar to Alternative 2 except that Alternative 3 would provide less protection of scenic quality. VRM Class I designations would be limited to WSAs and current and future wilderness. VRM Class II includes fewer acres designated as lands with wilderness characteristics and less protection for wild and scenic rivers, which means that long-term changes to the character of the landscape and its visual values would occur because of increased potential for surface-disturbing activities. The number of community pits designated as VRM Class III would be greater than in Alternative 3, hence the negative impacts.

4.2.13.4.12.5. Alternative 4

Impacts are similar to Alternative 3 except that Alternative 4 would provide the least amount of protection of the scenic quality. Fewer ACECs mean that scenic R&I values would not receive protection of their scenic quality and would be managed as a less restrictive class. The degree of negative impacts is dependent on the extent of change from the visual inventory. Generally, those areas would be managed as a less restrictive class which would result in changes to the form, line, color, and texture of the landscape. There would be no specific management action to protect the visual aesthetics of either the Mojave Road Scenic Area or wild and scenic rivers. More areas designated would be designated as VRM Class IV, including community pits and six SEZs.

4.2.13.4.13. Lands with Wilderness Characteristics Impacts on Visual Resource Management

4.2.13.4.13.1. Impacts Common to All Alternatives

Because lands with wilderness characteristics do not exist in Alternative 1, there are no impacts common to all alternatives.

4.2.13.4.13.2. Alternative 1

No areas would be designated as lands with wilderness characteristics to preserve the natural and undeveloped character and thus there would be no benefits to retaining visual character of the area. Projects would be required to meet VRM class objectives. Impacts may be negligible to major depending on project implementation. This alternative would provide the least amount of protection for visual resources.

4.2.13.4.13.3. Alternative 2

Alternative 2 would designate 242,214 acres as lands with wilderness characteristics. Management actions designed to preserve the natural and undeveloped character of lands with wilderness characteristics would tend to retain and improve the existing visual aesthetics by limiting surface-disturbing and disruptive activities such as closure to motorized, mechanized travel, excluding ROWs, and no surface occupancy for oil and gas. Limiting these activities would result in long- and short-term positive impacts to visual quality by reducing contrasts to the form, line, color, and textural elements of scenic views and sensitive viewers. Any permitted activities would be limited to those that preserve the natural and undeveloped character. Structures and facilities would impact relatively small, localized areas and would vary based on surface

disturbance, size, and type of visual element introduced. Projects would be required to meet VRM class objectives. This alternative would provide the most protection of visual resources.

4.2.13.4.13.4. Alternative 3

Impacts from Alternative 3 would be similar to those under Alternative 2 except that 36,033 acres of lands with wilderness characteristics would be designated. Management actions designated to preserve the natural and undeveloped character of lands with wilderness characteristics tend to retain visual resource of the area. In addition, motorized and mechanized travel would be limited to designated trails and areas would be ROW avoidance areas rather than exclusion. This alternative would provide less protection of visual resources compared to Alternative 2.

4.2.13.4.13.5. Alternative 4

Alternative 4 would be similar to Alternative 3 except it would designate 29,840 acres as lands with wilderness characteristics. Management actions designated to preserve the natural and undeveloped character of lands with wilderness characteristics tend to retain visual resource of the area. This alternative would provide less protection of visual resources compared to Alternatives 2 and 3.

4.2.13.5. Resource Uses

4.2.13.5.1. Forestry and Woodland Products Impacts on Visual Resource Management

4.2.13.5.1.1. Impacts Common to All Alternatives

Managing woodlands and conifer forests for all aged stands would benefit visual aesthetics through variety in vegetation and color of the natural landscape compared to single-aged stands and a monoculture of vegetation. Firewood cutting and gathering could have negative impacts by creating surface disturbances that diminish visual aesthetics. Limiting cutting and gathering to designated areas would mitigate impacts. Projects would be required to meet VRM class objectives, and therefore impacts would vary based on surface disturbance, size, and type of visual element introduced.

4.2.13.5.1.2. Alternative 1

Allowing harvesting of dead and down or marked green mesquite and acacia can diminish the visual quality of the natural landscape by removing variety of vegetation and color. Removal may also change the form, line, and texture of the landscape.

4.2.13.5.1.3. Alternative 2

Prohibitions would be imposed on the collection of live, dead, or down mesquite and acacia throughout the planning area. This would help protect the visual quality of the natural landscape by retaining variety in vegetation and color, as well as reducing changes in form, line, and texture. Impacts are assumed to be negligible on the landscape.

4.2.13.5.1.4. Alternatives 3 and 4

Impacts would be similar to those under Alternative 2 except that personal collection of down and dead mesquite acacia for on-site recreational campfires would be allowed in areas open to firewood gathering. This could cause localized changes to vegetation and color.

4.2.13.5.2. Livestock Grazing Impacts on Visual Resource Management

4.2.13.5.2.1. Impacts Common to All Alternatives

Areas of livestock concentration where vegetation is removed and soil disturbance has occurred would continue to create a contrast with the landscape and potentially reduce scenic quality. Range improvements would tend to be localized and are required to meet VRM class objectives for the areas. Closures of allotments could result in an improvement to visual resources through the removal of unnecessary range improvements that contrast with the natural landscape. Generally, impacts would be negligible.

4.2.13.5.2.2. Alternatives 1 through 4

There are no additional impacts to visual resources management.

4.2.13.5.3. Minerals

4.2.13.5.3.1. Fluid Leasable, Solid Leasable, Locatable, and Saleable Mineral Impacts on Visual Resource Management

4.2.13.5.3.1.1. Impacts Common to All Alternatives

The minerals program includes fluid leasable, solid leasable, locatable, and saleable minerals, therefore analysis of impacts is described collectively. Mining and mineral extraction could represent a major impact to visual resources by presenting high visual contrast to the surrounding landscapes. The location, nature, and size of mining facilities and operations could be visible from a number of sensitive viewpoints and from long distances. Locatable mining operations in areas of high scenic value would develop mitigation measures to limit, to the extent feasible, the impacts on scenic quality. Reclamation could recover much of the visual character of an area, but change could still be minor to moderate for many years after mining has ceased. Since locatable and leasable mining allow more discretion by the agency, mining operations would have to conform to VRM class objectives, thereby reducing impacts to the visual resource.

Impacts from each alternative would vary based on the number of acres opened, closed, or withdrawn and based on special or standard stipulations or mitigation measures. Types of restrictions such as those on siting and operation that can be applied vary by the type of mineral activity and whether they are saleable, leasable, or locatable. Generally, greater restrictions on disturbances result in fewer changes to the natural characteristic landscape. For example, controlled surface use (CSU) and no surface occupancy (NSO) for fluid minerals could limit or remove impacts due to surface-disturbing activities, respectively. All things taken together, impacts to visual resources are anticipated to be no more than moderate.

4.2.13.5.3.1.2. Alternative 1

Fluid mineral leasing would be allowed outside identified disposal, administrative areas, and ACECs totaling 1,909,351 acres, while within 866,000 acres of ACECs, activities could occur subject to NSO. Solid mineral leasing would be allowed on 1,862,673 acres outside of identified areas and additional areas on released WSAs. Locatable minerals would remain open on approximately 2,135,146 acres while the remainder of the planning area would be withdrawn.

4.2.13.5.3.1.3. Alternative 2

Fluid minerals would be managed as open, CSU, NSO, and closed according to the acreages described in the Minerals section of Chapter 2 (p. 89). Solid mineral leasing would be managed as open or closed according to the acreages described in Chapter 2 (p. 94). Generally, fewer acres would be designated as open and therefore unavailable for solid mineral leasing than in Alternative 1. Additionally, locatable minerals would be managed as open or withdrawn according to acreages described in Chapter 2 (p. 97). Generally, fewer acres would remain open than in Alternative 1.

4.2.13.5.3.1.4. Alternative 3

Impacts would be similar to Alternative 2 except that in general, Alternative 3 allows for more fluid mineral leasing to occur within areas designated as open, CSU, and NSO; however, fewer acres are designated as closed. Generally, more acres would be designated as open and thus available for solid mineral leasing than under Alternative 2. Additionally, more acres would be designated as open and thus available for locatable mineral development than Alternative 2.

4.2.13.5.3.1.5. Alternative 4

Impacts would be similar to Alternative 3 except that in general, Alternative 4 allows for more fluid mineral leasing to occur within areas designated as open, CSU, and NSO; however, there would be more acres designated as closed. Generally, this alternative would designate the greatest number of acres as open and thus available for solid mineral leasing. Impacts from locatable minerals management actions would be identical to Alternative 3.

4.2.13.5.4. Recreation Impacts on Visual Resource Management

4.2.13.5.4.1. Impacts Common to All Alternatives

Recreation encompasses a wide range of activities including OHV travel, hiking, biking, horseback riding, target shooting, camping, rock climbing, fishing, hunting, and sightseeing. Impacts from recreation are often visible only in the foreground, but they may also be seen in the middle and background on landscapes such as mountains that are visible from long distances. In addition, uses that disturb a larger area, such as OHV routes as compared to a hiking trail, are more likely to be visible at the middle and longer distances. Motorized use tends to have greater effects on visual resources than non-motorized use. Areas that would be subject to more recreational use include easily accessible locations, such as along major roads, near communities, or in areas that offer attractive opportunities for recreation.

Recreation uses that would increase OHV travel and vehicle-based camping or other activities that would change the natural character of the landscape could impact visual resources by creating

contrasts to the form, line, color, and texture of the scenery. Recreation facilities can also impact visual resources though these would be subject to project-level NEPA analysis and are required to meet VRM class objectives. Additional protection of visual resources would be provided by seasonal closures of certain habitats that can be less resistant to surface disturbances. Although recreational activities are temporary in nature, the impacts of these activities can be long-lasting and could have moderate to major impacts to the scenic quality of an area, particularly if they involve uses such as recreational target shooting and unauthorized OHV use.

The main difference between the alternatives is the designation of different areas as SRMAs or ERMAs. Through the active management of recreation uses, the allocation of SRMAs could provide long-term protection from surface-disturbing activities that could limit loss of scenic quality. Areas allocated as ERMAs would be managed to meet custodial standards and would not provide structured recreational opportunities except where needed to attain custodial activity-based outcomes, address visitor health and safety or user conflicts, or resolve conflicts with other resources. These areas would be managed for recreational uses with few restrictions and minimal management oversight.

The experience of recreational users on public lands is frequently dependent on the visual character of the areas being used. Most recreationists are seeking a recreation experience in a natural-appearing landscape. To this end, facilities intended to support recreation management are designed to repeat the elements of form, line, color, and texture found in the landscape as much as possible.

4.2.13.5.4.2. Alternative 1

Recreation will be managed to concentrate the majority of its recreation program effort within SRMAs while the remaining lands would be managed as ERMAs to emphasize dispersed and diverse recreation opportunities. Recreation use would continue to be generally unmanaged, except in a few SRMAs. Impacts are expected to be minor but could rise to the level of moderate due to unauthorized casual use.

4.2.13.5.4.3. Alternative 2

Recreation would be managed within SRMAs and ERMAs according to the designations, acreages, and prescriptions described in the Recreation section of Chapter 2 (p. 104). Generally, there would be approximately more acres designated as SRMAs as compared to Alternative 1. This alternative would include the most areas of developed and intensively managed recreation. While the opportunity for degrading visual resources could exist in areas of greater recreation development, conformance with allocated VRM classes would manage the visual impacts. Overall, impacts would be moderate.

4.2.13.5.4.4. Alternative 3

Recreation would be managed within SRMAs and ERMAs according to the designations, acreages, and prescriptions described in the Recreation section of Chapter 2 (p. 104). Generally, there would be slightly more acres designated as SRMAs than in Alternative 2. Impacts are similar to Alternative 2.

4.2.13.5.4.5. Alternative 4

Recreation would be managed within SRMAs and ERMAs according to the designations, acreages, and prescriptions described in the Recreation section of Chapter 2 (p. 104). Generally, Alternative 4 provides the least amount of acres designated as SRMAs and ERMAs compared to the other alternatives. This alternative has the least developed recreation management actions. Some areas would still include developed and intensively managed recreation, but most of the planning area would be managed for more a more unstructured type of recreational experience. While visual resources may be degraded in areas of greater recreation development or where development is required to resolve resource or user conflicts, conformance with allocated VRM class objectives would manage visual impacts caused by surface disturbances. Impacts would range from negligible to minor.

4.2.13.5.5. Travel and Transportation Impacts on Visual Resource Management

4.2.13.5.5.1. Impacts Common to All Alternatives

Roads and trails are surface disturbances that can change the basic elements of form, line, color, and texture of the existing natural landscape, thereby decreasing scenic values. Moreover, the number and extent of roads and trails decreases the seldom-seen zones and foreground and middleground views and negatively impacts sensitive areas. The existing travel and transportation network evolved primarily from routes leading to sites of authorized activities such as grazing management facilities, ROWs, mine exploration and development, casual and permitted recreation events, or from the proliferation of unauthorized recreational routes over time. In either case, route designs that best fit the natural landscape usually were not considered. Most of the planning area would be designated as limited to designated routes in Alternatives 2, 3, and 4. Route evaluation and designation considers conflicts to resources in the network and design and is structured to minimize those impacts, including impacts to visual resources. Limiting travel and transportation to designated routes would help reduce negative impacts to visual resources. Those impacts would vary depending on the reduction in the number and miles of routes. Decommissioning roads would result in benefits to visual resources by reducing contrasts on the landscape.

Generally, any attempt to manage a transportation network will improve its impact on the visual resource by considering the visual characteristics of form, line, color, and texture in route design. Reducing the number of miles in the route network will also reduce its visual intrusiveness if the routes chosen for closure are selected because of their visual characteristics and if they are carefully reclaimed. Impacts would range from negligible to moderate.

The alternatives differ in the number of acres designated as open, closed, and limited to designated. Open areas generally have the least visual variety in terms of landform, water, vegetation and are mostly the least visually scenic. Most of the planning area would be designated as limited to designated routes in each alternative. Limiting vehicles to designated routes could help reduce contrasts to scenic quality depending on the number and location of designated routes.

4.2.13.5.5.2. Alternatives 1 through 4

There are no additional impacts to visual resource management.

4.2.13.5.6. Lands and Realty Impacts on Visual Resource Management

4.2.13.5.6.1. Impacts Common to All Alternatives

The lands and realty program includes land tenure (disposals, acquisitions, exchanges, withdrawals, and segregations), land-use authorizations (rights-of-way, permits, leases, and easements), renewable energy, and utility corridors. Utilities, communication sites, and renewable energy projects, as well as ancillary facilities and structures for all of the above, could impact visual and scenic resources by necessitating construction and vegetation clearing. Overhead utilities, transmission lines, wind generation facilities, solar power towers, and cellular phone towers can be visible from long distances, while facilities such as solar fields, which are typically closer to the ground, may more directly affect middle-distance viewing.

Adhering to VRM class objectives will ensure that lands and realty-related developments are designed to blend into the line, form, color, and texture of landscapes as much as possible. Allocations for lands actions, such as communication sites and utility corridors, recognize the inherent design constraints of lands-related structures. In those areas, VRM class objectives will allow for development needs while requiring or encouraging designs that minimize visual contrast. By requiring land-use authorizations to conform to assigned VRM classes, most developments are expected to have moderate to major negative effects on the visual resource.

The designation of areas as exclusion or avoidance zones for ROWs would benefit visual resources by limiting or prohibiting related activities/disturbances resulting in the long-term protection of visual resources and scenic quality. Benefits to visual resources could also occur from lands and realty management by acquiring lands that have potentially high scenic quality while degraded areas could be improved.

Land tenure adjustments such as acquisitions or disposals can affect scenic quality or viewer sensitivity. Acquisitions can benefit visual resources through the addition of scenic areas to the BLM's jurisdiction and protecting or restoring their scenic values. Disposals would affect visual resources by removing BLM control over the parcels, resulting in development and loss of the natural landscape. Impacts of disposals would vary depending on the subsequent use and development of the parcel. For example, recreation facilities, including parks, may make an area more aesthetically pleasing through the addition of vegetation variety and color. Disposals or leases next to or surrounded by development would diminish the visual and scenic values. Disposals and leases in semi-rural or rural settings would be more likely to diminish the visual and scenic values as the change to the baseline visual resource inventory class may be major and not consistent with the local setting.

For land disposals and leases, the level of impact depends on the size of the parcels, the baseline visual inventory class, locations of parcels on the landscape and in relation to other development, and the ultimate disposition or type and level of landscape modification. Parcels that are already disturbed or rated as having low scenic quality would cause less impact to visual resources than the disposal of an area with high scenic quality or sensitivity.

The level of impact from renewable energy projects depends on the size, location, and type of facility. Solar development projects tend to introduce visual contrasts through clearing of vegetation and the addition of structures and roads. Since siting of solar projects tends to be in relatively flat areas such as valley bottoms, the angle of view is less obtrusive when the angle of observation is generally level to the site than when looking down from an elevated

viewpoint. Either way, solar projects would likely dominate the views from most locations. While wind projects often have an overall project footprint that is larger than solar projects, surface disturbance is normally isolated to the areas around the turbines, access roads, and associated facilities. The heights, type, and color of turbines, together with their placement with respect to local topography (i.e., on a ridge or mesa) are factors that would contribute to visual intrusion on the landscape. Wind projects located near areas of VRM Class I and II viewsheds could result in cumulative impacts to visual resources. Some impacts from both solar and wind projects could be minimized through proper siting, employing BMPs, project design stipulations, and mitigation measures to minimize impacts.

In general, ROW developments (e.g, power lines, pipelines, fiber optic lines, and communication sites), and associated access roads would alter the visual character to the extent that it meets the VRM class objectives of the area. The level of impacts would depend on the location, size, type of facility, VRM class, and the landscape characteristics. These types of projects are usually small and localized, although impacts could cause a cumulative impact in the planning area over the long term. Most communication site ROWs would be located in common (within existing or shared ROWs), which would help reduce surface disturbance. Co-locating communication sites would also limit new surface disturbance.

Designation of utility corridors would help reduce overall impacts to visual resources by focusing surface disturbances, reducing the number of access roads, and focusing ROWs in an area rather than spread across the landscape. Impacts in corridors from new power lines could be reduced by requiring the use of the same access roads for multiple projects.

4.2.13.5.6.2. Alternatives 1 through 4

There are no additional impacts to visual resource management.

4.2.13.6. Special Designations

4.2.13.6.1. Areas of Critical Environmental Concern Impacts on Visual Resource Management

4.2.13.6.1.1. Impacts Common to All Alternatives

Generally, special management areas such as ACECs result in protection of the scenic quality of an area and potential improvements to the natural landscape because of numerous use restrictions. ACEC management could reduce or eliminate surface disturbances that have degraded the visual character by reducing contrasts of visual elements. Use restrictions in ACECs could include ROW exclusion or avoidance, closures or limits to mineral exploration, limits to or exclusion of certain types of recreation use, and limiting travel to designated routes. All these restrictions would help protect visual resources to various degrees. The main difference between the alternatives is the number and size of ACECs proposed for designation and thus the number of acres of scenic quality potentially protected.

4.2.13.6.1.2. Alternative 1

ACECs would be managed according to the designations, acreages, and prescriptions described in the ACEC section of Chapter 2 (p. 180).

4.2.13.6.1.3. Alternative 2

ACECs would be managed according to the designations, acreages, and prescriptions described in the ACEC section of Chapter 2 (p. 180). In general, this alternative would result in the greatest amount of protection and improvement of visual resources.

4.2.13.6.1.4. Alternative 3

ACECs would be managed according to the designations, acreages, and prescriptions described in the ACEC section of Chapter 2 (p. 180). In general, this alternative would be similar to Alternative 2 but would result in less protection and improvement of visual resources.

4.2.13.6.1.5. Alternative 4

ACECs would be managed according to the designations, acreages, and prescriptions described in the ACEC section of Chapter 2 (p. 180). In general, this alternative would be similar to Alternative 1 except that Alternative 4 would contain more prescriptions to reduce activities that would result in negative impacts to visual resources.

4.2.13.6.2. National Trails Impacts on Visual Resource Management

4.2.13.6.2.1. Impacts Common to All Alternatives

See Cultural Resources for impacts on visual resources management.

4.2.13.6.3. Wild and Scenic Rivers Impacts on Visual Resource Management

4.2.13.6.3.1. Impacts Common to All Alternatives

Because no river segments are proposed to be determined to be suitable for wild and scenic river designation under Alternative 4, there are no impacts common to all alternatives.

4.2.13.6.3.2. Alternative 1

Managing eligible river segments to protect their outstandingly remarkable values (ORVs) and free-flowing nature would provide negligible positive indirect impacts to VRM within the river corridors. A suitability determination would not be made, but the eligible river corridors would be given protection through continued interim protective management. This would provide additional measures that would preserve and promote retention of the existing characteristic landscape.

4.2.13.6.3.3. Alternative 2

Managing suitable river segments to protect their ORVs, free-flowing nature, and tentative classification offers the greatest level of positive impacts to visual resources through protection of seven river corridors as either wild, scenic, or recreational. Management direction to limit or close segments to certain mineral uses, close segments to OHV use, and exclude ROWs, would help protect the scenic quality, sensitivity, and distance zones.

4.2.13.6.3.4. Alternative 3

This alternative offers a lower level of positive impacts to visual resources than Alternative 2 as only one river segment would be determined suitable with a classification of recreational. Management direction to close the river segment to mining, designate it as NSO for oil and gas, and avoid ROWs would all help promote retention of the existing scenic landscape.

4.2.13.6.3.5. Alternative 4

Under Alternative 4, all currently eligible river segments would be determined not suitable and thus scenic quality, sensitivity, and distance zones that comprise the existing visual character of the landscape would no longer be afforded protection under interim management under the Wild and Scenic Rivers Act. This alterative provides no direct benefit to the protection of visual resources.

4.2.13.6.4. Wilderness Impacts on Visual Resource Management

4.2.13.6.4.1. Impacts Common to All Alternatives

There would be negligible positive impacts on VRM resulting from wilderness management actions under all of the alternatives. Management actions are designed to preserve the natural landscape and preserve the undeveloped character. The primary objective of wilderness management is to retain the area's natural character as essentially unaltered by humans. Limiting the number and length of routes and trails for access will improve the visual resources by reducing surface disturbances and increasing seldom-seen zones and foreground and middleground views. Visually sensitive areas would be protected.

4.2.13.6.4.2. Alternatives 1 through 4

There are no additional impacts to visual resources management.

4.2.13.6.5. Wilderness Study Areas Impacts on Visual Resource Management

4.2.13.6.5.1. Impacts Common to All Alternatives

There would be negligible positive impacts on VRM resulting from wilderness study area management actions under all of the alternatives. Management actions are designed to preserve the natural landscape. The primary objective of WSA management is to retain the area's natural character as essentially unaltered by humans. Limiting the number and length of routes and trails will improve visual resources by reducing surface disturbances and increasing seldom-seen zones foreground and middleground views. Visually sensitive areas would be protected.

4.2.13.6.5.2. Alternatives 1 through 4

There are no additional impacts to visual resources management.

4.2.13.7. Cumulative Impacts on Visual Resource Management

4.2.13.7.1. Past and Present Actions/Impacts

The cumulative impact analysis boundary for visual resources includes the planning area and neighboring lands within the viewshed that overlap the planning area. Past and present impacts resulting from minerals lands and realty, and renewable energy developments have impacted visual quality of landscapes due to construction of infrastructure, mine pits, and other facilities. Designation of national conservation areas and wilderness adjacent to the planning area has benefitted visual resources through management actions that retain or preserve the characteristic natural landscape. Increased OHV use has created new roads and trails that created linear features within the landscape. Site-specific mitigation measures to reduce impacts on landscape settings have been developed to ensure that projects meet VRM class objectives. Improvements to VRM have occurred as a result of restoration efforts such as mine reclamation, travel and transportation management, decommissioning of roads and trails, restoration of casual use recreation sites, removal of range improvements, and weed treatments. These actions contribute to the overall improvement of visual resources by reducing contrasts in form, line, color, and texture upon the natural landscape. Land tenure actions have impacted visual resources by increasing the ability to apply VRM tools to previously private owned lands from acquisitions. Conversely, disposals have removed areas of scenic quality for private development. Population growth of large and small communities has contributed to a negative impact dark sky conditions as well as the general landscape. Large landscape wildfires and subsequent dominance by weed species have created long-term impacts to the visual resources due to changes in line, color, and texture of vegetation.

4.2.13.7.2. Reasonable Foreseeable Actions

Reasonable foreseeable future actions, including planning efforts to locate and develop mineral resources, establish ROW corridors, and renewable energy development would have impacts on visual resources. Impacts would be caused by surface disturbance from production, exploration, and exploration of drilling and mining facilities and development within ROWs and new renewable energy projects. However, these projects would be required to conform to an area's VRM class objectives. Impacts would be similar to the past and present actions for minerals, lands and realty, and renewable energy developments. These activities would increase the number of facilities, roads, and other disturbances that affect scenic quality. These impacts would be reduced based on implementation of best management practices, standard operating procedures, permit stipulations, and mitigation measures to reduce visual impacts to meet VRM objectives. Based on implementation of land-use plan goals, objectives, and management actions, combined with OHV travel restrictions, the number of new trails or roads developed in areas would be reduced.

4.2.13.7.3. Cumulative Impacts

4.2.13.7.3.1. Impacts Common to All Alternatives

Development actions within and outside the planning area could produce long-term cumulative impacts on visual resources. Allocating VRM classes establishes standards for managing the effects of surface-disturbing activities. Potential impacts of the alternatives on visual resources are based on the potential management decisions to create visual changes in or contrasts on the landscape. The analysis shows that the VRM classes have a spectrum or range of potential

impacts by each alternative. Impacts would continue to result from resource uses that tend to alter the scenic landscape such as minerals, lands and realty, renewable energy, and recreation. Renewable energy projects could potentially have long-term adverse impacts to visual resources within the planning area. Management of travel and transportation networks would benefit visual resources through the overall reduction of roads and trails.

During the life of the plan, population growth of cities and towns is expected to continue, further contributing to long-term negative impacts on the general landscape and a decrease in dark sky conditions. VRM classes and associated mitigation would likely limit the impacts to viewsheds with high scenic quality in the planning area and in the adjacent national forest, national parks, national wildlife refuges, national conservation areas, and national monuments. Protections for visual resources as Class I and II would be in addition to restrictions on development on adjacent protected areas. VRM Class III and IV area objectives in the planning area would not emphasize protection of an unmodified landscape and visual resources would allow for major modifications to the landscape. Activities that occur in these areas could result in changes to the characteristic landscape and may not protect scenic values.

4.2.13.7.3.2. Alternative 1

Alternative 1 represents current management under guidance of the 1998 RMP. Alternative 1 contains fewer and sometimes already-achieved management actions. In some cases, this is because new objectives have been formulated based on experience gained since the development of the previous plan. In other cases, new or different management options have been formulated to address existing and new objectives that are carried forward in the new RMP.

The cumulative impacts from Alternative 1 would be major. This is mostly reflecting the large previously undisturbed areas made available for renewable energy development and land disposals.

4.2.13.7.3.3. Alternative 2

Alternative 2 is the most protective of visual resource because it involves the least new development, excludes potentially impactful uses, and prioritizes protection and restoration of resources when conflicts among uses occur.

While Alternative 2 has the most area set aside for preservation and conservation (in terms of wilderness, lands with wilderness characteristics, ACECs, wild and scenic rivers, etc.) and has the most beneficial impacts on visual resources, the negative impacts would still be considered moderate. Again, this is mostly due to the large tracts of previously undisturbed land that will be made available for renewable energy development and land disposals.

4.2.13.7.3.4. Alternative 3

Alternative 3 alternatively emphasizes development priorities or preservation priorities according to resource realm. Alternative 3 therefore represents a compromise, and its impacts on visual resources are expected to be generally intermediate between Alternatives 2 and 4. Overall, it tends to encourage economic development but recognizes sensitive environmental concerns on a greater amount of land, resulting in more acres excluded or restricted from conflicting uses than Alternative 4.

The cumulative impacts from Alternative 3 would be major. This is mostly reflecting the large previously undisturbed areas made available for renewable energy development and land disposals. However, the cumulative impacts would be less than Alternatives 1 and 4.

4.2.13.7.3.5. Alternative 4

Alternative 4 generally prioritizes development of resources for economic return while relying on mitigation to reduce, rather than prevent, adverse impacts. Alternative 4 would likely have greater impacts on visual resources than Alternatives 2 and 3.

The cumulative impacts from Alternative 4 would be major. This is mostly reflecting the large previously undisturbed areas made available for renewable energy development and land disposals. This alternative would have the most negative cumulative impacts on visual resources.

4.2.14. Lands with Wilderness Characteristics

4.2.14.1. Summary

This section presents potential impacts on lands with wilderness characteristics that are not already within wilderness areas or wilderness study areas (WSAs). These are areas of 5,000 acres or more with landscapes generally in a natural or undisturbed condition. Naturalness refers to the appearance of an area as being primarily affected by the forces of nature, and any work of human beings must be substantially unnoticeable. That is, works of humans appear to be substantially unnoticeable to the average visitor who is not familiar with the biological composition of natural ecosystems versus human-affected ecosystems. These areas also provide outstanding opportunities for solitude or primitive and unconfined forms of recreation. Solitude is the experience of being away from the sights, sounds, and evidence of other people in the area. Primitive and unconfined recreation are activities that provide dispersed, undeveloped recreation and do not require facilities, motor vehicles, motorized equipment, or mechanized transport; opportunities may exist through either the diverse types of recreational activities possible or the outstanding quality of one opportunity. Lastly, these areas may contain ecological, geological, or other features of scientific, educational, scenic, or historical use that do not overlap with other wilderness elements. While these supplemental values are not required, when present, they should be protected as rigorously as the other required qualities.

4.2.14.2. Methods of Analysis

Generally, actions that create surface disturbance impact the natural character of these areas, the setting for experiences of solitude and primitive recreational activities, and compromise supplemental values. Impacts on lands with wilderness characteristics result from actions that maintain, enhance, or diminish the amount, distribution, and quality of the wilderness resource indicators. Wilderness characteristic indicators include the following:

- The extent, location, distribution, and quality of naturalness and natural conditions in the landscape. Naturalness is affected by surface-disturbing activities and associated human uses and developments that control or manipulate natural processes.
- Opportunities for the maintenance, enhancement, or diminishment of solitude are impacted by the sights and sounds of, or evidence of, other human beings and human activities within the area and on adjacent lands where the impacts are pervasive and omnipresent.
- Opportunities for the maintenance, enhancement, or diminishment of primitive and unconfined recreation. Opportunities for primitive and unconfined recreation are affected by the presence of motorized and mechanized activities and the availability, or unavailability, of landscape conducive for such activities.
- Supplemental values such as ecological, geological, or other features of scientific, educational, scenic, or historical use. Supplemental values are affected by surface-disturbing activities, disruptions, and associated human uses and developments.

Management actions that could impact an area's natural appearance could include the presence or absence of roads and trails, nature and extent of landscape modifications, presence or lack of native vegetation communities, connectivity of wildlife habitats, or other actions that result in or preclude surface-disturbing activities. Examples of human-made features that may be considered substantially unnoticeable in certain cases are trails, trail signs, fire breaks, wildlife enhancement facilities, water-measuring devices, minor ratio repeater sites, fences, spring developments, and

barely visible linear disturbances. These activities affect the presence or absence of human activity and, therefore, could affect and area's natural appearance. Likewise, mining and land-use authorizations sometimes result in impacts with long-term surface disturbance or permanent installations.

The wilderness characteristics of outstanding solitude or primitive recreation are related to the human experience in an area. Visitors may have outstanding opportunities for solitude when the sights, sounds, and evidence of other people is rare or infrequent; or where visitors can be isolated, alone, or secluded from others. Factors or elements that influence solitude may include size, configuration, topographic, and vegetative screening, and the ability of the visitor to find seclusion. Noise from motor vehicles and motorized equipment can detract from opportunities for solitude. Moreover, motorized vehicles and equipment, mechanical transport, and developed recreation facilities (e.g., trails, bridges) detract from opportunities for primitive forms of recreation. Additionally, solitude or primitive and unconfined recreation may be diminished a result of actions related to construction, installation, maintenance, and monitoring unrelated to recreation facilities.

In 2010 and 2011, the wilderness inventory within the planning area was updated and identified 242,214 acres within 21 areas that were found to possess wilderness characteristics. The inventory findings constitute the baseline to which the management actions and alternatives are compared and impacts assessed. The analysis considers the effects of plan alternatives on designated lands with wilderness characteristics, as well as impacts on areas that possess wilderness values where there is not management specifically to protect, preserve, and maintain their wilderness characteristics. The table below summarizes lands with wilderness characteristics designations across the alternatives.

Table 4.1. Lands with Wilderness Characteristics Proposed for Designation by Alternative

Alternative	Number of units	Total acres
Alternative 1	0	0
Alternative 2	21	242,214
Alternative 3	8	35,266
Alternative 4	5	23,721

To the extent practical, spacial data were used to compare the proposed management actions of each alternative to existing conditions. Impacts are quantified where possible; however, the lack of project-specific locations results in impacts often being described qualitatively. In the absence of qualitative data, best professional judgment was used. Impacts are sometimes described using ranges of potential impacts or in qualitative terms, if appropriate.

Assumptions

Impacts were assessed according to the following assumptions:

- All guidelines for the maintenance of wilderness characteristics as identified in this document would be followed to the extent allowed by existing budget and available personnel.
- Any new surface-disturbing activities proposed would be subject to implementation-level NEPA analysis. Proposed activities that would not initially meet management objectives for the area would be mitigated to the extent needed to meet the objectives.
- Uses and activities occurring both inside and outside these lands could influence wilderness characteristics, though outside influences would generally be indirect.
- There would be an increase in use of BLM-administered land.

- The proposed management prescribed for an area with wilderness characteristics would protect the qualities that are associated with the area.
- Surface disturbances related to mineral exploration and development identified in the RFD would occur within the planning area.
- No part of the planning area is designated to lands managed to protect wilderness characteristics under Alternative 1, however, other decisions could impact the baseline conditions that support existing wilderness characteristics. Therefore, analysis of these potential impacts is focused on the likelihood that management decisions under Alternative 1 would affect these baseline conditions.

4.2.14.3. Qualitative Intensity Scale

A range of qualitative terms have been used to gauge the intensity of each impact from one program area on another. The following analysis considers a management action's potential to cause changes to a landscape that could alter the elements of inventoried and designated lands with wilderness characteristics, specifically: size, naturalness, outstanding opportunities for solitude, outstanding opportunities for primitive and unconfined recreation, and supplemental values. Both positive and negative impacts are considered and, where necessary, the net impact of the two is discussed. The intensities of impacts are described using the following definitions:

- **Negligible:** The impact would not be detectable or measurable. There would be no appreciable change to lands with wilderness characteristics.
- **Minor:** Direct effects are apparent, measurable, small, localized, and contained within the footprint of the action. There would be a slight change to lands with wilderness characteristics. There would be small or slightly noticeable changes in the BLM's ability to manage and protect lands with wilderness characteristics.
- **Moderate:** Direct effects would be readily apparent and measurable over a larger area but are still mainly within the footprint of the action. Indirect effects are apparent and measurable but do not exceed much beyond the footprint of the action. Changes in the ability of the BLM to manage and protect lands with wilderness characteristics would be very apparent.
- **Major:** Direct effects would be highly noticeable and extend well beyond the footprint of the action. Indirect affects would be readily apparent and measurable well beyond the footprint of the action. The impact would be severe. There would be substantial change to lands with wilderness characteristics. Changes in the BLM's ability to manage and protect lands with wilderness characteristics would be severe.
- **Short-Term Effects:** The effect occurs only during or immediately after implementation of the alternative. For the purposes of this RMP, short-term effects would occur during the first five years.
- **Long-Term Effects:** The effect could occur for an extended period after implementing the alternative. The effect could last several years or more and could be beneficial or adverse. For the purposes of this RMP, long-term effects would occur beyond the first five years and perhaps over the life of the RMP.

4.2.14.4. Resources

4.2.14.4.1. Air Quality Impacts on Lands With Wilderness Characteristics

4.2.14.4.1.1. Impacts Common to All Alternatives

Air quality protections would indirectly benefit ecosystems by reducing air pollution that could decrease plant vigor and make plants more susceptible to pest and disease outbreaks. This would foster a healthier ecosystem and would help protect and preserve the aesthetic and scenic wilderness characteristics. No impacts to solitude, primitive and unconfined recreation, and supplemental values would occur.

4.2.14.4.1.2. Alternative 1

Alternative 1 would not designate any lands with wilderness characteristics within the planning area, however wilderness values would still exist. Those wilderness values of naturalness would be maintained only as an incidental byproduct of air quality management actions. Although air quality management actions would act to protect wilderness values, this alternative would provide the least amount of indirect protection to naturalness. The overall effect of Alternative 1 would be minor reductions in quality of wilderness characteristics. The degree of naturalness would decline over the long term.

4.2.14.4.1.3. Alternative 2

Air quality management actions in Alternative 2 would contribute to providing the greatest amount of protection to natural character. The overall effect would be a minor improvement in the quality of naturalness.

4.2.14.4.1.4. Alternative 3

Impacts from Alternative 3 would be similar to Alternative 1 except there would be more indirect protection of natural character as a result of designated lands with wilderness characteristics than in Alternative 1. The degree of naturalness would decline over the long term.

4.2.14.4.1.5. Alternative 4

Impacts from Alternative 4 would be similar to Alternative 3 except there would be less indirect protection of natural character than Alternative 3. The degree of naturalness would further decline over the long term.

4.2.14.4.2. Soil Resources Impacts on Lands With Wilderness Characteristics

4.2.14.4.2.1. Impacts Common to All Alternatives

There would be a positive benefit on wilderness characteristics resulting from soil management actions. Management actions are designed to improve or maintain soil quality, reduce wind and water erosion, and conserve soils. These and restoration of disturbed and degraded sites would improve naturalness. Reducing compaction and increasing infiltration would indirectly improve

ecosystem health over the short term; however, these impacts could extend into long-term benefits from increased vegetative productivity and improved habitat connectivity. All of these effects would help enhance wilderness characteristics. Generally, impacts would be positive and minor. No impacts to solitude, primitive and unconfined recreation, and supplemental values would occur.

4.2.14.4.2.2. Alternative 1

Alternative 1 would not designate any lands with wilderness characteristics within the planning area, but wilderness values would still exist. Those wilderness values of naturalness would be maintained only as an incidental byproduct from management of soil resources. Although soil management actions would act to protect wilderness characteristics, the overall effect of Alternative 1 would be minor reductions in quality of wilderness characteristics. The degree of naturalness would decline over the long term.

4.2.14.4.2.3. Alternative 2

Soil resources management actions in Alternative 2 would contribute to providing the greatest amount of protection to natural character. The overall effect would be minor improvement in quality of naturalness.

4.2.14.4.2.4. Alternative 3

Impacts from Alternative 3 would be similar to Alternative 1 except there would be more indirect protection of natural character as a result of more designated lands with wilderness characteristics than in Alternative 1. The degree of naturalness would decline over the long term.

4.2.14.4.2.5. Alternative 4

Impacts from Alternative 4 would be similar to Alternative 3 except there would be less indirect protection of natural character under Alternative 3. The degree of naturalness would further decline over the long term.

4.2.14.4.3. Water Resources Impacts on Lands With Wilderness Characteristics

4.2.14.4.3.1. Impacts Common to All Alternatives

Management actions propose to protect water quality and to ensure that adequate water is available to meet management goals. Protecting water quality will also help protect aquatic species that live in the water, as well as species that drink from the water sources. Actions designed to increase BLM access to water sources for wildlife and habitat improvements would decrease naturalness due to surface disturbances and disruptions; however, it would likely result in more stable or increased wildlife populations. Installations and the need for maintenance of improvements would decrease experiences of solitude. However, protecting water quality in support of wildlife would tend to benefit primitive recreation through improved hunting, trapping, and wildlife viewing opportunities. No impacts to supplemental values are anticipated. Generally, impacts may be positive or negative and minor.

4.2.14.4.3.2. Alternative 1

Alternative 1 would not designate lands with wilderness characteristics within the planning area, but wilderness values would still exist. Those wilderness values of naturalness, solitude, and primitive and unconfined recreation would be maintained only as an incidental byproduct from management of water resources. Although water resources management actions would act to protect these characteristics while diminishing solitude, the overall effect of Alternative 1 would be a minor decline in quality of wilderness characteristics over the long term.

4.2.14.4.3.3. Alternative 2

Water resources management actions in Alternative 2 would provide the greatest amount of protection to wilderness character.

4.2.14.4.3.4. Alternative 3

Impacts from Alternative 3 would be similar to Alternative 1 except there would be less protection of wilderness character as a result of designated lands with wilderness characteristics than in Alternative 1. Therefore, wilderness characteristics would decline over the long term.

4.2.14.4.3.5. Alternative 4

Impacts from Alternative 4 would be similar to Alternative 3 except there would be even less protection of wilderness character as a result of designated lands with wilderness characteristics than in Alternative 3. There would be a further decline in wilderness characteristics.

4.2.14.4.4. Integrated Vegetation Impacts on Lands With Wilderness Characteristics

4.2.14.4.4.1. Impacts Common to All Alternatives

Integrated vegetation includes general vegetation, riparian areas, wetlands, weeds, forests, and woodlands, and therefore analysis of impacts are described collectively. General management, including potential natural community, would maintain vegetation and maintain or enhance wildlife habitats, thereby benefitting wilderness characteristics. Restoring communities would improve long-term ecological health and habitats while restoration of roads and improvements that are no longer necessary could deter continued use of the areas, resulting in improvements to naturalness. In addition, noise and disturbance associated with roads would be eliminated by reclamation. This would improve the ability for visitors to escape the sight, sounds, and evidence of other people and modern civilization, thereby benefitting solitude and primitive recreation. Treatments for restoration could cause a temporary diminishment of solitude for recreationists. Using native species for restoration, including transplanted salvaged cactus and yucca, would help preserve naturalness. Actions that would improve riparian and wetland proper functioning condition would in turn improve naturalness, especially via increases in quantity and quality of riparian vegetation. Improved habitats for riparian and wetland-dependent wildlife species may also improve opportunities for recreation such as hunting and biological and zoological sightseeing.

Management of noxious and invasive species would improve the ecological health and condition in treated areas over time, which would improve naturalness, but it could cause temporary impacts to recreationists in the area. Weeds affect naturalness by decreasing vegetative diversity. Consequently, decreased habitat quality negatively affects wildlife populations and hence primitive recreation. Reducing the quantity of weed species would improve vegetation diversity and wildlife populations. Although weed treatments would generally improve wilderness characteristics in the long term, short-term impacts could result from vegetation removal as it would alter the scenic value. Short-term impacts would vary by the type of application. Treatments, especially mechanical treatments, would impact solitude.

Weed control measures would help prevent conditions that reduce indicators of naturalness such as riparian habitat and water quality. Reduction of total acres impacted by weeds would positively affect riparian habitat, water quality, and aquatic resources. Mechanical treatments may have a greater impact on solitude than chemical treatments or prescribed burning for weeds management. Also, mechanical treatments would include crushing or removal of vegetation and disturbance of soils, thereby impacting naturalness. Limiting the spread of weeds would reduce the size and intensity of wildfires that destroy native vegetation, representing additional protection for the non-fire adapted plant communities. Naturalness would be retained to the extent that native plant communities are protected from direct mortality or indirect harm due to weeds.

4.2.14.4.4.2. Alternative 1

Alternative 1 would not designate any lands with wilderness characteristics. Those wilderness values of natural solitude, primitive and unconfined recreation, and any supplemental values would be maintained only as an incidental byproduct from management of vegetation resources. Alternative 1 would not contain many of the management actions found in the other alternatives that could provide long-term benefit to naturalness. These actions could still be carried out on a case-by-case basis. Impacts from Alternative 1 could be negligible or moderate, depending on the type and extent of the management action.

4.2.14.4.4.3. Alternative 2

Requiring no net unmitigated loss of vegetation communities, including riparian areas, would mitigate for loss of naturalness. Mitigation actions could improve naturalness in other locations. Requiring mitigation for all the ecosystem services, managing native plant communities for climate change, and protecting genetic integrity of vegetation may also help protect the apparent naturalness in the long term.

Fuel breaks would help reduce the changes of large scale wildfires in ecosystems that are not fire-adapted, thereby benefitting naturalness in the long term. Construction of fuel breaks would diminish naturalness and solitude in the short term. The fuel break could also lead to OHV use of the cleared area, further impacting solitude and primitive and unconfined recreation. Prescribed fires would in the long term improve the vegetative diversity and age class that contributes to naturalness. However, prescribed fires are usually conducted in the cooler months of the year, thereby increasing the likelihood of temporarily impacting solitude.

Monitoring vegetation change and cooperating in vegetation research could contribute to the scientific supplemental values of the areas through increased understanding of natural processes at the landscape level.

4.2.14.4.4.4. Alternative 3

Impacts from Alternative 3 would be similar to those under Alternative 2 except that weed management plans would be required for projects with a disturbance footprint of five acres or more. This will cover fewer projects than in Alternative 2, and thus more projects could spread weeds into neighboring designated lands with wilderness characteristics.

4.2.14.4.4.5. Alternative 4

Impacts form Alternative 4 would be similar to those under Alternative 2. Weed management plans would only be required for projects with a disturbance of 10 acres or more. This could lead to the increased spread of weeds onto adjacent designated lands with wilderness characteristics. Also, Alternative 4 does not have language requiring no net unmitigated loss of vegetation communities, and therefore naturalness could decrease.

4.2.14.4.5. Fish and Wildlife Impacts on Lands With Wilderness Characteristics

4.2.14.4.5.1. Impacts Common to All Alternatives

The wildlife objectives stress the importance of natural ecological processes and functions in relation to land uses and discretionary actions. Implementing management actions to restore or improve wildlife habitats would support apparent naturalness by ensuring species health and diversity. However, this could cause temporary disruption to solitude or primitive and unconfined recreation during project construction. Fish and wildlife introductions, reintroductions, and augmentation could improve apparent naturalness by ensuring healthy, viable, and well-distributed wildlife populations, as well as increasing primitive recreation such as wildlife viewing, hunting, and trapping. Introductions of species into areas where they did not previously exist could also decrease naturalness because of competition with local populations of other species. Control of non-native, nuisance, and overpopulated species is unlikely to have any impacts on apparent naturalness, but ecological supplemental values could improve through improving biological conditions.

Avoidance, mitigation, and BMP measures to limit impacts to migratory birds would help reduce surface-disturbing activities that could impact naturalness. Management of ROWs and ROW corridors for siting and construction of communication towers could indirectly protect opportunities for solitude inside adjacent designated lands with wilderness characteristics by limiting the sights, sounds, and evidence of modern civilization.

New wildlife water developments (guzzlers) would result in a relatively minor human impact to the areas' natural appearance. The impact would occur due to the installation itself, as well as potential changes to species variety, populations, and distribution. Design and modifications to developments could alleviate some of those impacts. Construction, installation, and maintenance of developments would impact solitude. New wildlife waters could attract more wildlife species, which could result in a slight benefit to primitive recreation through increased opportunities for hunting, trapping, and wildlife viewing.

4.2.14.4.5.2. Alternative 1

Alternative 1 would not designate any lands with wilderness characteristics within the planning area. Those wilderness values of natural, solitude, primitive and unconfined recreation, and any supplemental values would be maintained only as an incidental byproduct from fish and wildlife management actions. Alternative 1 contains contradictory water resource protection measures for other resources; impacts from surface disturbances would occur and vary. Alternative 1 does not contain many of the management actions proposed in the other alternatives that could impact wilderness characteristics. These actions could still be carried out on a case-by-case basis. Impacts from Alternative 1 on wilderness characteristics could be negligible or moderate, depending on the type and extent of the management action.

4.2.14.4.5.3. Alternative 2

Avoiding authorized actions within one half mile of natural waters and within one quarter mile of artificial waters would help protect naturalness and solitude by reducing surface-disturbing activities, sights, sounds, and evidence of others. Actions to limit and reduce fragmentation may directly or indirectly benefit ecological values by ensuring population viability. Inventorying and monitoring wildlife populations and their habitats could contribute to the scientific supplemental values of the areas through increased understanding of natural processes at the landscape level.

4.2.14.4.5.4. Alternative 3

Impacts under Alternative 3 would be similar to those under Alternative 2 except that there would be a smaller avoidance buffer around natural water sources in Alternative 3. In addition, language for artificial water sources would only be to minimize impacts and not full avoidance. The reduced buffer for natural waters and softer language for artificial waters could lead to some additional impacts to naturalness and solitude due to surface-disturbing activities, sights, sounds, and evidence of others.

4.2.14.4.5.5. Alternative 4

Impacts under Alternative 4 would be similar to those under Alternative 2 except that the avoidance buffer around natural water sources would be one quarter mile and there would be no buffer around artificial waters. The reduced buffer around natural waters could lead to additional impacts to naturalness and solitude due to surface-disturbing activities, sights, sounds, and evidence of others.

4.2.14.4.6. Special Status Species Impacts on Lands With Wilderness Characteristics

4.2.14.4.6.1. Impacts Common to All Alternatives

Maintaining or improving habitats for special status species would also provide long-term benefits wilderness characteristics. Managing for diverse native vegetation, wildlife, and a variety of habitats would have a positive effect on apparent naturalness, primitive and unconfined recreation (e.g. increased opportunities for hunting, trapping, and wildlife viewing), and any identified supplemental values (e.g. biological). However, there could be negative impacts on solitude

and primitive and unconfined recreation resulting from project implementation, installations, and maintenance actions.

4.2.14.4.6.2. Alternative 1

Alternative 1 would not designate any lands with wilderness characteristics within the planning area. Alternative 1 would not contain some of the actions proposed under the other alternatives that could also positively or negatively impact wilderness characteristics. These actions could still be carried out on a case-by-case basis. Fish and wildlife management actions would affect wilderness values. Those wilderness values could be maintained only as an incidental byproduct of fish and wildlife management actions, but the overall effect of Alternative 1 may be a minor reduction in the quality of wilderness characteristics.

4.2.14.4.6.3. Alternative 2

Managing and protecting important genetic and demographic corridors for listed and sensitive species would also benefit apparent naturalness, primitive recreation, and supplemental values (e.g. ecological). Mitigation performed as part of no net unmitigated loss of sensitive species habitats would likely benefit those same wilderness values.

4.2.14.4.6.4. Alternative 3

Impacts under Alternative 3 would be similar to those under Alternative 2. Since fewer acres would be designated as lands with wilderness characteristics, in the long term there may be a decline in the quality of wilderness character.

4.2.14.4.6.5. Alternative 4

Impacts under Alternative 4 would be similar to those under Alternative 2 except for impacts to sensitive species would only need to be minimized and would not have to meet the no net unmitigated standard. Minimizing impacts would also help minimize impacts to apparent naturalness, primitive recreation, and supplemental values (e.g. ecological) but would not provide the same level. Since the least amount of acres would be protected within designated lands with wilderness characteristics, in the long term, there may be a further decline in the quality of wilderness character.

4.2.14.4.7. Wild Horse and Burro Impacts on Lands With Wilderness Characteristics

4.2.14.4.7.1. Impacts Common to All Alternatives

Wild horse and burro management actions involving installation of facilities (water developments, underpasses) and landform and vegetation disturbance needed to accommodate the facilities would modify the landscape and detract from the natural appearance of the area while construction of facilities would result in temporary negative impacts to solitude. As large herbivores, horses in particular consume relatively large amounts of vegetation and water and cause substantial impacts on riparian areas, all of which contribute to decreases of apparent naturalness. However, primitive and unconfined recreation could be enhanced by increasing the opportunities for viewing wild

horses and burros. All alternatives identify the need to maintain the appropriate management level (AML) within herd management areas (HMAs), limit forage utilization, and would gather animals. Gathers would help prevent excess impacts from overpopulation of the species and ensure adequate maintenance of natural conditions. Gathers would result in temporary negative impacts to solitude, while primitive and unconfined recreation would remain unaffected. Habitat monitoring for sustainability may result in adjustment of AML. If unacceptable adverse impacts occur from use, corrective management actions would be taken. This action is important in ensuring apparent naturalness. No impacts to supplemental values are anticipated.

4.2.14.4.7.2. Alternative 1

Under Alternative 1, horses and burros would be managed for zero animals in specific areas. Overall, this would help reduce negative impacts to undesignated lands with wilderness characteristics. Not recommending any new horse or burro ranges would limit impacts to wilderness character to only current ranges and not expand impacts to new areas.

4.2.14.4.7.3. Alternative 2

Similar to Alternative 1, there would be specific areas where horses and burros would be managed for zero animals. The use of fertility control to manage horse and burro populations may help reduce impacts from overpopulation and impacts from frequent gathers. The possibility of new horse or burro ranges could spread impacts to areas currently not receiving impacts from horses or burros. Excluding ROWs of five acres or greater and excluding surface-disturbing activities that adversely impact key horse and burro habitat components within HMAs would indirectly benefit wilderness characteristics (i.e., naturalness, solitude) on adjacent lands.

4.2.14.4.7.4. Alternative 3

Impacts under Alternative 3 would be similar to those under Alternative 2 except that ROWs and other surface-disturbing activities would only be avoided, not excluded. While impacts to designated lands with wilderness characteristics would not change, areas not designated as lands with wilderness characteristics would incur a loss to wilderness values.

4.2.14.4.7.5. Alternative 4

Impacts under Alternative 3 from language about the use of fertility control and potential new ranges would be the same as those under Alternative 2. Alternative 4 would not contain language to manage certain areas to zero AML. This could lead to impacts from horses or burros as they move in from surrounding areas and are not gathered. ROWs of five acres or more may be allowed, and this could further impact areas not designated as lands with wilderness characteristics. This alternative has the greatest potential to result in long-term loss of naturalness, solitude, and primitive and unconfined recreation.

4.2.14.4.8. Cave and Karst Management Impacts on Lands With Wilderness Characteristics

4.2.14.4.8.1. Impacts Common to All Alternatives

Cave and karst management actions would result in positive or negative and negligible impacts to wilderness characteristics depending on the extent of changes to the natural appearance and restrictions on primitive and unconfined recreation. Decisions directed toward protection of the cave resource such as limiting developments would protect the area's naturalness in the long term. Restricting access to cave location data to bona fide scientific studies and experienced cavers would protect solitude, primitive and unconfined recreation, and potential supplemental values unique to the resource such as ecological, geological, scientific, or educational use. A special recreation permit for commercial groups, registration system, and gating and fencing of entrances would impose restrictions on use which, while preserving solitude, would conversely negatively impact unconfined recreation.

4.2.14.4.8.2. Alternative 1

Wilderness values of natural, solitude, primitive and unconfined recreation, and any supplemental values may be maintained only as an incidental byproduct from cave and karst management actions. ROW avoidance areas for all significant cave resources and newly discovered caves would tend to preserve the natural appearance by limiting the extent of surface-disturbing activities. This could also benefit solitude within areas containing wilderness characteristics, as well as adjacent to the inventoried areas where ROWs may be pervasive and omnipresent. Restoration of altered or vandalized cave and karst systems would not occur, and therefore no benefit to improving the natural appearance of the area would occur.

4.2.14.4.8.3. Alternative 2

Restoring altered or vandalized cave and karst systems would benefit wilderness characteristics by returning the landscape to a more natural appearance in the long term. ROW avoidance areas within one half mile of significant caves may provide only slightly less protection of natural appearance than Alternative 1. This could also benefit solitude within designated lands with wilderness characteristics, as well as the viewshed on adjacent lands where ROWs may be pervasive and omnipresent. This alternative could consider a special recreation permit for organized groups, which could further preserve solitude while conversely negatively impacting unconfined recreation.

4.2.14.4.8.4. Alternative 3

Impacts would be similar to Alternative 2 except that ROW avoidance areas within one quarter mile of significant caves may provide slightly less protection of solitude and naturalness.

4.2.14.4.8.5. Alternative 4

Impacts would be similar to Alternative 2 except that allowing ROWs near cave sites would provide the least amount of protection for naturalness and solitude.

4.2.14.4.9. Wildland Fire Management Impacts on Lands With Wilderness Characteristics

4.2.14.4.9.1. Impacts Common to All Alternatives

Fire (wild and prescribed) and fire suppression affect wilderness characteristics in a variety of ways. Where the ecosystem is fire adapted, wildland fire would be allowed to function in its natural ecological role, mirroring historical fire return interval and severity. Management actions would result in long-term modification of the current condition to one that would be more representative of the native vegetation diversity. On the other hand, fire can also result in the invasion of non-native plant species and conversion of the landscape to a monoculture, thereby reducing naturalness. Environmental actions, including changes to vegetation communities and the resulting modification of fire's role and regime, have resulted in an existing environment different from historical conditions. Recognizing that vegetation conditions and fuel loading within these lands are not in a historically natural condition, fire would still be considered a natural, but managed, component within these areas. Likewise, a variety of political and regulatory management constraints associated with other resource needs and safety considerations affect how the role of fire management can be applied within these areas.

Fire line construction during suppression activities negatively impacts wilderness character in several ways. Construction is a surface-disturbing activity while suppression manipulates natural processes, both of which impact naturalness. Construction involving the use of motor vehicles and motorized equipment creates noise that detracts from solitude. Primitive and unconfined recreation may be restricted (e.g., access) or impaired (e.g., visibility) during all naturally ignited and planned fire events. However, these impacts on the quality of visitor experience would be limited to the fire area and duration and likely would not affect overall use and wilderness characteristics outside of the fire area. Solitude is positively influenced by vegetation that can provide screening. Depending on the vegetation community in which the fires occur, vegetation screening could be reduced or eliminated. Use of retardant would impact naturalness, but this would fade over time. Stabilization and rehabilitation of disturbances and implementing hazardous fuels and noxious weed treatments would enhance or restore natural vegetation communities over time though activities could temporarily impact solitude. Actions geared toward restoring natural ecosystems can benefit an array of supplemental values contained within lands with wilderness characteristics. Likewise, visitor experience and opportunities for solitude and primitive unconfined recreation may be enhanced by restoration of the historical natural condition.

Prescribed fire could have similar effects, but these could be avoided or minimized through site-specific project plans. Because actions to protect resources and project-specific analyses would limit impacts of prescribed fire and other hazardous fuel treatments, short-term impact from these fire management activities would be minimized or eliminated and there would be a long-term benefit to wilderness characteristics by reducing catastrophic wildland fires.

4.2.14.4.9.2. Alternative 1

Alternative 1 would not designate any lands with wilderness characteristics within the planning area, but wilderness characteristics would still exist. Those wilderness values of naturalness, solitude, primitive and unconfined recreation, and any supplemental values would be maintained only as an incidental byproduct from wildland fire management actions. There would not be specific management actions to address emergency stabilization and rehabilitation (ESR)

activities involving erosion control or reseeding. In the long term, this may result in the persistence of surface disturbances, conversion of the landscape to a monoculture of grasses, and reduced vegetative screening. No hazardous fuels and weed management actions involving noxious or invasive species treatments would occur. Short-term impacts to solitude from these management actions would not occur, but in the long term, this would result in a landscape that is less representative of natural plant species composition and distribution that is associated with the natural fire regime. Not allowing fuel breaks and prescribed fire could result in a long-term detriment to wilderness characteristics by increasing the impacts created by future catastrophic wildland fires.

4.2.14.4.9.3. Alternative 2

This alternative would allow ESR activities such as erosion control and reseeding. This would benefit naturalness by reducing surface disturbances and likeliness of conversion of the landscape to a monoculture of grasses, both of which would contribute to improving vegetative screening. Hazardous fuels and weed management involving noxious or invasive species treatments would in the long term benefit naturalness by creating a landscape that is more representative of native plant species distribution and composition. In the short term, allowing treatments (mechanical, chemical, or biological) could negatively impact solitude. Allowing fuel breaks and prescribed fire would result in long-term improvement to wilderness characteristics by decreasing the impacts created by future catastrophic wildland fire.

4.2.14.4.9.4. Alternative 3

Impacts from Alternative 3 would be similar to Alternative 2 except there would be fewer designated lands with wilderness characteristics and thus less protection of wilderness values. Therefore, wilderness values may be more likely to decline over the long term in the undesignated lands with wilderness characteristics.

4.2.14.4.9.5. Alternative 4

Impacts from Alternative 4 would be similar to Alternative 3 except there would be fewer designated lands with wilderness characteristics and thus less protection of wilderness values. Therefore, wilderness values may be further diminished over the long term in the undesignated lands with wilderness characteristics.

4.2.14.4.10. Cultural Resources Impacts on Lands With Wilderness Characteristics

4.2.14.4.10.1. Impacts Common to All Alternatives

Authorized excavation of cultural sites localities could result in short-term impacts to solitude during implementation. Though activities would result in surface disturbance, the footprint would be limited in scope, and in the long term, excavation could enhance supplemental values. The possibility of increased human presence around cultural sites managed for public recreational use could decrease opportunities for solitude and primitive recreation depending on the current levels of visitation, location, and level of development associated with the site. Cultural resource management guidance prohibiting surface disturbance near some archaeological sites would

directly benefit naturalness in those areas. Management to protect traditional areas would also help protect wilderness values in those areas through limitations on the type of activities that could occur. Managing cultural resources for public values such as educational also benefit supplemental values of wilderness.

4.2.14.4.10.2. Alternative 1

Wilderness values of naturalness, solitude, primitive and unconfined recreation, and any supplemental values would be maintained only as an incidental byproduct from cultural resources management actions. No specific decisions to avoid impacts to eligible National Historic Trails would be identified. Activities could occur in these areas that could alter any identified wilderness characteristics.

4.2.14.4.10.3. Alternative 2

A 500-foot exclusion buffer around cultural sites could help limit the types of activities that could potentially impact wilderness values.

4.2.14.4.10.4. Alternative 3

A 100-foot exclusion buffer around cultural sites could help limit the types of activities that could potentially impact wilderness values.

4.2.14.4.10.5. Alternative 4

Impacts would be identical to Alternative 3.

4.2.14.4.11. Paleontological Resources Impacts on Lands With Wilderness Characteristics

4.2.14.4.11.1. Impacts Common to All Alternatives

Management actions designed to mitigate adverse effects to paleontological localities and study known sites could have varying degrees of localized impacts to wilderness values. Impacts could include surface disturbances, reduced solitude, and loss of supplemental values due to collection and data recovery.

4.2.14.4.11.2. Alternative 1

There are no additional impacts to lands with wilderness characteristics.

4.2.14.4.11.3. Alternative 2

Scientifically important paleontological localities would be protected in place and closed to unpermitted collection while developing interpretation and public access to resources. Impacts to wilderness values from this management action could include reduced solitude and primitive recreation while protecting and enhancing supplemental values. This alternative would allow

collection of common invertebrate and botanical paleontological resources without a permit, thereby supporting primitive recreation.

4.2.14.4.11.4. Alternative 3

This alternative provides for reconsideration of collections of common invertebrate and botanical paleontological resources where resources are of critical scientific or recreational value, which, while negatively impacting primitive and unconfined recreation, could benefit supplemental wilderness values by leaving resources in situ. On-site interpretation and creating access to paleontological resources within Tertiary-aged trackways and conservation of scientific importance could have various impacts to wilderness values, including reduced solitude and primitive recreation while protecting and enhancing supplemental values.

4.2.14.4.11.5. Alternative 4

There are no additional impacts to lands with wilderness characteristics.

4.2.14.4.12. Visual Resource Management Impacts on Lands With Wilderness Characteristics

4.2.14.4.12.1. Impacts Common to All Alternatives

Management decisions that result in surface disturbance would have direct impacts on naturalness by changing the appearance of the landscape. Similarly, decisions that reduce surface disturbance generally would decrease changes to the landscape and preserve apparent naturalness. The area of impact is not limited to the specific areas of disturbance. Rather, the viewshed in which the disturbance occurs would be impacted. The severity of the impact, or degree of changes and contrast from the existing visual conditions, generally would decrease as distance from the disturbance increases. In addition, the larger the disturbance, the more visible it would be from foreground and middleground viewpoints, and thus the greater the impact on naturalness.

4.2.14.4.12.2. Alternative 1

Alternative 1 would provide the least amount of protection for undesignated lands with wilderness characteristics. VRM class objectives would be attributed to these areas due to other resource values and uses, not because of their wilderness values. Where VRM Class II is assigned, the naturalness of these areas would be afforded some protection because of restrictions that require development activities to retain the existing character of the landscape. For areas within VRM Class III and IV, naturalness would not be protected as disturbances and/or developments in these areas would occur. Activities could change native vegetation and create surface disturbances. These impacts would have the overall effect of reducing naturalness at a site-specific and landscape level.

4.2.14.4.12.3. Alternative 2

Alternative 2 would manage all designated lands with wilderness characteristics to VRM Class I standards, which would support the continued appearance of a natural landscape by retaining native vegetation communities and precluding surface-disturbing activities. These lands would

receive the highest visual and scenic resource protection with greater wilderness characteristic acreage under VRM Class I than under any other alternative. Visual resource management actions that address designated lands with wilderness characteristics that no longer meet the size criteria would negatively impact scenic values. These areas would adjust to a less restrictive VRM class designation, thereby degrading natural character and natural conditions.

4.2.14.4.12.4. Alternative 3

Impacts are similar to Alternative 2 except that Alternative 3 would provide less protection of the natural appearance. There would be fewer designated lands with wilderness characteristics, and these lands would be assigned as VRM Class II. This alternative would contribute toward preserving naturalness, although to a lesser extent than Alternative 2.

4.2.14.4.12.5. Alternative 4

Impacts are similar to Alternative 3 except that there would be slightly less protection of the apparent naturalness than Alternative 3. There would be fewer designated lands with wilderness characteristics, and they would be assigned as VRM Class II.

4.2.14.4.13. Lands with Wilderness Characteristics Impacts on Lands With Wilderness Characteristics

4.2.14.4.13.1. Impacts Common to All Alternatives

There would be no impacts common to all alternatives because there are no designated lands with wilderness characteristics in Alternative 1.

4.2.14.4.13.2. Alternative 1

Because Alternative 1 would not designate lands with wilderness characteristics, no future standards or management prescriptions would be established for structures and facilities; wildland fire, integrated vegetation, recreation and travel, minerals, and lands and realty actions would not be employed to protect or maintain existing wilderness values. Naturalness, solitude, primitive and unconfined recreation, and supplemental values would only be maintained as an incidental byproduct from management of other resources. Overall, long-term loss, impairment or diminishment of wilderness characteristics would be anticipated in localized areas. Impacts would primarily be negligible to minor, while major impacts would occur in very limited areas.

4.2.14.4.13.3. Alternative 2

Alternative 2 would designate 242,214 acres of lands with wilderness characteristics in 21 areas. Designating lands with wilderness characteristics and the associated management prescriptions are designed to protect and preserve the wilderness values of natural, outstanding opportunities for solitude or primitive, unconfined recreation, and supplemental values by excluding or limiting activities that may impact those characteristics. This alternative provides the most restrictive management prescription and therefore the most protection of wilderness character. Management actions include limiting surface-disturbing and disruptive activities such as limiting motorized and mechanized travel to existing designated routes, excluding ROWs, and no surface occupancy for

oil and gas. No new and/or additional designated routes would be permitted under this alternative. Limiting these activities would result in long-term positive impacts on wilderness character. Any permitted activities would be limited to those that preserve the natural and undeveloped character. Structures and facilities would impact relatively small, localized areas; however, it would continue to appear affected primarily by the forces of nature.

4.2.14.4.13.4. Alternative 3

Impacts on Alternative 3 would be similar to those under Alternative 2 except that 36,033 acres of lands with wilderness characteristics would be designated in eight areas. Generally, these designated lands with wilderness characteristics would receive slightly less protection of their wilderness values due to management prescriptions that allow for more resource uses. Motorized and mechanized travel could be allowed although use would be limited to designated trails. No direct impacts to naturalness would occur; however, noise can detract from opportunities for solitude. Additionally, motorized and mechanized uses are developed types of recreation that tend to conflict with simple forms of recreation such as hiking and horseback riding, negatively affecting opportunities for solitude or primitive and unconfined recreation. Areas with identified wilderness values but not designated as lands with wilderness characteristics may not be protected from potential impacts unless the values are protected through management prescriptions under other resource or resource use sections.

4.2.14.4.13.5. Alternative 4

Alternative 4 would be similar to Alternative 3 except it would designate lands with wilderness characteristics in five areas totaling 29,840 acres. Similar to Alternative 3, areas with identified wilderness values but not designated as lands with wilderness characteristics may not be protected from potential impacts unless the values are protected through management prescriptions under other resource or resource use sections.

4.2.14.5. Resource Uses

4.2.14.5.1. Forestry and Woodland Products Impacts on Lands With Wilderness Characteristics

4.2.14.5.1.1. Impacts Common to All Alternatives

Maintaining woodlands and conifer forests for all aged stands would benefit wilderness values such as naturalness (i.e., presence of native plant communities), solitude (i.e., vegetative screening), and primitive recreation (e.g., nature study of these plant communities). Firewood cutting and gathering could have negative impacts by creating surface disturbances that reduce native plant diversity and vegetative screening, although limiting cutting and gathering to designated areas would mitigate impacts.

4.2.14.5.1.2. Alternative 1

Allowing collection of dead and down or marked green mesquite and acacia can diminish the natural appearance. Collecting can both positively and negatively impact primitive recreation by providing opportunities for visitors to create campfires while decreasing nature study.

4.2.14.5.1.3. Alternative 2

Alternative 2 would prohibit the collection of mesquite and acacia wood, including dead and down wood. This could protect naturalness and primitive creation by retaining native vegetation and supporting nature study, respectively. However, this prohibition would decrease unconfined recreation.

4.2.14.5.1.4. Alternative 3

Alternative 3 would prohibit the commercial collection of mesquite and acacia but would still allow collection for personal use for on-site recreational campfires. This could diminish the natural appearance while both positively and negatively impacting primitive recreation by providing opportunities for visitors to create campfires while decreasing nature study.

4.2.14.5.1.5. Alternative 4

Impacts under Alternative 4 would be similar to those under Alternative 3.

4.2.14.5.2. Livestock Grazing Impacts on Lands With Wilderness Characteristics

4.2.14.5.2.1. Impacts Common to All Alternatives

Managing allotments to maintain rangeland health standards can help reduce the impacts on wilderness values, but impacts would still be expected to occur. Requiring salt and mineral supplements to be placed at least one mile from water would help protect riparian vegetation. Maintenance and construction of range improvement could result in a short-term loss of opportunities for solitude during implementation and a long-term decrease in naturalness; however, due to the small size and localized nature of range improvements, this would not eliminate naturalness throughout lands with wilderness characteristics. Closures of allotments could result in a long-term improvement to naturalness by eliminating vegetation trampling, soil compaction, reducing the spread of weeds, and removing unnecessary range improvements.

4.2.14.5.2.2. Alternative 1

Alternative 1 would leave the most allotments open for grazing compared to the other alternatives. Many of these allotments are currently inactive and had their previous grazing privileges bought out as part of mitigation for the desert tortoise. Not permanently closing these allotments could lead to a reintroduction of grazing onto areas with wilderness values.

4.2.14.5.2.3. Alternative 2

Under Alternative 2, all allotments, including the three currently active allotments, would be closed to grazing. Thus grazing as a potential impact to wilderness values would be removed from the entire planning area.

4.2.14.5.2.4. Alternative 3

Alternative 3 would leave only three administered allotments open in the planning area. No wilderness values were identified within those areas, and therefore no unique impacts were identified for Alternative 3.

4.2.14.5.2.5. Alternative 4

Alternative 4 would leave five administered allotments open in the planning area. No wilderness values were identified within those areas, and therefore no unique impacts were identified for Alternative 4.

4.2.14.5.3. Minerals Impacts on Lands With Wilderness Characteristics

4.2.14.5.3.1. Locatable, Saleable, Fluid and Solid Leasable Minerals Impacts on Lands With Wilderness Characteristics

4.2.14.5.3.1.1. Impacts Common to All Alternatives

The minerals program includes fluid leasable, solid leasable, locatable, and saleable minerals, and therefore analysis of impacts are described collectively. Impacts associated with these actions include increased human presence, motor vehicles and equipment, mechanized transport, noise, and surface disturbance from extraction and access roads. Developing and mining valid existing rights would entail disturbing the land surface and building roads for access and extraction activities. The related sights and sounds of mining activity would degrade or eliminate opportunities for solitude and primitive recreation on affected parcels. Mitigation strategies could be identified and reclamation could recover wilderness values of an area, but changes could still be minor to moderate for many years after mining has ceased.

Impacts from each alternative would vary based on the number of acres opened, closed, or withdrawn and based on special or standard stipulations or mitigation measures. Types of restrictions such as those on siting and operations that can be applied vary by the type of mineral activity and whether they are saleable, leasable, or locatable. Generally, greater restrictions on disturbances result in fewer changes to the baseline wilderness character. For example, controlled surface use (CSU) and no surface occupancy (NSO) for fluid minerals could limit or remove impacts due to surface-disturbing activities, respectively.

4.2.14.5.3.1.2. Alternative 1

Implementation of Alternative 1 could permit fluid leasable, solid leasable, locatable, and saleable mineral uses within areas containing wilderness characteristics. Mining claims could be located and minerals extracted, impacting naturalness and the opportunities for solitude and primitive recreation. Mineral use location, assessment, and development could have negligible to major impacts on wilderness characteristics, not only from the activity itself, but also from access roads, transportation, and increasing public access to remote areas. The loss or impairment of wilderness characteristics is more likely where there is moderate to higher mineral potential. On the other hand, impacts are anticipated to be only minor to negligible in areas with low mineral potential.

4.2.14.5.3.1.3. Alternative 2

Alternative 2 designates the greatest amount of lands with wilderness characteristics and has the most restrictive prescriptions, thus providing the most protection for wilderness value from mineral uses. All the designated lands with wilderness characteristics would be closed to fluid and solid mineral leasing and saleable minerals. This would provide protection to the wilderness values from surface disturbances and mining activities. Pursuing withdrawal from locatable mineral entry would protect wilderness values in these areas from this type of activity.

Most designated lands with wilderness characteristics have management prescriptions to either close the area or put limits on fluid mineral leasing activities. These closures or limits provide the greatest protection of wilderness values. Because these closures or limits would be in place due to lands with wilderness characteristics designation, areas with wilderness values but not designated would be more at risk to these types of impacts.

4.2.14.5.3.1.4. Alternative 3

Alternative 3 designates fewer lands with wilderness characteristics than Alternative 2 and contains somewhat less restrictive management actions. Prescriptions for solid, locatable, and saleable minerals are identical to Alternative 2, but designated lands with wilderness characteristics would be open to fluid mineral leasing with NSO in this alternative. Projects would still have to go through implementation-level NEPA analysis prior to approval, and impacts to wilderness values could be minimized or mitigated. Overall, Alternative 3 would provide less protection of wilderness values from mineral activities compared to Alternative 2.

4.2.14.5.3.1.5. Alternative 4

Alternative 4 designates fewer lands with wilderness characteristics than Alternative 3, but prescriptions for solid, locatable, saleable, and fluid minerals are identical. This would provide slightly less protection for wilderness values than Alternative 3 but more than Alternative 1.

4.2.14.5.4. Recreation Impacts on Lands With Wilderness Characteristics

4.2.14.5.4.1. Impacts Common to All Alternatives

Under all alternatives, areas would be designated as special recreation management areas (SRMAs) or extensive recreation management areas (ERMAs). Designating an area as either SRMA could lead to increased recreational development, recreation restrictions, and visitor use, thereby decreasing naturalness, solitude and primitive, unconfined recreation. A SRMA designation, though, could involve increased management oversight and planning efforts, thereby helping to reduce impacts to wilderness values by careful siting of recreational developments and managing access points and recreation use. Areas allocated as ERMAs and all other public lands that were not designated as recreation management areas would be managed to provide unstructured recreational opportunities with few restrictions and minimal management oversight, and therefore a diminishment of wilderness character is more likely to occur.

High concentrations of recreation users (e.g., large group sizes and/or frequent group encounters) in areas found to have wilderness characteristics could decrease outstanding opportunities for solitude. Opportunities for solitude would more likely be negatively affected in areas where

there are conflicting user groups such as OHV use and hikers in a wilderness setting. Primitive recreation is negatively affected by the presence of motor vehicles and mechanized transport in addition to the decrease in the amount of landscapes available for simple forms of recreation. Closing or limiting motor vehicle or mechanized transport to designated routes throughout the planning area would benefit wilderness characteristics by reducing surface disturbances, disruptions caused by vehicle noise, and uses that conflict with primitive recreation. However, overall most of the areas with wilderness characteristics would not receive consistent concentrated recreation use.

Providing signs for visitor information, regulations, or interpretation could diminish naturalness in localized areas by increasing the appearance of structures, however, the extent and distribution is not anticipated to affect the apparent naturalness of an area. It is likely that signs or facilities would be located near roads or access points where the magnitude of such intrusions would be negligible. Additionally, information and interpretation can be an effective tool to indirectly manage recreation use rather than more direct and invasive methods (e.g., regulations, limits) that negatively affect primitive and unconfined recreation.

Recreation uses that would increase OHV travel and vehicle-based camping or other activities could decrease solitude and primitive recreation. Recreation facilities can impact naturalness, although these would be subject to project-level NEPA analysis. Seasonal closures of certain habitats that can be less resistant to surface disturbances would result in a long-term benefit to naturalness, though short-term impacts to primitive and unconfined recreation would occur as a result of the temporary loss of access.

Although recreational activities themselves are temporary in nature, the impacts of these activities can be long-lasing, particularly if they involve uses such as recreational target shooting and unauthorized OHV use.

4.2.14.5.4.2. Alternative 1

Recreation will be managed to concentrate the majority of its recreation program effort within ERMAs while the remaining lands would be managed as a SRMA to emphasize dispersed and diverse recreation opportunities. Recreation use would continue to be generally unmanaged, except in a few SRMAs. This alternative does not contain any of the management actions addressing general recreation and special recreation permits (SRPs) that are present in the other three alternatives. Speed and non-speed based recreation events could be permitted on a case-by-case basis.

At some point in the future, these SRMAs might have additional standards established for visitation, facility development, or other recreation-related considerations that would not maintain wilderness characteristics, thus impairing or impacting them to a degree. Areas outside SRMAs would continue to be managed as ERMAs and would not have facilities or visitation standards established to conserve wilderness characteristics, potentially causing long-term impact to wilderness characteristics. Continued motor vehicle use could degrade naturalness, solitude, and primitive recreation over time, particularly considering the expected populations increases. Alternative 1 does not designate any lands with wilderness characteristics within the planning area even though wilderness values are present. Overall, long-term loss, impairment, or diminishment of wilderness characteristics due to recreation management would occur in localized areas. Thus this alternative would provide the least amount of protection for wilderness values from these types of recreation activities.

4.2.14.5.4.3. Alternative 2

Recreation would be managed within SRMAs and ERMAs according to the designations, acreages, and prescriptions described in the Recreation section of Chapter 2. Generally, there would be approximately more acres designated as SRMAs as compared to Alternative 1. This alternative would include the most areas of developed and intensively managed recreation. Allocation of SRMAs and ERMAs would include designated lands with wilderness characteristics. Future standards established for visitation, facility developments, and other recreation-related activities must consider naturalness and outstanding opportunities for solitude and primitive, unconfined recreation. All designated lands with wilderness characteristics would be allocated for non-motorized and non-mechanized travel, with the exception of existing designated routes, with these values paramount.

Managing general recreation use would have various impacts on wilderness characteristics depending on the potential for surface disturbance, type of use, recreation-related developments, access points, and management restrictions. Generally, wilderness character benefits from recreation management actions that retain the area's natural appearance (e.g., minimum of signs) and allow dispersed forms of recreation (i.e., hiking and equestrian use) that are not reliant on motor vehicles, motorized equipment (e.g., chainsaws, power drills), mechanical transport (e.g., mountain bikes, game carts), or facilities (e.g., permanent fixed anchors) that, in order to occur, minimize facilities that make recreation more convenient or safer (e.g., trails, composting toilets) and allow visitors the opportunity to experience a sense of freedom (e.g., providing information and education over limits and restrictions).

4.2.14.5.4.4. Alternative 3

Recreation would be managed within SRMAs and ERMAs according to the designations, acreages, and prescriptions described in the Recreation section of Chapter 2. Generally, there would be slightly more acres designated as SRMAs than Alternative 2. Alternative 3 would have similar recreation management prescriptions that apply to designated lands with wilderness characteristics as in Alternative 2 except that fewer lands possessing wilderness values would be designated in Alternative 3. Thus those baseline wilderness values that exist and are not proposed for lands with wilderness characteristics designation would not benefit from recreation management restrictions that may lead to more impacts on wilderness values compared to Alternative 2.

Impacts are similar to Alternative 2. Recreation decisions for SRPs that focus on general use, speed, and non-speed based permitted recreation would benefit wilderness character by limiting surface disturbance to designated routes, though impacts to solitude and primitive recreation would be negatively impacted in localized areas.

4.2.14.5.4.5. Alternative 4

Recreation would be managed within SRMAs and ERMAs according to the designations, acreages, and prescriptions described in the Recreation section of Chapter 2. Generally, Alternative 4 provides the least amount of acres designated as SRMAs and ERMAs compared to the other alternatives. The majority of the planning area would be managed as public lands not designated as recreation management areas. This alternative has the least developed recreation management actions. Some areas would still include developed and intensively managed

recreation, but most of the planning area would be managed for a more unstructured type of recreational experience. Alternative 4 would have similar recreation management prescriptions for designated lands with wilderness characteristics as in Alternatives 3 except that fewer lands with wilderness characteristics would be designated in Alternative 4. Thus inventoried wilderness characteristics but not designated would not benefit from recreation management restrictions that may lead to more impacts on wilderness values compared to Alternatives 2 and 3.

4.2.14.5.5. Travel and Transportation Impacts on Lands With Wilderness Characteristics

4.2.14.5.5.1. Impacts Common to All Alternatives

In general, roads and trails negatively impact wilderness characteristics of naturalness, solitude, and primitive recreation. Roads and trails are surface disturbances that modify the natural landscape, remove vegetation, and introduce weeds. Depending on the nature and extent of the modification, these features may be considered substantially unnoticeable. Limiting roads and trails would minimize disturbance, thereby protecting the natural character. The number and extent of roads and trails decreases opportunities for visitors to experience isolation and find seclusion. Impacts to solitude result from motorized vehicle noise, which diminishes the ability for recreationists to escape the sounds of others. Roads and trails constitute developed recreation facilities, and when combined with the motorized vehicles, motorized equipment, and mechanical transport which they support, contributes to diminishment of primitive recreation.

The existing travel and transportation network evolved primarily from routes leading to sites of authorized activities, casual and permitted recreation events, or from the proliferation of unauthorized recreational routes over time. In either case, route designs that best fit with the natural landscape were not considered. Most of the planning area would be managed as limited to designated routes in each alternative. Route evaluation and designation considers conflicts to resources in the network and design and is structured to minimize those impacts. Limiting travel and transportation to designated routes would help reduce negative impacts to wilderness character, and those impacts would vary depending on the type of route and reduction in the number and miles of routes. A decrease in the number and extent of roads would improve the wilderness recreationists' ability to find seclusion and experience isolation and natural soundscapes. This is because poorly located roads and trails are visually intrusive, so selective closures followed by decommissioning are beneficial. Limiting routes also improves opportunities to experience the physical and emotional challenge of self-discovery and self-reliance. Decommissioning roads and trails would result in benefits to wilderness character. Apparent naturalness would be improved through naturalizing surface disturbances and restoring vegetation. Impacts would range from negligible to moderate.

The alternatives differ in the number of acres designated as open, closed, and limited to designated. Open areas generally have the greatest impacts to wilderness characteristics. Most of the planning area would be designated as limited to designated routes in each alternative. Limiting vehicles to designated routes could help reduce impacts to wilderness character depending on the type, number, and location of designated routes.

4.2.14.5.5.2. Alternative 1

Alternative 1 would not designate any lands within the planning area specifically to protect wilderness characteristics. Those wilderness values of naturalness, solitude, primitive and unconfined recreation, and any supplemental values, would be maintained only as an incidental byproduct from travel and transportation management. Alternative 1 would manage travel and transportation under the following classifications: open; closed; limited to existing roads, trails, and dry washes; limited to designated roads and trails; and limited to existing trails and ways. This alternative would not contain some of the management directions proposed in the other alternatives that would be beneficial to wilderness character, and therefore would have the greatest potential negative effect. Lack of OHV management use along with management allocation limiting travel to existing roads, trails, and washes has led to resource damage. This use has resulted in a proliferation of routes and off-road use that removes vegetation, increases the spread of weeds, disturbs soils, and increases intrusions. Continuing this management scheme could expand the size and magnitude of the damaged area, leading to moderate or major effects.

4.2.14.5.5.3. Alternative 2

Management classifications of open, closed, and limited to designated roads and trails would occur with acreages and prescriptions described in the Travel and Transportation section in Chapter 2. Generally, there would be less than half as many acres designated as open than in Alternative 1. Acres of travel classifications of limited and closed are similar to Alternative 1. A management designation of "limited" would be applied to all designated lands with wilderness characteristics. Restricting motorized and/or mechanized travel to only existing designated routes and not allowing the designation of any additional routes would result in the greatest protection of naturalness, solitude, and primitive recreation within designated lands with wilderness characteristics. Additionally, a well-managed route network on lands adjacent to designated lands with wilderness characteristics would generally result in indirect improvements to naturalness, solitude, and primitive recreation by reducing the incidences of unauthorized motorized and mechanized use.

4.2.14.5.5.4. Alternative 3

Overall, travel and transportation classifications and prescriptions would be less protective of lands with wilderness characteristics than in Alternative 2. Management classifications of open, closed, and limited to designated roads and trails would occur with acreages and prescriptions described in the Travel and Transportation section in Chapter 2. Generally, there would be more acreage designated as open than in Alternative 2 but less than Alternative 1. Travel and transportation classifications and prescriptions would be less protective of lands with wilderness characteristics than in Alternative 2. Within designated lands with wilderness characteristics, travel and transportation management is limited to designated routes for both motor vehicles and mechanized transport. A well-managed route network on lands adjacent to designated lands with wilderness characteristics would generally result in indirect improvements to naturalness, solitude and primitive recreation by reducing the incidences of unauthorized motorized and mechanized use. Conversely, areas that possess wilderness characteristics but are undesignated would be managed as open, closed, or limited; wilderness values would likely be diminished in the long term.

4.2.14.5.5.5. Alternative 4

Impacts under Alternative 4 would be similar to those under Alternative 3, except there would be less direct protection of lands with wilderness characteristics.

4.2.14.5.6. Lands and Realty Impacts on Lands With Wilderness Characteristics

4.2.14.5.6.1. Impacts Common to All Alternatives

Alternative 1 would not contain decisions to protect wilderness characteristics and thus there would be no impacts common to all alternatives.

4.2.14.5.6.2. Alternative 1

The lands and realty program includes land tenure (disposals, acquisitions, exchanges, withdrawals, and segregations), land-use authorizations (rights-of-way, permits, leases, and easements), renewable energy, and utility corridors. Lands actions such as disposals, ROWs, utility corridors and renewable energy development can all result in surface disturbance that may lead to loss, degradation, or fragmentation of wilderness values. Impacts to wilderness values from such things such as dispersed motorized and mechanized recreation use and development can also increase due to nearby lands actions even if the action does not impact wilderness values itself.

Under Alternative 1, areas inventoried and found to have wilderness values would not be managed to protect wilderness characteristics, therefore wilderness values could be impacted. Most of these lands and realty actions would be allowed, and thus not managing to protect wilderness characteristics in Alternatives 1, 3, and 4 may lead to increased impacts to wilderness values compared to alternatives where management to protect wilderness characteristics are proposed. Significant portions of areas having wilderness characteristics overlap with lands actions such that resource uses would accrue resulting in direct, long-term negative impacts to naturalness, opportunities for solitude, and primitive, unconfined recreation.

Land tenure adjustments such as disposals and acquisitions can affect naturalness, solitude, and primitive, unconfined recreation. The level of impact depends on the size of the parcels, location of parcels on the landscape, relation to wilderness character areas, and the ultimate disposition or type and level of landscape modification. Disposals would affect wilderness values by removing BLM control over the parcels, resulting in development and loss of the natural landscape. Disposals would directly affect scenic quality while indirect effects would result as visitors' ability to escape the sights and sounds of modern civilization is diminished. Furthermore, primitive forms of recreation would be foregone as lands are disposed from BLM jurisdiction. Conversely, land tenure adjustments such as acquisitions can benefit wilderness character through the addition of natural landscapes and areas for primitive recreation to BLM's jurisdiction. These lands actions can help protect and restore native plant communities that benefit scenic values and opportunities for solitude through vegetative screening. Acquisitions can also safeguard solitude within adjacent wilderness character areas. Potential acquisitions and locations of parcels identified for disposal are minimal compared to the total acres identified as having wilderness characteristics, and therefore impacts would be negligible overall.

Land-use authorizations such as ROWs (e.g., power lines, pipelines, fiber optic lines, and communication sites), permits, and leases can lead to major impacts to wilderness values though the impact depends on the size, type, and location of the authorization. Naturalness and scenic value are directly affected by surface disturbances, human uses, and developments that manipulate natural processes. Opportunities for solitude would be impacted from the sights and sounds of other people and human activities within or on adjacent lands. A loss of opportunity for primitive and unconfined recreation would result from the unavailability of landscapes conducive for such activities combined with the tendency for increased OHV use to occur on access roads created for project construction.

Significant portions of areas having wilderness characteristics overlap with open areas for wind development, and to a lesser extent, avoidance/variance for solar energy development. At least portions of most of these areas would be available for renewable energy development except where the terrain is too rugged. Development of these large-scale projects could lead to minor to major impacts to the wilderness values in these areas. In addition, there would be an increase of requests for transmission lines and access for operations and maintenance of the renewable energy projects. Naturalness and opportunities for solitude and primitive, unconfined recreation would be subject to major impacts, potentially completely forgone.

Utility corridors would be designated along and within a limited number of areas with wilderness character. These corridors, if utilized, could have moderate impacts on naturalness along the extremities. Impacts would accrue mainly through direct, long-term surface disturbances, loss of solitude, and primitive unconfined recreation. Indirect impacts could also occur as described previously for the other land uses. Areas exhibiting wilderness characteristics could be impaired or foregone over the long-term under full utilization of the utility corridors. Development of corridors, however, concentrates impacts into the corridor as opposed to potentially having linear ROWs and their impacts spread throughout areas of wilderness characteristics.

4.2.14.5.6.3. Alternative 2

Of all the alternatives, Alternative 2 would manage to protect the most wilderness characteristics. It has the least amount of acres for disposal. There may still be some impact to protected wilderness characteristics due to disposals nearby if those disposals result in indirect changes to naturalness from habitat fragmentation and increased likelihood for weed spread. Alternative 2 would protect the most wilderness values from lands actions. All lands managed to protect wilderness characteristics would be excluded for ROWs and retained in federal ownership. This would provide the most protection for lands managed to protect wilderness characteristics compared to the other alternatives. All lands managed to protect wilderness characteristics would be closed to wind and solar energy projects, so Alternative 2 would protect the most wilderness values from these types of projects. Linear ROWs and utility corridors would not be allowed as they are not necessary for the preservation or enhancement of wilderness values. Overall, Alternative 2 would provide the greatest protection of baseline wilderness character compared to the other alternatives.

4.2.14.5.6.4. Alternative 3

Alternative 3 would manage more lands to protect wilderness characteristics compared to Alternative 1 but less than Alternative 2. Potential acquisitions and locations of parcels identified for disposal are minimal compared to the total acres identified as having wilderness characteristics; therefore impacts would be similar to Alternative 1. This alternative offers slightly

less protection of wilderness values from lands actions. Lands managed to protect wilderness characteristics would be avoidance areas for ROWs rather than exclusion, but structures and facilities would be allowed only if necessary for preservation or enhancement of wilderness character. Moreover, no ROWs or corridors are proposed within or adjacent to lands managed to protect wilderness characteristics, therefore no direct or indirect impacts would occur from this lands action. Avoidance/variance areas for solar energy development and open/avoidance areas for wind would be greater than Alternative 2 but less than Alternative 1. There is minimal overlap with lands managed to protect wilderness characteristics, so negative impacts are negligible.

4.2.14.5.6.5. Alternative 4

Alternative 4 would provide more protection of wilderness characteristics compared to Alternative 1, but less protection compared to Alternatives 2 and 3. Impacts from management actions concerning disposals and acquisitions are identical to Alternatives 1 and 3. Alternative 4 is identical to Alternative 3 regarding ROWs, utility corridors, and solar and wind development.

4.2.14.6. Special Designations

4.2.14.6.1. Areas of Critical Environmental Concern Impacts on Lands With Wilderness Characteristics

4.2.14.6.1.1. Impacts Common to All Alternatives

Generally, special management areas such as ACECs result in protection of the native biological communities, solitude, and primitive recreation by limiting or excluding surface disturbances and motorized and mechanized use, respectively. Use restrictions in ACECs could include ROW exclusion or avoidance, closure or limits to mineral exploration, limits to or exclusion of certain types of recreation use, and limiting travel to designated routes. Furthermore, ACECs protect relevance and importance (R&I) values that correspond to the supplemental values of wilderness, specifically ecological, geological, historical, and scenic. All these restrictions would help protect wilderness character to various degrees. The main difference between the alternatives is the number and size of ACECs proposed for designation and the number of acres of wilderness values potentially protected.

4.2.14.6.1.2. Alternative 1

Alternative 1 contains three ACECs that overlay lands that possess wilderness characteristics, but no lands with wilderness characteristics would be designated. Areas identified as having values for which no ACECs are proposed to protect R&I values may not be protected from potential impacts unless they are protected through management prescriptions under other resource or resource use sections.

4.2.14.6.1.3. Alternative 2

Alternative 2 would designate the most lands with wilderness characteristics and ACECs. Some designated lands with wilderness characteristics would be afforded additional protection with an overlaying ACEC designation. Alternative 2 would have the most restrictive ACEC management prescriptions and thus protection of wilderness values would be greater than Alternative 1.

4.2.14.6.1.4. Alternative 3

Alternative 3 would designate fewer lands with wilderness characteristics and ACECs compared to Alternative 2 but more than Alternative 1. Where designated lands with wilderness characteristics are overlaid with ACEC designations, the latter could provide additional protection of wilderness values. Where no lands with wilderness characteristics designation is proposed, prescriptions for ACECs could provide some retention of wilderness values. Negative impacts to wilderness characteristics would be greater than in Alternative 2 but less than Alternative 1. It is anticipated that wilderness values would be diminished over the long term.

4.2.14.6.1.5. Alternative 4

Alternative 4 is similar to Alternative 1 regarding the number and approximate acreage designated to protect R&I values through ACEC designations, but prescriptions would be more restrictive in Alternative 4. Though fewer lands with wilderness characteristics would be designated as compared to Alternative 3, they would all be contained within ACECs. A majority of the areas found to have wilderness characteristics would not be designated as lands with wilderness characteristics, nor would most of them be afforded additional protection within an ACEC. In the long term, there would be a further loss of wilderness values as compared to Alternative 3.

4.2.14.6.2. National Trails Impacts on Lands With Wilderness Characteristics

4.2.14.6.2.1. Impacts Common to All Alternatives

See Cultural Resources for impacts on lands with wilderness characteristics.

4.2.14.6.3. Wild and Scenic Rivers Impacts on Lands With Wilderness Characteristics

4.2.14.6.3.1. Impacts Common to All Alternatives

The river segments found to be eligible for inclusion in the National Wild and Scenic Rivers System are not located within or adjacent to areas found to have wilderness characteristics. No direct or indirect impacts are anticipated, and therefore no further analysis is required.

4.2.14.6.4. Wilderness Impacts on Lands With Wilderness Characteristics

4.2.14.6.4.1. Impacts Common to All Alternatives

Lands with wilderness characteristics have been identified contiguous with Arrow Canyon Wilderness, Jumbo Springs Wilderness, Lime Canyon Wilderness, Muddy Mountains Wilderness, and Spirit Mountain Wilderness (NPS). Managing these congressionally designated areas to protect wilderness character would expand opportunities for solitude and primitive forms of recreation found in the adjacent areas. Certain uses prohibited by law within wilderness (i.e., motor vehicles, motorized equipment, structures, and installations) may indirectly benefit adjacent lands with wilderness values by minimizing the potential for surface disturbance, noise, and conflicts with primitive recreation from OHV use. Wilderness safeguards resources uses that

could create pervasive and omnipresent developments and thus reduce opportunities for visitors to avoid the sights, sounds, and evidence of modern civilization. Furthermore, preservation of natural processes and integrity within wilderness could offer continuity of natural biological composition within adjacent wilderness character areas.

4.2.14.6.4.2. Alternative 1

Alternative 1 would not designate any lands with wilderness characteristics specifically to protect baseline wilderness values. This alternative does not contain any wilderness management prescriptions that could indirectly benefit lands with wilderness characteristics and thus a diminishment of these values would occur in the long term.

4.2.14.6.4.3. Alternative 2

Alternative 2 affords the most protection of wilderness values through lands with wilderness characteristics designations. Wilderness management prescriptions such as mitigation for decreases in benchmark conditions of wilderness character and facilities in support of wilderness management could indirectly protect lands with wilderness characteristics.

4.2.14.6.4.4. Alternative 3

This alternative is similar to Alternative 2 except that Alternative 3 would designate fewer lands with wilderness characteristics.

4.2.14.6.4.5. Alternative 4

This alternative is similar to Alternative 3 except that Alternative 4 would designate fewer lands with wilderness characteristics.

4.2.14.6.5. Wilderness Study Areas Impacts on Lands With Wilderness Characteristics

4.2.14.6.5.1. Impacts Common to All Alternatives

Resting Springs is the only wilderness study area (WSA) that is contiguous with an area found to contain wilderness character. Managing the WSA to protect its wilderness values would expand opportunities for solitude and primitive forms of recreation found in the adjacent wilderness character areas. Managing travel within WSAs to designated routes for all motorized and mechanized vehicles may indirectly benefit adjacent lands with wilderness values by minimizing the potential for surface disturbance, noise, and conflicts with primitive recreation from OHV use. The WSA restricts resource uses (e.g., lands actions) that could create pervasive and omnipresent developments and thus reduce opportunities for visitors to avoid the sights, sounds, and evidence of modern civilization. Furthermore, resource use restrictions within the WSA offers continuity of natural biological composition and therefore could benefit naturalness on adjacent wilderness character areas. Overall, impacts of WSA management would be indirect and negligible.

4.2.14.6.5.2. Alternative 1

Alternative 1 would not designate any lands with wilderness characteristics specifically to protect baseline wilderness values. Wilderness character areas would benefit from management prescriptions that address release of WSAs. These include limited OHV use, visual resource management, and recreation use consistent with designations in place on adjacent lands. This could add some protection to adjacent wilderness values by minimizing developments, maintaining naturalness, the aesthetic quality, and solitude. Mineral exploration and development of released WSAs would be consistent with minerals decisions on other lands and thus there may be negative impacts to wilderness character areas. Overall, impacts from WSA management actions would be indirect and negligible.

4.2.14.6.5.3. Alternative 2

Alternative 2 affords the most protection of wilderness values through lands with wilderness characteristics designations, however only one area is contiguous with a WSA (Resting Springs). Attaining no net unmitigated loss of wilderness values within the WSA could indirectly benefit lands with wilderness characteristics. For example, restoring surface disturbances and applying weed treatments could improve naturalness. If the WSA is released by Congress, the goals, objectives, and management prescriptions within Alternative 2 of the RMP would apply. Increased resource uses such as lands and realty, mineral development, and motorized and mechanized recreation would be expected, and therefore indirect impacts to lands with wilderness character would occur. Overall, impacts from WSA management actions would be indirect and negligible.

4.2.14.6.5.4. Alternative 3

Any lands with wilderness characteristics would not be designated contiguous with the Resting Springs WSA; however, wilderness characteristics still exist, and thus impacts are similar to Alternative 2.

4.2.14.6.5.5. Alternative 4

Any lands with wilderness characteristics would not be designated contiguous with the Resting Springs WSA; however, wilderness characteristics still exist. Impacts are similar to Alternative 3 except that mitigation for WSAs would occur on a case-by-case basis, and thus wilderness values may not be afforded as much indirect protection.

4.2.14.7. Cumulative Impacts on Lands With Wilderness Characteristics

4.2.14.7.1. Past and Present Actions/Impacts

The cumulative impacts analysis area includes lands with wilderness characteristics and certain lands surrounding such areas as deemed necessary to satisfactorily assess impacts on the resource. Past, present, and reasonably foreseeable actions have the potential to cause cumulative impacts on wilderness characteristics.

Past and present impacts to wilderness characteristics would be similar to those discussed under the specific program that manages those resources. The 1998 RMP does not administratively designate or provide management direction for lands with wilderness characteristics, that

is, areas separate from wilderness areas designated by Congress or WSAs pending before Congress. Until recently, the BLM had not reviewed relevant data, conducted, or maintained a wilderness characteristics inventory on a continuing basis. Thus, potential wilderness values have not benefitted from lands with wilderness characteristics designations that could limit ground-disturbing activities and protect opportunities for solitude or primitive recreation. Some wilderness values have indeed been lost, for example, where WSAs have been released by Congress from further wilderness review and development has ensued (e.g., transmission lines, detention basis). Moreover, areas with wilderness character may well have been lost as a result of changes in land status (e.g., land sales and transfers out of BLM jurisdiction). Conversely, beneficial actions such as habitat restoration, route designations for motor vehicles and mechanical transport, vehicle barriers, and removal of range developments have occurred and improved wilderness values.

4.2.14.7.2. Reasonable Foreseeable Actions

Wilderness characteristics in areas not managed to protect those characteristics could be lost or impaired due to urban expansion and population growth. Simply put, more people mean more development and recreation pressures within the planning area. Community needs include roads, power, utilities, sand and gravel pits, and ROWs, while recreation use includes motorized and non-motorized recreation use. The majority of these community growth developments and recreation uses could occur on BLM lands and contribute to the overall availability and quality of naturalness and non-motorized recreation settings and associated solitude. Solar developments would remove a large amount of public lands from recreation-related visitor use, contributing to greater concentrations of visitors within the planning area. Greater concentrations of recreation use would detract from or decrease the quality of solitude and primitive recreation activities.

Wilderness characteristics are primarily affected by the number and proximity of motorized travel corridors; the volume and type of traffic on those corridors; and the quantity and type of recreational users. Population growth and the resulting increase in recreational use are expected to eventually impact lands with wilderness characteristics. An increase in use of motor vehicles and mechanical transport could have major impacts on solitude, naturalness, and opportunities for primitive and unconfined recreation, mainly on lands not managed to protect such characteristics.

Recreational developments in SRMAs would impair naturalness and opportunities for primitive recreation and solitude. On the other hand, comprehensive recreation and travel and transportation management planning could avoid adverse impacts altogether in some areas through maintenance of visual standards and recreation settings. Designation of ERMAs would limit developments and facilities except in response to visitor health and safety or conflicts with other resource uses. This would, in effect, globally protect or enhance wilderness characteristics.

Population growth in the Las Vegas area and the smaller communities is expected to result in increased recreational use which would create moderate to significant impacts to lands with wilderness characteristics in the planning area over the life of the plan. Increased use of motor vehicles and mechanical transport (e.g., mountain bikes) during the life of this plan could have minor to potentially major impacts on all the components of wilderness character.

Lands with wilderness characteristics will be primarily affected by the number and proximity of adjacent motorized travel corridors, the volume and type of traffic on those corridors, the sights and sounds of urbanizing human development near or on the borders of lands with wilderness characteristics, and the quantity and type of recreational users.

Reasonable foreseeable future actions, including planning efforts to locate and develop mineral resources and establish ROW corridors and renewable energy development would have impacts on lands with wilderness characteristics. Impacts would be caused by surface disturbance from production, exploration, and exploration of drilling and mining facilities and development within ROWs and new renewable energy projects. Impacts would be similar to the past and present actions for minerals, lands and realty, and renewable energy developments. These activities would increase the number of facilities, roads, and other disturbances that affect wilderness values.

4.2.14.7.3. Cumulative Impact

4.2.14.7.3.1. Impacts Common to All Alternatives

Development actions within the planning area could produce long-term cumulative impacts on wilderness characteristics. Potential impacts of the alternatives on wilderness character are based on the potential management decisions that result in development, particularly in close proximity to lands with wilderness characteristics. Impacts would continue to result from resources uses that tend to create surface disturbances such as minerals, lands and realty, renewable energy, and recreation. These resource uses could potentially have long-term adverse impacts to wilderness character within the planning area.

4.2.14.7.3.2. Alternative 1

Alternative 1 would not designate lands with wilderness characteristics, therefore the cumulative adverse impacts on wilderness characteristics would be the greatest. No lands would be managed to maintain wilderness characteristics. Community growth, ROWs, management of recreation, travel and transportation, mineral development, and renewable energy projects could contribute to adverse effects, both directly and indirectly. Wilderness characteristics could be potentially lost or diminished in all areas, but adverse effects are more likely in areas close to urban and populated rural areas.

4.2.14.7.3.3. Alternative 2

Alternative 2 would designate the most lands with wilderness characteristics and protect the most acres with wilderness characteristics. Alternative 2 would also have the most restrictive management prescriptions of all the alternatives. This would result in the least amount of cumulative impacts to wilderness values of all the alternatives. Alternative 2 also has high levels of landscape-based protective prescriptions. Management decisions designed to retain or protect resources such as vegetation, riparian, special status species, visual aesthetics, and designations for ACECs and recreation, could lead to implementation-level actions that help improve and protect wilderness characteristics above the current level.

4.2.14.7.3.4. Alternative 3

Alternative 3 would designate fewer lands with wilderness characteristics and have less restrictive management prescriptions than Alternative 2. Therefore, cumulative impacts to wilderness values would be more than in Alternative 2 but less than in Alternatives 1 and 4. This alternative presents and array of resource-based landscape protections and resource uses. Management decisions designed to retain or protect resources such as vegetation, riparian, special status species, visual aesthetics, and designations for ACECs and recreation, could lead to implementation-level actions

that help improve and retain wilderness characteristics above the current level. In areas where no specific management decision to protect wilderness values exists, a loss or diminishment of such characteristics could occur as a result of resource uses.

4.2.14.7.3.5. Alternative 4

Alternative 4 would designate five lands with wilderness characteristics compared to zero in Alternative 1. These lands with wilderness characteristics would have less restrictive management prescriptions than Alternatives 2 and 3. Management decisions designed to retain or protect resources such as vegetation, riparian, special status species, visual aesthetics, and designations for ACECs and recreation, could lead to implementation-level actions that help improve and retain wilderness characteristics above the current level. In areas where no specific management decision to protect wilderness values exists, a loss or diminishment of such characteristics could occur as a result of resource uses.

4.3. Resource Uses

4.3.1. Forestry and Woodland Products

4.3.1.1. Summary

The goals of the forestry program are to provide economic benefits to the American public through the sale or disposal of forest products while maintaining land health through land management actions.

In the planning area, five native plant communities are managed for forest health: riparian woodlands, mesquite acacia woodlands, Joshua tree woodlands, pinyon juniper woodland, and ponderosa pine woodland. The majority of pinyon juniper woodlands and all ponderosa pine woodlands in the planning area are located in the South McCullough Mountain Wilderness, Virgin Peak Instant Study Area, and Gold Butte Part A ACEC. Forestry management in these areas must be consistent with management under these designations. Joshua tree woodlands, riparian woodlands, and mesquite acacia woodlands are managed for forest health. Where these stands are located in ACECs, restrictions on multiple-use activities generally benefit stand management while restrictions on commercial activities generally do not benefit program implementation. Forestry program sales in riparian and mesquite acacia woodland communities are not sustainable because of the limited geographic extent and importance as habitats for wildlife and special status species.

In Nevada, the primary forest products managed under the forestry program include firewood, fence posts, fence stays, Christmas trees, pinyon nuts and cones, pine cones, wildlings (rooted wild plants), biomass (chips and boughs), and native seed. In the planning area, cactus and yucca wildlings, native seed, and wood cutting in mesquite acacia woodlands are the primary products sold under the forestry program.

Cactus and yucca wildlings are in demand by BLM revegetation projects and by the public for xeriscaping or native plant landscaping. Cactus and yucca can be salvaged and transplanted with relatively high survival rates. Consistent with disposal of this government property, the Southern Nevada District Office generally requires salvage of cactus and yucca plants from sites subject to surface disturbance. The first priority for the use of these plants is for revegetation of project-related impacts. The second priority is to make plants available for other BLM-related revegetation efforts by placing them in BLM stockpile yards. A third priority is to sell salvaged plants through a sale. If salvage or a public sale is not practicable, the proponent may purchase the plants and destroy them during construction.

Native seed is an important commodity. BLM and U.S. Forest Service lands are a primary source of the native seed sold commercially. The BLM is one of the largest purchasers of native seed in the world and uses commercially collected seed for fire rehabilitation, restoration, and reclamation of project impacts to BLM lands. Making BLM lands available to commercial seed collection is in the interest of the BLM and the public.

Wood cutting was historically permitted in the planning area. Under the 1998 RMP, the BLM maintained the ability to issue wood-cutting permits in mesquite acacia woodlands and riparian woodlands to reduce fuel loads or control mistletoe infestations as needed; however, the BLM did not issue any wood-cutting permits to meet these management objectives.

This section discusses the potential impacts on forestry program activities from the proposed land allocation decisions and management actions described in Chapter 2. The primary impacts to

forestry program activities could include changes in the BLM's ability to authorize and implement commercial seed collections, dispose of salvaged cactus and yucca wildlings, issue wood-cutting permits, and changes in the BLM's ability to authorize and implement forestry program activities.

4.3.1.2. Methods of Analysis

The impact of land allocation decisions and resource management actions on BLM forestry program activities are compared across alternatives. Where important outcomes or differences are identified, the effects are discussed. This analysis is qualitative because quantitative information is not available.

Effects are determined by assessing the impact of actions on the ability of the BLM to implement BLM forestry program activities including: (1) the sale of salvaged cactus and yucca wildlings; (2) issuance of collection permits for native seed harvest; (3) issuance of wood-cutting permits in mesquite acacia woodlands and riparian woodlands; and (4) implement forestry program management actions undertaken to improve land health.

In addition to the general RMP assumptions and guidelines, the following assumptions were made for the forestry program analysis:

- Seed collection technology will not appreciably change during the lifetime of the RMP.
- Bureau-specific funding forestry program activities will continue at current levels.

4.3.1.3. Qualitative Intensity Scale

There are potential impacts on forestry program activities from the proposed land allocation decisions and management actions described in Chapter 2. The primary impacts to forestry program activities could include changes in the BLM's ability to authorize and implement commercial seed collections, dispose of salvaged cactus and yucca wildlings, issue wood-cutting permits, and changes in the BLM's ability to authorize and implement forestry management activities to protect stand health.

A range of qualitative terms have been used to gauge the intensity of each impact. Both positive and negative impacts are considered and, where necessary, the net impact of the two is discussed. Both generalized and forestry program-specific definitions for impact intensity are summarized below:

- **Negligible:** General: No known impacts to resources or resource uses. Any change is undetectable and immeasurable. Specific: No changes in the BLM's ability to authorize and implement forestry program activities in the short and long term.
- **Minor:** General: Direct effects to resource or resource uses are apparent, measurable, small, localized, and contained within the footprint of the action. Indirect effects are undetectable. Specific: Small or slightly noticeable changes in the BLM's ability to authorize and implement forestry program activities.
- **Moderate:** General: Direct effects to resources or resource uses would be readily apparent and measurable over a larger area, but they are still mainly within the footprint of the action. Indirect effects are apparent and measurable but do not exceed much beyond the footprint of the action. Specific: Changes in the BLM's ability to authorize or implement forestry program activities would be very apparent.
- **Major:** General: Direct effects to resources or resource uses would be highly noticeable and extend well beyond the footprint of the action. Indirect affects would be readily apparent

and measurable well beyond the footprint of the action. Specific: Changes in the ability to administer the forestry program would be severe.

The management alternatives proposed in this RMP for the following programs would have no impact on forestry program activities in the planning area and are not analyzed: Air Resources, Soil Resources, Water Resources, Weed Management, Wildland Fire, Fish and Wildlife, Special Status Species Management, Cave and Karst Resources, Cultural Resources, Paleontological Resources, Visual Resource Management, Minerals Management, Recreation, Travel and Transportation, Tribal Interests, Public Health and Safety, Socioeconomic, and Environmental Justice.

4.3.1.4. Resources

4.3.1.4.1. Air Quality Impacts on Forestry and Woodland Products

4.3.1.4.1.1. Impacts Common to All Alternatives

Alternatives proposed for the air quality program are not expected to affect the forestry program.

4.3.1.4.1.2. Alternatives 1 through 4

There are no additional impacts on forestry and woodland products.

4.3.1.4.2. Soil Resources Impacts on Forestry and Woodland Products

4.3.1.4.2.1. Impacts Common to All Alternatives

Alternatives proposed for the soil resources program are not expected to affect the forestry program.

4.3.1.4.2.2. Alternatives 1 through 4

There are no additional impacts on forestry and woodland products.

4.3.1.4.3. Water Resources Impacts on Forestry and Woodland Products

4.3.1.4.3.1. Impacts Common to All Alternatives

Alternatives proposed for the water resources program are not expected to affect the forestry program.

4.3.1.4.3.2. Alternatives 1 through 4

There are no additional impacts on forestry and woodland products.

4.3.1.4.4. Integrated Vegetation Impacts on Forestry and Woodland Products

4.3.1.4.4.1. Vegetation Impacts on Forestry and Woodland Products

4.3.1.4.4.1.1. Impacts Common to All Alternatives

Under all alternatives, vegetation management actions that improve the quality and quantity of native plant communities are expected provide a negligible to minor benefit to the forestry program by improving or maintaining opportunities for activities such as native seed collection.

4.3.1.4.4.1.2. Alternatives 1 through 4

There are no additional impacts on forestry and woodland products.

4.3.1.4.4.2. Riparian Areas and Wetlands Impacts on Forestry and Woodland Products

4.3.1.4.4.2.1. Impacts Common to All Alternatives

Under all alternatives, maintaining healthy wetlands and riparian vegetation communities will maintain current opportunities for native seed collections for wetland species. The proposed management alternatives would have a negligible impact on the forestry program.

4.3.1.4.4.2.2. Alternatives 1 through 4

There are no additional impacts on forestry and woodland products.

4.3.1.4.4.3. Weeds Impacts on Forestry and Woodland Products

4.3.1.4.4.3.1. Impacts Common to All Alternatives

Alternatives proposed for the weeds program are not expected to affect the forestry program.

4.3.1.4.4.3.2. Alternatives 1 through 4

There are no additional impacts on forestry and woodland products.

4.3.1.4.4.4. Forests and Woodlands Impacts on Forestry and Woodland Products

4.3.1.4.4.4.1. Impacts Common to All Alternatives

There are no impacts common to all alternatives.

4.3.1.4.4.4.2. Alternative 1

Under Alternative 1, BLM would allow the harvest of dead and/or down wood or BLM-marked green mesquite trees for dwarf mistletoe control only in approved areas. Regionally, mesquite

acacia woodlands are declining due to development and groundwater withdrawal. The need for stand management under the forestry and fuels program is limited. Under the 1998 RMP, the BLM did not issue any wood collection permits because of the environmental constraints and sensitivity. Instead, BLM has used off-season fire crews and youth crews to implement treatments rather than issue permits to the public. This management direction is no longer necessary given regional declines of this vegetation community and environmental constraints for migratory birds and threatened and endangered species. This management action does not reflect current conservation status of this vegetation community and advancements in knowledge as related to management of mesquite acacia woodlands. Mistletoe is no longer perceived as a threat to stand health, and dwarf mistletoe berries are now known to be an important food source for migratory birds. In addition, the public has exploited this management action by illegally cutting green trees and returning later to collect the trees as dead and downed material. Continuation of management under Alternative 1 would not have a negligible impact on forestry program activities.

4.3.1.4.4.4.3. Alternative 2

Under Alternative 2, the BLM would prohibit harvest of mesquite and acacia woodlands, including live, dead standing, or dead and down. Because BLM did not issue permits for wood collection under the 1998 RMP, the impact of this action on the forestry program would be negligible.

Under Alternative 2, BLM would authorize commercial seed collections within identified seed-collection areas. Commercial seed collections outside designated seed collection areas would be authorized on a case-by-case basis except where otherwise prohibited (such as a wilderness area). Local seed collections for BLM-authorized, project-specific restoration would be allowed within the project footprint and 1,000 feet adjacent to the project area. This alternative provides opportunities for commercial seed collections on public lands. The primary purchasers of wildland collected seed are the BLM, project proponents implementing fire rehabilitation and restoration projects on public lands, and other state and federal agencies. In general, native plant communities produce more seed than is needed for natural recovery. If seed is collected too frequently, this could reduce the amount of seed available for natural recovery. Seed collection is a discretionary activity; repeated seed collections in the same area that could affect native plant communities would be avoided. This management action would have a beneficial effect on the forestry program; the impact would be minor.

Under Alternative 2, BLM would allow noncommercial personal use collection of reasonable amounts of renewable native plant products, including flowers, leaves, fruit, seeds, nuts, cones, berries, and dead-and-downed native vegetation, except within ACECs. The impact of this action on the forestry program would be negligible.

4.3.1.4.4.4.4. Alternative 3

Under Alternative 3, BLM would allow personal use of dead and down mesquite acacia woodlands for on-site recreational campfires, except in areas closed to firewood gathering and subject to seasonal fire restrictions. This alternative would allow for immediate personal use as part of a recreational campfire. The impact of this management action on the forestry program would be negligible.

4.3.1.4.4.4.5. Alternative 4

Under Alternative 4, impacts to the forestry program would be similar to Alternatives 2 and 3.

4.3.1.4.5. Fish and Wildlife Impacts on Forestry and Woodland Products

4.3.1.4.5.1. Impacts Common to All Alternatives

Under all alternatives, wildlife management actions that protect wildlife, including nesting migratory birds, could have a negligible to moderate negative impact on the ability to authorize or implement forestry program actions (such as native seed collection or wood harvesting permits).

4.3.1.4.5.2. Alternatives 1 through 4

There are no additional impacts on forestry and woodland products.

4.3.1.4.6. Special Status Species Impacts on Forestry and Woodland Products

4.3.1.4.6.1. Impacts Common to All Alternatives

Occasionally best management practices needed to protect wildlife, migratory birds and threatened and endangered species can conflict with forestry program actions. Under all alternatives, depending on the location, special status management actions that protect wildlife could have a negligible to moderate negative impact on the ability to authorize or implement native seed collection or wood harvesting permits.

4.3.1.4.6.2. Alternatives 1 through 4

There are no additional impacts on forestry and woodland products.

4.3.1.4.7. Wild Horse and Burro Impacts on Forestry and Woodland Products

4.3.1.4.7.1. Impacts Common to All Alternatives

Under all alternatives, depending on the location and number of animals, the negative impacts from wild horse and burro grazing on forestry program-authorized seed collections can range from negligible, under low intensity grazing, to major, where there is overgrazing. In general, selective grazing by wild horses and burros can have a negative effect on native plant communities and opportunities to collect native seed within herd management areas. Selective grazing affects composition and productivity of native plant communities (Brooks et al 2006). It is commonly accepted that present-day Mojave Desert native plant communities did not evolve with significantly selective pressure from large-bodied herbivores (Beever et. al. 2003, Brown and McDonald 1995, Grayson 1987, Hall 1946), and desert vegetation is very slow to recover if overgrazed or disturbed (Abella et. al.2007, Tueller 1989). Higher grazing use is expected to increase selective grazing that would result in lower densities of more palatable native forbs and grasses which, in turn, would reduce opportunities for commercial seed collections of these species.

4.3.1.4.7.2. Alternatives 1 through 4

There are no additional impacts on forestry and woodland products.

4.3.1.4.8. Cave and Karst Management Impacts on Forestry and Woodland Products

4.3.1.4.8.1. Impacts Common to All Alternatives

Alternatives proposed for the cave and karst resource management are not expected to affect the forestry program.

4.3.1.4.8.2. Alternatives 1 through 4

There are no additional impacts on forestry and woodland products.

4.3.1.4.9. Wildland Fire Management Impacts on Forestry and Woodland Products

4.3.1.4.9.1. Impacts Common to All Alternatives

Under all alternatives, impacts from wildland fire management activities could range from negative moderate to positive moderate. Depending on location and proposed activities, wildland fire management activities could positively or negatively affect native vegetation; changes in the density and composition of native plants can, in turn, enhance or reduce opportunities for native seed collections.

4.3.1.4.9.2. Alternatives 1 through 4

There are no additional impacts on forestry and woodland products.

4.3.1.4.10. Cultural Resources Impacts on Forestry and Woodland Products

4.3.1.4.10.1. Impacts Common to All Alternatives

Alternatives proposed for cultural resources management are not expected to affect the forestry program.

4.3.1.4.10.2. Alternatives 1 through 4

There are no additional impacts on forestry and woodland products.

4.3.1.4.11. Paleontological Resources Impacts on Forestry and Woodland Products

4.3.1.4.11.1. Impacts Common to All Alternatives

Alternatives proposed for paleontological resource management are not expected to affect the forestry program.

4.3.1.4.11.2. Alternatives 1 through 4

There are no additional impacts on forestry and woodland products.

4.3.1.4.12. Visual Resource Management Impacts on Forestry and Woodland Products

4.3.1.4.12.1. Impacts Common to All Alternatives

Under all alternatives, visual resource management is expected to benefit vegetation management because vegetation is an important component of the viewshed. Management actions that maintain the quality and character of the viewshed are expected to provide a negligible to minor benefit by improving or maintaining opportunities for native seed collection under the forestry program.

4.3.1.4.12.2. Alternatives 1 through 4

There are no additional impacts on forestry and woodland products.

4.3.1.4.13. Lands with Wilderness Characteristics Impacts on Forestry and Woodland Products

4.3.1.4.13.1. Impacts Common to All Alternatives

There are no impacts common to all alternatives.

4.3.1.4.13.2. Alternative 1

There are no impacts to the forestry program.

4.3.1.4.13.3. Alternative 2

Under Alternative 2, BLM would not authorize commercial seed collection activities within lands with wilderness characteristics. The restriction of native seed collections in lands with wilderness characteristics would reduce the area available for commercial seed collections. Negative impacts to the forestry program would be negligible to minor.

4.3.1.4.13.4. Alternative 3

Under Alternative 3, BLM would authorize commercial seed collection activities within lands with wilderness characteristics. Alternative 3 would not impact the forestry program.

4.3.1.4.13.5. Alternative 4

Impacts are similar to Alternative 3.

4.3.1.5. Resource Uses

4.3.1.5.1. Forestry and Woodland Products Impacts on Forestry and Woodland Products

4.3.1.5.1.1. Impacts Common to All Alternatives

See the Forests and Woodlands section under Integrated Vegetation.

4.3.1.5.1.2. Alternatives 1 through 4

There are no additional impacts on forestry and woodland products.

4.3.1.5.2. Livestock Grazing Impacts on Forestry and Woodland Products

4.3.1.5.2.1. Impacts Common to All Alternatives

Under all alternatives, livestock grazing could affect the ability to perform native seed collections under the forestry program. Depending on the location and number of animals, the negative impact could range from negligible, under low intensity grazing, to major, where there is overgrazing. In general, grazing by livestock removes plant biomass and the ability of plants to produce seed, which decreases overall availability for commercial collection. In addition, grazing affects which native species are present through selective grazing (Brooks et al 2006). Higher grazing use is expected to increase selective grazing that would result in lower densities or removal of more palatable native forbs and grasses which, in turn, would reduce opportunities for commercial seed collections.

4.3.1.5.2.2. Alternatives 1 through 4

There are no additional impacts on forestry and woodland products.

4.3.1.5.3. Minerals Impacts on Forestry and Woodland Products

4.3.1.5.3.1. Fluid Leasable Minerals Impacts on Forestry and Woodland Products

4.3.1.5.3.1.1. Impacts Common to All Alternatives

In general, minerals and mineral activities create surface disturbance which reduces opportunities for native seed collection. Because the Mojave Desert is so slow to recover, surface disturbance is additive over the lifetime of the RMP. Depending on the total number of projects and acreage of native plant communities affected by minerals activities, the impact to the BLM forestry program could range from minor to moderate. Cactus and yucca present on minerals and materials sites will be salvaged and stockpiled prior to disturbance for post-project reclamation.

4.3.1.5.3.1.2. Alternatives 1 through 4

There are no additional impacts on forestry and woodland products.

4.3.1.5.3.2. Solid Leasable Minerals Impacts on Forestry and Woodland Products

4.3.1.5.3.2.1. Impacts Common to All Alternatives

In general, minerals and mineral activities create surface disturbance, which reduces opportunities for native seed collection. Because the Mojave Desert is so slow to recover, surface disturbance is additive over the lifetime of the RMP. Depending on the total number of projects and acreage of native plant communities affected by minerals activities, the impact to the BLM forestry program could range from minor to moderate. Cactus and yucca present on minerals and materials sites will be salvaged and stockpiled prior to disturbance for post-project reclamation.

4.3.1.5.3.2.2. Alternatives 1 through 4

There are no additional impacts on forestry and woodland products.

4.3.1.5.3.3. Locatable Minerals Impacts on Forestry and Woodland Products

4.3.1.5.3.3.1. Impacts Common to All Alternatives

In general, minerals and mineral activities create surface disturbance, which reduces opportunities for native seed collection. Because the Mojave Desert is so slow to recover, surface disturbance is additive over the lifetime of the RMP. Depending on the total number of projects and acreage of native plant communities affected by minerals activities, the impact to the BLM forestry program could range from minor to moderate. Cactus and yucca present on minerals and materials sites will be salvaged and stockpiled prior to disturbance for post-project reclamation.

4.3.1.5.3.3.2. Alternatives 1 through 4

There are no additional impacts on forestry and woodland products.

4.3.1.5.3.4. Saleable Minerals Impacts on Forestry and Woodland Products

4.3.1.5.3.4.1. Impacts Common to All Alternatives

In general, minerals and mineral activities create surface disturbance, which reduces opportunities for native seed collection. Because the Mojave Desert is so slow to recover, surface disturbance is additive over the lifetime of the RMP. Depending on the total number of projects and acreage of native plant communities affected by minerals activities, the impact to the BLM forestry program could range from minor to moderate. Cactus and yucca present on minerals and materials sites will be salvaged and stockpiled prior to disturbance for post-project reclamation.

4.3.1.5.3.4.2. Alternatives 1 through 4

There are no additional impacts on forestry and woodland products.

4.3.1.5.4. Recreation Impacts on Forestry and Woodland Products

4.3.1.5.4.1. Impacts Common to All Alternatives

Recreation activities can result in surface disturbance that can negatively affect native plant communities and opportunities for native seed collection under the forestry program. To the extent practical, special recreation permits and the general public are encouraged to use existing disturbed areas; however, casual and permitted recreation activities still result in negligible to minor unreported trampling, removal of plants, and compacted soils that affect land health. This is particularly evident in the creation of new trails, road widening, route proliferation, corner cutting, the creation of camping sites, staging areas, parking areas, and target shooting areas. In general, negative impacts from these activities are small, localized in nature, and have negligible to minor impacts; however, the Mojave Desert is slow to recover and these impacts are additive on the landscape. On a landscape scale, disturbance caused by recreational use would negatively affect native seed collection under the forestry program by removing biomass and reducing opportunities for native seed collection. The negative impact is expected to range from negligible to major depending on the recreation designation and level of public use. Within designated open areas, the removal of individual plants resulting from off-highway vehicle activity is expected to result in major impacts and is expected to preclude native seed collections.

4.3.1.5.4.2. Alternatives 1 through 4

There are no additional impacts on forestry and woodland products.

4.3.1.5.5. Travel and Transportation Impacts on Forestry and Woodland Products

4.3.1.5.5.1. Impacts Common to All Alternatives

Under all alternatives, travel management is expected to improve protection of BLM resources and resource uses by providing more efficient network of roads and trails for public travel and reducing illegal impacts to public lands. Beneficial impacts to the BLM forestry program are expected to be minor by helping to maintain ecosystem health of potential seed collection areas.

4.3.1.5.5.2. Alternatives 1 through 4

There are no additional impacts on forestry and woodland products.

4.3.1.5.6. Lands and Realty Impacts on Forestry and Woodland Products

4.3.1.5.6.1. Land Tenure (Disposals and Acquisitions) Impacts on Forestry and Woodland Products

4.3.1.5.6.1.1. Impacts Common to All Alternatives

Land-use authorizations and subsequent development result in surface disturbance and other activities that negatively affect native plant communities and reduce the quality of the surrounding

native plant communities, which reduces opportunities for native seed collection under the forestry program. On a project-by-project basis, the negative impacts of land-use authorizations can range from negligible to major depending on the project size and location. The slow rate of recovery of native vegetation in the Mojave ecoregion means impacts are additive at a landscape scale. On the landscape scale, loss of native plant communities would affect the BLM's ability to authorize native seed collections and other activities under the forestry program. Depending on the number and location of lands actions over the lifetime of the RMP, the negative impact to the forestry program could range from moderate to major. Where practicable, cactus and yucca present on project sites with permanent and temporary disturbance will be salvaged prior to disturbance and, where appropriate, the plants will be used for post-project restoration; made available for BLM restoration, revegetation, and reclamation projects; or made available to the public though a sale.

4.3.1.5.6.1.2. Alternatives 1 through 4

There are no additional impacts on forestry and woodland products.

4.3.1.5.6.2. Land-Use Authorizations (Right-of-Ways, Leases, Permits) Impacts on Forestry and Woodland Products

4.3.1.5.6.2.1. Impacts Common to All Alternatives

Impacts are the same as land tenure.

4.3.1.5.6.2.2. Alternatives 1 through 4

There are no additional impacts on forestry and woodland products.

4.3.1.5.6.3. Renewable Energy Impacts on Forestry and Woodland Products

4.3.1.5.6.3.1. Impacts Common to All Alternatives

Impacts are the same as land tenure.

4.3.1.5.6.3.2. Alternatives 1 through 4

There are no additional impacts on forestry and woodland products.

4.3.1.5.6.4. Utility Corridors Impacts on Forestry and Woodland Products

4.3.1.5.6.4.1. Impacts Common to All Alternatives

Impacts are the same as land tenure.

4.3.1.5.6.4.2. Alternatives 1 through 4

There are no additional impacts on forestry and woodland products.

4.3.1.6. Special Designations

4.3.1.6.1. Areas of Critical Environmental Concern Impacts on Forestry and Woodland Products

4.3.1.6.1.1. Impacts Common to All Alternatives

The designation of ACECs will benefit native plant communities by limiting some multiple-use activities. The impacts of designating ACECs on the forestry program will vary depending on whether commercial seed collections are prohibited under the ACEC management prescriptions.

4.3.1.6.1.2. Alternatives 1 through 4

There are no additional impacts on forestry and woodland products.

4.3.1.6.2. National Trails Impacts on Forestry and Woodland Products

4.3.1.6.2.1. Impacts Common to All Alternatives

There are no impacts to the forestry program.

4.3.1.6.2.2. Alternatives 1 through 4

There are no additional impacts on forestry and woodland products.

4.3.1.6.3. Wild and Scenic Rivers Impacts on Forestry and Woodland Products

4.3.1.6.3.1. Impacts Common to All Alternatives

There are no additional impacts on forestry and woodland products.

4.3.1.6.3.2. Alternatives 1 through 4

There are no additional impacts on forestry and woodland products.

4.3.1.6.4. Wilderness Impacts on Forestry and Woodland Products

4.3.1.6.4.1. Impacts Common to All Alternatives

Under all alternatives, commercial activities are not authorized in designated wilderness. Negative impacts to the forestry program are minor.

4.3.1.6.4.2. Alternatives 1 through 4

There are no additional impacts on forestry and woodland products.

4.3.1.6.5. Wilderness Study Areas Impacts on Forestry and Woodland Products

4.3.1.6.5.1. Impacts Common to All Alternatives

Under all alternatives, commercial sales are not authorized in wilderness study areas. Negative impacts to the forestry program are minor.

4.3.1.6.5.2. Alternatives 1 through 4

There are no additional impacts on forestry and woodland products.

4.3.1.7. Cumulative Impacts on Forestry and Woodland Products

4.3.1.7.1. Past and Present Actions/Impacts

Past and present BLM actions are identified and described in the Analysis of Existing Management Situation, Chapter 3 (Affected Environment) and Chapter 4 (as part of Alternative 1). Because Mojave Desert native plant communities are so slow to recover from disturbance (see the Vegetation sections in Chapters 3 and 4) the impacts of previous lands and realty, and minerals, and recreation programs largely remain today. Cumulatively, these impacts reduce the area and quality of native plant communities which in turn reduce opportunities for native seed collections. Under the 1998 RMP, the designation of ACECs for desert tortoise recovery closed a significant portion of the planning area to commercial seed collections.

Less than 10 percent of the historic distribution of mesquite acacia woodlands has been lost in the planning area, and wood cutting is no longer sustainable. Recreation, illegal wood cutting, and groundwater pumping have both reduced the area and quality of mesquite acacia woodlands in the planning area. Land disposals and development in the Las Vegas and Pahrump valleys have dramatically reduced the size and quality of mesquite acacia woodlands in the planning area.

4.3.1.7.2. Reasonable Foreseeable Actions

The population of Southern Nevada will likely increase by an additional million sometime during the next RMP; increased population will result in higher demand for public lands and the resources on them. Disposals and lands actions will create increased opportunities for salvage sale of cactus and yucca. Increased disposals and impacts associated with land-use authorizations, minerals authorizations, and recreation will increase the need for native seed for revegetation and reclamation projects; however, it will also decrease opportunities for native seed collection.

4.3.1.7.3. Cumulative Impacts

4.3.1.7.3.1. Impacts Common to All Alternatives

Under all alternatives cumulatively, the proposed land-use allocations and management activities, impacts from past/present management actions, and the foreseeable future will result in irreversible impacts to native plant communities that will result in a negative effect on the BLM's ability to implement forestry program actions (such as authorize native seed collections and

secure locally sourced native seed for BLM revegetation, reclamation, and restoration activities). The number of acres affected by BLM actions could vary significantly. The impact on the forestry program could range from moderate to major depending on location and how many land-use authorizations are issued.

4.3.1.7.3.2. Alternatives 1 through 4

There are no additional impacts on forestry and woodland products.

4.3.2. Livestock Grazing

4.3.2.1. Summary

The goals of the range program are to provide economic benefit to the American public by providing for livestock grazing on public lands while maintaining land health through range management actions. All allotments in the planning area are ephemeral (annual) ranges. Ephemeral ranges do not consistently produce forage, but they periodically provide annual vegetation in a suitable quantity for livestock grazing. On ephemeral allotments, the potential to improve range conditions and produce a dependable supply of forage through intensive management practices is generally not possible.

Impacts on livestock grazing are generally the result of activities that affect forage levels, the ability to construct range improvements, human disturbance of livestock, and costs associated with livestock management to the operators. In general, management actions to improve or protect resources could increase the amount of forage available for livestock grazing. Management actions that increase surface disturbance and destroy vegetation would decrease the amount of forage available for livestock grazing. Management actions that restrict the location, extent, or type of rangeland projects may reduce the efficiency of the livestock management program and reduce the area available for livestock grazing.

4.3.2.2. Methods of Analysis

Management actions described in the alternatives could result in impacts to the grazing program. Indicators used to quantitatively assess management changes include:

- Reduction or increase of acres available for livestock grazing.
- Reduction or increase of forage resources available to livestock grazing.
- Limitations or restrictions on the access to, placement of, type of, or scale of livestock management facilities, including watering facilities and pipelines, livestock handling facilities, and/or fencing.

The following assumptions regarding the future management of livestock grazing are made:

- All existing leases and permits would be subject to terms and conditions by the authorizing officer.
- Although some areas are more suitable for different classes of livestock, the impacts from different classes of livestock would be similar and would not be discussed separately.
- Grazing allotments in the planning area will continue to be managed under the Special Ephemeral Range Rule [43 CFR 4115.2-1].
- Grazing is likely to directly impact the surface in areas where livestock concentrate.
- Construction of range improvements (e.g., fences, pipeline, water wells, troughs, and reservoirs) would result in a localized loss of vegetation throughout their useful life.
- Range improvements generally lead to improved livestock distribution and improved resource conditions.
- Livestock grazing management actions will comply with the Land Health Standards and Guidelines for Grazing Administration requiring livestock operators to remove livestock during periods of drought for up to one year. This would potentially impact livestock operator flexibility and viability. However, over the long term, this could maintain or improve the vegetative communities and forage conditions.

4.3.2.3. Qualitative Intensity Scale

A range of qualitative terms have been used to gauge the intensity of each impact from one program area on another. Both positive and negative impacts are considered and, where necessary, the net impact of the two is discussed. The intensities of impacts are described using the following definitions:

- **Negligible:** The impact would not be detectable or measurable. There would be no appreciable change to available forage or the grazing operations.
- **Minor:** The impact would be slightly detectable and measurable. There would be a slight change to available forage and the grazing operations. There would be small or slightly noticeable changes in the BLM's ability to authorize and implement range program activities.
- **Moderate:** The impact would be very apparent and measurable. There would be a limited change to available forage and the grazing operations. Changes in the ability of the BLM to authorize or implement range program activities would be very apparent.
- **Major:** The impact would be severe. There would be a substantial change to the grazing operations. Changes in the BLM's ability to administer the range program would be severe.

4.3.2.4. Resources

4.3.2.4.1. Air Quality Impacts on Livestock Grazing

4.3.2.4.1.1. Impacts Common to All Alternatives

Alternatives proposed for the air quality program are not expected to affect the range program.

4.3.2.4.1.2. Alternatives 1 through 4

There are no additional impacts to livestock grazing..

4.3.2.4.2. Soil Resources Impacts on Livestock Grazing

4.3.2.4.2.1. Impacts Common to All Alternatives

Alternatives proposed for the soil program could have a negligible impact on the range program.

4.3.2.4.2.2. Alternatives 1 through 4

There are no additional impacts to livestock grazing.

4.3.2.4.3. Water Resources Impacts on Livestock Grazing

4.3.2.4.3.1. Impacts Common to All Alternatives

Alternatives proposed for the water program could have a negligible impact on the range program.

4.3.2.4.3.2. Alternatives 1 through 4

There are no additional impacts to livestock grazing.

4.3.2.4.4. Integrated Vegetation Impacts on Livestock Grazing

4.3.2.4.4.1. Vegetation Impacts on Livestock Grazing

4.3.2.4.4.1.1. Impacts Common to All Alternatives

Under all alternatives, vegetation management actions provide the tools to manage for healthy native plant communities and ecosystems. Alternatives proposed for vegetation management could have both positive and negative impacts on the range program. Impacts would likely be minor.

4.3.2.4.4.1.2. Alternatives 1 through 4

There are no additional impacts to livestock grazing.

4.3.2.4.4.2. Riparian Areas and Wetlands Impacts on Livestock Grazing

4.3.2.4.4.2.1. Impacts Common to All Alternatives

There are very few mesquite acacia woodlands and little riparian vegetation in active grazing allotments. Alternatives proposed for the riparian program would have a negligible impact on the range program.

4.3.2.4.4.2.2. Alternatives 1 through 4

There are no additional impacts to livestock grazing.

4.3.2.4.4.3. Weeds Impacts on Livestock Grazing

4.3.2.4.4.3.1. Impacts Common to All Alternatives

Under all alternatives, weed management actions improve the health of native plant communities and ecosystems. Alternatives proposed for weed management would have negligible impacts on the range program.

4.3.2.4.4.3.2. Alternatives 1 through 4

There are no additional impacts to livestock grazing.

4.3.2.4.4.4. Forests and Woodlands Impacts on Livestock Grazing

4.3.2.4.4.4.1. Impacts Common to All Alternatives

Under all alternatives, forestry management actions provide the tools to manage for healthy native plant communities and ecosystems. Alternatives proposed for forestry management could have positive and negative impacts on the range program. Impacts would likely be minor.

4.3.2.4.4.4.2. Alternatives 1 through 4

There are no additional impacts to livestock grazing.

4.3.2.4.5. Fish and Wildlife Impacts on Livestock Grazing

4.3.2.4.5.1. Impacts Common to All Alternatives

Wildlife management actions that serve to support wildlife populations, such as not allowing new fencing in bighorn sheep habitat, can negatively impact livestock grazing by making livestock operations less efficient, by limiting livestock management options, or by closing or restricting areas to livestock grazing. Constructing new wildlife waters could have minor impacts from increased roads and road density and increased conflicts between vehicles and livestock. Modification of existing range improvements or adding design features to prevent wildlife entrapment could increase construction costs. The intensity of the impact would vary by the area restricted by the action. The impact would range from negligible to minor depending on the location and the proposed project.

4.3.2.4.5.2. Alternatives 1 through 4

There are no additional impacts to livestock grazing.

4.3.2.4.6. Special Status Species Impacts on Livestock Grazing

4.3.2.4.6.1. Impacts Common to All Alternatives

Avoidance and impact minimization measures for special status species could be included in the allotment management plan or as stipulations on the grazing permit or authorization. Potential impacts to grazing activities could include changes in the number of animal unit months authorized, changes in period of use, changes in type of livestock, and changes to range improvements. All allotments in the planning area provide habitat for the federally listed desert tortoise. Impacts to desert tortoises would be analyzed on a case-by-case basis as part of the allotment management plan and, if necessary, a separate biological opinion. There are a number of BLM special status plant species that have the potential to occur in active grazing allotments. Depending on the species and avoidance or impact minimization measures needed, negative impacts on the range program would range from negligible to moderate.

4.3.2.4.6.2. Alternatives 1 through 4

There are no additional impacts to livestock grazing.

4.3.2.4.7. Wild Horse and Burros Impacts on Livestock Grazing

4.3.2.4.7.1. Impacts Common to All Alternatives

In general, grazing by wild horses and burros decreases the amount of forage available for domestic livestock. In addition, range improvements within active allotments must be compatible with wild horse and burro management. Depending on the location and number of animals, the negative impacts from wild horse and burro grazing on the range program would range from negligible to major.

4.3.2.4.7.2. Alternatives 1 through 4

There are no additional impacts to livestock grazing.

4.3.2.4.8. Cave and Karst Management Impacts on Livestock Grazing

4.3.2.4.8.1. Impacts Common to All Alternatives

Cave and karst resource management is not expected to affect the range program.

4.3.2.4.8.2. Alternatives 1 through 4

There are no additional impacts to livestock grazing.

4.3.2.4.9. Wildland Fire Management Impacts on Livestock Grazing

4.3.2.4.9.1. Impacts Common to All Alternatives

Low elevation Mojave Desert native plant communities are not adapted to fire. More than 90 percent of the planning area is in moderate to severe departure from historic fire and fuels conditions because of the presence of nonnative annual grasses. Disturbance-created fire management or construction of fire and fuel breaks would have a negligible to minor negative impact on the range program. However, on a landscape scale, fire and fuels management activities would provide a moderate to major positive impact on rangelands because these activities minimize the amount of area burned and reduce the potential for large-scale fires.

Managing areas as suitable for wildland fire and allowing naturally ignited wildland fire, prescribed fire, and treatments would have impacts such as reducing the amount of forage and area available for livestock grazing. Temporary closures after fire would result in short term negative impacts to operations, that would be off set by long-term benefits to rangeland health. The level of impact would vary depending upon the size of the area burned. Impact intensities could range from negligible to moderate, depending on the size of the burn.

4.3.2.4.9.2. Alternatives 1 through 4

There are no additional impacts to livestock grazing.

4.3.2.4.10. Cultural Resources Impacts on Livestock Grazing

4.3.2.4.10.1. Impacts Common to All Alternatives

In general, activities associated with cultural resource management and tribal uses would affect relatively small, localized areas and would not have measurable impacts on the range program. Even under the most intense management (i.e. site excavation), the amount of acreage disturbed would be relatively small. Increased heritage tourism and/or use of vegetation for traditional Native American purposes could result in some disturbance to vegetation. Impacts to the range program are expected to be negligible.

4.3.2.4.10.2. Alternatives 1 through 4

There are no additional impacts to livestock grazing.

4.3.2.4.11. Paleontological Resources Impacts on Livestock Grazing

4.3.2.4.11.1. Impacts Common to All Alternatives

Impacts of paleontological resources to livestock grazing are expected to be similar to cultural resource management. Impacts to the range program are expected to be negligible.

4.3.2.4.11.2. Alternatives 1 through 4

There are no additional impacts to livestock grazing.

4.3.2.4.12. Visual Resource Management Impacts on Livestock Grazing

4.3.2.4.12.1. Impacts Common to All Alternatives

Range improvements are subject to visual resource management restrictions dependent on the VRM classification. In general, range improvements are not intrusive and can be modified to meet VRM classification standards. Impacts to the range program are expected to be negligible.

4.3.2.4.12.2. Alternatives 1 through 4

There are no additional impacts to livestock grazing.

4.3.2.4.13. Lands with Wilderness Characteristics Impacts on Livestock Grazing

4.3.2.4.13.1. Impacts Common to All Alternatives

All active grazing allotments are outside of current and proposed lands with wilderness characteristics. No impacts to the range program are expected.

4.3.2.4.13.2. Alternatives 1 through 4

There are no additional impacts to livestock grazing.

4.3.2.5. Resource Uses

4.3.2.5.1. Forestry and Woodland Products Impacts on Livestock Grazing

4.3.2.5.1.1. Impacts Common to All Alternatives

BLM seed collection areas are located within active grazing allotments. Excessive native seed collections could affect the availability of rangelands to recover; best management practices incorporated in seed collection authorizations are used to prevent this from happening. Potential impacts of native seed collections on the range program are expected to be negligible.

4.3.2.5.1.2. Alternatives 1 through 4

There are no additional impacts to livestock grazing.

4.3.2.5.2. Livestock Grazing Impacts on Livestock Grazing

4.3.2.5.2.1. Impacts Common to All Alternatives

Under all alternatives, the BLM would continue to manage grazing allotments under Special Ephemeral Range Rules (43 CFR 4115.2). Grazing permit renewals would be based on rangeland health evaluations, with associated NEPA analysis, as appropriate to allotment-specific characteristics and multiple-use requirements. Existing and proposed management actions would continue to involve each livestock operator, stakeholder, and the interested public for individual allotments on a case-by-case basis. Range improvement projects would be developed and analyzed pursuant to 43 CFR 4120-3. Surface disturbance from constructing rangeland development projects and water sources would cause negligible impacts from short-term losses of vegetation for forage, but would support appropriate distribution and management of livestock in the long term.

Under all alternatives, the BLM would not administer livestock grazing in allotments in the planning area managed by Arizona Strip District.

Under all alternatives, the BLM would maintain a closure of all unallotted lands in Nye County and would maintain current allotment closures implemented: (1) to protect desert tortoise critical habitat as determined by the U.S. Fish and Wildlife Service; (2) were relinquished by willing sellers of grazing interests (base property and/or water rights) to protect desert tortoise habitat and other species as mitigation under the Clark County Multiple Species Habitat Conservation Plan; and (3) by BLM because of agency and congressionally mandated changes in land management (including wilderness designations, land disposals, and transfers to the state of Nevada, National Park Service, Bureau of Indian Affairs, and U.S. Forest Service). The BLM considered an RMP alternative to reverse these closures (see Alternatives Considered but not Moved Forward). The rationale to close these allotment closures has not changed and remains valid.

Because these actions are a continuation of existing activities, impacts to the range program are expected to be negligible. Potential impacts to permitees would be addressed on a case-by-case basis through the permit renewal process.

4.3.2.5.2.2. Alternative 1

Under Alternative 1, livestock grazing would continue on all active allotments. This includes the Flat Top Mesa, Lower Mormon Mesa, and Hidden Valley allotments. Open but inactive allotments would continue to be available for livestock grazing or applications of non-use. This includes Muddy River, Wheeler Wash, Roach Lake, White Basin, Mesa Cliff, Muddy River, Wheeler Wash, Arrow Canyon, Arrow Canyon in Battleship Wash, and Jean Lake allotments. Because this alternative is the least restrictive to livestock grazing, impacts to the range program are expected to be negligible and would be addressed on a case-by-case basis through the permit renewal process.

4.3.2.5.2.3. Alternative 2

Under Alternative 2, BLM would discontinue livestock grazing on all active allotments. The impacts to individual permittees and livestock operations would range from minor to major. The ranching operations in the planning area are already small and limited by ephemeral forage production. The smallest allotment, Flat Top Mesa, typically has less than seven horses. The remaining two allotments typically have 60 animals or less. There are currently three active grazing operations in the planning area. Closing all allotments would have a negligible to minor impact on the local ranching community.

4.3.2.5.2.4. Alternative 3

Under Alternative 3, BLM would continue livestock grazing on active allotments including the Flat Top Mesa, Lower Mormon Mesa, and Hidden Valley. Under Alternative 3, BLM would close inactive allotments including Muddy River, Wheeler Wash, Roach Lake, White Basin, Mesa Cliff, Muddy River, Wheeler Wash, Arrow Canyon, Arrow Canyon in Battleship Wash, and Jean Lake.

The Muddy River allotment was last grazed in 1997. No grazing authorizations were issued for this allotment under the 1998 RMP. Historically, this small, 17,888-acre ephemeral allotment was not highly productive and was used as part of grazing operations that included the nearby Upper Mormon Mesa allotment, which is now closed. Much of the allotment contains steep rocky cliffs and hills that are important habitat for bighorn sheep with low suitability for livestock grazing. Only two grazing bills were issued under the last 10-year permit. An average of 44 cow-calf pairs were grazed for an average of 30 days each. Land health assessments completed in 2014 suggest native vegetation in the allotment has not fully recovered 17 years after the last authorized grazing. Under Alternative 3, the area available for livestock grazing within the allotment could be reduced, and additional restrictions would be placed on grazing. Under Alternative 3, a portion of the allotment would become part of the Logandale Special Recreation Management Area, a portion of the allotment could become part of the Lower Mormon Mesa and Mesa Milkvetch ACECs, and a majority of the allotment would be within the Moapa Valley disposal area and could be developed.

Closure of the Muddy River allotment would reduce opportunities for grazing on public lands. The impact of this closure on the range program would be negligible because historic use is extremely low. The allotment has been inactive since 1997, and nearly all range improvements have been removed. Restrictions for desert tortoise and bighorn sheep would mean there would likely be

fewer animal unit months (AUMs) available for livestock, and the number of AUMs authorized would be significantly lower than in 1997. Forage in the allotment is ephemeral and inconsistent; BLM cannot consistently issue a grazing permit or a set number of animals in the allotment. The cost to replace range improvements coupled with fewer animals on the allotment, combined with ephemeral status, means it would not be economically viable for a rancher to restart grazing in the allotment. Land-use allocations under Alternative 3 will likely restrict future ranching operations and reduce pasture size. The Logandale Trails Special Recreation Management Area, utility corridor construction, minerals development, and wildlife management under these alternatives would exacerbate economic viability of ranching operations in the allotment.

The Wheeler Wash allotment was last grazed in 1998. Historically, this 64,701-acre ephemeral allotment was much larger and included summer pastures and water rights that are now within the Spring Mountains National Recreation Area. In 1993, the U.S. Forest Service denied a grazing application for the Forest Service portion because it was no longer compatible with its resource management plan. Approximately 12,000 acres of the BLM half was designated by Congress as part of the Mt. Charleston Wilderness; because the allotment was not active, grazing was not included as a grandfathered use within the wilderness. Expansion of Highway 160 into a four-lane highway with a fenced median now isolates approximately one-quarter of the allotment. The allotment is within both the Johnnie and Wheeler Pass wild horse and burro herd management areas. A portion of the allotment is being used as a release site for captive and displaced desert tortoises. Two grazing bills were issued under the last 10-year permit issued for the allotment. An average of 55 cow-calf pairs was authorized for an average 90 days' use. Land health assessments completed in 2014 suggest native vegetation in the allotment has not fully recovered 16 years after the last authorized grazing. Under Alternative 3, a portion of the allotment would be within Pahrump Valley disposal area, variance areas for solar development, and within designated utility corridors. Currently, BLM has multiple pending applications for solar energy development within the allotment; if these applications are approved, approximately half to two-thirds of the allotment would be developed.

Closure of the Wheeler Wash allotment would reduce opportunities for grazing on public lands. The impact of this closure on the range program would be negligible because the allotment has been inactive since 1998, historic use is low, and the allotment can no longer support an economically viable ranching operation. Nearly all range improvements have been removed, and any potential permitees would be required to build new fences and improvements. The ephemeral status of the allotment means that forage may not be consistently available and the BLM cannot authorize a set number of AUMs for the allotment. The number of animals that could be authorized is likely to be much lower than when the allotment was last grazed in 1998 because of the need to maintain forage for the desert tortoise and wild horses and burros that also use the allotment. The BLM would likely authorize fewer animals than in 1998 because of reductions in the size of the allotment and changes in multiple-use activities including the designation of wilderness, the expansion of Highway 160 through the allotment, an increase in casual off-highway vehicle use in the allotment, utility corridor development and construction, minerals development and management, and as a release site for desert tortoises. Under Alternative 3, land-use allocations including land disposal and solar energy development will likely restrict future ranching operations and further reduce the area available for grazing and the number of animals authorized.

The Roach Lake, White Basin, Mesa Cliff, Arrow Canyon, Arrow Canyon in Battleship Wash allotments have not been grazed since 1998. The Jean Lake allotment was last grazed in 2005. These allotments are currently inactive because the Clark County Multiple Species Habitat

Conservation Plan (MSHCP), in partnership with the Nature Conservancy through the purchase of the base property with attached grazing preference, water rights, and range improvements from willing sellers as mitigation for desert tortoise under a U.S. Fish and Wildlife Service (USFWS) Section 10 permit. The primary purpose of the purchase was to eliminate competition between desert tortoise and livestock for forage and trampling of juvenile tortoises; additional benefits include the removal of selective foraging by livestock that removes more palatable native forage and grasses that are essential for tortoise hatchling nutrition and a reduction in soil disturbance by livestock which promotes establishment of nonnative weeds that in turn degrades tortoise habitat. Following the purchase, Clark County agreed to relinquish the grazing permits and preferences associated with the allotments with the understanding that the BLM would analyze their closure.

Closure of these allotments would reduce opportunities for grazing on public lands. However, it is no longer practical for BLM to re-establish grazing in these allotments because land-use changes since the allotments were created have reduced the grazable portion of each allotment and made replacement of range improvements impractical. The need to conserve the desert tortoise remains; closure of the allotments would continue to provide important benefits to USFWS tortoise conservation efforts and BLM multiple-use management.

The Roach Lake, White Basin, Arrow Canyon, and Arrow Canyon in Battleship Wash allotments are relatively small with low historic use [averaging 55,000 acres and 250 AUMs annually]. Land-use changes, such as the designation of wilderness, a land transfer to the National Park Service, and the creation of areas of critical environmental concern, have further reduced the grazable portions of the White Basin, Arrow Canyon, and Arrow Canyon in Battleship Wash allotments. Within Jean Lake and Roach Lake allotments, congressional conveyance of lands for the Ivanpah Valley Airport and construction of the Silverstate South Solar Project have reduced the area available for grazing.

Nearly all range improvements purchased by Clark County and the TNC have been removed. It is no longer practical to replace these range improvements. Re-establishing grazing on these allotments would require substantial permitee and BLM financial investment. There is not a reasonable assurance BLM and permitees would recoup this investment though future grazing authorizations because the allotments are ephemeral (forage is inconsistent) and reductions in the grazable portions of the allotment significantly reduce the number of AUMs that may be authorized.

Replacement of range improvements in these allotments is not compatible with current uses. Replacing range improvements within the wilderness portions of the White Basin, Arrow Canyon, and Arrow Canyon in Battleship allotments would threaten wilderness character. The Jean Lake and Roach Lake allotments are within the Jean Roach Special Recreation Management Area. Since the Roach Lake and Jean Lake allotments were last active, recreation use in the SRMA has skyrocketed (the SRMA now hosts up to 1 million casual and permitted visitors annually, including high-speed competitive racing). If grazing is re-established and range improvements replaced, the sheer number of OHV users would severely impair livestock operations. Collisions between OHV recreation users and cattle would be likely. Replacing pasture fences would be difficult because of OHV collisions and the threat that fences pose to human health and safety. The construction of fences and gates that would be essential for range management would impair travel and compromise recreation experiences in the SRMA.

USFWS has identified livestock grazing as a significant threat to the desert tortoise, and conditions that lead to listing the desert tortoise largely remain today. Closure of the allotments would help

achieve USFWS recovery goals for the tortoise. Conflicts with desert tortoise remain within the six allotments. Closure of the allotments would further BLM multiple-use management within the allotments. The removal of livestock grazing reduces cumulative impacts to desert tortoise and its habitat; this in turn, has allowed BLM to authorize multiple management actions that it might not otherwise. Under all alternatives, BLM would continue to authorize multiple-use activities within the six allotments. Re-establishing livestock grazing, and the impacts it has on the desert tortoise habitat, would make it considerably more difficult for BLM to authorize future multiple-use activities in the allotments. Rather than close the allotments, BLM considered reducing the number of AUM available for livestock grazing; however, any further reductions in AUMs would not support an economically viable ranching operation.

The impact of these closures on the range program would be negligible because the allotments are not manageable for the reasons described above.

4.3.2.5.2.5. Alternative 4

Under Alternative 4, the Muddy River and Wheeler Wash allotments would remain open, and impacts to the range program would be similar to Alternatives 2 and 3. Land-use allocations, recreation activities, and renewable energy development under Alternative 4 would likely restrict ranching operations and may reduce economic viability of current grazing operations.

4.3.2.5.3. Minerals Impacts on Livestock Grazing

4.3.2.5.3.1. Fluid Leasable Minerals Impacts on Livestock Grazing

4.3.2.5.3.1.1. Impacts Common to All Alternatives

Mineral development within active grazing allotments could impact livestock operations by disturbing surfaces and decreasing vegetation. Livestock could be excluded during active mineral operations, thus reducing available forage. The level of impact on livestock operations will vary by the size of the mineral development but are generally expected to be minor in scale.

4.3.2.5.3.1.2. Alternatives 1 through 4

There are no additional impacts to livestock grazing.

4.3.2.5.3.2. Solid Leasable Minerals Impacts on Livestock Grazing

4.3.2.5.3.2.1. Impacts Common to All Alternatives

The impacts are the same as fluid leasable minerals.

4.3.2.5.3.2.2. Alternatives 1 through 4

There are no additional impacts to livestock grazing.

4.3.2.5.3.3. Locatable Minerals Impacts on Livestock Grazing

4.3.2.5.3.3.1. Impacts Common to All Alternatives

The impacts are the same as fluid leasable minerals.

4.3.2.5.3.3.2. Alternatives 1 through 4

There are no additional impacts to livestock grazing.

4.3.2.5.3.4. Saleable Minerals Impacts on Livestock Grazing

4.3.2.5.3.4.1. Impacts Common to All Alternatives

The impacts are the same as fluid leasable minerals.

4.3.2.5.3.4.2. Alternatives 1 through 4

There are no additional impacts to livestock grazing.

4.3.2.5.4. Recreation Impacts on Livestock Grazing

4.3.2.5.4.1. Impacts Common to All Alternatives

Permitted and casual recreation activities have the potential to harass livestock and/or interfere with range improvements and permittee access. Impacts from this would be negligible in areas of light use, and minor in areas of moderate to heavy use. Impacts would include soil disturbance from vehicular traffic to and from the sites and loss of vegetation from vehicles and human trampling. Additionally, litter from shell casings and targets are often left behind, impacting the quality and quantity of vegetation and soils affected. Additionally, impacts could be moderate to major if livestock are wounded and/or killed, which would become a financial loss to the livestock operator. Impacts to livestock grazing during permitted activities would be avoided and minimized on a project level through the use of best management practices and permit stipulations.

4.3.2.5.4.2. Alternatives 1 through 4

There are no additional impacts to livestock grazing.

4.3.2.5.5. Travel and Transportation Impacts on Livestock Grazing

4.3.2.5.5.1. Impacts Common to All Alternatives

Permittee access to grazing allotments is an important consideration during travel and transportation planning. Impacts to the range program from travel and transportation management are expected to be negligible.

4.3.2.5.5.2. Alternatives 1 through 4

There are no additional impacts to livestock grazing.

4.3.2.5.6. Lands and Realty Impacts on Livestock Grazing

4.3.2.5.6.1. Land Tenure (Disposals and Acquisitions) Impacts on Livestock Grazing

4.3.2.5.6.1.1. Impacts Common to All Alternatives

Land tenure adjustments could impact livestock operations and management. The authorization of rights-of-ways within allotments would have impacts that range from negligible to major and vary by allotment due to the loss of parcels that contain important range developments or facilities and/or a reduction of forage available for livestock. Replacement or relocations of these facilities could mitigate some of the impacts. Development of renewable energy projects, mainly solar, would have impacts ranging from moderate to major on some livestock operations by removing acreage and associated forage available for livestock grazing (AUMs) and potentially remove livestock developments needed for the appropriate management of livestock operations. The designation of utility corridors throughout the planning area could lead to new access roads and associated increased vehicle traffic within allotments. Impacts would likely be negligible from conflicts between vehicles and livestock (direct collision or harassment) where the corridors are limited to administrative access only or current projects that already exist.

4.3.2.5.6.1.2. Alternatives 1, 3, and 4

Under Alternatives 1, 3, and 4, BLM would potentially sell (dispose) public lands with the Flat Top Mesa and Muddy River allotments. The sale of public lands within the grazing allotment would reduce the area available for livestock grazing, This could affect the economic viability of livestock grazing operations and lead to the discontinuance of grazing in these allotments. The impact could range from minor to major.

4.3.2.5.6.1.3. Alternative 2

Under Alternative 2, BLM would not dispose of public lands with the Flat Top Mesa and Muddy River grazing allotments. There would be no impacts to livestock operations.

4.3.2.5.6.2. Land-Use Authorizations (Right-of-Ways, Leases, Permits) Impacts on Livestock Grazing

4.3.2.5.6.2.1. Impacts Common to All Alternatives

The impacts are the same as land tenure.

4.3.2.5.6.2.2. Alternatives 1 through 4

There are no additional impacts to livestock grazing.

4.3.2.5.6.3. Renewable Energy Impacts on Livestock Grazing

4.3.2.5.6.3.1. Impacts Common to All Alternatives

The impacts are the same as land tenure.

4.3.2.5.6.3.2. Alternatives 1 through 4

There are no additional impacts to livestock grazing.

4.3.2.5.6.4. Utility Corridors Impacts on Livestock Grazing

4.3.2.5.6.4.1. Impacts Common to All Alternatives

The impacts are the same as land tenure.

4.3.2.5.6.4.2. Alternatives 1 through 4

There are no additional impacts to livestock grazing.

4.3.2.6. Special Designations

4.3.2.6.1. Areas of Critical Environmental Concern Impacts on Livestock Grazing

4.3.2.6.1.1. Impacts Common to All Alternatives

The designation of ACECs has the potential to impact range program activities in active allotments. Under all alternatives, ACEC management prescriptions would be consistent with range program administration. The impacts from ACEC designations are expected to have a negligible impact on the range program.

4.3.2.6.1.2. Alternatives 1 through 4

There are no additional impacts to livestock grazing.

4.3.2.6.2. National Trails Impacts on Livestock Grazing

4.3.2.6.2.1. Impacts Common to All Alternatives

Designation of the Old Spanish Trail through the Lower Mormon Mesa allotments could impact range activities. The impact to the range program could range from negligible to moderate depending on the location and proposed action.

4.3.2.6.2.2. Alternatives 1 through 4

There are no additional impacts to livestock grazing.

4.3.2.6.3. Wild and Scenic Rivers Impacts on Livestock Grazing

4.3.2.6.3.1. Impacts Common to All Alternatives

Wild and scenic river designations are proposed within active grazing allotments. No impacts to the range program are expected.

4.3.2.6.3.2. Alternatives 1 through 4

There are no additional impacts to livestock grazing.

4.3.2.6.4. Wilderness Impacts on Livestock Grazing

4.3.2.6.4.1. Impacts Common to All Alternatives

The designation of wilderness could impact operations and access. There are no designated wilderness areas within active allotments. No impacts are expected.

4.3.2.6.4.2. Alternatives 1 through 4

There are no additional impacts to livestock grazing.

4.3.2.6.5. Wilderness Study Areas Impacts on Livestock Grazing

4.3.2.6.5.1. Impacts Common to All Alternatives

No impacts to the range program are expected.

4.3.2.6.5.2. Alternatives 1 through 4

There are no additional impacts to livestock grazing.

4.3.2.7. Cumulative Impacts to Livestock Grazing

4.3.2.7.1. Past and Present Actions/Impacts

Past and present BLM actions are identified and described in the Analysis of Existing Management Situation, Chapter 3 (Affected Environment) and Chapter 4 (as part of Alternative 1). As discussed in the Vegetation section, native plant communities in the Mojave ecoregion are slow to recover from disturbance. It is commonly accepted that present day Mojave Desert native plant communities did not evolve with significant selective pressure from large-bodied herbivores (Beever et. al. 2003, Brown and McDonald 1995, Grayson 1987, Hall 1946), and desert vegetation is very slow to recover if overgrazed or disturbed (Abella et. al. 2007, Tueller 1989). In general, grazing by livestock affects composition and productivity of native plant communities through selective grazing (Brooks et al 2006). The quality of rangelands in the planning area has declined as a result decades of grazing. BLM land health assessments indicate that allotments that were closed under the 1998 RMP continue to show a departure from expected

reference conditions and have not recovered from the effects of livestock grazing. This includes lower densities of native perennial and annual grasses, lower densities of native forbs, and higher densities of nonnative annual grasses.

Throughout the planning area, there has been a decline in ecosystem services and reduced the ability of rangelands to recover from disturbance and wildfire. This is a result of colonization by nonnative species, in particular nonnative annual grasses, as well as recurrent wildfire, BLM multiple-use activities including livestock grazing, wild horse and burro grazing, road and trail proliferation by casual and permitted recreation, and development and fragmentation by BLM land-use authorizations.

The range program in Southern Nevada has gotten smaller. After the desert tortoise was federally listed, the value of rangelands for conservation increased. The number of active grazing allotments in the planning area decreased as willing sellers sold base property, water rights, and range improvements to the Nature Conservancy and Clark County Multiple Species Habitat Conservation Plan. The 1998 RMP closed all allotments except Hidden Valley, Mount Stirling, Lower Mormon Mesa, Roach Lake, White Basin, Muddy River, Wheeler Wash, Mesa Cliff, Arrow Canyon in Battleship Wash, Flat Top Mesa, and Jean Lake. The Roach Lake, White Basin, Mesa Cliff, Arrow Canyon, Arrow Canyon in Battleship Wash, and Jean Lake allotments have been inactive for most of the 1998 RMP after Clark County purchased the base property, water rights, and range improvements associated with them from willing sellers.

Conditions have changed since the Roach Lake, White Basin, Muddy River, Wheeler Wash, Mesa Cliff, Arrow Canyon in Battleship Wash, and Jean Lake allotments were last active. As analyzed above in the range section, changes in land-use including the designation of wilderness, ACECs, and recreation use make it impractical to reopen the allotments to grazing. Creation of the Coyote Springs and Upper Mormon Mesa ACECs and designation of the Arrow Canyon Wilderness effectively eliminate grazing within the Arrow Canyon and Arrow Canyon in Battleship Wash allotments. The Jean/Roach Lake Special Recreation Management Area, which includes the Roach Lake and Jean Lake allotments, potentially receives up to a million casual and permitted visitors annually and hosts high-speed competitive motorcycle and truck and buggy races. Under these circumstances, the BLM is unable to ensure public safety and effectively administer livestock grazing.

4.3.2.7.2. Reasonable Foreseeable Actions

The population of Southern Nevada will likely reach 3 million during the next RMP; increased population will result in greater demand for BLM land-use authorizations and casual recreation opportunities in the planning area. With higher demand, impacts to rangelands and grazing allotments in the planning area will increase. The BLM's capacity to manage impacts to rangelands, through law enforcement, fire and fuels management, travel management, and restoration will likely remain unchanged from current levels. For the foreseeable future, higher demand without an increase in capacity to monitor, protect, and repair damage will mean impacts to rangelands and the range program will escalate.

Using conservative climatic models, by 2050 much of the low elevation creosote bursage scrub in the planning area will have a temperature profile similar to present day Stove Pipe Wells in Death Valley, CA. As discussed in chapter 3, climate change will affect the quality and quantity of native plant communities in the planning area. Rangelands and their ability to sustainably provide forage and remain healthy will be similarly be affected by climate change. Climate change

means the ability of rangelands to recover from disturbance will likely be reduced. This could also mean rangelands may not be able to provide the level of ecosystem services and economic value currently provided.

4.3.2.7.3. Cumulative Impact

4.3.2.7.3.1. Impacts Common to All Alternatives

Cumulatively, the proposed land use allocations and management activities, impacts from past/present management actions, and the foreseeable future have the potential to reduce the quality of forage in allotments and area available for grazing. Under all alternatives, BLM will minimize project impacts to grazing allotments, rangelands and administration of the range program during the NEPA process. During the NEPA process, BLM would have the discretion to deny applications or develop project specific mitigation that would reduce cumulative impacts. The proposed management alternatives differ in the degree of impact.

4.3.2.7.3.2. Alternative 1

Cumulative impacts to livestock grazing are usually those that affect available forage, water, and space. If implemented, the overall cumulative impacts from Alternative 1 would result in livestock operations at or near current capacity, but with the likelihood of AUM reductions due to loss of lands to other resource uses such as recreation, energy development, land disposal, mineral development, wildfires, and wildlife habitat enhancement.

Alternative 1 contains the least restrictions on solar energy development. Under this alternative, portions of most active allotments could be developed depending on whether an application has already been received. This alternative contains the least restrictions on recreation activities. Because recreational use is expected to increase throughout the planning area due to an increase in the region's population, impacts to livestock grazing would likely occur from recreation. Cumulatively, impacts from this would include soil disturbance and loss of vegetation from vehicles and human trampling, litter from shell casings and targets that are often left behind, and potential injury and/or death of livestock. These combined impacts could cause avoidance or displacement of cattle in affected areas, which could negatively affect livestock distribution patterns and forage availability. Another impact to available space for livestock is wildland fires, which are increasing with the population growth and human expansion into public areas. Managing areas as suitable for wildland fire and allowing naturally ignited wildland fire, prescribed fire, and treatments would have cumulative impacts on the amount of forage and area available for livestock grazing in the short term, but could improve vegetation condition in the long term in fire-adapted communities. The level of impact would vary depending upon the size of the area burned. However, fire in Mojave Desert native plant communities that are not fire adapted would reduce the amount of forage available to livestock on a longer term. Suppression of wildfires in the Mojave Desert would have short-term impacts by removing vegetation, but it would reduce overall impacts to livestock forage in the long term by retaining the vegetative communities and stabilizing the soil. Impact intensities could range from negligible to major, depending on the size of the burn. These impacts would be similar under all alternatives.

Under Alternative 1, lands within allotments could be disposed of and developed as part of lands and minerals actions. Actions that would reduce, damage, or destroy vegetation communities would generally decrease available forage for livestock grazing. Management actions, such

as requiring mitigation or avoidance of vegetation removal for projects, in order to protect vegetation resources, would protect or restore vegetation communities and would generally maintain available forage for livestock grazing. Any of these actions are likely to be negligible to minor in scale and in some cases may be short term.

Fencing developments can cumulatively impact the amount of land and forage available to livestock. While pasture fencing tends to be conducive to good grazing management by allowing rotational/rest regimes, it can also be detrimental to livestock and wildlife movement across the landscape. There is often a tenuous balance between improving rangeland resources through the use of fencing to manage or exclude livestock, and minimizing fencing for the benefit of wildlife movement and dispersal. This is particularly important along wildlife corridors. For instance, restrictions on new fencing in bighorn sheep habitat that improve bighorn sheep movement can impact livestock grazing by making livestock operations less efficient, limiting livestock management options, or closing or restricting areas to livestock grazing. Fencing certain important cultural resource sites to exclude grazing would result in a small decrease in forage, but few sites would need to be fenced. Individually, activities associated with management of cultural and paleontological resources would affect relatively small, localized areas. Even cumulatively, the amount of acreage involved with multiple cultural sites and excavations would still remain small. Mineral development within areas open to mineral entry could impact livestock operations by disturbing surfaces and decreasing vegetation and add to fenced-out areas.

4.3.2.7.3.3. Alternative 2

Under Alternative 2 grazing would be discontinued. The removal of livestock grazing would increase the amount of forage available for wildlife. Removal of livestock grazing in active allotments would reduce cumulative impacts to the quality and quantity native plant communities.

4.3.2.7.3.4. Alternative 3

Under Alternative 3, impacts would be similar to those described under Alternative 1 except this alternative is the most restrictive for renewable energy development. Only the Flat Top Mesa allotment would be available for renewable energy development. Under this alternative, the number of acres available for livestock grazing would be reduced through the closure of inactive allotments. Under Alternative 3, ACECs designated to protect resources would be developed within grazing allotments; livestock grazing would continue within designated ACECs, and impacts to range resources would vary depending on the management actions proposed to protect relevance and importance criteria. Under Alternative 3, recreation and urban expansion are likely to cause the majority of impacts to livestock grazing. As described for Alternative 1, the cumulative effects of the individual resources would coalesce in the loss of space, forage, and water for livestock use

Overall cumulative impacts would be similar to Alternative 1, except with an aggregate increase in effects. The cumulative impacts would include managing livestock operations with a reduction in permitted AUMs; the increased impacts from recreation including damage and/or loss of land and forage; harassment and/or injury to cattle and vandalism to range developments; the likelihood of future AUM reductions due to additional loss of lands to other resource uses; and gradual reduction of available land and forage for other resources such as recreation, energy development, land disposal, mineral development, wildfires, and wildlife habitat enhancement. Individually and possibly collectively, permitees would likely experience increased costs of operations for the maintenance of vandalized fences and water developments while incurring a reduction in their

potential income from their livestock revenues. Often livestock operators choose to run reduced numbers for a variety of reasons (drought, fire, personal finances, etc.), so impacts from reduced AUMs might not affect overall economic impacts of Alternative 3. However, all of these impacts combined could potentially make continued livestock grazing untenable in the planning area

Under Alternative 3, management directions restricting developments and ground-disturbing activities from areas of significant desert pavement, cryptogamic crust, and soils that are vulnerable to disruption or have high wind or water erosion potential could have a minor impact by limiting the location of livestock management facilities. Allowing projects in these areas if mitigation occurs could offset this impact. Likewise, restrictions on placement of new water developments could impact distribution of livestock. The intensity of these impacts would generally be minor. Emphasis is placed on protection of the vegetative communities across the planning area. Management actions, such as requiring mitigation or avoidance of vegetation removal for projects, in order to protect vegetation resources, would protect or restore vegetation communities and would generally increase available forage for livestock grazing. Actions that would reduce, damage, or destroy vegetation communities would generally decrease available forage for livestock grazing. Any of these actions are likely to be negligible to minor in scale and in some cases may be short term.

4.3.2.7.3.5. Alternative 4

Cumulative impact to the range program would be similar to Alternatives 1 and 2, the magnitude of potential impacts from lands and realty actions, recreation, minerals, would be the highest under Alternative 4. Depending on the level of urban and solar energy development within allotments, the area available for grazing may become too small to support economically viable ranching operations.

4.3.3. Minerals

Minerals can be subdivided into two primary categories: discretionary and nondiscretionary minerals. Discretionary minerals consist of saleable minerals and both leasable minerals (fluid and solid); these mineral developments can occur at the discretion of the land-use plan, i.e. RMP with areas designated as open[1] or closed. Nondiscretionary minerals constitute the locatable minerals and require the location of mining claims with valid existing rights. For locatable minerals, all lands are classified as open unless they have undergone a formal withdrawal process, which removes those lands from this form of mineral development.

4.3.3.1. Fluid Leasable Minerals

4.3.3.1.1. Summary

The impact issues for fluid minerals result from the management actions for the protection of other resources. There are several categories of restrictions on fluid minerals including (1) areas open to leasing, subject to standard lease terms and conditions; (2) areas open to leasing, subject to moderate constraints; (3) areas open to leasing, subject to major constraints such as no surface occupancy; and (4) areas closed to leasing.

The levels of restrictions from "open subject to standard lease terms and conditions" to "closed" have varying levels of impacts on the exploration and development of fluid minerals. The standard lease terms and conditions are provided in Section 6 of BLM's fluid mineral lease form (Form 3160–3 approved April 2004). Stipulations are also attached to the lease form for those areas that have restrictions. Detailed discussions regarding restrictions and closures proposed for each alternative are presented in Appendix C (p. 1711). All fluid mineral developments would be governed by the best management practices contained in the Gold Book: Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development (U.S. Department of the Interior and the U.S. Department of Agriculture 2007). Prior best management practices specific to the Southern Nevada District Office also would be retained. Those are included in the Gold Book's Geology and Mineral Extraction section in Appendix F, Section 1. The types and styles of facilities associated with fluid mineral development, including steam injection, horizontal drilling, hydraulic fracturing, etc., may be altered through the application of conditions of approval (COAs) associated with site-specific projects to achieve nonmineral resource goals and objectives (e.g., BMPs for VRM and soils, SOPs and Avoidance Measures for threatened and endangered species).

Geophysical exploration operations also would be conducted under the best management practices of the Gold Book and prior best management practices; however, such operations may have additional proposed requirements depending on the alternative as described in the Gold Book's Sections 2.4.18, 2.5.18, 2.6.18, 2.7.18, and 2.8.18, Geology and Mineral Extraction.

The restrictions placed on fluid mineral development to protect other resources can affect the ability to develop mineral resources. Lands open to leasing under standard terms and conditions would represent impacts of little consequence to fluid minerals. Closure of lands to leasing, no surface occupancy designations, and overlapping timing restrictions, however, could result in the loss of the fluid mineral resource, employment opportunities, revenue from production royalties, and taxes.

[1]Open for fluid leasable minerals consist of three categories: open; open with moderate constraints (i.e. CSU and timing restraints); and open with major constraints (i.e. NSO).

The lease stipulations have been developed to provide protection for a number of resources such as cultural resources, lands and realty, paleontological resources, recreation, special status species, visual resources, and wildlife resources. The requirements of the stipulations can include restrictions on seasonal access, designation of buffers around sensitive areas, or other mitigation measures that would be critical to protecting a particular resource.

The Southern Nevada District Office has strived to use the least restrictive constraint to meet the resource protection objective. For example, areas containing resources that require protection from all surface disturbance have generally been designated as no surface occupancy rather than closed. Large ACECs that would need protection through closure also would have their outer mile designated as no surface occupancy. The no surface occupancy zone would allow some exploration and production from beneath the protected surfaces through directional and extended reach drilling.

Some areas may be closed to fluid mineral leasing because of statutory requirements. For example, designated wilderness and wilderness study areas are closed to mineral entry. If a wilderness study area is designated as wilderness, then it would continue to be closed to mineral development. If it is dropped from consideration, it could be open to leasing. Other areas can be closed to fluid mineral leasing because of special designations, recreation areas, lands withdrawals, cultural resources, or as part of an ACEC.

4.3.3.1.2. Methods of Analysis

Impacts are analyzed in this section on the basis of reasonable foreseeable development scenarios for each category of minerals. These development scenarios are applied in total in the least constraining alternative and scaled downward in other alternatives as various constraints limit the area of lands available for development in a particular mineral category. However, actual activity levels, as with prices, cannot be predicted with certainty. Various additional assumptions have been incorporated based on changes in mineral markets in the recent past.

Each of the other resources are evaluated and analyzed to determine if there is a competing use or impact that would affect the mineral resource from being developed. A determination has been made using the Qualitative Intensity Scale on the impact that each resource has on mineral development.

4.3.3.1.3. Qualitative Intensity Scale

Evaluation of the impacts to the mineral programs have been based on a four-point scale:

- **Negligible:** These are impacts that have little to no impact to the commodity as they tend to be solely stipulations or conditions that are required in permitting.
- **Low:** These are impacts that may require project scoping to address potentially unknown issues or conditions that may affect the resource's development.
- **Moderate:** These are impacts that will require project scoping to address known issues or conditions that may limit the resource's development potential. They may require avoidance and mitigation actions and will incorporate best management practices.
- **Major:** These are impacts that will require project scoping as there are major or significant issues or conditions that prevent or limit the resource's development potential. These may include closure of specific lands or pursuing mineral withdrawal as the only alternative. These

impacts have mitigation factors and best management practices that must be incorporated into the permitting process.

4.3.3.1.4. Resources

4.3.3.1.4.1. Air Quality Impacts on Fluid Leasable Minerals

4.3.3.1.4.1.1. Impacts Common to All Alternatives

Air quality management actions have low to moderate impacts to fluid leasable mineral development. All permitted activities typically over 0.25 acre of combined disturbance require operators to obtain state and local air quality permits before they are allowed to begin their operations. The operator is required to make sure that permits are up to date. Any violation could result in noncompliance from local, state, or federal authorities. The SNDO could issue noncompliance orders, decisions, and/or even terminate authorizations if public health and human safety are at risk.

4.3.3.1.4.1.2. Alternatives 1 through 4

There are no additional impacts to fluid leasable mineral development.

4.3.3.1.4.2. Soil Resources Impacts on Fluid Leasable Minerals

4.3.3.1.4.2.1. Impacts Common to All Alternatives

Soil resource management actions have moderate impacts to fluid leasable mineral development. There may be a need in the future for new road development to access specific mineral locations; these would be addressed during project review and scoping. All fluid leasable mineral development activities from exploration to full development are required to be reclaimed and are the responsibility of the operator. To limit soil-disturbing activities, existing routes are the preferred means of access, but there is the potential for needing new routes to access operations. These will be evaluated during the scoping and commenting periods for each project. Reclamation includes re-contouring, earthwork, stabilization, revegetation, and restoration.

4.3.3.1.4.2.2. Alternatives 1 through 4

There are no additional impacts to fluid leasable mineral development.

4.3.3.1.4.3. Water Resources Impacts on Fluid Leasable Minerals

4.3.3.1.4.3.1. Impacts Common to All Alternatives

Water resource management actions have moderate to major impacts to fluid leasable mineral development. The protesting of water rights could impact fluid leasable mineral development as operators' need for additional water rights could be prohibited or limited. This action has the potential to impact their approved operations. In some instances, operations have been required to acquire water rights to retire them as a mitigation measure. If these are protested, it could impact the existing operation and contradict the mitigation measure.

4.3.3.1.4.3.2. Alternatives 1 through 4

There are no additional impacts to fluid leasable mineral development.

4.3.3.1.4.4. Integrated Vegetation Management Impacts on Fluid Leasable Minerals

4.3.3.1.4.4.1. Vegetation Impacts on Fluid Leasable Minerals

4.3.3.1.4.4.1.1. Impacts Common to All Alternatives

Vegetation management actions have moderate impacts to fluid leasable mineral development. Cactus and yucca are required to be salvaged or avoided on all authorized and approved fluid leasable exploration and development activity. Site reclamation is required on all associated surface-disturbing activities. Reclamation includes re-contouring topography, removal of equipment and structures, and revegetation of public lands. Specified seed mixes that are approved by the SNDO botanist(s) and restoration plans are used to revegetate the disturbed lands. Operations are required to reclaim disturbances, which includes re-contouring, earthwork, stabilization, revegetation, and restoration.

4.3.3.1.4.4.1.2. Alternative 1

Vegetation management does not affect or impair any form of fluid leasable mineral development under this alternative. Any impacts would be addressed during project evaluation and scoping with the incorporation of the appropriate BMPs.

4.3.3.1.4.4.1.3. Alternatives 2 through 4

Native plant community connectivity has a moderate impact on fluid leasable mineral development on more of a localized scale rather than a regional scale. If production were to develop as the result of exploration findings, then infrastructure consisting of roads, drill pads and pipelines could impact some sensitive communities. Regulatory authority allows fluid leasable developments to be repositioned up to 200 meters away from these areas. This would be addressed during project scoping.

Adaptive management of the native plant community would have a low impact to mineral resources. Changes in methodology and techniques will be incorporated into approved reclamation and restoration plans as needed to comply with resource needs. New operations will incorporate the changes in the initial stages of the project prior to authorization whereas future authorized operations would incorporate changes at times of modification, renewal, or amendments.

4.3.3.1.4.4.2. Riparian Areas and Wetlands Impacts on Fluid Leasable Minerals

4.3.3.1.4.4.2.1. Impacts Common to All Alternatives

Riparian and wetlands management has moderate impacts to fluid leasable mineral development. Any impacts associated with riparian and wetlands management are similar to those addressed under the preceding Vegetation subsection of this resource. Any impacts would be addressed

during project scoping and by implementing best management practices with avoidance where feasible.

4.3.3.1.4.4.2.2. Alternatives 1 through 4

There are no additional impacts to fluid leasable mineral development.

4.3.3.1.4.4.3. Weeds Impacts on Fluid Leasable Minerals

4.3.3.1.4.4.3.1. Impacts Common to All Alternatives

Weed management actions have moderate impacts to fluid leasable mineral resources. Mitigation measures would include the incorporation of weed plans as part of the project's approval requirements.

4.3.3.1.4.4.3.2. Alternatives 1 through 4

There are no additional impacts to fluid leasable mineral development.

4.3.3.1.4.4.4. Forests and Woodlands Impacts on Fluid Leasable Minerals

4.3.3.1.4.4.4.1. Impacts Common to All Alternatives

Forest and woodland management actions have moderate impacts to fluid leasable mineral development. Any impacts associated with forestry and woodland management are similar to those addressed under the preceding Vegetation subsection of this resource. Any impacts would be addressed during project scoping and by implementing best management practices with avoidance where feasible.

4.3.3.1.4.4.4.2. Alternatives 1 through 4

There are no additional impacts to fluid leasable mineral development.

4.3.3.1.4.5. Fish and Wildlife Impacts on Fluid Leasable Minerals

4.3.3.1.4.5.1. Impacts Common to All Alternatives

Fish and wildlife management actions have moderate to major impacts to fluid leasable mineral development. Seasonal restrictions and controlled surface use during certain seasons could impact fluid leasable mineral development for new exploration and construction activities. Any impacts are addressed during individual project scoping and permitting on a project-by-project basis.

4.3.3.1.4.5.2. Alternative 1

There are no additional impacts to fluid leasable mineral development.

4.3.3.1.4.5.3. Alternative 2

This alternative will have major impacts to fluid leasable mineral development. All hydrographic basins that are encompassing or are up gradient from Devil's Hole or the Muddy River will be closed to fluid mineral leasing under this alternative. These lands are the location of many of the proposed fluid leasable mineral parcels that the office has received in the past and may re-receive in the future. The loss of these lands would remove opportunities for fluid leasable mineral development in these areas.

4.3.3.1.4.5.4. Alternative 3 and 4

Alternatives 3 and 4 leave the lands with hydrographic basins that are encompassing or are up gradient from Devil's Hole or the Muddy River open, therefore, development could take place in areas where interest has been expressed in the past. Under these alternatives the Fluid Leasable programs regulatory protocols would allow reasonable development of fluid leasables while protecting Fish and Wildlife resource values.

4.3.3.1.4.6. Special Status Species Impacts on Fluid Leasable Minerals

4.3.3.1.4.6.1. Impacts Common to All Alternatives

Special status species management actions have moderate to major impacts to fluid leasable mineral development. Fluid mineral development may be impacted by big game species, particularly bighorn sheep, through seasonal (timing) restrictions as lands would be designated as controlled surface use (CSU). Exploration and development activities are to occur outside of lambing season. Impacts associated with fluid leasable mineral exploration and development activities were addressed during project scoping.

4.3.3.1.4.6.2. Alternative 1

The 1998 RMP classifies land as no surface occupancy (NSO), when it contains sensitive species habitat. This accounts for nearly the entire district and prevents all forms of fluid leasable mineral exploration and development in the planning area. Between 2009 and 2012, there were 115 proposed fluid leasable parcels. The SNDO has not issued any of the proposed parcels.

4.3.3.1.4.6.3. Alternative 2

This alternative will have major impacts to fluid leasable mineral development. All hydrographic basins that are encompassing or are up gradient from Devil's Hole or the Muddy River will be closed to fluid mineral leasing under this alternative. These lands are the location of many of the proposed fluid leasable mineral parcels that the SNDO has received in the past and may re-receive in the future. The loss of these lands would remove opportunities for fluid leasable mineral development in these areas.

4.3.3.1.4.6.4. Alternatives 3 and 4

Alternatives 3 and 4 leave the lands with hydrographic basins that are encompassing or are up gradient from Devil's Hole or the Muddy River open, therefore, development could take place in areas where interest has been expressed in the past. Under these alternatives the Fluid Leasable

programs regulatory protocols would allow reasonable development of fluid leasables while protecting Special Status Species resource values.

4.3.3.1.4.7. Wild Horse and Burro Impacts on Fluid Leasable Minerals

4.3.3.1.4.7.1. Impacts Common to All Alternatives

There are no impacts common to all alternatives.

4.3.3.1.4.7.2. Alternative 1

Wild horse and burro management actions have negligible impacts to fluid leasable mineral development. Management prescriptions for wild horses and burros do not affect any form of fluid leasable mineral development under this alternative.

4.3.3.1.4.7.3. Alternatives 2 through 4

Wild horse and burro management actions have low to moderate impacts to fluid leasable mineral development. Fluid leasable minerals are impacted as the Muddy Mountains HMA surrounds an actively proposed area for oil and gas lease parcels. The geology of the Muddy Mountains mirrors that seen in the oil fields of east central Nevada and into Utah. Since 2004, there have been over 40 proposed lease parcels in that region. There is a potential that future exploration could take place within the HMA. Avoidance for both of these resources could have impacts on timing restrictions or stipulations to fluid leasable mineral development in the region.

4.3.3.1.4.8. Cave and Karst Management Impacts on Fluid Leasable Minerals

4.3.3.1.4.8.1. Impacts Common to All Alternatives

Cave and karst management actions have negligible impacts to fluid leasable mineral development as these are small, site-specific locations that can be avoided. Any impacts associated with fluid leasable mineral exploration and development activities were addressed during project scoping.

4.3.3.1.4.8.2. Alternatives 1 through 4

There are no additional impacts to fluid leasable mineral development.

4.3.3.1.4.9. Wildland Fire Management Impacts on Fluid Leasable Minerals

4.3.3.1.4.9.1. Impacts Common to All Alternatives

Wildland fire management actions have a low impact on fluid leasable mineral development. It does not impair fluid leasable mineral development activity and focuses on resource protection in response to fire on the landscape and health and human safety. In times of emergency, the resource can provide information about the region to aid in resource protection.

4.3.3.1.4.9.2. Alternatives 1 through 4

There are no additional impacts to fluid leasable mineral development.

4.3.3.1.4.10. Cultural Resource Impacts on Fluid Leasable Minerals

4.3.3.1.4.10.1. Impacts Common to All Alternatives

Cultural resource management actions have moderate impacts to fluid leasable mineral development. Regulatory authority allows for repositioning fluid leasable developments up to 200 meters away from these areas, which would be addressed during project scoping.

4.3.3.1.4.10.2. Alternatives 1 through 4

There are no additional impacts to fluid leasable minerals.

4.3.3.1.4.11. Paleontological Resource Impacts on Fluid Leasable Minerals

4.3.3.1.4.11.1. Impacts Common to All Alternatives

Paleontological resource management actions have a low to moderate impact to fluid leasable mineral development. Regulatory authority allows for repositioning fluid leasable developments up to 200 meters away from these areas, which would be addressed during project scoping.

4.3.3.1.4.11.2. Alternatives 1 through 4

There are no additional impacts to fluid leasable mineral development.

4.3.3.1.4.12. Visual Resource Management Impacts on Fluid Leasable Minerals

4.3.3.1.4.12.1. Impacts Common to All Alternatives

Visual resource management (VRM) actions have low to major impacts on fluid leasable mineral development based on the class rank.

Lands designated as Class I prevent all forms of surface disturbance that would lead to a change to the visual landscape by preserving the existing character of the landscape. Lands designated as Class I are wilderness and wilderness study areas (WSAs), which are closed to fluid leasable mineral resources. If WSAs are released, they would only benefit the mineral resource in the district by potentially opening lands to a different VRM classification, allowing for development. Designation of new WSAs would have an indirect negative impact to the resource as the lands would no longer be classified as their original class but as Class I, which prevents any changes to the visual landscape.

Lands listed as Class II can modify, limit, or prevent fluid leasable mineral development as the lands need to retain the existing character of the landscape. Exploration activities tend to be temporary, less impactive, and may be positioned to limit the visual impact. Class III lands have less of an impact as fluid leasable mineral development can be an acceptable impact as the

lands need to partially retain the existing character of the landscape. Class III doesn't impact or hinder exploration activities due to their temporary nature. Class IV allows for surface-disturbing activity and is the least restrictive. Surface-use stipulations under some VRM classes could redesign or cancel operational plans resulting in increased costs for all mineral activities. Each of the alternatives will address how each is impacted by the four classes.

4.3.3.1.4.12.2. Alternative 1

Lands designated as VRM Class I account for approximately 2 percent of the planning area. These lands are closed to fluid leasable mineral resources, which is a major impact.

Class II lands account for approximately 29 percent in the planning area. Most fluid leasable mineral actions will be avoided in Class II due to identifiable visible changes to landform and to visual landscape. The impact of Class II would be moderate to major to fluid leasable mineral exploration and development. Unless mitigated, fluid leasable mineral exploration and development could be significantly impacted in the Bitter Springs region. This region has geologic similarities to producing oil fields in Central Nevada (outside of the planning area) and is the most desired place to explore in our planning area. The appropriate BMPs would be incorporated into permitting these operations.

Class III lands account for approximately 52 percent of the planning area, which would have a low to moderate impact. All impacts related to fluid leasable mineral activities would be analyzed during scoping, and the appropriate BMPs will be incorporated into permitting the operation.

Class IV lands, accounting for approximately 17 percent, have low impacts to fluid leasable mineral resources because VRM doesn't limit activity or disturbance in its effect to the visual landscape.

4.3.3.1.4.12.3. Alternative 2

Lands designated as VRM Class I account for approximately 12 percent of the planning area. The increase of nearly 10 percent under this alternative is attributed to incorporating lands with wilderness characteristics, which need to maintain wilderness characteristics but do not go through congressional designation. These lands are closed to fluid leasable mineral resources, which is a major impact.

Class II lands account for approximately 33 percent in the planning area. Most fluid leasable mineral actions will be avoided in Class II due to identifiable visible changes to landform and to visual landscape. The impact of Class II would be moderate to major. Unless mitigated, fluid leasable mineral exploration and development could be significantly impacted in the Bitter Springs region. This region has geologic similarities to producing oil fields in Central Nevada (outside of the planning area) and is the most desired place to explore in the planning area. Mormon Mesa has been reclassified as Class II under this alternative and is also a desirable area of fluid leasable interest in the planning area. The appropriate BMPs would be incorporated into permitting these operations.

Class III lands account for approximately 27 percent of the planning area, which would have a low to moderate impact. All impacts related to fluid leasable mineral activities would be analyzed during scoping, and the appropriate BMPs will be incorporated into permitting the operation.

Class IV lands, accounting for approximately 28 percent, have low impacts to fluid leasable mineral resources because VRM doesn't limit activity or disturbance in its effect to the visual landscape.

4.3.3.1.4.12.4. Alternative 3

Lands designated as VRM Class I account for approximately 7 percent of the planning area. These lands are closed to fluid leasable mineral resources, which is a major impact.

Class II lands account for approximately 37 percent in the planning area. Most fluid leasable mineral actions will be avoided in Class II due to identifiable visible changes to landform and to visual landscape. The impact of Class II would be moderate to major to fluid leasable mineral exploration and development. Unless mitigated, fluid leasable mineral exploration and development could be significantly impacted in the Bitter Springs region. This region has geologic similarities to producing oil fields in Central Nevada (outside of the planning area) and is the most desired place to explore in the planning area. Mormon Mesa has been reclassified as Class II under this alternative and is also a desirable area of fluid leasable interest in the planning area. The appropriate BMPs would be incorporated into permitting these operations.

Class III lands account for approximately 27 percent of the planning area, which would have a low to moderate impact. All impacts related to fluid leasable mineral activities would be analyzed during scoping, and the appropriate BMPs will be incorporated into permitting the operation.

Class IV lands, accounting for approximately 28 percent, have low impacts to fluid leasable mineral resources because VRM doesn't limit activity or disturbance in its effect to the visual landscape.

4.3.3.1.4.12.5. Alternative 4

Lands designated as VRM Class I account for approximately 7 percent of the planning area. These lands are closed to fluid leasable mineral resources, which is a major impact.

Class II lands account for approximately 29 in the planning area. Most fluid leasable mineral actions will be avoided in Class II due to identifiable visible changes to landform and to visual landscape. The impact of Class II would be moderate to major to fluid leasable mineral exploration and development. Unless mitigated, fluid leasable mineral exploration and development could be significantly impacted in the Bitter Springs region. This region has geologic similarities to producing oil fields in Central Nevada (outside of the planning area) and is the most desired place to explore in the planning area. Mormon Mesa has been reclassified as Class II under this alternative and is also a desirable area of fluid leasable interest in the planning area. The appropriate BMPs would be incorporated into permitting these operations.

Class III lands account for approximately 27 percent of the planning area, which would have a low to moderate impact. All impacts related to fluid leasable mineral activities would be analyzed during scoping, and the appropriate BMPs will be incorporated into permitting the operation.

Class IV lands, accounting for approximately 37 percent, have low impacts to fluid leasable mineral resources because VRM doesn't limit activity or disturbance in its effect to the visual landscape.

4.3.3.1.4.13. Lands with Wilderness Characteristics Impacts on Fluid Leasable Minerals

4.3.3.1.4.13.1. Impacts Common to All Alternatives

There are no impacts that are common to all alternatives.

4.3.3.1.4.13.2. Alternative 1

Lands with wilderness characteristics do not exist in the 1998 RMP.

4.3.3.1.4.13.3. Alternative 2

Lands with wilderness characteristics management actions have a major impact to fluid leasable mineral development. Lands with wilderness characteristics would be closed to fluid mineral leasing under this alternative, resulting in 147,697 acres of public lands in the district. These lands need to maintain wilderness characteristics without being impaired. All surface-disturbing activities are prohibited and are closed to fluid leasable mineral activities. Under this alternative, 15 lands with wilderness characteristics are being proposed. Five are inside existing ACECs, and the remaining 10 account for approximately 118,000 acres on lands currently open. All of the Muddy Mountains additions will significantly impact fluid leasable mineral resources. The addition consisting of the Bitter Springs area is the location of many of the proposed fluid leasable mineral parcels that the office has received in the past and may re-receive in the future. The loss of these lands would remove opportunities for fluid leasable mineral development.

4.3.3.1.4.13.4. Alternative 3

Lands with wilderness characteristics management actions have moderate to major impact to fluid leasable mineral development. These lands account for approximately 35,851 acres of public lands in the district. These lands need to maintain the wilderness characteristics without being impaired. All surface-disturbing activities are prohibited and are NSO to fluid leasable mineral activities. Under this alternative, eight lands with wilderness characteristics are being proposed. Six are inside existing ACECs, and the remaining two account for approximately 6,200 acres on lands currently open. There have been no proposed fluid leasable parcels in the Ireteba Peaks addition. The Muddy Mountains addition may impact some of the proposed fluid leasable mineral parcels that the office has received in the past and may re-receive in the future. The loss of these lands would remove numerous proposed fluid leasable mineral parcels that could be sold.

4.3.3.1.4.13.5. Alternative 4

Lands with wilderness characteristics management actions have a moderate impact to fluid leasable mineral development. Lands with wilderness characteristics account for approximately 29,840 acres of public lands in the district, and fluid leasable mineral resources are to a degree negatively impacted. These lands need to maintain wilderness characteristics without being impaired, essentially using the same protections afforded by Congress through wilderness designation. All surface-disturbing activities are prohibited and are closed to all forms of fluid leasable mineral activities. Under this alternative, six lands with wilderness characteristics are

being proposed. All of the lands with wilderness characteristics are located inside existing ACECs, and the ACEC prescriptions have closed those lands to all fluid leasable minerals.

4.3.3.1.5. Resource Uses

4.3.3.1.5.1. Forestry and Woodland Products Impacts on Fluid Leasable Minerals

4.3.3.1.5.1.1. Impacts Common to All Alternatives

Forestry and woodland management actions have a moderate impact to fluid leasable mineral development. Salvage of cacti and yucca is currently done and addressed under this resource's Vegetation section.

4.3.3.1.5.1.2. Alternatives 1 through 4

There are no additional impacts to fluid leasable mineral development.

4.3.3.1.5.2. Livestock Grazing Impacts on Fluid Leasable Minerals

4.3.3.1.5.2.1. Impacts Common to All Alternatives

Livestock grazing management actions have a negligible impact to fluid leasable mineral development. The two resources coexist without impacting the other.

4.3.3.1.5.2.2. Alternatives 1 through 4

There are no additional impacts to fluid leasable mineral development.

4.3.3.1.5.3. Minerals Impacts on Fluid Leasable Minerals

4.3.3.1.5.3.1. Fluid Leasable Minerals

Benefits of the fluid leasable minerals program were addressed under the resource summary at the beginning of this commodity.

4.3.3.1.5.4. Recreation Impacts on Fluid Leasable Minerals

4.3.3.1.5.4.1. Impacts Common to All Alternatives

There are no impacts common to all alternatives.

4.3.3.1.5.4.2. Alternative 1

Recreation management actions have low to moderate impactss to fluid leasable mineral exploration development. The existing SRMAs are open to all forms of mineral exploration and development, except for the Nellis Dunes SRMA, which is an extensively used recreation area near the Speedway Community Pit northeast of the Las Vegas Valley. It is approximately

10,865 acres, and although never formally closed, it is essentially closed to fluid leasable mineral development. Nellis Dunes is better used for recreation over mineral development. The loss of these lands is negligible to the resource.

4.3.3.1.5.4.3. Alternatives 2 through 4

Recreation management actions have negligible to moderate impacts to fluid leasable mineral development.

The recreation program has addressed a need for BLM administrative right-of-ways. These ROWs would enhance recreational R&I values and address specific recreational uses in a region. These are negligible because these ROWs are small, less than 100 acres, site-specific, and typically confined to previously disturbed areas.

The majority of the SRMAs do not impact fluid leasable mineral resources but have overlapping management from other resources that is more restrictive to mineral development and are addressed in their supporting sections. Examples of overlapping management include ACECs, wilderness/WSAs, specific disposal boundaries, etc.

Fluid leasable mineral resources are impacted to varying degrees by recreation management prescriptions. There has been increasing interest in geothermal leasing in the Crater Flats area, within the Big Dune SRMA, that may be impacted by recreational use. Since 2004, there has been some interest in oil and gas leasing near Nelson, which is within the Clark County South ERMA, and future lessees will need to work with the recreational community and vice versa. These recreational areas would have a negligible to slight impact to fluid leasable mineral development.

Since 2004, there has been significant interest in oil and gas leasing in two distinct locations: Mormon Mesa and the Muddy Mountains/Bitter Springs areas. These recreational areas have a moderate impact to fluid leasable mineral development. The former's proposed lease parcels are located in the Clark County North ERMA and have moderate recreational use, predominantly casual use. The latter's proposed parcels are located in the Muddy Mountains ERMA, and the area has moderate to heavy recreational use. The closure of the Logandale North RMZ and Nellis Dunes SRMA equals approximately 28,694 acres and impacts potential fluid leasable mineral development. The recreational values and uses of those lands justify the best use of these public lands as recreational over mineral development.

Table 4.2. Summary of Impacts Associated with Recreational Designations

Region	Negligible		Low		Moderate	
	O/G[a]	Geo[b]	O/G	Geo	O/G	Geo
Big Dune SRMA		X		X		
Clark County South ERMA	X		X			
Clark County North ERMA					X	
Muddy Mountains ERMA					X	
Nellis Dunes SRMA	X		X			
Logandale North RMZ	X		X			

[a]Oil and gas
[b]Geothermal

4.3.3.1.5.5. Travel and Transportation Impacts on Fluid Leasable Minerals

4.3.3.1.5.5.1. Impacts Common to All Alternatives

Travel management has negligible impacts on fluid leasable resource development. Impacts from travel would involve access roads and routes associated with mining operations and exploration activities. Minerals will provide the necessary input during the development of the travel management plans.

4.3.3.1.5.5.2. Alternatives 1 through 4

There are no additional impacts to fluid leasable mineral development.

4.3.3.1.5.6. Lands and Realty Impacts on Fluid Leasable Minerals

The broad scope of lands and realty management impacts fluid leasable mineral resources, but these impacts tend to be site specific. There is no definable limit to the degree of the impact, and many of them can be addressed during project scoping.

4.3.3.1.5.6.1. Land Tenure (Disposals and Acquisitions) Impacts on Fluid Leasable Minerals

4.3.3.1.5.6.1.1. Impacts Common to All Alternatives

There are no impacts common to all alternatives.

4.3.3.1.5.6.1.2. Alternative 1

Land tenure management actions have negligible to moderate impacts to fluid leasable mineral development. All of the disposals in Clark County managed by the LVFO are closed to fluid leasable minerals, whereas they are open in PFO. These lands have a low resource potential for fluid leasable development, therefore the closures have low impact on this resource. Acquisitions are analyzed on an as-needed basis and address mineral concerns.

4.3.3.1.5.6.1.3. Alternatives 2 through 4

Land tenure management actions have negligible to low impacts to fluid leasable mineral development. The SNPLMA and Ivanpah Airport Environs Overlay District disposal boundaries are closed to fluid leasable minerals whereas the majority of the smaller and more distant disposal areas remain open to fluid leasable development. In summary, the impacts from land disposals on fluid leasable mineral exploration and development is negligible. Acquisitions are analyzed on an as-needed basis and address mineral concerns.

4.3.3.1.5.6.2. Land-Use Authorizations (Right-of-Ways, Leases, Permits) Impacts on Fluid Leasable Minerals

4.3.3.1.5.6.2.1. Impacts Common to All Alternatives

Land-use authorization management actions have negligible to moderate impacts to fluid leasable mineral development. In cases where there are authorized existing fluid leasable mineral leases/operations and an overlying ROW, then the ROW applicant will need to make the appropriate adjustments. Fluid leasable mineral operations that would occupy lands encumbered by an existing ROW would require the mineral operation to adjust its location or work out arrangements with the ROW holder.

4.3.3.1.5.6.2.2. Alternatives 1 through 4

There are no additional impacts to fluid leasable mineral development.

4.3.3.1.5.6.3. Renewable Energy Impacts on Fluid Leasable Minerals

4.3.3.1.5.6.3.1. Impacts Common to All Alternatives

Impacts caused by renewable energy development to fluid leasable mineral resources will vary depending on the type of renewable energy source that is being developed.

Solar energy development has moderate to major impacts to fluid leasable mineral resources in the planning area. The Solar Programmatic Environmental Impact Statement (PEIS) contains guidance for the development of large-scale solar projects by splitting lands into three categories: solar energy zones (SEZs), variance, and exclusion. There are two existing SEZs, Dry Lake (LVFO) and Amargosa (PFO), that cover approximately 14,128 acres. In addition to the development of SEZs, grandfathered solar projects will continue to be processed. Solar energy plants are single-use, large-scale developments. When these projects are constructed, all lands under them will be open with major constraints to fluid leasable mineral development for as long as the solar energy plant exists with access to the resource coming from the outside using directional drilling. Some of these variance lands may contain moderate potential fluid leasable mineral resources.

Wind energy development has a low impact to fluid leasable mineral resources in the planning area. Wind energy development right-of-ways are similar to linear type right-of-ways with turbines developed in arrays that branch out from access roads. Wind turbines can be micro-sited to avoid potential impacts to other resources during the planing process, that is, the position of each turbine can be adjusted. Adjusting tower locations can lower or remove the impact of wind energy development to the resource. Currently, there is one large-scale wind energy project in the planning area, Searchlight Wind. Impacts to fluid leasable mineral resources were addressed in the EIS for the project.

Geothermal energy development has a negligible impact to fluid leasable mineral resources in the planning area. The two forms of geothermal energy development, power generation through power plants and direct-use, have a small footprint generally less than 20 acres in size. There has been interest in the Crater Flats area in the district, presumably for power generation purposes. Direct-use geothermal energy developments are small-scale and site-specific developments that

provide energy for single structures. The impacts associated with geothermal can be addressed during scoping.

4.3.3.1.5.6.3.2. Alternative 1

There are two existing SEZs in the planning area that cover approximately 14,128 acres. Fluid leasable minerals remain open to development in a SEZ as long as they do not impact the future development of those lands for solar energy development. In addition to the development of SEZs, grandfathered solar projects will continue to be processed. When these projects are constructed, all lands under them will be open with major constraints to fluid leasable mineral development for as long as the solar energy plant exists with access to the resource coming from the outside using directional drilling. Some of these variance lands may contain fluid leasable mineral resources. If only SEZs and grandfathered solar projects are developed, the impacts to fluid leasable mineral resources will be moderate. Variance lands are those where solar energy development can occur provided the applicant can justify the need to use those lands over SEZs. If variance lands are developed in addition to SEZs and grandfathered solar projects, impacts to fluid leasable mineral resources will increase to major.

4.3.3.1.5.6.3.3. Alternative 2

There are two existing SEZs in the planning area that cover approximately 14,128 acres. Fluid leasable minerals remain open to development in a SEZ as long as they do not impact the future development of those lands for solar energy development. In addition to the development of SEZs, grandfathered solar projects will continue to be processed. When these projects are constructed, all lands under them will be open with major constraints to fluid leasable mineral development for as long as the solar energy plant exists. Under this alternative, there are significantly fewer acres of variance lands.

4.3.3.1.5.6.3.4. Alternative 3

There are two existing SEZs and four new proposed SEZs in the planning. Five of the SEZs are located in Nye County; one of the SEZs is in Clark County. Fluid leasable minerals remain open to development in a SEZ as long as they do not impact the future development of those lands for solar energy development. Grandfathered solar projects will continue to be processed. When these projects are constructed, all lands under them will be open with major constraints to fluid leasable mineral development for as long as the solar energy plant exists. Under this alternative, there are significantly fewer acres of variance lands.

4.3.3.1.5.6.3.5. Alternative 4

There are two existing SEZs and four new proposed SEZs in the planning area. Three of the SEZs are located in Nye County; three of the SEZs are in Clark County. The new SEZs in Clark County impact numerous fluid leasable mineral resources. The smaller southern SEZ near Sandy Valley does not impact proposed fluid leasable parcels for exploration in the area. The larger northern SEZ that extends from Apex to Mesquite heavily impacts fluid leasable mineral exploration and development as approximately 75 to 80 out of the 115 proposed lease parcels are located within this SEZ. Grandfathered solar projects will continue to be processed. When these projects are constructed, all lands under them will be open with major constraints to fluid leasable mineral development for as long as the solar energy plant exists. The loss of these lands to solar

development will remove the majority of the developable area for fluid leasable minerals. The two small SEZs in Nye County are in areas that will not impact fluid leasable mineral resource development as they are in the alluvial lowlands.

4.3.3.1.5.6.4. Utility Corridor Impacts on Fluid Leasable Minerals

4.3.3.1.5.6.4.1. Impacts Common to All Alternatives

Utility corridor management actions have a negligible impact to fluid leasable mineral development. The purpose of these designations is to focus linear developments into a confined location. Fluid leasable mineral development could still occur as there would be minimal impacts to utility transmission in the corridor.

4.3.3.1.5.6.4.2. Alternatives 1 through 4

There are no additional impacts to fluid leasable mineral development.

4.3.3.1.6. Special Designations

4.3.3.1.6.1. Areas of Critical Environmental Concern Impacts on Fluid Leasable Minerals

4.3.3.1.6.1.1. Impacts Common to All Alternatives

ACEC management actions have major impacts to fluid leasable mineral development. There are 23 existing ACECs accounting for approximately 1,014,301 acres in the planning area. A mineral potential report, the Ludington Report, was done by the USGS (Ludington 2006) on all of the district's existing ACECs. Two of the ACECs in that report are outside the planning area of this RMP and occur within the boundaries of the district's national conservation areas; therefore, no further discussion of those resources is warranted. The results of the Ludington Report (2006) documented that half of the ACECs[2] have a low potential occurrence for fluid leasable mineral development. More recent data show that these lands have moderate potential for development (Garside and Hess 2007).

4.3.3.1.6.1.2. Alternative 1

ACEC management actions have major impacts to fluid leasable mineral development. The ACECs designated the lands as no surface occupancy (NSO) which prevented surface occupancy. This designation has significantly impacted fluid leasable mineral resources with the loss of over three quarters of the planning area, see Table 4.3, "Impacts to Fluid Leasable Mineral Resources Related to ACEC Designations Under Alternative 1" (p. 1026). The 1998 RMP estimated that less than 5,000 acres of disturbance were associated with fluid leasable mineral development.

[2]Arrow Canyon, Coyote Springs, Gold Butte (Part A, includes Devil's Throat, Red Rock Spring, and Whitney Pockets), Gold Butte (Part B), Keyhole Canyon, Mormon Mesa, Piute/Eldorado, and Virgin Mountains

Table 4.3. Impacts to Fluid Leasable Mineral Resources Related to ACEC Designations Under Alternative 1

ACEC acreage: **1,014,301**[a]		**Acres for this classification**	**Percent accounted for in the planning area**
Fluid leasables	Open	52,280	2
	Open with CSU	121,234	4
	Open with NSO	2,587,999	83
	Closed	349,936[b]	11[b]

[a]Does not include acreages associated with the Devil's Throat, Gold Butte Townsite, Red Rock Springs, and Whitney Pocket, which are contained inside the larger Gold Butte ACECs

[b]Geothermal resources were closed in the Ash Meadows ACEC while oil and gas was NSO in this ACEC, hence the 4 percent of ACEC lands.

As noted earlier, the majority of the ACECs (83 percent) are classified as NSO, meaning that the surface is inaccessible. At the time of classification, those lands were thought to have low potential for resource development. Based on new published data (Garside and Hess 2007), these lands are identified as moderate potential for fluid leasable mineral development, which is the highest potential grade in the planning area. The resource may be reached laterally through directional drilling.

Only 4 percent of remaining ACEC lands had been classified as controlled surface use and timing restraints requiring specific stipulations. These specific stipulations had not been created to allow for these lands to be developed and leased. If Alternative 1 is selected, then the stipulations found in Appendix C (p. 1711) will apply. There are no ACECs that are open with standard terms and conditions under this alternative, and this accounts for no change between this alternative and Alternative 1.

There have been dozens of parcels located along the boundary of the Mormon Mesa ACEC. These parcels wouldn't be impacted as directional drilling could access any fluid resources within the ACEC to an extent possible with current technology. The ACECs identified as NSO have been a significant deterrent on fluid leasable mineral development as the interest has been forced outside of the ACECs onto surrounding lands.

The Ash Meadows ACEC comprises approximately 37,280 acres; fluid leasable mineral management has been split due to the sensitive resource values of the ACEC. It is closed specifically to geothermal resource exploration and development but remains open with major constraints (NSO) for oil and gas exploration and development. That split has led to a minor double dipping of acreages with the closed acreage only referencing Ash Meadows' geothermal provision. None of the geothermal lease parcels was impacted by the designation of the ACECs.

4.3.3.1.6.1.3. Alternative 2

ACEC management actions have major impacts to fluid leasable mineral development. Under this alternative, there are 43 existing and proposed ACECs which account for approximately 1,444,548 acres of the public lands administered by the two field offices. This is an increase of 21 ACECs when compared to Alternative 1. In addition, this is an increase of over 43 percent to what is currently designated, see Table 4.4, "Comparison of the ACECs Between Alternative 2 and Alternative 1" (p. 1027). Under this alternative, the existing Arden and Crescent Townsite ACECs and their associated mineral closures would be released. There are additions

and boundary adjustments to some of the existing ACECs that account for the majority of the additional acres under this alternative.

Table 4.4. Comparison of the ACECs Between Alternative 2 and Alternative 1

Alternative 1		
Total ACECs	Total acreage	Total percentage of district
23	1,014,548	33 percent
Alternative 2		
Total ACECs	Total acreage	Total percentage of district
44	1,444,548	47 percent

The addition of new ACECs and the reclassification of the existing ACECs for fluid leasable mineral development has significantly altered how many acres are available to the resource and may be explored for or developed across the planning area. Under this alternative, approximately 1,798,276 acres of ACEC lands are closed to fluid leasable mineral development whereas under Alternative 1, there are approximately 37,280 acres associated with Ash Meadows' closure to geothermal resource development.

Only about 42,656 acres of the ACECs are classified as NSO. The significant reduction of NSO lands under this alternative is the result of reclassifying lands as closed to fluid leasable mineral resources. Aproximately 78,750 acres are classified as CSU. A substantial portion of the lands designated as NSO or CSU under Alternative 1 have been closed under this alternative to fluid leasable mineral exploration and development.

Table 4.5. Impacts to Fluid Leasable Mineral Resources Related to ACEC Designations Under Alternative 2

ACEC acreage: **1,444,548**		**Acres for this classification**	**Percent accounted for in the planning area**
Fluid leasables	Open	1,192,996	38
	Open with CSU	78,750	3
	Open with NSO	42,656	1
	Closed	1,798,276	58

Sixty-three of the 118* proposed fluid mineral lease parcels received by the district (see Minerals section, Chapter 3) will be directly impacted by the designation of the ACECs under this alternative. The following ACECs would have a significant impact to the proposed parcels by closing these lands to leasing, exploration, and development: California Wash, Old Spanish Trail, Bitter Springs, Muddy Mountains, Moapa Mesquite, the additions to Mormon Mesa, Lower Mormon Mesa, Mesa Milkvetch, the additions to the Virgin River ACECs, and Bird Spring Valley. As noted in Chapter 3 with reference to oil and gas exploration in the Muddy Mountains region, under this alternative; those parcels would be rejected although they show similarities to the producing parcels in Railroad Pass north of the planning area.

The loss of these lands creates a significant negative impact to fluid leasable mineral resources by 1) closing a substantial portion of public lands that were previously designated as either NSO or CSU; 2) the two regions, the Muddy Mountains / Bitter Springs and Mormon Mesa areas, with geologic similarity to the oil producing Railroad Pass area are completely closed to exploration

*Includes the geothermal parcels.

and development; and 3) areas that were not production capable in the past but may in the future as technology improves would be closed under this alternative. Therefore, the impact of the ACECs on fluid leasable mineral resource exploration and development is significant.

4.3.3.1.6.1.4. Alternative 3

ACEC management actions have moderate to major impacts to fluid leasable mineral development. Under this alternative, there are 41 existing and proposed ACECs which account for 1,292,216 of the public lands administered by the two field offices. In addition, this is an increase in acreage from Alternative 1, see Table 4.6, "Comparison of the ACECs Between Alternative 3 and Alternative 1" (p. 1028). Under this alternative, the existing Arden and Crescent Townsite ACECs and their associated mineral closures would be released. There are additions and boundary adjustments to some of the existing ACECs that account for the majority of the additional acres under this alternative.

Table 4.6. Comparison of the ACECs Between Alternative 3 and Alternative 1

Alternative 1		
Total ACECs	Total acreage	Total percentage of district
23	1,014,301	33 percent
Alternative 3		
Total ACECs	Total acreage	Total percentage of district
41	1,292,216	42 percent

The addition of 19 new ACECs and the reclassification of the existing 22 ACECs for fluid leasable mineral development has significantly altered how many acres are available to the resource and may be explored for or developed across the planning area. Under this alternative, approximately 1,162,783 acres of ACEC lands are closed to fluid leasable mineral development, see Table 4.7, "Impacts to Fluid Leasable Mineral Resources Related to ACEC Designations Under Alternative 3" (p. 1028).

Table 4.7. Impacts to Fluid Leasable Mineral Resources Related to ACEC Designations Under Alternative 3

ACEC acreage: **1,292,216**		**Acres for this classification**	**Percent accounted for in planning area**
Fluid leasables	Open	1,291,933	42
	Open with CSU	362,353	12
	Open with NSO	294,301	9
	Closed	1,162,783	37

Fifty-seven of the 118* proposed fluid mineral lease parcels received by the district (see Minerals, Chapter 3) would have been directly impacted by the designation of the ACECs under this alternative. The Old Spanish Trail and Mormon Mesa ACECs would have a significant impact to approximately 20 proposed parcels by closing these lands to leasing, exploration, and development. Unlike Alternative 2, the majority (37) of impacted parcels would be located in lands designated as CSU and the leases would be allowed to go issued, including the majority of the interested parcels within the Muddy Mountains / Bitter Springs regions.

*Includes the geothermal parcels.

The loss of these lands creates an impact to fluid leasable mineral resources by 1) closing off portions of public lands that were previously designated as either NSO or CSU and 2) areas that were not production capable in the past but may in the future as technology improves would be closed under this alternate. Therefore, the impact of the ACECs on fluid leasable mineral resource exploration and development is moderate to major.

4.3.3.1.6.1.5. Alternative 4

ACEC management actions have moderate impacts to fluid leasable mineral development. Under this alternative, there are 25 existing and proposed ACECs which account for approximately 1,021,365 acres of the public lands administered by the two field offices. Under this alternative, the existing Arden and Crescent Townsite ACECs and their associated mineral closures would be released. There are four proposed ACECs that would be designated under this alternative; Grapevine Spring, Jean Lake, Perkins Ranch, and Stuart Ranch would provide a small increase in the designated acreage.

Table 4.8. Comparison of the ACECs Between Alternative 4 and Alternative 1

Alternative 1		
Total ACECs	Total acreage	Total percentage of district
23	1,014,301	33 percent
Alternative 4		
Total ACECs	Total acreage	Total percentage of district
25	1,021,365	33 percent

The addition of new ACECs and the reclassification of some of the existing ACECs for fluid leasable mineral development has altered how many acres are available to the resource and may be explored for or developed across the planning area. Under this alternative, approximately 962,314 acres of ACEC lands are closed to fluid leasable mineral development (see Table 4.9, “Impacts to Fluid Leasable Mineral Resources Related to ACEC Designations Under Alternative 4” (p. 1029)).

Table 4.9. Impacts to Fluid Leasable Mineral Resources Related to ACEC Designations Under Alternative 4

ACEC acreage: **1,021,365**		**Acres for this classification**	**Percent accounted for in the planning area**
Fluid leasables	Open	1,818,010	58
	Open with CSU	130,494	4
	Open with NSO	202,315	6
	Closed	1,818,010	58

Approximately 10 of the 118 * proposed lease parcels will be directly impacted by the designation of the ACECs. These parcels are located in the boundary expansion of the Mormon Mesa ACEC, which is designated as NSO. Unless portions of these parcels’ footprints occur outside the ACEC boundary, the parcel could not be developed. Unlike Alternative 1, many of the parcels that were identified along the fringe of the ACEC are now located within the Mormon Mesa ACEC, and this accounts for the increase between the two alternatives. There are few parcels that now fringe the new ACEC boundary; these shouldn’t be impacted as directional drilling could access any

*Includes geothermal parcels.

fluid resources within the ACEC to an extent possible with current technology. Therefore, the loss of these lands has had a minimal impact on fluid leasable mineral development as the vast majority of interest has been outside of the ACECs.

The loss of these lands creates an impact to fluid leasable mineral resources by 1) closing off portions of public lands that were previously designated as either NSO or CSU and 2) areas that were not production capable in the past but may in the future as technology improves would be closed under this alternative. Therefore, the impact of the ACECs on fluid leasable mineral resource exploration and development is moderate.

4.3.3.1.6.2. National Trails Impacts on Fluid Leasable Minerals

4.3.3.1.6.2.1. Impacts Common to All Alternatives

There are no impacts common to all alternatives.

4.3.3.1.6.2.2. Alternative 1

National trail management actions have a negligible impact to fluid leasable mineral development. The Old Spanish Trail (OST) is the only national trail in the planning area. Currently, there are no specific management prescriptions for the OST in the district that would directly impact fluid leasable mineral resource development. Fluid leasable minerals can avoid these lands, and impacts would be addressed on a case-by-case basis as projects are submitted and evaluated.

4.3.3.1.6.2.3. Alternatives 2 and 3

National trail management actions have a negligible impact to fluid leasable mineral development. The Old Spanish Trail is the only national trail in the planning area. Under this alternative, it has been designated as an ACEC.

4.3.3.1.6.2.4. Alternative 4

National trail management actions have a negligible impact to fluid leasable mineral development. The OST is the only national trail in the planning area. Under this alternative, the OST will not be designated as an ACEC and will be managed under prescriptions addressed under National Trails in Chapter 2. As noted under Alternative 1, fluid leasable minerals can avoid these lands, and impacts would be addressed on a case-by-case basis as projects are submitted and evaluated.

4.3.3.1.6.3. Wild and Scenic Rivers Impacts on Fluid Leasable Minerals

4.3.3.1.6.3.1. Impacts Common to All Alternatives

There are no impacts common to all alternatives.

4.3.3.1.6.3.2. Alternative 1

Wild and scenic river management has a negligible impact to fluid leasable mineral resources in the planning area. Seven segments of river were found eligible and are awaiting a suitability determination. The 1998 RMP only listed the Virgin River, within the Virgin River ACEC, as

eligible, but no additional action was taken. As part of the update to this RMP, a new eligibility determination was made with the results incorporated under this alternative as the existing condition on public lands. Six additional river segments were identified as eligible; therefore, they are included under this alternative. The 1998 RMP should have closed those lands to fluid leasable mineral resources.

4.3.3.1.6.3.3. Alternative 2

Wild and scenic river management has a low impact to fluid leasable mineral resources in the planning area. Management for wild and scenic rivers would close the lands within the buffer to fluid leasable mineral resources. Under this alternative, seven river segments were found eligible and suitable for wild, scenic, or recreational qualities. The majority of those lands are associated with recreational rivers. The Meadow Valley Wash and the western end of the Muddy River are in the vicinity of several proposed oil and gas lease parcels. If future fluid leasable parcels are proposed in those areas, any of the lease parcels that overlap portions of these rivers would need to be modified to remove those lands.

4.3.3.1.6.3.4. Alternative 3

Wild and scenic river management has a negligible impact to fluid leasable mineral resources in the planning area. One segment of river was found eligible and classified as recreational. The three-mile segment of the Meadow Valley Wash is located within the Mormon Mesa ACEC, which is closed to fluid leasable mineral development. The wash and its associated management do not change the existing condition of the lands due to the overlapping ACEC.

4.3.3.1.6.3.5. Alternative 4

There are no eligible or suitable river segments under this alternative for wild and scenic rivers.

4.3.3.1.6.4. Wilderness Impacts on Fluid Leasable Minerals

4.3.3.1.6.4.1. Impacts Common to All Alternatives

Wilderness management actions have a major impact to fluid leasable mineral development. Mineral resources are impacted by wilderness and their management by limiting the availability of lands for mineral development. The 10 designated wildernesses account for approximately 183,000 acres within the planning area. Wilderness lands are designated by Congress and are closed to all forms of fluid leasable mineral development.

4.3.3.1.6.4.2. Alternatives 1 through 4

There are no additional impacts to fluid leasable mineral development.

4.3.3.1.6.5. Wilderness Study Areas Impacts on Fluid Leasable Minerals

4.3.3.1.6.5.1. Impacts Common to All Alternatives

Wilderness study area management actions have a major impact to fluid leasable mineral development. These lands are also designated by Congress as lands awaiting final action by Congress. The majority of the WSA acreage is located within existing ACECs. Like wilderness lands, WSAs are closed to all forms of fluid leasable mineral development. In the case of congressional release of these lands, these lands could become open to all forms of fluid leasable mineral development unless another special designation, i.e. ACECs, with specific fluid leasable mineral development protocols, overlays those lands.

4.3.3.1.6.5.2. Alternatives 1 through 4

There are no additional impacts to fluid leasable mineral development.

4.3.3.1.7. Cumulative Impacts on Fluid Leasable Minerals

4.3.3.1.7.1. Past and Present Actions/Impacts

The 1998 RMP created a condition that made fluid leasable minerals undevelopable. The condition related to a specific language error stating that all lands would be no surface occupancy if “areas having ... special status plant and animal habitat.” This inadvertently constituted the entire district. Except for Alternative 2, which closes much of the SNDO, the correction of the above mentioned language would allow fluid mineral lease parcels in the areas of interest that have been set aside since 2004. This correction would allow entities to drill in areas that have similar geologic conditions seen in the oil and gas producing regions of central Nevada and western Utah and may allow for geothermal prospecting in areas that have potential.

4.3.3.1.7.2. Reasonable Foreseeable Actions

Alternative 2 would close the majority of lands that have potential for mineral development based on hydrographic basin containing and upgrading from Devil’s Hole and the Muddy River thereby limiting reasonable foreseeable actions. Alternatives 3 and 4 leave most of these lands open, therefore, development could take place in areas where interest has been expressed in the past.

4.3.3.1.7.3. Cumulative Impact

Table 4.10. Comparison of Acreages for All Alternatives

Fluid leasable mineral categories	Alternative 1	Alternative 2	Alternative 3	Alternative 4
	Acres	Acres	Acres	Acres
Ranking of alternative	3	4	1	2
Open	No similar action.	311,521	1,281,291	1,818,010
Open with CSU	121,234	78,750	362,314	130,494
Open with NSO	2,640,278	0	294,301	202,315
Closed	349,937	2,721,963	1,173,464	1,818,010

4.3.3.1.7.3.1. Alternative 1

This is the second most restrictive alternative to fluid leasable mineral exploration and development. Under this alternative, the cumulative impacts to fluid leasable minerals relates to one issue pertaining to NSO. The resource has been impacted significantly by language within a specific management prescription that stated lands will be designated as NSO on "areas having ... special status plant and animal habitat." This equates to nearly 2.6 million acres or over 83 percent of the planning area and virtually closes the lands from exploration and development as any form of occupancy is strictly prohibited (see Table 4.10, "Comparison of Acreages for All Alternatives" (p. 1032)). The designations of ACECs, SEZs and disposal areas have had significant impact to the resource's development capability.

The language discrepancy has been corrected for all other alternatives. If this alternative is selected and lands retain their current designations, NSO would potentially create a new problem. As noted earlier, NSO lands can not be encumbered by any form of occupancy and current drilling technology could never reach the interior portions of those lands. If NSO lands are leased and proponents cannot develop their leases, it opens up the district to potential litigation. Therefore, this alternative is the second least preferred alternative for fluid leasable minerals.

4.3.3.1.7.3.2. Alternative 2

This is the most restrictive alternative to fluid leasable mineral exploration and developmen (see Table 4.10, "Comparison of Acreages for All Alternatives" (p. 1032)). Conservation management prescriptions have eliminated resource exploration and development in the portions of the district where the most interest has occurred. Numerous new designations (ACECs, lands with wilderness characteristics, etc.) have significantly impacted fluid leasable mineral use in the planning area and would heavily impact development in the district. This is the least preferred alternative for fluid leasable minerals.

4.3.3.1.7.3.3. Alternative 3

This is the most preferred alternative for fluid leasable mineral exploration and development (see Table 4.10, "Comparison of Acreages for All Alternatives" (p. 1032)). This allows for more land to be available for exploration and development.

4.3.3.1.7.3.4. Alternative 4

This is the second least restrictive alternative to fluid leasable mineral exploration and development (see Table 4.10, "Comparison of Acreages for All Alternatives" (p. 1032)). This alternative allows for more land to be available for exploration and development than Alternative 2.

4.3.3.2. Solid Leasable Minerals

4.3.3.2.1. Summary

Solid leasable minerals are composed of two primary mineral commodities: energy and non-energy. These two commodities provide the coal resources that supply the majority of the nation's power grid and agricultural amendments that are applied to agricultural fields to add naturally depleted nutrients to the food we eat. These minerals are developed by leasing selected parcels in areas that have the right geologic conditions that would allow these resources to form and mature. The more land that is available, the more likely that a resource may be discovered. As noted in Chapter 3, there are three historically known deposits of solid leasable minerals in the deposit. One has been lost due to the formation of Lake Mead, while the remaining two are still accessible. There has been little development of these resources, and it probably has the lowest potential for development.

Solid leasable minerals are also one of the three discretionary minerals and can be closed through land-use planing. Like with solid leasable minerals, the main impacts from the RMP to solid leasable minerals involve the areas of critical environmental concern, wilderness, and wild and scenic rivers to name a few. These special designations have closed off hundreds of thousands of acres both through congressional and administrative actions. As noted earlier, there is a low potential for the development of the resource in the planning area.

4.3.3.2.2. Methods of Analysis

Each of the other resources are evaluated and analyzed to determine if there is a competing use or impact that would affect the mineral resource from being developed. A determination has been made using the Qualitative Intensity Scale on the impact that resource has on mineral development.

4.3.3.2.3. Qualitative Intensity Scale

Evaluation of the impacts to the mineral programs have been based on a four-point scale:

- **Negligible:** These are impacts that little to no impact to the commodity as they tend to be solely stipulations or conditions that are required in permitting.
- **Low:** These are impacts that may require project scoping to address potentially unknown issues or conditions that may affect the resource's development.
- **Moderate:** These are impacts that will require project scoping to address known issues or conditions that may limit the resource's development potential. They may require avoidance or mitigation actions and will incorporate best management practices.
- **Major:** These are impacts that will require project scoping as there are major or significant issues or conditions that prevent or limit the resource's development potential. These may include closure of specific lands or pursuing mineral withdrawal as the only alternative. These impacts have mitigation factors and best management practices that must be incorporated into the permitting process.

4.3.3.2.4. Resources

4.3.3.2.4.1. Air Quality Impacts on Solid Leasable Minerals

4.3.3.2.4.1.1. Impacts Common to All Alternatives

Air quality management actions have a negligible impact to solid leasable mineral development. All permitted activities typically over 0.25 acre of aggregated disturbance require operators to get the necessary state and local air quality permits before they are allowed to begin their operations. The operator is required to make sure that permits are up to date. Any violation could result in noncompliance from local, state, or federal authorities. The planning area could issue noncompliance orders and decisions and even terminate authorizations if public health and human safety are at risk.

4.3.3.2.4.1.2. Alternatives 1 through 4

There are no additional impacts to solid leasable mineral development.

4.3.3.2.4.2. Soil Resources Impacts on Solid Leasable Minerals

4.3.3.2.4.2.1. Impacts Common to All Alternatives

Soil resource management actions have a moderate impact to solid leasable mineral development. There may be a need in the future for new road development to access specific mineral locations; these would be addressed during project review and scoping. All solid leasable mineral development activities from exploration to full development are required to be reclaimed and are the responsibility of the operator. Reclamation includes re-contouring, earthwork, stabilization, revegetation, and restoration. This is ensured through reclamation bonding that is evaluated and adjusted with specific time frames. These bonds are based on reclamation estimates that account for changes in inflation, materials and wages. To limit soil-disturbing activities, existing routes are the preferred means of access, but there is the potential for new routes to access operations, and these will be evaluated during the scoping and commenting periods for each project.

4.3.3.2.4.2.2. Alternatives 1 through 4

There are no additional impacts to solid leasable mineral development.

4.3.3.2.4.3. Water Resources Impacts on Solid Leasable Minerals

4.3.3.2.4.3.1. Impacts Common to All Alternatives

Water resources management actions have moderate to major impact to solid leasable mineral development. The protesting of water rights would impact solid leasable mineral developments as operators who need additional water rights would be prohibited or limited and have the potential negatively impact their approved operations. In some instances, operations have been required to acquire water rights to retire them as a mitigation measure. If the water rights are protested, it could impact the existing operation and contradict the mitigation measure.

4.3.3.2.4.3.2. Alternatives 1 through 4

There are no additional impacts to solid leasable mineral development.

4.3.3.2.4.4. Integrated Vegetation Impacts on Solid Leasable Minerals

4.3.3.2.4.4.1. Vegetation Impacts on Solid Leasable Minerals

4.3.3.2.4.4.1.1. Impacts Common to All Alternatives

Vegetation management actions have moderate impacts to solid leasable mineral development. Cactus and yucca are required to be salvaged or avoided on all authorized and approved solid leasable exploration and development activity. Site reclamation is required on all associated surface-disturbing activities. Reclamation includes re-contouring topography, removal of equipment and structures, and revegetation of public lands. Specified seed mixes that are approved by the SNDO botanist(s) and restoration plans are used to re-vegetate the disturbed lands. Operations are required to reclaim disturbances, which includes re-contouring, earthwork, stabilization, revegetation, and restoration.

4.3.3.2.4.4.1.2. Alternative 1

Vegetation management does not affect or impair any form of solid leasable mineral development under this alternative. Any impacts would be addressed during project evaluation and scoping with the incorporation of the appropriate BMPs.

4.3.3.2.4.4.1.3. Alternatives 2 through 4

Native plant community connectivity has a moderate impact to solid leasable mineral development on more of a localized scale rather than a regional scale. In the case of solid leasable minerals, if production were to develop as the result of exploration findings, then the impacts of resource development will be addressed during project scoping. Best management practices will be incorporated in the permitting.

Adaptive management of the native plant community would have a minor impact to mineral resources. Changes in methodology and techniques will be incorporated into approved reclamation and restoration plans as needed to comply with resource needs. New operations will incorporate the changes in the initial stages of project prior to authorization. Existing, authorized operations would incorporate changes at times of modification, renewal, or amendments unless doing so would cause undue or unnecessary degradation.

4.3.3.2.4.4.2. Riparian Areas and Wetlands Impacts on Solid Leasable Minerals

4.3.3.2.4.4.2.1. Impacts Common to All Alternatives

Riparian and wetland management has moderate impacts to solid leasable mineral development. Any impacts associated with riparian and wetland management are similar to those addressed under the preceding vegetation subsection of this resource. Any impacts would be addressed

during project scoping and by implementing best management practices with avoidance where feasible.

4.3.3.2.4.4.2.2. Alternatives 1 through 4

There are no additional impacts to solid leasable mineral development.

4.3.3.2.4.4.3. Weeds Impacts on Solid Leasable Minerals

4.3.3.2.4.4.3.1. Impacts Common to All Alternatives

Weed management actions have moderate impacts to solid leasable mineral resources. Mitigation measures would include the incorporation of weed plans as part of the project's approval requirements.

4.3.3.2.4.4.3.2. Alternatives 1 through 4

There are no additional impacts to solid leasable mineral development.

4.3.3.2.4.4.4. Forests and Woodlands Impacts on Solid Leasable Minerals

4.3.3.2.4.4.4.1. Impacts Common to All Alternatives

Forest and woodland management actions have moderate impacts to solid leasable mineral development. Any impacts associated with forestry and woodland management are similar to those addressed under the Vegetation subsection of this resource. Any impacts would be addressed during project scoping and by implementing best management practices with avoidance where feasible.

4.3.3.2.4.4.4.2. Alternatives 1 through 4

There are no additional impacts to solid leasable mineral development.

4.3.3.2.4.5. Fish and Wildlife Impacts on Solid Leasable Minerals

4.3.3.2.4.5.1. Impacts Common to All Alternatives

Fish and wildlife management actions have moderate to major impacts to solid leasable mineral development. Seasonal restrictions and controlled surface use during certain seasons could impact solid leasable mineral development for new exploration and construction activities. Any impacts are addressed during individual project scoping and permitting on a project-by-project basis.

4.3.3.2.4.5.2. Alternatives 1 through 4

There are no additional impacts to solid leasable mineral development.

4.3.3.2.4.6. Special Status Species Impacts on Solid Leasable Minerals

4.3.3.2.4.6.1. Impacts Common to All Alternatives

Special status species management actions have moderate to major impacts to solid leasable mineral development. Solid leasable mineral development may be impacted by big game species, particularly bighorn sheep, through seasonal (timing) restrictions. Exploration and development activities are expected to occur outside of lambing season. Impacts associated with solid leasable mineral exploration and development activities are addressed during project scoping.

4.3.3.2.4.6.2. Alternatives 1 through 4

There are no additional impacts to solid leasable mineral development.

4.3.3.2.4.7. Wild Horse and Burro Impacts on Solid Leasable Minerals

4.3.3.2.4.7.1. Impacts Common to All Alternatives

There are no impacts common to all alternatives.

4.3.3.2.4.7.2. Alternative 1

Wild horse and burro management actions have negligible impacts to solid leasable mineral development. Management of wild horses and burros does not affect any form of solid leasable mineral development under this alternative.

4.3.3.2.4.7.3. Alternatives 2 through 4

Wild horse and burro management actions have low to moderate impacts on solid leasable mineral development. Solid leasable minerals are impacted as the Muddy Mountains HMA overlays one of two known solid leasable resources in the planning area. Based on historical information, the Lowell Wash area has the potential to produce solid leasable minerals for agricultural and industrial uses. This is one of two areas in the district where this resource may exist. Avoidance for both of these resources could have impacts of timing restrictions or stipulations to solid leasable mineral development in the region.

4.3.3.2.4.8. Cave and Karst Management Impacts on Solid Leasable Minerals

4.3.3.2.4.8.1. Impacts Common to All Alternatives

Cave and karst management actions have a negligible impact to solid leasable mineral development as these are small, site-specific locations. Any impacts associated with mining exploration and development activities are addressed during project scoping.

4.3.3.2.4.8.2. Alternatives 1 through 4

There are no additional impacts to solid leasable mineral development.

4.3.3.2.4.9. Wildland Fire Management Impacts on Solid Leasable Minerals

4.3.3.2.4.9.1. Impacts Common to All Alternatives

Wildland fire management actions have a low impact to solid leasable mineral development and do not negatively impact or impair solid leasable mineral development activity. Management focuses on resource protection in response to fire on the landscape and health and human safety. In times of emergency, the resource can provide information about the region to aid in resource protection.

4.3.3.2.4.9.2. Alternatives 1 through 4

There are no additional impacts to solid leasable mineral development.

4.3.3.2.4.10. Cultural Resources Impacts on Solid Leasable Minerals

4.3.3.2.4.10.1. Impacts Common to All Alternatives

There are no impacts common to all alternatives.

4.3.3.2.4.10.2. Alternative 1

Cultural resources management actions have a low impact to solid leasable mineral development. All impacts are addressed under project scoping and permitting.

4.3.3.2.4.10.3. Alternatives 2 through 4

Cultural resources management actions have a low impact to solid leasable mineral development. Any impacts are addressed during project scoping. Any sensitive areas will be mitigated or avoided, and best management practices will be used.

4.3.3.2.4.11. Paleontological Resources Impacts on Solid Leasable Minerals

4.3.3.2.4.11.1. Impacts Common to All Alternatives

Paleontological resource management actions have a low impact to solid leasable mineral development. Any impacts are addressed during individual project scoping to identify all necessary BMPs and permitting on a project-by-project basis.

4.3.3.2.4.11.2. Alternatives 1 through 4

There are no additional impacts to solid leasable mineral development.

4.3.3.2.4.12. Visual Resource Management Impacts on Solid Leasable Minerals

4.3.3.2.4.12.1. Impacts Common to All Alternatives

Visual resource management (VRM) actions have low to major impacts to solid leasable mineral development based on the class rank.

Lands designated as Class I prevent all forms of surface disturbance that would lead to a change to the visual landscape by preserving the existing character of the landscape. Lands designated as Class I are wilderness and wilderness study areas (WSAs), which are closed to solid leasable mineral resources. If these lands are released, they would benefit the mineral resourceby potentially opening lands to a different VRM classification, allowing for development. Designation of new WSAs would have an indirect negative impact to the resource through VRM classification as the lands would no longer be classified as their original class but Class I, which prevents any changes to the visual landscape.

Lands listed as Class II can modify, limit, or prevent solid leasable mineral development as the lands need to retain the existing character of the landscape. Exploration activities tend to be more temporary and less impactive and may be positioned to limit the visual impact. Class III lands have less of an impact as solid leasable mineral development can be an acceptable impact as the lands need to partially retain the existing character of the landscape. Class III doesn't impact or hinder exploration activities due to their temporary nature. Class IV allows for surface-disturbing activity and is the least restrictive. Surface use stipulations under some VRM classes could redesign or cancel operational plans, resulting in increased costs for all mineral activities. Each of the alternatives will address how each is impacted by the four classes.

4.3.3.2.4.12.2. Alternative 1

Lands designated as VRM Class I account for approximately 2 percent of the planning area. These lands are closed to solid leasable mineral resources, which is a major impact.

Class II lands account for approximately 29 percent in the planning area. Most solid leasable mineral actions will be avoided in Class II due to identifiable visible changes to landform and to visual landscape. The impact of Class II would be moderate to major to solid leasable mineral exploration and development. Unless mitigated, solid leasable mineral exploration and development could be significantly impacted in the Anniversary Narrows area as it is the only known remaining solid leasable resource in Clark County. The appropriate BMPs would be incorporated into permitting these operations.

Class III lands account for approximately 52 percent of the planning area, which would have a low to moderate impact. All impacts related to solid leasable mineral activities would be analyzed during scoping, and the appropriate BMPs will be incorporated into permitting the operation.

Class IV lands, accounting for approximately 17 percent, have low impacts to solid leasable mineral resources because VRM doesn't limit activity or disturbance in its effect to the visual landscape.

4.3.3.2.4.12.3. Alternative 2

Lands designated as VRM Class I account for approximately 12 percent of the planning area. The increase of nearly 10 percent under this alternative is attributed to incorporating lands with wilderness characteristics, which need to maintain wilderness characteristics but do not go through congressional designation. These lands are closed to solid leasable mineral resources, which is a major impact.

Class II lands account for approximately 33 percent in the planning area. Most solid leasable mineral actions will be avoided in Class II due to identifiable visible changes to landform and

to visual landscape. The impact of Class II would be moderate to major to solid leasable mineral exploration and development. Unless mitigated solid leasable mineral exploration and development could be significantly impacted in the Anniversary Narrows area as it is the only known remaining solid leasable resource in Clark County. The Class II surrounding Ash Meadows ACEC would have major impacts on the known solid leasable mineral resource in Nye County. The appropriate BMPs would be incorporated into permitting these operations.

Class III lands account for approximately 27 percent of the planning area, which would have a low to moderate impact. All impacts related to solid leasable mineral activities would be analyzed during scoping and the appropriate BMPs will be incorporated into permitting the operation.

Class IV lands, accounting for approximately 28 percent, have low impacts to solid leasable mineral resources because VRM doesn't limit activity or disturbance in its effect to the visual landscape.

4.3.3.2.4.12.4. Alternative 3

Lands designated as VRM Class I account for approximately 7 percent of the planning area. These lands are closed to solid leasable mineral resources, which is a major impact.

Class II lands account for approximately 37 percent in the planning area. Most solid leasable mineral actions will be avoided in Class II due to identifiable visible changes to landform and to visual landscape. The impact of Class II would be moderate to major to solid leasable mineral exploration and development. Unless mitigated solid leasable mineral exploration and development could be significantly impacted in the Anniversary Narrows area as it is the only known remaining solid leasable resource in Clark County. The Class II surrounding Ash Meadows ACEC would have major impacts on the known solid leasable mineral resource in Nye County. The appropriate BMPs would be incorporated into permitting these operations.

Class III lands account for approximately 27 percent of the planning area, which would have a low to moderate impact. All impacts related to solid leasable mineral activities would be analyzed during scoping, and the appropriate BMPs will be incorporated into permitting the operation.

Class IV lands, accounting for approximately 28 percent, have low impacts to solid leasable mineral resources because VRM doesn't limit activity or disturbance in its effect to the visual landscape.

4.3.3.2.4.12.5. Alternative 4

Lands designated as VRM Class I account for approximately 7 percent of the planning area. These lands are closed to solid leasable mineral resources, which is a major impact.

Class II lands account for approximately 29 percent in the planning area. Most solid leasable mineral actions will be avoided in Class II due to identifiable visible changes to landform and to visual landscape. The impact of Class II would be moderate to major to solid leasable mineral exploration and development. Unless mitigated, solid leasable mineral exploration and development could be significantly impacted in the Anniversary Narrows area as it is the only known remaining solid leasable resource in Clark County. The appropriate BMPs would be incorporated into permitting these operations.

Class III lands account for approximately 27 percent of the planning area, which would have a low to moderate impact. All impacts related to solid leasable mineral activities would be analyzed during scoping, and the appropriate BMPs will be incorporated into permitting the operation.

Class IV lands, accounting for approximately 37 percent, have low impacts to solid leasable mineral resources because VRM doesn't limit activity or disturbance in its effect to the visual landscape.

4.3.3.2.4.13. Lands with Wilderness Characteristics Impacts on Solid Leasable Minerals

4.3.3.2.4.13.1. Impacts Common to All Alternatives

There are no impacts that are common to all alternatives.

4.3.3.2.4.13.2. Alternative 1

Lands with wilderness characteristics do not exist in the 1998 RMP.

4.3.3.2.4.13.3. Alternative 2

Lands with wilderness characteristics management actions have a major impact to solid leasable mineral development. These lands account for 147,697 acres of public lands in the district. These lands need to maintain the wilderness characteristics without being impaired, essentially using the same protections afforded by Congress through wilderness designation. All surface-disturbing activities are prohibited and are closed to solid leasable mineral activities. Under this alternative, 15 lands with wilderness characteristics are being proposed. Five of the lands with wilderness characteristics are inside existing ACECs; the remaining 10 account for approximately 118,000 acres on lands currently open. All of the Muddy Mountains additions will significantly impact solid leasable mineral resources. The addition consisting of the Bitter Springs area, part of the Muddy Mountains, is one of two known locations of solid leasable minerals in the planning area. The loss of these lands would remove opportunities for solid leasable mineral development.

4.3.3.2.4.13.4. Alternative 3

Lands with wilderness characteristics management actions have negligible to low impacts to solid leasable mineral development. These lands account for approximately 35,851 acres of public lands in the district. These lands need to maintain the wilderness characteristics without being impaired. All surface-disturbing activities are prohibited and are closed to solid leasable mineral activities. Under this alternative, eight lands with wilderness characteristics are being proposed. Six of the lands with wilderness characteristics are inside existing ACECs, the remaining two account for approximately 6,200 acres on lands currently open. The two remaining lands with wilderness characteristics, the Ireteba Peaks addition and the Muddy Mountains addition, will have a negligible impact to solid leasable mineral development and could impact unknown solid leasable mineral resources.

4.3.3.2.4.13.5. Alternative 4

Lands with wilderness characteristics management actions have a moderate impact to solid leasable mineral development. Lands with wilderness characteristics account for approximately 29,840 acres of public lands in the district, and solid leasable mineral resources are to a degree negatively impacted. These lands need to maintain the wilderness characteristics without being impaired, essentially using the same protections afforded by Congress through wilderness designation. All surface-disturbing activities are prohibited and the areas are closed to all forms of solid leasable mineral activities. Under this alternative, six lands with wilderness characteristics are being proposed. All the lands with wilderness characteristics are located inside existing ACECs, and the ACEC prescriptions have closed those lands to all solid leasable minerals.

4.3.3.2.5. Resource Uses

4.3.3.2.5.1. Forestry and Woodland Products Impacts on Solid Leasable Minerals

4.3.3.2.5.1.1. Impacts Common to All Alternatives

Forestry and woodland management actions have moderate impacts to solid leasable mineral development. Salvage of cacti and yucca is currently done and would be required for any permitted solid leasable operation.

4.3.3.2.5.1.2. Alternatives 1 through 4

There are no additional impacts to solid leasable mineral development.

4.3.3.2.5.2. Livestock Grazing Impacts on Solid Leasable Minerals

4.3.3.2.5.2.1. Impacts Common to All Alternatives

Livestock grazing management has negligible impacts to the solid leasable mineral resources in the planning area. The two resources typically coexist without impacting the other.

4.3.3.2.5.2.2. Alternatives 1 through 4

There are no additional impacts to solid leasable mineral development.

4.3.3.2.5.3. Minerals Impacts on Solid Leasable Minerals

4.3.3.2.5.3.1. Solid Leasable Minerals

Benefits of the solid leasable minerals program were addressed under the resource summary at the beginning of this commodity.

4.3.3.2.5.4. Recreation Impacts on Solid Leasable Minerals

4.3.3.2.5.4.1. Impacts Common to All Alternatives

There are no impacts common to all alternatives.

4.3.3.2.5.4.2. Alternative 1

Recreation management actions have a negligible impact to solid leasable mineral exploration development. The two resources have co-existed without deleteriously affecting each other. The existing SRMAs are open to all forms of solid leasable mineral exploration and development with one exception. The Nellis Dunes SRMA is the only exception; it is an extensively used recreation area near the Speedway Community Pit northeast of the Las Vegas Valley. The Nellis Dunes SRMA is approximately 10,865 acres, and although never formally closed, it is essentially closed to solid leasable mineral development. Nellis Dunes is better for recreational uses than mineral development, and the loss of these lands will have a negligible impact to the resource.

4.3.3.2.5.4.3. Alternatives 2 through 4

Recreation management actions have negligible to low impacts to solid leasable mineral development.

The recreation program has addressed a need for BLM administrative right-of-ways (ROWs) for uses. These ROWs would enhance recreational R&I values and address specific recreational uses in a region. These are negligible because these ROWs are small, less than 100 acres, site-specific, and typically confined to previously disturbed areas.

As a resource, solid leasable mineral resources have an unknown potential across the majority of the planning area. The majority of the SRMAs/ERMAs have a negligible impact to solid leasable mineral resources but have overlapping management from other resources that are more restrictive to mineral development and are addressed in their supporting sections. Examples of the overlapping management include ACECs, wilderness/WSAs, specific disposal boundaries, etc.

There are two known solid leasable resources that could be impacted by the recreation management prescriptions. Solid leasable mineral resources are minimally impacted by recreation management. The Ash Meadows region has solid leasable mineral deposits, and the management of the Amargosa ERMA will not impact or impede future development of these minerals. The Gale Hills region managed as part of the Muddy Mountains ERMA will not impact or impede future development of solid leasable deposits. The closure of the Logandale North RMZ and Nellis Dunes SRMA contain approximately 28,694 acres and may impact potential solid leasable mineral development. The recreational values and uses of those lands justify the best use of these public lands as recreational.

4.3.3.2.5.5. Travel and Transportation Impacts on Solid Leasable Minerals

4.3.3.2.5.5.1. Impacts Common to All Alternatives

Travel management has negligible impacts to solid leasable mineral resource development in the planning area. Impacts from travel would involve access roads and routes associated with

mining operations and exploration activities. Minerals will provide the necessary input during the development of the travel management plans.

4.3.3.2.5.5.2. Alternatives 1 through 4

There are no additional impacts to solid leasable mineral development.

4.3.3.2.5.6. Lands and Realty Impacts on Solid Leasable Minerals

The broad scope of lands and realty management impacts solid leasable mineral resources, but these impacts tend to be site specific. There is no definable limit to the degree of the impact, and many impacts can be addressed during project scoping.

4.3.3.2.5.6.1. Land Tenure (Disposals and Acquisitions) Impacts on Solid Leasable Minerals

4.3.3.2.5.6.1.1. Impacts Common to All Alternatives

There are no impacts common to all alternatives.

4.3.3.2.5.6.1.2. Alternative 1

Land tenure management actions have negligible to low impacts to solid leasable mineral development. All of the disposals in Clark County managed by the LVFO are closed to solid leasable minerals, whereas they are open in the PFO. None of the known resources occur within or in vicinity to the disposal areas. These lands have a low resource potential for solid leasable development, therefore the closures have low impact on this resource. Acquisitions are analyzed on an as-needed basis and address mineral concerns.

4.3.3.2.5.6.1.3. Alternatives 2 through 4

Land tenure management actions have negligible to low impacts to solid leasable mineral development. All of the disposals in the planning area are closed to solid leasable mineral exploration and development. As with Alternative 1, none of the known resources occurs within the vicinity to the disposals. These lands have a low resource potential for solid leasable development, therefore the closures have minimal impact on this resource. Acquisitions are analyzed on an as-needed basis and address mineral concerns.

4.3.3.2.5.6.2. Land-Use Authorizations (Right-of-Ways, Leases, Permits) Impacts on Solid Leasable Minerals

4.3.3.2.5.6.2.1. Impacts Common to All Alternatives

Land-use authorization management actions have negligible impacts to solid leasable mineral development. The issuance of ROWs has minimal impacts to solid leasable mineral resources. Currently, there are no pending or authorized solid leasable mineral parcels or operations in the planning area. In the future, where there are authorized solid leasable mineral operations and an overlying ROW, then the ROW applicant will need to make the appropriate adjustments.

Conversely, solid leasable mineral operations that would occupy lands encumbered by an existing ROW would be required to adjust its location or work out arrangements with the ROW holder for use of the land.

4.3.3.2.5.6.2.2. Alternatives 1 through 4

There are no additional impacts to solid leasable mineral development.

4.3.3.2.5.6.3. Renewable Energy Impacts on Solid Leasable Minerals

4.3.3.2.5.6.3.1. Impacts Common to All Alternatives

Impacts caused by renewable energy development to solid leasable mineral resources will vary depending on the type of renewable energy source that is being developed and the location. These sources are solar, wind, and geothermal. Each of the renewable energy source impacts will be discussed below.

Solar energy development has moderate impacts to solid leasable mineral resources in the planning area. The Solar Programmatic Environmental Impact Statement (PEIS) contains guidance for the development of large-scale solar projects by splitting lands into three categories: solar energy zones (SEZs), variance, and exclusion. There are two existing SEZs, Dry Lake (LVFO) and Amargosa (PFO), in the planning area that cover approximately 14,000 acres. Solid leasable minerals remain open to development in a SEZ as long as they do not impact the future development of those lands for solar energy development. In addition to the development of SEZs, grandfathered solar projects will continue to be processed. Solar energy plants are single-use, large-scale developments. When these projects are constructed, all lands under them will be inaccessible to solid leasable mineral development for as long as the solar energy plant exists. Some of these variance lands may contain high-quality solid leasable mineral resources.

Wind energy development has a negligible to low impact to solid leasable mineral resources in the planning area. Wind energy development right-of-ways are similar to linear type right-of-ways with turbines developed in arrays that branch out from access roads. Wind turbines can be micro-sited to avoid potential impacts to other resources during the planing process, that is, the position of each turbine can be adjusted. Adjusting tower locations can lower or remove the impact of wind energy development to the resource. Currently, there is one large-scale wind energy project in the planning area, Searchlight Wind, which is isolated from the known solid leasable mineral resources in the planning area.

Geothermal energy development has a negligible impact to solid leasable mineral resources in the planning area. The two forms of geothermal energy development, power generation through power plants and direct-use, have a small footprint generally less than 20 acres in size. There has been interest in the Crater Flats area in the district, presumably for power generation purposes. Direct-use geothermal energy developments are small-scale and site-specific developments that provide energy for single structures. The impacts associated with geothermal can be addressed during scoping.

4.3.3.2.5.6.3.2. Alternative 1

Solar energy development has negligible to moderate impacts to solid leasable mineral resources in the planning area. If only SEZs and grandfathered solar projects are developed, the impacts to

solid leasable mineral resources will be negligible. Variance lands are those where solar energy development can occur provided the applicant can justify the need to use those lands over SEZs. If variance lands are developed in addition to SEZs and grandfathered solar projects, impacts to solid leasable mineral resources will increase to moderate as some of the variance lands cover one of the two known solid leasable mineral resources (Anniversary Narrows region) in the planning area.

Wind energy development has a low impact to solid leasable mineral resources in the planning area. There are no additional impacts to solid leasable mineral development from geothermal energy development under this alternative.

Geothermal energy development has a negligible impact to solid leasable mineral resources in the planning area. There are no additional impacts to solid leasable mineral development from geothermal energy development under this alternative.

4.3.3.2.5.6.3.3. Alternative 2

Solar energy development have negligible to low impacts to solid leasable mineral resources in the planning area. If only SEZs and grandfathered solar projects are developed, the impacts to solid leasable mineral resources will be negligible. Variance lands are those where solar energy development can occur provided the applicant can justify the need to use those lands over SEZs. Under this alternative, there are significantly fewer acres of variance lands. If variance lands are developed in addition to SEZs and grandfathered solar projects, impacts to solid leasable mineral resources will increase to low.

Wind energy development has a low impact to solid leasable mineral resources in the planning area. There are no additional impacts to solid leasable mineral development.

Geothermal energy development has a negligible impact to solid leasable mineral resources in the planning area. There are no additional impacts to solid leasable mineral development.

4.3.3.2.5.6.3.4. Alternative 3

Solar energy development has moderate impacts to solid leasable mineral resources in the planning area. Under this alternative, there would be eight SEZs in the district, and none would impact known solid leasable mineral resources. If only SEZs and grandfathered solar projects are developed, the impacts to solid leasable mineral resources will be moderate. Variance lands are those where solar energy development can occur provided the applicant can justify the need to use those lands over SEZs. Under this alternative, there are significantly fewer acres of variance lands when compared to Alternative 1. If variance lands are developed in addition to SEZs and grandfathered solar projects, impacts to solid leasable mineral resources will remain moderate.

Wind energy development has a low impact to solid leasable mineral resources in the planning area. There are no additional impacts to solid leasable mineral development from geothermal energy development.

Geothermal energy development has a negligible impact to solid leasable mineral resources in the planning area. There are no additional impacts to solid leasable mineral development from geothermal energy development.

4.3.3.2.5.6.3.5. Alternative 4

Solar energy development has moderate impacts to solid leasable mineral resources in the planning area. Under this alternative, there are four new proposed SEZs, bringing the total to six in the planning area, which cover approximately 168,255 acres. Three (two proposed, one existing) of the SEZs are located in Nye County; three (two proposed, one existing) of the SEZs are in Clark County. None of the existing or proposed SEZs will impact known solid leasable mineral resources in the planning area. If only SEZs and grandfathered solar projects are developed the impacts to solid leasable mineral resources will be moderate. Variance lands are those where solar energy development can occur provided the applicant can justify the need to use those lands over SEZs. Under this alternative, there are significantly fewer acres of variance lands when compared to Alternative 1. If variance lands are developed in addition to SEZs and grandfathered solar projects, impacts to solid leasable mineral resources will remain moderate.

Wind energy development has a low impact to solid leasable mineral resources in the planning area. Wind energy development right-of-ways are similar to linear type right-of-ways with turbines developed in arrays that branch out from access roads. Wind turbines can be micro-sited to avoid potential impacts to other resources during the planing process, that is, the position of each turbine can be adjusted. Adjusting tower locations can lower or remove the impact of wind energy development to the resource. Currently, there is one large-scale wind energy project in the planning area, Searchlight Wind. Impacts to solid leasable mineral resources were addressed in the EIS for the project.

Geothermal energy development has a negligible impact to solid leasable mineral resources in the planning area. The two forms of geothermal energy development, power generation through power plants and direct-use, have a small footprint generally less than 20 acres in size. There has been interest in the Crater Flats area, presumably for power generation purposes. Direct-use geothermal energy developments are small-scale and site-specific developments that provide energy for single structures. The impacts associated with geothermal can be addressed during scoping.

4.3.3.2.5.6.4. Utility Corridors Impacts on Solid Leasable Minerals

4.3.3.2.5.6.4.1. Impacts Common to All Alternatives

Utility corridor management actions have a negligible impact to solid leasable mineral development. The purpose of these designations is to focus linear developments into a confined location. Solid leasable mineral development could still occur as there would be minimal impacts to utility transmission in the corridor.

4.3.3.2.5.6.4.2. Alternatives 1 through 4

There are no additional impacts to solid leasable mineral development.

4.3.3.2.6. Special Designations

4.3.3.2.6.1. Areas of Critical Environmental Concern Impacts on Solid Leasable Minerals

4.3.3.2.6.1.1. Impacts Common to All Alternatives

ACEC management actions have moderate to major impacts to solid leasable mineral development. There are 23 existing ACECs, accounting for approximately 1,014,301 acres in the planning area, which are closed to solid leasable mineral development. A mineral potential report called the Ludington Report was done by the USGS (Ludington 2006) on all of the district's existing ACECs. Two of the ACECs in that report are outside the planning area of this RMP and occur within the boundaries of the district's national conservation areas; therefore, no further discussion of those resource areas is warranted. The results of the Ludington Report (2006) documented that nearly half of the ACECs[3] have a low potential occurrence for solid leasable mineral development.

4.3.3.2.6.1.2. Alternative 1

ACEC management actions have moderate impacts to solid leasable mineral development as the lands are closed to the resource's development. This designation has moderately impacted solid leasable mineral resources with the loss of more than a third of planning area. The 1998 RMP estimated that less than 5,000 acres was associated with solid leasable mineral development.

As noted under the Impacts Common to All Alternatives, all of the existing ACECs are closed to solid leasable mineral development. As noted in Chapter 3, the potential for solid leasable minerals has been historically low in the district. Only the Ash Meadows ACEC may have low to moderate potential for solid leasable (potash) mineral development; it is one of two known solid leasable mineral resources in the planning area. The loss of those lands to solid leasable mineral exploration and development has reduced the total number of acres available for their development and created a moderate impact to the resource.

4.3.3.2.6.1.3. Alternative 2

ACEC management actions have major impacts to solid leasable mineral development. As noted under the Impacts Common to All Alternatives, the ACECs were closed. Under this alternative, there are 44 existing and proposed ACECs that account for 1,444,548 acres of the public lands administered by the two field offices. In addition, this is an increase of approximately 43 percent to what is currently designated (see Table 4.11, "Comparison of the ACECs Between Alternative 2 and Alternative 1" (p. 1050)). Under this alternative, the existing Arden and Crescent Townsite ACECs and their associated mineral closures would be released. There are additions and boundary adjustments to some of the existing ACECs that account for the majority of the additional acres under this alternative.

[3]Arrow Canyon, Coyote Springs, Gold Butte (Part A) [includes Devil's Throat, Red Rock Spring and Whitney Pockets], Gold Butte (Part B), Keyhole Canyon, Mormon Mesa, Piute/Eldorado and Virgin Mountains

Table 4.11. Comparison of the ACECs Between Alternative 2 and Alternative 1

Alternative 1		
Total ACECs	Total acreage	Total percentage of district
23	1,014,301	33 percent
Alternative 2		
Total ACECs	Total acreage	Total percentage of district
44	1,444,548	47 percent

Solid leasable mineral resources continue to be significantly impacted especially under this alternative. The addition of new ACECs and the existing ACECs for solid leasable mineral development has significantly altered how many acres are available to the resource and may be explored for or developed across the planning area. Under this alternative, all of the acres designated as ACECs would be closed to solid leasable mineral development. This loss equates to over 47 percent of the lands within the district. As previously noted in Chapter 3, the resource potential for solid leasable minerals has been historically low in the district.

In the LVFO, one of two solid leasable mineral deposits is known to occur in the Lowell Wash (proposed Gale Hills ACEC) area. This deposit was historically mined and used in Henderson, while the second deposit (St. Thomas) has been submerged by Lake Mead. The potential of development has been historically low, but future regional needs may warrant future exploration and development of these resources. The Gale Hills ACEC would remove that only known solid leasable mineral resource from potential exploration and development.

In the PFO, the existing Ash Meadows ACEC surrounds the only known low to moderate potential for solid leasable (potash) mineral development. The deposit may extend outside the existing boundary of the ACEC. Under this alternative, these outlying deposits would be incorporated into the proposed expansion of the ACEC and would be closed to mineral exploration and development.

4.3.3.2.6.1.4. Alternative 3

ACEC management actions have major impacts to solid leasable mineral development. As noted under the Impacts Common to All Alternatives, the existing ACECs were closed. The ACECs under this alternative account for 1,292,216 acres of the public lands administered by the two field offices. When compared to the ACEC acreages associated with Alternative 1, this accounts for 42 percent of the planning area (see Table 4.12, “Comparison of the ACECs Between Alternative 3 and Alternative 1” (p. 1050)). Under this alternative, the existing Arden and Crescent Townsite ACECs and their associated mineral closures would be released. There are some additions and boundary adjustments to some of the existing ACECs that account for the majority of the additional acres under this alternative.

Table 4.12. Comparison of the ACECs Between Alternative 3 and Alternative 1

Alternative 1		
Total ACECs	Total acreage	Total percentage of district
23	1,014,301	33 percent
Alternative 3		
Total ACECs	Total acreage	Total percentage of district
41	1,292,216	42 percent

Solid leasable mineral resources continue to be significantly impacted especially under this alternative. Under this alternative, there is a substantial increase in both the number of ACECs and acres of land that are being designated as ACEC lands. The majority of the ACECs are closed to solid leasable mineral development. As previously noted in Chapter 3, the resource potential for solid leasable minerals has been historically low in the district.

In the LVFO, as noted under Chapter 3, one of two solid leasable mineral deposits are known to occur in the Gale Hills area and were historically mined and used in Henderson. The second deposit (St. Thomas) was submerged with the formation of Lake Mead. Although potential for development has been historically low, future regional needs may warrant renewed exploration and development of these resources. The Gale Hills ACEC would remain open to solid leasable mineral leasing, exploration, and development.

In the PFO, the existing Ash Meadows ACEC surrounds the only known low to moderate potential for solid leasable (potash) mineral development in that field office. The deposit may extend outside the existing boundary of the ACEC. Under this alternative, these deposits would be incorporated into the proposed expansion of the ACEC and closed to mineral exploration and development.

4.3.3.2.6.1.5. Alternative 4

ACEC management actions have major impacts to solid leasable mineral development. As noted under the Impacts Common to All Alternatives, the ACECs were withdrawn for 20 years in 2009 and can be renewed for additional years indefinitely. The ACECs under this alternative account for 1,021,365 of the public lands administered by the two field offices. Under this alternative, the existing Arden and Crescent Townsite ACECs and their associated mineral closures would be released. There are some additions and boundary adjustments to some of the existing ACECs that account for the majority of the additional acres under this alternative.

Solid leasable mineral resources continue to be significantly impacted. Under this alternative, there is an increase in both the number of ACECs and acres of land that are being designated as ACECs. When compared to the ACEC acreages associated with Alternative 1, there is an increase of nearly 1 percent to what is currently designated (see Table 4.13, “Comparison of the ACECs Between Alternative 4 and Alternative 1” (p. 1051)). As previously noted in Chapter 3, the resource potential for solid leasable minerals has been historically low in the district.

Table 4.13. Comparison of the ACECs Between Alternative 4 and Alternative 1

Alternative 1		
Total ACECs	Total acreage	Total percentage of district
23	1,014,301	33 percent
Alternative 4		
Total ACECs	Total acreage	Total percentage of district
25	1,021,365	33 percent

Under this alternative, all the acres designated as ACECs would be closed to solid leasable mineral development. This closure equates to approximately 33 percent of the planning area and is a minimal increase in comparison to the existing environment (Alternative 1). As noted in Chapter 3, the resource potential for solid leasable minerals has been historically low in the district. Only Ash Meadows ACEC may have low to moderate potential for solid leasable (potash) mineral development that would be impacted.

Many of the issues and concerns addressed under Alternatives 2 and 3 do not occur under this alternative. Under this alternative, 1) the Gale Hills ACEC is not proposed and 2) the Ash Meadows ACEC boundary is not adjusted and would only impact solid leasable minerals deposits that would occur within the existing ACEC. In summary, the loss of these lands does impact solid leasable mineral resources by reducing the total number of acres available for their development, but this impact is moderate, mirroring Alternative 1.

4.3.3.2.6.2. National Trails Impacts on Solid Leasable Minerals

4.3.3.2.6.2.1. Impacts Common to All Alternatives

There are no impacts common to all alternatives.

4.3.3.2.6.2.2. Alternative 1

National trail management actions have a negligible impact to solid leasable mineral development. The Old Spanish Trail (OST) is the only national trail in the planning area. Currently, there are no specific management prescriptions for the OST in the district that would directly impact solid leasable mineral resources development. Solid leasable minerals can avoid these lands, and impacts would be addressed on a case-by-case basis as projects are submitted and evaluated.

4.3.3.2.6.2.3. Alternatives 2 and 3

National trail management actions have a negligible impact to solid leasable mineral development. Under this alternative, it has been designated as an ACEC.

4.3.3.2.6.2.4. Alternative 4

National trail management actions have a negligible impact to solid leasable mineral development. Under this alternative, the OST will not be designated as an ACEC and will be managed under prescriptions addressed under National Trails (see Chapter 2). As noted under Alternative 1, solid leasable minerals can avoid these lands, and impacts would be addressed on a case-by-case basis as projects are submitted and evaluated.

4.3.3.2.6.3. Wild and Scenic Rivers Impacts on Solid Leasable Minerals

4.3.3.2.6.3.1. Impacts Common to All Alternatives

There are no impacts common to all alternatives.

4.3.3.2.6.3.2. Alternative 1

Wild and scenic river management has a negligible impact to solid leasable mineral resources in the planning area. Seven segments of river were found eligible and are awaiting a suitability determination. The 1998 RMP only listed the Virgin River, within the Virgin River ACEC, as eligible, but no additional action was made. As part of the update to this RMP, a new eligibility determination was made on the district with its results incorporated under this alternative as the existing condition on public lands. Six additional river segments were identified as eligible

and are included under this alternative. The 1998 RMP should have closed those lands to solid leasable mineral development.

4.3.3.2.6.3.3. Alternative 2

Wild and scenic river management has a negligible impact to solid leasable mineral resources. Management for wild and scenic rivers would close the lands within the buffer to discretionary mineral developments. Under this alternative, seven river segments were found eligible and suitable for wild, scenic or recreational qualities. The majority of those lands are associated with recreational rivers. There are no impacts to known solid leasable mineral resources on these lands. Portions of Meadow Valley Wash, the Virgin River, and all of Carson Slough are inside existing ACECs (Mormon Mesa, Virgin River, and Ash Meadows) with associated mineral resource restrictions. Hiko Wash is also in a proposed ACEC (Hiko Wash ACEC) with specific solid leasable mineral restrictions.

4.3.3.2.6.3.4. Alternative 3

Wild and scenic river management has a negligible impact to solid leasable mineral resources in the planning area. One segment of river was found eligible and classified as recreational. The three-mile segment of the Meadow Valley Wash is located within the Mormon Mesa ACEC, which is closed to solid leasable mineral development. The wash and its associated management do not change the existing condition of the lands due to the overlapping ACEC.

4.3.3.2.6.3.5. Alternative 4

Wild and scenic river management does not impact solid leasable mineral resources as there are no eligible or suitable river segments under this alternative.

4.3.3.2.6.4. Wilderness Impacts on Solid Leasable Minerals

4.3.3.2.6.4.1. Impacts Common to All Alternatives

Wilderness management actions have a moderate impact to solid leasable mineral development. The 10 designated wildernesses account for approximately 183,000 acres within the planning area. Wilderness lands are designated by Congress and are closed to all forms of solid leasable mineral development. The closure reduces the number of acres available to exploration and development.

4.3.3.2.6.4.2. Alternatives 1 through 4

There are no additional impacts to solid leasable mineral development.

4.3.3.2.6.5. Wilderness Study Areas Impacts on Solid Leasable Minerals

4.3.3.2.6.5.1. Impacts Common to All Alternatives

Wilderness study area management actions have a low impact to solid leasable mineral development as the known locations of these resources occur elsewhere. These lands are also designated by Congress as lands awaiting final action by Congress. The majority of the WSA

acreage is located within existing ACECs. Like wilderness lands, WSAs are closed to forms of solid leasable mineral development. In the case of congressional release of these lands, these lands could become open to all forms of solid leasable mineral development unless another special designation, i.e. ACEC, with specific solid leasable mineral development protocols, overlays those lands.

4.3.3.2.6.5.2. Alternatives 1 through 4

There are no additional impacts to solid leasable mineral development.

4.3.3.2.7. Cumulative Impacts on Solid Leasable Minerals

4.3.3.2.7.1. Past and Present Actions/Impacts

The resource is the least likely to occur in the district, and all past actions, including the ACECs, have had minimal impact to solid leasable mineral resources.

4.3.3.2.7.2. Reasonable Foreseeable Actions

Solid leasable mineral resources is the least impacted mineral commodity in the planning area as it may only occur in two distinct regions. The RMP and special interest groups continue to push our management direction into a conservation action with the creation of new ACECs that would remove those remaining resources from development.

4.3.3.2.7.3. Cumulative Impact

Table 4.14. Comparison of Acreages for All Alternatives

Solid leasable mineral categories	Alternative 1	Alternative 2	Alternative 3	Alternative 4
	Acres	Acres	Acres	Acres
Ranking of alternative	1	4	3	2
Open	1,916,135	1,373,556	1,702,600	1,791,582
Closed	1,195,212	1,737,791	1,408,747	1,319,765

4.3.3.2.7.3.1. Alternative 1

Under this alternative, the cumulative impacts to solid leasable minerals are the preferred alternative; the resource as whole does not exist in large enough or economically viable volumes to warrant large-scale development. This may change in the future if there is renewed interest in the resource. The two areas of historically known occurrences are outside any designated area.

4.3.3.2.7.3.2. Alternative 2

This is the most restrictive alternative to solid leasable mineral exploration and development. Approximately 55 percent of the planning area is closed to the resource. Numerous new conservation designations (ACECs, lands with wilderness characteristics, etc.) significantly impact solid leasable mineral use in the planning area by closing off the two known and would heavily impact growth and development in the district. This is the least-preferred alternative for solid leasable minerals.

4.3.3.2.7.3.3. Alternative 3

This is the second most restrictive alternative to solid leasable mineral exploration and development. Approximately 46 percent of the planning area is closed to the resource. Some of the new conservation designations (ACECs, lands with wilderness characteristics, etc.) significantly impact solid leasable mineral use in the planning area by closing one (Ash Meadows expansion) of the two known resources in the district.

4.3.3.2.7.3.4. Alternative 4

This is the second most preferred alternative to solid leasable mineral exploration and development. Approximately 42 percent of the planning area is closed to the resource. None of the new conservation designations (ACECs, lands with wilderness characteristics, etc.) significantly impacts solid leasable mineral use in the planning area.

4.3.3.3. Locatable Minerals

4.3.3.3.1. Summary

Locatable minerals comprise all other mineral deposits and come in two primary mineral commodities: metallic and nonmetallic minerals. These resources provide the majority of the resources that run and maintain our society and include, but are not limited to, electronics, green energy, homes, vehicles, utensils and cookware, etc. These minerals are developed by locating mining claims, developing the resource, and bringing it to its respective market. These locations must have the right geologic conditions that would allow these resources to form and mature, otherwise the minerals are not there. Many of these minerals are found in only a few locations around the globe (such as Rare Earths) or could form extensive deposits (such as gypsum or Portland cement grade limestone). The more land that is available to claim staking, to exploration, and to development, the more likely it is that a resource may be discovered. The planning area has more than two dozen distinct mining districts that have actively produced in the past through the present. Some provided only metallic minerals while others provided nonmetallic minerals, but the majority of these districts provided both commodities.

The exploration and development of locatable minerals are nondiscretionary activities established through the General Mining Law of 1872 (17 Stat. 91, as amended), which provides U.S. citizens the right to develop those minerals on public lands. Locatable minerals cannot be closed through land-use planining; they must be withdrawn from mineral location and must be analyzed by a mineral potential report that justifies the withdrawal. The single greatest impact from the RMP to locatable minerals has been the withdrawal of the areas of critical environmental concern in the planning area. The original mineral potential report showed that the majority of the existing ACECs have high to moderate mineral potential for development. Solar energy development and proposals could remove hundreds of thousands of acres of multiple-use lands.

4.3.3.3.2. Methods of Analysis

Each of the other resources was evaluated and analyzed to determine if there is a competing use or impact that would affect the mineral resource from being developed. A determination has been made using the Qualitative Intensity Scale on the impact that resource has on mineral development.

4.3.3.3.3. Qualitative Intensity Scale

Evaluation of the impacts to the mineral programs have been based on a four-point scale:

- **Negligible:** These are impacts that have little to no impact to the commodity as they tend to be solely stipulations or conditions that are required in permitting.
- **Low:** These are impacts that may require project scoping to address potentially unknown issues or conditions that may affect the resource’s development.
- **Moderate:** These are impacts that will require project scoping to address known issues or conditions that may limit the resource’s development potential. They may require avoidance, mitigation actions and will incorporate best management practices.
- **Major:** These are impacts that will require project scoping as there are major or significant issues or conditions that prevent or limit the resource's development potential. These may include closure of specific lands or pursuing mineral withdrawal as the only alternative. These

impacts have mitigation factors and best management practices that must be incorporated into the permitting process.

4.3.3.3.4. Resources

4.3.3.3.4.1. Air Quality Impacts on Locatable Minerals

4.3.3.3.4.1.1. Impacts Common to All Alternatives

Air quality management actions have a negligible impact to locatable mineral development. All permitted activities typically over 0.25 acre of aggregated disturbance require operators to get state and local air quality permits before they are allowed to begin operations. The operator is required to make sure that permits are up to date. Any violation could result in noncompliance from local, state, or federal authorities. The SNDO could issue noncompliance orders and decisions and even terminate authorizations if public health and human safety are at risk.

4.3.3.3.4.1.2. Alternatives 1 through 4

There are no additional impacts to locatable mineral development.

4.3.3.3.4.2. Soil Resources Impacts on Locatable Minerals

4.3.3.3.4.2.1. Impacts Common to All Alternatives

Soil resource management actions have a low impact to locatable mineral development. There may be a need in the future for new road development to access specific mineral locations; these would be addressed during project review and scoping. All locatable mineral development activities from exploration to full development are required to be reclaimed and are the responsibility of the operator. Reclamation includes re-contouring, earthwork, stabilization, revegetation, and restoration. This is ensured through reclamation bonding that is evaluated and adjusted with specific time frames. A reclamation cost-estimating program is used to calculate these reclamation bonds and is updated yearly.

All mining operations would be required to maintain a reclamation bond that, dependent on commodity, is reviewed at specific intervals of time. Based on the resource and the appropriate regulatory authority, these intervals could be reviewed yearly, biannually, tri-annually, or at time of renewal. These bonds are based on reclamation estimates that account for changes in inflation, materials, and wages. To limit soil-disturbing activities, existing routes are the preferred means of access, but there is the potential for new routes to access operations, and these will be evaluated during the scoping and commenting periods for each project.

4.3.3.3.4.2.2. Alternatives 1 through 4

There are no additional impacts to locatable mineral development.

4.3.3.3.4.3. Water Resources Impacts on Locatable Minerals

4.3.3.3.4.3.1. Impacts Common to All Alternatives

Water resource management actions have a moderate to major impact to locatable mineral development. The protesting of water rights could impact locatable mineral exploration and development, as operators who need additional water rights would be prohibited or limited. This could have a negative impact on their approved operations. In some instances, operations have been required to acquire water rights to retire them as a mitigation measure that if these were to be protested, could impact the existing operation and contradict the mitigation measure.

4.3.3.3.4.3.2. Alternatives 1 through 4

There are no additional impacts to locatable mineral development.

4.3.3.3.4.4. Integrated Vegetation Impacts on Locatable Minerals

4.3.3.3.4.4.1. Vegetation Impacts on Locatable Minerals

4.3.3.3.4.4.1.1. Impacts Common to All Alternatives

Vegetation management actions have a moderate impact to locatable mineral development. Cactus and yucca are required to be salvaged or avoided on all authorized surface mining operations and acknowledged exploration activity. Site reclamation is required on all minerals-related surface-disturbing activities. Reclamation includes re-contouring topography, removal of equipment and structures, and revegetation of public lands. Operations are required to maintain a reclamation bond based on an estimate that accounts for equipment costs, material costs, and wages that are updated yearly. Bonds are updated every one to three years based on the mineral resource and its regulatory authority. Specified seed mixes and restoration plans are used to re-vegetate the disturbed lands. The seed mixes are approved by the SNDO botanist(s).

4.3.3.3.4.4.1.2. Alternative 1

Management of vegetation management does not affect or impair any form of locatable mineral exploration and development under this alternative. Any impacts would be addressed during project evaluation and scoping with the incorporation of the appropriate BMPs.

4.3.3.3.4.4.1.3. Alternatives 2 through 4

Native plant community connectivity has the potential to impact all forms of mineral development on more of a localized scale rather than a regional scale. In the case of locatable minerals, if production were to develop as the result of exploration findings, then the impacts of resource development will be addressed during project scoping. Best management practices will be incorporated in the permitting.

Adaptive management of the native plant community would have a minor impact to mineral resources. Changes in methodology and techniques will be incorporated into approved reclamation and restoration plans as needed to comply with resource needs. New operations will

incorporate the changes in the initial stages of a project prior to authorization. Existing, authorized operations would incorporate changes at times of modification, renewal, or amendments.

4.3.3.3.4.4.2. Riparian Areas and Wetlands Impacts on Locatable Minerals

4.3.3.3.4.4.2.1. Impacts Common to All Alternatives

Any impacts associated with riparian and wetland management are similar to those addressed under the Vegetation subsection of this resource. Any impacts would be addressed during project scoping and implement best management practices incorporated into permitting the operation.

4.3.3.3.4.4.2.2. Alternatives 1 through 4

There are no additional impacts to locatable mineral development.

4.3.3.3.4.4.3. Weeds Impacts on Locatable Minerals

4.3.3.3.4.4.3.1. Impacts Common to All Alternatives

Weed management actions have a moderate impact to locatable mineral development. Mitigation measures would include the incorporation of weed plans as part of the project's approval requirements. The impacts associated with each weed plan would vary from project to project and is based on the size and scale of development of the operation.

4.3.3.3.4.4.3.2. Alternatives 1 through 4

There are no additional impacts to locatable mineral development.

4.3.3.3.4.4.4. Forests and Woodlands Impacts on Locatable Minerals

4.3.3.3.4.4.4.1. Impacts Common to All Alternatives

Forest and woodland resource management actions have a low impact to locatable mineral development. Any impacts associated with forestry and woodland management are similar to those addressed under the preceding Vegetation subsection of this resource. Impacts would be addressed during project scoping. Best management practices with avoidance would be implemented where feasible.

4.3.3.3.4.4.4.2. Alternatives 1 through 4

There are no additional impacts to locatable mineral development.

4.3.3.3.4.5. Fish and Wildlife Impacts on Locatable Minerals

4.3.3.3.4.5.1. Impacts Common to All Alternatives

Fish and wildlife management actions have a moderate impact to locatable mineral development. Seasonal restrictions during nesting season may impact this mineral resource through timing of

authorizing a project's new construction to occur after the birds had fledged. Any impacts would be addressed during individual project scoping to identify all necessary BMPs and permitting on a project-by-project basis.

4.3.3.3.4.5.2. Alternatives 1 through 4

There are no additional impacts to locatable mineral development.

4.3.3.3.4.6. Special Status Species Impacts on Locatable Minerals

4.3.3.3.4.6.1. Impacts Common to All Alternatives

Special status species management actions have a moderate to major impact to locatable mineral development. Special status species, such as desert tortoises and bighorn sheep, impact locatable mineral exploration and development. Much of the impacts associated with special status species management can be addressed during project scoping and mirrors that addressed under this resource's Section 4.3.3.3.4.5, "Fish and Wildlife Impacts on Locatable Minerals" (p. 1059) (preceding) section.

4.3.3.3.4.6.2. Alternatives 1 through 4

There are no additional impacts to locatable mineral development.

4.3.3.3.4.7. Wild Horse and Burro Impacts on Locatable Minerals

4.3.3.3.4.7.1. Impacts Common to All Alternatives

Wild horse and burro management actions have a negligible impact to locatable mineral development. Any impacts to locatable mineral development would be addressed during project scoping and permitting.

4.3.3.3.4.7.2. Alternatives 1 through 4

There are no additional impacts to locatable mineral development.

4.3.3.3.4.8. Cave and Karst Management Impacts on Locatable Minerals

4.3.3.3.4.8.1. Impacts Common to All Alternatives

Cave and karst management actions have a negligible impact to locatable mineral development as these are small, site-specific locations that can be avoided. Any impacts associated with mining exploration and development activities are addressed during project scoping.

4.3.3.3.4.8.2. Alternatives 1 through 4

There are no additional impacts to locatable mineral development.

4.3.3.3.4.9. Wildland Fire Management Impacts on Locatable Minerals

4.3.3.3.4.9.1. Impacts Common to All Alternatives

Wildland fire management actions have negligible impacts to locatable mineral development. Actions do not impair locatable mineral development activity and focus on resource protection in response to fire on the landscape and health and human safety. In times of emergency, the resource can provide information about the region to aid in resource protection.

4.3.3.3.4.9.2. Alternatives 1 through 4

There are no additional impacts to locatable mineral development.

4.3.3.3.4.10. Cultural Resources Impacts on Locatable Minerals

4.3.3.3.4.10.1. Impacts Common to All Alternatives

There are no impacts common to all alternatives.

4.3.3.3.4.10.2. Alternative 1

Cultural resource management actions have a low impact to locatable mineral development. Any impacts are addressed during individual project scoping to identify all necessary BMPs and permitting on a project-by-project basis.

4.3.3.3.4.10.3. Alternatives 2 through 4

Cultural resource management actions have a low impact to locatable mineral development. Any impacts from cultural resource management are addressed during project scoping. Any sensitive areas will be mitigated or avoided. Best management practices will be used.

4.3.3.3.4.11. Paleontological Resources Impacts on Locatable Minerals

4.3.3.3.4.11.1. Impacts Common to All Alternatives

Paleontological resource management actions have a low impact to locatable mineral development. Any impacts are addressed during individual project scoping to identify all necessary BMPs and permitting on a project-by-project basis.

4.3.3.3.4.11.2. Alternatives 1 through 4

There are no additional impacts to locatable mineral development.

4.3.3.3.4.12. Visual Resource Management Impacts on Locatable Minerals

4.3.3.3.4.12.1. Impacts Common to All Alternatives

Visual resource management (VRM) actions have low to major impacts to locatable mineral development based on the class.

Lands designated as Class I prevent all forms of surface disturbance that would lead to a change to the visual landscape by preserving the existing character of the landscape. Lands designated as Class I are wilderness and wilderness study areas (WSAs), which are withdrawn to locatable mineral resources. If these lands are released, they would benefit mineral development in the district as the lands would be managed under the surface management regulations (43 CFR 3809). Designation of new WSAs would have an indirect negative impact to the resource through VRM classification as the lands would no longer be classified as their original class but as Class I, which prevents any changes to the visual landscape.

Lands listed as Class II can modify, limit, or prevent locatable mineral development as the lands need to retain the existing character of the landscape. Exploration activities tend to be temporary, less impactive, and may be positioned to limit the visual impact. In some cases, particularly for Class I or II, operations would need to consider siting of peripheral features to block and hide their associated impacts and incorporate the Standard Environmental Color Scale. Mining in Class III lands has less of an impact because mining can be an acceptable impact to the visual landscape as the lands need to partially retain the existing character of the landscape. These operations may need to incorporate the color scale. Class III doesn't impact or hinder exploration activities due to their temporary nature. Class IV allows for surface-disturbing activities and is the least restrictive. Surface-use stipulations under some VRM classes could redesign or cancel operational plans, resulting in increased costs for all mineral activities. Each of the alternatives will address how each is impacted by the four classes.

Surface-use stipulations under some VRM classes could redesign or cancel operational plans, resulting in increased costs for all mineral activities.

4.3.3.3.4.12.2. Alternative 1

Lands designated as VRM Class I account for approximately 2 percent of the planning area. These lands are withdrawn to locatable mineral resources, which is a major impact.

Class II lands account for approximately 29 percent in the planning area. The impact of Class II would be moderate to major to locatable mineral exploration and development. Class II visual stipulations could add significant costs to mine development and prohibit production. Impacts to the VRM would be analyzed during project scoping. The appropriate BMPs would be incorporated into permitting these operations.

Class III lands account for approximately 52 percent of the planning area, which would have a low to moderate impact. Class III allows for more impacts to the visual landform and changes to landscapes. All impacts related to federal action locatable mineral activities would be analyzed. The appropriate BMPs will be incorporated into permitting the operation.

Class IV lands, accounting for nearly 17 percent, have negligible impacts on mineral resources because VRM doesn't limit any kind of activity or disturbance in its effect to the visual landscape.

The majority of these lands are in the alluvial valleys and in many of the hard rock mining districts throughout the district and would be primary locations for locatable mineral developments.

Alternative 1 has the least impacts of all of the alternatives. Its management prescriptions on locatable mineral resources allows for more land to remain accessible while maintaining the necessary visual resource protocols.

4.3.3.3.4.12.3. Alternative 2

Lands designated as Class I account for approximately 12 percent of the planning area. The increase of nearly 10 percent under this alternative is attributed to incorporating lands with wilderness characteristics, which need to maintain wilderness characteristics but do not go through congressional designation. These lands are closed to locatable mineral resources, which is a major impact.

Class II lands account for approximately 33 percent in the planning area. Class II could impact locatable mineral development, and any impacts to the VRM would be analyzed during project scoping. The appropriate BMPs would be incorporated into permitting these operations. Lands with Class II with active mining operations include but are not limited to the areas surrounding Goodsprings and Nelson; south of Overton; portions of the Searchlight doughnut hole; lands surrounding Ash Meadows ACEC; and the Rainbow Gardens ACEC. The appropriate BMPs would be incorporated into permitting these operations.

Class III lands account for approximately 27 percent of the planning area, which would have a low to moderate impact. All impacts related to locatable mineral activities would be analyzed during scoping, and the appropriate BMPs will be incorporated into permitting the operation. Lands with Class III with active mining operations include but are not limited to the Crescent Peak region; northern flank of Pahrump; western Bare Mountains; Spirit Mountain area; Nelson; and Bird Spring Valley.

Class IV lands, accounting for approximately 28 percent, have low impacts to locatable mineral resources because VRM doesn't limit activity or disturbance in its effect to the visual landscape. The majority of these lands are the alluvial valleys and many of the hard rock mining districts throughout the district and would be primary locations for locatable mineral developments.

Alternative 2 is the most restrictive to locatable mineral development. Nearly half of the planning area is classed as I or II; much of the change is due to reclassifying lands previously ranked at a much lower quality and could force existing operations to comply with protocols that may impact health and human safety.

4.3.3.3.4.12.4. Alternative 3

Lands designated as VRM Class I account for approximately 7 percent of the planning area. These lands are withdrawn to locatable mineral resources, which has a major impact.

Class II lands account for approximately 37 percent of the planning area. Class II will have similar impacts as those identified under Alternative 2 for locatable mineral development. Any impacts to the VRM would be analyzed during project scoping. The appropriate BMPs would be incorporated into permitting these operations. Lands with Class II with active mining operations include but are not limited to the areas surrounding Goodsprings and Nelson; south of Overton;

portions of the Searchlight doughnut hole; lands surrounding Ash Meadows ACEC; and the Rainbow Gardens ACEC.

Class III lands account for approximately 27 percent of the planning area, which would have a low to moderate impact. All impacts related to locatable mineral activities would be analyzed during scoping, and the appropriate BMPs will be incorporated into permitting the operation. Lands with Class III with active mining operations include but are not limited to Crescent Peak region; the Johnnie region; western Bare Mountains; Spirit Mountain area; Nelson; and Bird Spring Valley.

Class IV lands, accounting for approximately 28 percent, have low impacts to locatable mineral resources because VRM doesn't limit activity or disturbance in its effect to the visual landscape. The majority of these lands are in the alluvial valleys and many of the hard rock mining districts throughout the district and would be primary locations for locatable mineral developments.

Alternative 3 is the second most restrictive to locatable mineral development. As with Alternative 2, nearly half of the planning area is classed as I or II; much of the change is due to reclassifying lands previously ranked at a much lower quality and could force existing operations to comply with protocols that may impact health and human safety.

4.3.3.3.4.12.5. Alternative 4

Lands designated as VRM Class I account for approximately 7 percent of the planning area. These lands are withdrawn to locatable mineral resources, which is a major impact.

Class II lands account for over 29 percent which is a small increase over Alternative 1. Class II will have similar impacts as those identified under Alternative 2 for locatable mineral development. Any impacts to the VRM would be analyzed during project scoping. The appropriate BMPs would be incorporated into permitting these operations. Lands with Class II with active mining operations include but are not limited to the areas surrounding Goodsprings and Nelson; south of Overton; portions of the Searchlight doughnut hole; and the Rainbow Gardens ACEC.

Class III lands account for approximately 27 percent of the planning area, which would have a low to moderate impact. All impacts related to locatable mineral activities would be analyzed during scoping. The appropriate BMPs will be incorporated into permitting the operation. Lands with Class III with active mining operations include but are not limited to the following: Crescent Peak region, lands surrounding Ash Meadows ACEC, western Bare Mountains, Spirit Mountain area, Nelson, and portions of Bird Spring Valley.

Class IV lands, accounting for approximately 37 percent, have low impacts to locatable mineral resources because VRM doesn't limit activity or disturbance in its effect to the visual landscape. The majority of these lands are the alluvial valleys and many of the hard rock mining districts throughout the district and would the primary locations for locatable mineral developments.

Alternative 4 is the second least restrictive to locatable mineral development of all of the alternatives. Its management prescriptions on locatable mineral resources allows for more land to remain accessible while maintaining the necessary visual resource protocols.

4.3.3.3.4.13. Lands with Wilderness Characteristics Impacts on Locatable Minerals

4.3.3.3.4.13.1. Impacts Common to All Alternatives

There are no impacts that are common to all alternatives.

4.3.3.3.4.13.2. Alternative 1

Lands with wilderness characteristics do not exist in the 1998 RMP.

4.3.3.3.4.13.3. Alternative 2

Lands with wilderness characteristics management actions have a major impact to locatable mineral development. Lands with wilderness characteristics account for 147,697 acres in the district. These lands need to maintain wilderness characteristics without being impaired, essentially using the same protections afforded by Congress through wilderness designation. All surface-disturbing activities are prohibited, and the lands are being pursued for withdrawal from mineral entry under the mining laws. Under this alternative, 15 lands with wilderness characteristics are being proposed. The lands with wilderness characteristics are adjacent to and expand existing wilderness lands, particularly the WSAs. Only five of the lands with wilderness characteristics are inside existing ACECs, and the remaining 10 account for approximately 118,000 acres. This would impact locatable minerals in varying degrees.

The Newberry Mountain addition is very small and could impact locatable mineral resources. The Ireteba Peaks addition has the potential to impact locatable mining outside of the Piute/Eldorado ACEC between Searchlight and Nelson. The two additions to the South McCullough Wilderness will impact locatable resources as there is active exploration in the region. The Resting Springs addition will impact the locatable mineral operations in the region. All of the Muddy Mountains additions will impact mineral resources. The addition consisting of the Lowell Wash area may also impact locatable resources. The addition along the western flank of the Muddy Mountain wilderness may impact locatable operations in the Rainbow Gardens ACEC. In total, the loss of these lands would have a major impact to locatable mineral resources in the planning area impacting rare clays, rare earth elements, gypsum, and locatable sands resources.

4.3.3.3.4.13.4. Alternative 3

Lands with wilderness characteristics management actions have a moderate impact to locatable mineral development. Lands with wilderness characteristics account for approximately 35,851 acres in the district. These lands need to maintain wilderness characteristics without being impaired. All surface-disturbing activities are prohibited, and the lands are being pursued for withdrawal from mineral entry under the mining laws. Under this alternative, eight lands with wilderness characteristics are being proposed. All but two of the lands with wilderness characteristics, which account for approximately 6,200 acres, are inside existing ACECs. The Ireteba Peaks addition has the potential to impact locatable mining outside of the Piute/Eldorado ACEC between Searchlight and Nelson. There is no locatable mineral development in the Muddy Mountains addition.

4.3.3.3.4.13.5. Alternative 4

Lands with wilderness characteristics management actions have a low to moderate impact to locatable mineral development. Lands with wilderness characteristics account for approximately 29,840 acres in the district. These lands need to maintain the wilderness characteristics without being impaired, essentially using the same protections afforded by Congress through wilderness designation. All surface-disturbing activities are prohibited, and the lands are being pursued for withdrawal from mineral entry under the mining laws. Under this alternative, six lands with wilderness characteristics are being proposed. All the lands with wilderness characteristics are located inside existing ACECs, and the ACEC prescriptions have withdrawn the lands from mineral entry under the mining laws.

4.3.3.3.5. Resource Uses

4.3.3.3.5.1. Forestry and Woodland Products Impacts on Locatable Minerals

4.3.3.3.5.1.1. Impacts Common to All Alternatives

Forestry and Woodland Products management has a negligible impact on locatable mineral resources. Salvage of cacti and yucca is currently done in all of the mineral management and addressed under this resource's Section 4.3.3.3.4.4, "Integrated Vegetation Impacts on Locatable Minerals" (p. 1058) section. Any impacts would be addressed during project scoping with the incorporation of appropriate BMPs into permitting.

4.3.3.3.5.1.2. Alternatives 1 through 4

There are no additional impacts to locatable mineral development.

4.3.3.3.5.2. Livestock Grazing Impacts on Locatable Minerals

4.3.3.3.5.2.1. Impacts Common to All Alternatives

Livestock grazing management actions have a negligible impact to locatable mineral development. The two resources coexist without impacting the other.

4.3.3.3.5.2.2. Alternatives 1 through 4

There are no additional impacts to locatable mineral development.

4.3.3.3.5.3. Minerals Impacts on Locatable Minerals

4.3.3.3.5.3.1. Locatable Minerals

Benefits of the locatable minerals program were addressed under the resource summary at the beginning of this commodity.

4.3.3.3.5.4. Recreation Impacts on Locatable Minerals

4.3.3.3.5.4.1. Impacts Common to All Alternatives

There are no impacts common to all alternatives.

4.3.3.3.5.4.2. Alternative 1

Recreation management actions have negligible to low impacts to locatable mineral development, and its management in the planning area does not negatively impact any mineral resource exploration or development opportunities. The two resources have coexisted without ffecting each other. The existing SRMAs are open to all forms of mineral exploration and development with the exception of the Nellis Dunes SRMA, which is an extensively used recreation area near the Speedway Community Pit northeast of the Las Vegas Valley. The SRMA is approximately 10,865 acres and is open to locatable minerals. The land at Nellis Dunes is better used for recreational over mineral development, and the loss of these lands is negligible impact to the resource.

4.3.3.3.5.4.3. Alternatives 2 through 4

Recreation management actions have negligible to low impacts to locatable mineral development.

The recreation program has addressed a need for BLM administrative right-of-ways (ROW). These ROWs would enhance recreational R&I values and address specific recreational uses in a region. The impact to locatable mineral resources would be negligible as these ROWs are small, less than 100 acres, site specific, and typically confined to previously disturbed areas.

The management of the SRMAs has a negligible impact on locatable mineral resources. Some SRMAs have overlapping management from other resources or designations that are more restrictive to locatable mineral development and are addressed in their supporting sections. Examples of the overlapping management include ACECs, wilderness/WSAs, specific disposal boundaries, etc. There is precious metal development in the Bare Mountains region of the Big Dune SRMA, and the management of that SRMA will not impact or impede the existing mining activity and future development of the local mineral resource.

The Nellis Dunes SRMA and Logandale North RMZ have heavy recreational use and are being designated to maintain access to that use. This use warrants the need for the district to pursue withdrawal from mineral entry under the mining laws. Although the withdrawal from mineral entry in the Logandale North RMZ and Nellis Dunes SRMA equals approximately 28,694 acres, the recreational values and uses of those lands justify the best use of these public lands as recreational over mineral development. The loss of these lands has a low impact to locatable mineral resources.

4.3.3.3.5.5. Travel and Transportation Impacts on Locatable Minerals

4.3.3.3.5.5.1. Impacts Common to All Alternatives

Travel management has negligible impacts to locatable mineral resource exploration and development in the planning area. Impacts from travel would involve access roads and routes

associated with mining operations and exploration activities. Minerals will provide the necessary input during the development of the travel management plans.

4.3.3.3.5.5.2. Alternatives 1 through 4

There are no additional impacts to locatable mineral development.

4.3.3.3.5.6. Lands and Realty Impacts on Locatable Minerals

The broad scope of lands and realty management impacts mineral resources, but these impacts tend to be site specific. There is no definable limit to the degree of the impact, and many of them can be addressed during project scoping.

4.3.3.3.5.6.1. Land Tenure (Disposals and Acquisitions) Impacts on Locatable Minerals

4.3.3.3.5.6.1.1. Impacts Common to All Alternatives

Land tenure management actions have low to moderate impacts to locatable mineral development. The SNPLMA and Ivanpah Airport Environs Overlay District disposal areas are withdrawn from mineral entry under the mining laws, but all other disposal areas remain open to mineral location. In summary, the impacts from land disposals on locatable mineral exploration and development can be moderate depending on the location. Acquisitions are analyzed on an as-needed basis and address mineral concerns. Once lands are acquired, they can be left open and managed under the Acquired Lands Regulations (43 CFR 3500 series) or closed, as these minerals are deemed discretionary just like saleable and leasable minerals, to locatable mineral development under the land-use plan.

4.3.3.3.5.6.1.2. Alternative 1

There are no additional impacts to locatable mineral development.

4.3.3.3.5.6.1.3. Alternatives 2 through 4

Land tenure management actions have low to moderate impacts to locatable mineral development. The Sloan Hills area is being proposed for withdrawal based on successfully contested mineral exams. The withdrawal of Sloan Hills has a negligible impact to locatable resource exploration and development in the planning area. All remaining disposal areas will remain open to locatable mineral development. Acquisitions are analyzed on an as-needed basis and address mineral concerns.

4.3.3.3.5.6.2. Land-Use Authorizations (Right-of-Ways, Leases, Permits) Impacts on Locatable Minerals

4.3.3.3.5.6.2.1. Impacts Common to All Alternatives

Land-use authorization management actions have a negligible to low impact to locatable mineral development. For locatable mineral operations, it becomes a matter of critical dates and activity.

When the date of location of undeveloped mining claim(s) predate the ROW application, future mining on those claims would be allowed upon approval and authorization under the Surface Management Regulations. Mining operators would be required to work out the necessary adjustments or realignments of the encumbered ROW with the ROW holders.

4.3.3.3.5.6.2.2. Alternatives 1 through 4

There are no additional impacts to locatable mineral development.

4.3.3.3.5.6.3. Renewable Energy Impacts on Locatable Minerals

4.3.3.3.5.6.3.1. Impacts Common to All Alternatives

Impacts caused by renewable energy development to locatable mineral resources will vary depending on the type of renewable energy source that is being developed.

Solar energy development has moderate to major impacts to locatable mineral resources in the planning area. The Solar Programmatic Environmental Impact Statement (PEIS) contains guidance for the development of large-scale solar projects by splitting lands into three categories: solar energy zones (SEZs), variance, and exclusion. There are two existing SEZs, Dry Lake (LVFO) and Amargosa (PFO), in the planning area that cover approximately 14,128 acres. These lands have been formally withdrawn from mineral entry under the Mining Laws. Of the two SEZs, only the Dry Lake SEZ in LVFO is impacting locatable mineral resource development. There is one active mining operation within a half mile of the SEZ and two active milling operations within a mile of the Dry Lake SEZ. One of the milling operations is directly impacted by the SEZ as it is located on the southernmost end of this SEZ. In addition, grandfathered solar projects will continue to be processed. Solar energy plants are single-use, large-scale developments. When these projects are constructed, all lands under them will be inaccessible to locatable mineral development for as long as the solar energy plant exists. Some of these variance lands may contain high-quality locatable mineral resources.

Wind energy development has a low impact to locatable mineral resources in the planning area. Wind energy development right-of-ways are similar to linear type right-of-ways with turbines developed in arrays that branch out from access roads. Wind turbines can be micro-sited to avoid potential impacts to other resources during the planing process, that is, the position of each turbine can be adjusted. Adjusting tower locations can lower or remove the impact of wind energy development to the resource. Currently, there is one large-scale wind energy project in the planning area, Searchlight Wind. Impacts to locatable mineral resources were addressed in the EIS for the project.

Geothermal energy development has a negligible impact to locatable mineral resources in the planning area. The two forms of geothermal energy development, power generation through power plants and direct-use, are generally less than 20 acres in size. There has been interest in the Crater Flats area, presumably for power generation purposes. Direct-use geothermal energy developments are small-scale and site-specific developments that provide energy for single structures. The impacts associated with geothermal can be addressed during scoping.

4.3.3.3.5.6.3.2. Alternative 1

Solar energy development has moderate to major impacts to locatable mineral resources in the planning area. The impacts associated with the existing SEZs, particularly the Dry Lake SEZ (LVFO), were addressed under the Impacts Common to All Alternatives section. If only SEZs and grandfathered solar projects are developed, the impacts to locatable mineral resources will be moderate. Variance lands are those where solar energy development can occur provided the applicant can justify the need to use those lands over SEZs. If variance lands are developed in addition to SEZs and grandfathered solar projects, impacts to locatable mineral resources will increase to major.

Wind energy development has a low impact to locatable mineral resources in the planning area. As noted under the Impacts Common to All Alternatives, there is one large-scale wind energy project in the planning area, Searchlight Wind. Impacts to locatable mineral resources were addressed in the EIS for the project and minimized.

4.3.3.3.5.6.3.3. Alternative 2

Solar energy development has moderate to major impacts to locatable mineral resources in the planning area. The impacts associated with the existing SEZs, particularly the Dry Lake SEZ (LVFO), were addressed under Impacts Common to All. If only SEZs and grandfathered solar projects are developed the impacts to locatable mineral resources will be moderate. Variance lands are those where solar energy development can occur provided the applicant can justify the need to use those lands over SEZs. Under this alternative, there are significantly fewer acres of variance lands. If variance lands are developed in addition to SEZs and grandfathered solar projects, impacts to locatable mineral resources will increase to major.

Wind energy development has a low impact to locatable mineral resources in the planning area. As noted under the Impacts Common to All Alternatives, there is one large-scale wind energy project in the planning area, Searchlight Wind. Impacts to locatable mineral resources were addressed in the EIS for the project and minimized.

4.3.3.3.5.6.3.4. Alternative 3

Solar energy development has moderate to major impacts to locatable mineral resources in the planning area. The impacts associated with the existing SEZs, particularly the Dry Lake SEZ (LVFO), were addressed under Impacts Common to All section. The westernmost SEZ southwest of the Bare Mountains may minimally impact water resources that are associated with the active gold mines in the region. The other Nye County SEZs do not appear to impact mineral resources in the immediate region. If only SEZs and grandfathered solar projects are developed, the impacts to locatable mineral resources will be moderate. Variance lands are those where solar energy development can occur provided the applicant can justify the need to use those lands over SEZs. Under this alternative, there are significantly fewer acres of variance lands. If variance lands are developed in addition to SEZs and grandfathered solar projects, impacts to locatable mineral resources will increase to major.

Wind energy development has a low impact to locatable mineral resources in the planning area. As noted under the Impacts Common to All Alternatives, there is one large-scale wind energy project in the planning area, Searchlight Wind. Impacts to locatable mineral resources were addressed in the EIS for the project and minimized.

4.3.3.3.5.6.3.5. Alternative 4

Solar energy development has major impacts to locatable mineral resources in the planning area. There are two existing SEZs and four proposed SEZs in the planning area that cover approximately 168,255 acres. Three of the SEZs are located in Nye County; three of the SEZs are in Clark County. The impacts associated with the existing SEZs, particularly the Dry Lake SEZ (LVFO), were addressed under the preceding Common to All section. The two SEZs in Clark County significantly impact numerous locatable resources. The smaller southern SEZ near Sandy Valley impacts active locatable mineral developments and exploration in the area. The larger northern SEZ that extends from Apex to Mesquite impacts numerous authorized locatable mining operations and countless mining claims (valid existing rights). This SEZ impacts mineral resources including but not limited to gypsum, high-grade (cement grade) limestone, and silica. The two small SEZs in Nye County are in areas that will not impact mineral resource development as they are in the alluvial lowlands. The Lathrop Wells SEZ north of Amargosa could potentially impact locatable clay deposits that are currently being mined or claimed. If the SEZs, grandfathered solar projects and variance lands are developed, the impacts to locatable mineral resources will be major.

Wind energy development has a low to moderate impact to locatable mineral resources in the planning area. As noted under the Impacts Common to All Alternatives, there is one large-scale wind energy project in the planning area, Searchlight Wind. Impacts to locatable mineral resources were addressed in the EIS for the project and minimized. Future wind energy developments, depending on their location, will impact locatable mineral resources and increase the impact to moderate.

4.3.3.3.5.6.4. Utility Corridors Impacts on Locatable Minerals

4.3.3.3.5.6.4.1. Impacts Common to All Alternatives

Utility corridor management actions have a negligible impact to locatable mineral development. The purpose of these corridor designations is to focus linear developments into a confined location. Locatable mineral developments, especially if with valid existing rights, may proceed as long as they work out the necessary adjustments or realignments with the ROW holders.

4.3.3.3.5.6.4.2. Alternatives 1 through 4

There are no additional impacts to locatable mineral development.

4.3.3.3.6. Special Designations

4.3.3.3.6.1. Areas of Critical Environmental Concern Impacts on Locatable Minerals

4.3.3.3.6.1.1. Impacts Common to All Alternatives

ACEC management actions have major impacts to locatable mineral development. There are 23 existing ACECs accounting for approximately 1,014,301 acres. In 2009, these ACECs were withdrawn for 20 years and can be renewed for additional years indefinitely. There are numerous actively maintained mining claims that predate the segregation-withdrawal of these lands that

may be allowed to go into production following regulatory compliance. A mineral potential report, the Ludington Report, was done by the USGS (Ludington 2006) on all of the district's existing ACECs. Two of the ACECs in that report are outside the planning area of this RMP and occur within the boundaries of the district's national conservation areas; therefore, no further discussion of those resource areas is warranted.

The results of the Ludington Report (2006) documented that the majority of the remaining ACECs have the potential for mineral resource development (see Table 4.15, "Summary of the Locatable Mineral Resource Findings within the Ludington (2006) Mineral Potential Report on the District's ACECs" (p. 1072)). Twelve of these ACECs have moderate to high potential occurrences of future locatable mineral development (of metallic, nonmetallic or both of these resources); these include Amargosa Mesquite, Ash Meadows, Coyote Springs, Crescent Townsite, Piute/Eldorado, Rainbow Gardens, Mormon Mesa, River Mountains, Virgin Mountains ACECs, and all of Gold Butte. The Gold Butte ACECs are the primary location of known strategic minerals in the district consisting of, but not limited to, nickel, platinum group metals, beryllium, and uranium. The district's ACECs were all withdrawn from mineral entry whereas other ACECs across the state remain open to mineral development. In addition, there are hundreds of actively maintained claims in these ACECs that were located before withdrawal and may be allowed to operate on these lands.

Table 4.15. Summary of the Locatable Mineral Resource Findings within the Ludington (2006) Mineral Potential Report on the District's ACECs[ab]

ACEC	High potential			Moderate potential			Low potential		
	M	NM	S	M	NM	S	M	NM	S
Amargosa Mesquite		X							
Arden		X							X[e]
Arrow Canyon									
Ash Meadows		X							
Big Dune								X	
Coyote Springs		X							
Crescent Townsite	X			X					
Devil's Throat									
Gold Butte, Part A	X[c]	X	X[d]	X[c]	X	X[e]			
Gold Butte, Part B	X	X		X[c]	X	X[d]			
Gold Butte Townsite	X			X[c]					
Hidden Valley								X	
Keyhole Canyon									
Mormon Mesa		X			X				
Piute/Eldorado	X	X		X			X		
Rainbow Gardens		X			X		X	X	X[e]
Red Rock Spring									
River Mountains		X		X	X				
Stump Spring									
Virgin Mountains	X		X[f]		X				
Virgin River									
Whitney Pocket									

[a]This table does not include the two ACECs inside the NCAs: Bird Spring and Sloan Rock Art.

[b]Abbreviations: M: Metallic; NM: Nonmetallic; S: Strategic

[c]Kipushi-type Copper deposits.

[d]Nickel, Platinum Group (PGMs), Gallium, Germanium, Uranium

[e]Uranium

[f]Nickel, PGMs, Beryllium.

4.3.3.3.6.1.2. Alternative 1

ACEC management actions have major impacts to locatable mineral development. As noted under the Impacts Common to All Alternatives, the ACECs were withdrawn for 20 years in 2009 and can be renewed for additional years indefinitely.

The 1998 RMP estimated that locatable mineral development would account for up to 25,000 acres of disturbance over the life of the 1998 RMP. The withdrawal of these lands has significantly impacted locatable mineral resources in the planning area with the loss of nearly a third of resource area when less than 25,000 acres were likely to be developed.

Under this alternative, 100 percent of the ACECs are withdrawn to locatable mineral development. Locatable minerals are location specific, meaning they are not found everywhere and may have a wide range of project sizes. As noted under the Impacts Common to All Alternatives, the Ludington Report (2006) showed that half of the ACECs have high potential for locatable mineral potential. Some of the ACECs with high potential were exclusively nonmetallic locatable resources, a few were exclusively metallic locatable resources, and several were a combination of the two resources. Areas with the most diverse locatable mineral potentials were all of the primary Gold Butte and Piute/Eldorado ACECs. Nine of the ACECs have a moderate potential for development.

Since the 1998 RMP was signed, approximately 2,500 acres of disturbances associated with locatable mineral developments have been permitted. This is a magnitude smaller than what was anticipated. The loss of approximately 1 million acres available for locatable mineral development due to a fear of development coupled with the actual development of approximately 2,500 acres has impacted growth and economies in areas that rely on mining for good paying jobs.

4.3.3.3.6.1.3. Alternative 2

ACEC management actions have major impacts to locatable mineral development. As noted under the Impacts Common to All Alternatives, the ACECs were withdrawn for 20 years in 2009 and can be renewed for additional years indefinitely. The ACECs under this alternative account for approximately 1,444,548 acres of the public lands administered by the two field offices. When compared to the ACEC acreages associated with Alternative 1, this is an increase of over 43 percent to what is currently designated (see Table 4.16, “Comparison of the ACECs Between Alternative 2 and Alternative 1” (p. 1073). Under this alternative, the existing Arden and Crescent Townsite ACECs and their associated mineral withdrawals will be released.

Table 4.16. Comparison of the ACECs Between Alternative 2 and Alternative 1

Alternative 1		
Total ACECs	Total acreage	Total percentage of district
23	1,014,301	33 percent
Alternative 2		
Total ACECs	Total acreage	Total percentage of district
44	1,444,548	47 percent

ACEC designations will have a major impact to locatable mineral development. The addition of new ACECs and the existing ACECs for locatable mineral development has significantly altered how many acres are available to the resource and may be explored or developed across the

planning area. Under this alternative, more acres of ACEC lands would be withdrawn to locatable mineral development. If these ACECs are withdrawn for 20 years, they can be renewed for additional years indefinitely. Under this alternative, the existing Arden and Crescent Townsite ACECs and their associated mineral withdrawals will be released. There are some additions and boundary adjustments to some of the existing ACECs, which account for the majority of the additional acres under this alternative.

As noted in Chapter 3, nonmetallic minerals are the predominant locatable resource managed by the LVFO with extensive gypsum, silica, and high-grade limestone deposits. There are smaller metallic resources in the county predominantly toward the south. The proposed Muddy Mountains ACEC would impact gypsum deposits some of which are currently being explored and may be developed in the near future. Locatable borates and limestones of the proposed Gale Hills ACEC would be affected by a pursued withdrawal. The proposed Bird Spring Valley, by its shear acreage, impacts known high-grade limestone, locatable silica sand, and metallic deposits that have seen increased exploration, particularly for locatable sands. All of these regions have potential for future growth and development and would provide countless industries with needed raw and refined materials. The economic consequence of additional withdrawals would impact Clark County from lost high-paying jobs, taxes, and revenues associated with mining.

Nye County's economy relies on the high-paying jobs, revenues, and taxes associated with mining more than Clark County. The expansion of Amargosa Mesquite ACEC will directly impact the authorized operations for IMV Clay, which mines specialty clays for use in a variety of industries. IMV Clay has numerous mining claims in both the existing portion of the ACEC and the region that is being proposed for inclusion into the ACEC. IMV is actively mining on the patented lands that are surrounded by the ACEC. The Mt. Schrader ACEC overlays portions of the Johnnie Mining District that has active, undeveloped mining claims. The economic consequence of additional withdrawals would impact Nye County in a similar manner as in Clark County with the added impact of impeding an active mine from conducting its work and potentially limiting its expansion for a growing global commercial need.

The regulatory authority (43 CFR 3809) has guidance in effect for handling mining activities on specially designated lands such as ACECs. Proper processing of the pursued withdrawals would require individual mineral potential reports to document the mineral resource potential of each ACEC with an appropriate management decision and justification. Therefore, the impact to locatable mineral resource exploration and development under this alternative remains significant.

4.3.3.3.6.1.4. Alternative 3

ACEC management actions have major impacts to locatable mineral development. As noted under the Impacts Common to All Alternatives, the ACECs were withdrawn for 20 years in 2009 and can be renewed for additional years indefinitely. The ACECs under this alternative account for 1,292,216 acres of the public lands administered by the two field offices. When compared to the ACEC acreages associated with Alternative 1, this is an increase of approximately 42 percent to what is currently designated (see Table 4.17, "Comparison of the ACECs Between Alternative 3 and Alternative 1" (p. 1075). Under this alternative, the existing Arden and Crescent Townsite ACECs and their associated mineral withdrawals will be released. There are some additions and boundary adjustments to some of the existing ACECs that account for the majority of the additional acres under this alternative.

Table 4.17. Comparison of the ACECs Between Alternative 3 and Alternative 1

Alternative 1		
Total ACECs	Total acreage	Total percentage of district
23	1,014,301	33 percent
Alternative 3		
Total ACECs	Total acreage	Total percentage of district
41	1,292,216	42 percent

ACEC designations will have a major impact to locatable mineral development. Under this alternative, there is a substantial increase in the number of ACECs, and more acres of ACEC lands would be withdrawn from locatable mineral development. Locatable mineral resources are found in specific, confined locations that cannot be readily found elsewhere and need to be developed in place. These resources can have 1) specialty uses with small, defined markets and users, 2) global applications and users, and 3) major economic drivers as export materials in the global marketplace. If these ACECs are withdrawn for 20 years, they can be renewed for additional years indefinitely. Under this alternative, the existing Arden and Crescent Townsite ACECs and their associated mineral withdrawals will be released. There are some additions and boundary adjustments to some of the existing ACECs that account for the majority of the additional acres under this alternative.

As noted in Chapter 3, nonmetallic minerals are the predominant locatable resource managed by the LVFO with extensive gypsum, silica, and high-grade limestone deposits. There are smaller metallic resources in the county predominantly toward the south. The majority of the proposed withdrawals add additional lands to the existing ACECs while the minority creates a few smaller ACECs for specific resource protection (cultural, botanical, or geological). Many of the regions that were impacted under Alternative 2 are not impacted under this alternative as they remain open to entry and development. These open locations include, but are not limited to, the gypsum deposits within the proposed Muddy Mountains ACEC, the locatable borates and limestones of the proposed Lowell Wash ACEC, and the known high-grade limestone, locatable sand and metallic deposits within the proposed Bird Spring Valley ACEC. The economic consequence of additional withdrawals would impact Clark County from lost high-paying jobs, taxes, and revenues associated with mining and would vary from one community to the next.

Nye County's economy relies on the high-paying jobs, revenues, and taxes associated with mining more than Clark County. The expansion of Amargosa Mesquite ACEC will directly impact the authorized operations for IMV Clay, which mines globally rare, specialty clays for use in a variety of industries. IMV Clay has numerous valid mining claims in both the existing portion of the ACEC and the region that is being proposed for inclusion into the ACEC and is actively mining on the patented lands that are surrounded by the ACEC. The Lava Dune ACEC is situated around the patented Cind-r-lite mine that would be impacted by the ACEC's designation. The Mt. Schrader ACEC overlays portions of the Johnnie Mining District that has active, undeveloped mining claims. The economic consequence of additional withdrawals would impact Nye County in a similar manner as in Clark County with the added impact of impeding an active mine from conducting its work and potentially limiting its expansion for a growing global commercial need.

Pursuing additional withdrawals would circumvent the regulatory authority (43 CFR 3809) that has guidance in effect for handling mining activities on specially designated lands such as ACECs. Proper processing of the pursued withdrawals would require individual mineral potential reports to document the mineral resource potential of each ACEC with an appropriate

management decision and justification. Therefore, the impact to locatable mineral resource exploration and development under this alternative is major.

4.3.3.3.6.1.5. Alternative 4

ACEC management actions have major impacts to locatable mineral development. As noted under the Impacts Common to All Alternatives, the ACECs were withdrawn for 20 years in 2009 and can be renewed for additional years indefinitely. The ACECs under this alternative account for 1,021,365 acres of the public lands administered by the two field offices. When compared to the ACEC acreages associated with Alternative 1, this is an increase of approximately 1 percent to what is currently designated (see Table 4.18, "Comparison of the ACECs Between Alternative 4 and Alternative 1" (p. 1076). Under this alternative, the existing Arden and Crescent Townsite ACECs and their associated mineral withdrawals will be released. There are some additions and boundary adjustments to some of the existing ACECs that account for the majority of the additional acres under this alternative.

Table 4.18. Comparison of the ACECs Between Alternative 4 and Alternative 1

Alternative 1		
Total ACECs	Total acreage	Total percentage of district
22	1,014,301	33 percent
Alternative 4		
Total ACECs	Total acreage	Total percentage of district
25	1,021,365	33 percent

ACEC designations will have a major impact to locatable mineral development. Under this alternative, there is an increase in both the number of ACECs acres of lands that are being designated as ACEC lands. Locatable mineral resources are found in specific, confined locations that cannot be readily found elsewhere and need to be developed in place. These resources can have 1) specialty uses with small, defined markets and users; 2) global applications and users; and 3) major economic drivers as export materials in the global marketplace. If these ACECs are withdrawn for 20 years, they can be renewed for additional years indefinitely. Under this alternative, the existing Arden and Crescent Townsite ACECs and their associated mineral withdrawals will be released. There are some additions and boundary adjustments to some of the existing ACECs and account for the majority of the additional acres under this alternative.

As noted in Chapter 3, nonmetallic minerals are the predominant locatable resource managed by the LVFO with extensive gypsum, silica, and high-grade limestone deposits. There are smaller metallic resources in the county predominantly toward the south. As noted previously, the majority of the proposed withdrawals add additional lands to the existing ACECs while the minority creates a few smaller ACECs for specific resource protection (cultural, botanical, or geological). Many of the lands that were identified as ACECs under Alternatives 2 and 3 are not carried forward under this alternative and therefore do not impact locatable mineral development. The economic consequence of additional withdrawals would impact Clark County from lost high-paying jobs, taxes, and revenues associated with mining.

Nye County's economy relies on the high-paying jobs, revenues, and taxes associated with mining more than Clark County. None of the ACECs in Nye County has boundary adjustments, but both Ash Meadows and Amargosa Mesquite directly impact the authorized operations for IMV Clay, which mines globally rare, specialty clays for use in a variety of industries. IMV Clay has numerous valid mining claims both in the existing portions of the ACECs and surrounding

them. IMV Clay is actively mining on the patented lands that are surrounded by the ACECs. The economic consequence of additional withdrawals would impact Nye County in a similar manner as in Clark County with the added impact of impeding an active mine from conducting its work and potentially limiting its expansion to a growing global commercial need.

The regulatory authority (43 CFR 3809) has guidance in effect for handling mining activities on specially designated lands such as ACECs. Proper processing of the pursued withdrawals would require individual mineral potential reports to document the mineral resource potential of each ACEC with an appropriate management decision and justification. Therefore, there is a major impact to locatable mineral resource exploration and development under this alternative.

4.3.3.3.6.2. National Trails Impacts on Locatable Minerals

4.3.3.3.6.2.1. Impacts Common to All Alternatives

There are no impacts common to all alternatives.

4.3.3.3.6.2.2. Alternative 1

National trail management actions have a negligible impact to locatable mineral development. The Old Spanish Trail (OST) is the only national trail in the planning area. Currently, there are no specific management prescriptions for the OST in the district that would directly impact mineral resource development. Nondiscretionary, locatable mineral resources may be impacted but are dependent on where the project is in relation to the OST. Impacts would be addressed during project scoping and the environmental documentation.

4.3.3.3.6.2.3. Alternatives 2 and 3

National trail management actions have a negligible impact to locatable mineral development. The Old Spanish Trail is the only national trail in the planning area. Under this alternative, it has been designated as an ACEC.

4.3.3.3.6.2.4. Alternative 4

National trail management actions have a negligible impact to locatable mineral development. The OST is the only national trail in the planning area. Under this alternative, the OST will not be designated as an ACEC and will be managed under prescriptions addressed under National Trails in Chapter 2. As noted under Alternative 1, nondiscretionary, locatable mineral resources may be impacted but are dependent on where the project is in relation to the OST. Impacts would be addressed during project scoping and the environmental documentation.

4.3.3.3.6.3. Wild and Scenic Rivers Impacts on Locatable Minerals

4.3.3.3.6.3.1. Impacts Common to All Alternatives

There are no impacts common to all alternatives.

4.3.3.3.6.3.2. Alternative 1

Wild and scenic river management has a negligible impact to locatable mineral resources. Seven segments of river were found eligible and await a suitability determination accounting. The 1998 RMP only listed the Virgin River, within the Virgin River ACEC, as eligible, but no additional action was made. As part of the update to this RMP, a new eligibility determination was made with its results incorporated under this alternative as the existing condition on public lands. Six additional river segments were identified as eligible and included under this alternative. The 1998 RMP should have closed those lands to discretionary mineral development and withdrawn those lands. The impact is minimal to all mineral resources.

4.3.3.3.6.3.3. Alternative 2

Wild and scenic river management has a negligible impact to locatable mineral resources. By law, these lands need to pursue a withdrawal from mineral entry. Under this alternative, seven river segments were found eligible and suitable for wild, scenic, or recreational qualities. The majority of those lands are associated with recreational rivers. Portions of Meadow Valley Wash, Virgin River, and all of Carson Slough are inside existing ACECs (Mormon Mesa, Virgin River, and Ash Meadows ACECs) with associated mineral resource restrictions. Hiko Wash is also in a proposed ACEC (Hiko Wash ACEC) with specific mineral restrictions. The withdrawal of these lands will have a minimal impact to locatable minerals as the majority of the rivers are located in existing ACECs, which are withdrawn. Pursuing withdrawal of the remaining river portions does not impact mineral development as there are no authorized operations on these lands.

4.3.3.3.6.3.4. Alternative 3

Wild and scenic river management has a negligible impact to locatable mineral resources. One segment of river was found eligible and classified as recreational. The three-mile segment of the Meadow Valley Wash is located within the Mormon Mesa ACEC, which will need to be withdrawn from mineral entry to comply with federal law. The wash and its associated management do not change the existing condition of the lands due to the overlapping ACEC.

4.3.3.3.6.3.5. Alternative 4

Wild and scenic river management does not impact locatable mineral resources as there are no eligible or suitable river segments under this alternative.

4.3.3.3.6.4. Wilderness Impacts on Locatable Minerals

4.3.3.3.6.4.1. Impacts Common to All Alternatives

Wilderness management actions have a major impact to locatable mineral development by limiting the availability of lands for mineral development. The 10 designated wildernesses account for approximately 183,000 acres within the planning area. Wilderness lands are designated by Congress with an associated mineral withdrawal from entry under the mining laws. These lands are still subject to valid existing rights; therefore, any potential (locatable) mining operation under the Mining Law would require a Plan of Operations and an associated validity determination on the claims prior to development.

4.3.3.3.6.4.2. Alternatives 1 through 4

There are no additional impacts to locatable mineral development.

4.3.3.3.6.5. Wilderness Study Areas Impacts on Locatable Minerals

4.3.3.3.6.5.1. Impacts Common to All Alternatives

Wilderness study area management actions have a major impact to locatable mineral development. As stated in the Wilderness section, mineral resources are impacted by wilderness study areas (WSAs) and their management. These lands are also designated by Congress as lands awaiting final action by Congress. The five WSAs account for approximately 47,188 acres in the planning area. The majority of the WSA acreage is located within existing ACECs. Like wilderness lands, WSAs are closed to discretionary mineral development. These lands remain open to location but are subject to non-impairment rules.

In the case of congressional release of these lands, these lands could become open to all forms of mineral entry unless another special designation, i.e. ACECs, with specific mineral development protocols, overlays those lands. These lands are still subject to valid existing rights; therefore, any potential (locatable) mining operation under the Mining Law would require a Plan of Operations and an associated validity determination on the claims prior to development.

4.3.3.3.6.5.2. Alternatives 1 through 4

There are no additional impacts to locatable mineral development.

4.3.3.3.7. Cumulative Impacts

4.3.3.3.7.1. Past and Present Actions/Impacts

The withdrawal of the ACECs has had a significant negative impact to locatable mineral development. It has removed some of the most valuable mineral estate despite the findings of the Ludington mineral potential report. There are hundreds of mining claims in these lands that are impacted. These withdrawals removed nearly a third of the planning area from locatable development.

4.3.3.3.7.2. Reasonable Foreseeable Actions

The continued push to conserve public lands and move away from the multiple-use direction is an issue. Locatable mineral resources continue to be targeted for limiting or preventing their development. Special interest groups continue to push management direction into a conservation action with the creation of new ACECs, lands with wilderness characteristics, and so on. Locatable minerals provide the necessary resources for thousands of uses that many people take for granted, and groups are forced to seek development outside of the district or even country when this nation is the largest consumer of those products.

4.3.3.3.7.3. Cumulative Impact

Table 4.19. Comparison of Acreages for All Alternatives

Locatable mineral categories	Alternative 1	Alternative 2	Alternative 3	Alternative 4
	Acres	Acres	Acres	Acres
Ranking of alternative	1	4	2	3
Open	1,956,677	1,356,905	1,809,403	1,573,533
Pursue withdrawal	6,184	539,828	166,883	395,272
Withdrawn	1,148,448	1,214,576	1,135,676	1,146560

4.3.3.3.7.3.1. Alternative 1

This is the most favorable alternative for locatable resource exploration and development as it leaves the most land, nearly 63 percent, open to exploration and development. The cumulative impacts of the withdrawals, particularly the ACECs, has had a major impact on this resource. These are site-specific areas of development that undergo extensive environmental review and incorporate all appropriate environmental requirements before authorization.

4.3.3.3.7.3.2. Alternative 2

This is the most restrictive alternative to locatable mineral exploration and development. Over 56 percent of the planning area would be withdrawn or pursue withdrawal to mineral entry under the mining laws. This alternative would leave 44 percent of the planning area open to locatable mineral development. The cumulative impact of numerous new conservation designations (ACECs, lands with wilderness characteristics, etc.) would have major impacts on locatable mineral exploration and development in the planning area. Several historic mining districts that are currently being mined and evaluated for valuable mineral developments could be heavily impacted by this action. These include precious metal (gold and silver), base metals (copper), industrial (gypsum, silica, locatable sands, Portland cement grade limestones, etc.), and strategic minerals (rare earths).

4.3.3.3.7.3.3. Alternative 3

This is the second most preferred alternative to locatable mineral exploration and development. Approximately 42 percent of the planning area would be withdrawn or pursue withdrawal to mineral entry under the mining laws. This alternative would leave approximately 58 percent of the planning area open to locatable mineral development. Several designations (ACECs, lands with wilderness characteristics, etc.) would have major impacts on locatable mineral exploration and development in the planning area by pursuing additional withdrawals. Some mining districts that are currently being mined and evaluated for valuable industrial mineral developments (gypsum, silica, locatable sands, Portland cement grade limestones, etc.) could be significantly impacted by this action.

4.3.3.3.7.3.4. Alternative 4

This is the second most restrictive alternative to locatable mineral exploration and development. 49 percent of the planning area would be withdrawn or pursue withdrawal to mineral entry under the mining laws. This alternative would leave 51 percent of the planning area open to locatable

mineral development. Several of the designations (ACECs, lands with wilderness characteristics, and SEZs) would have major impacts on locatable mineral exploration and development in the planning area by pursuing additional withdrawals. Several historic mining districts that are currently being mined and evaluated for valuable mineral developments could be heavily impacted by this action. These include precious metal (gold and silver), base metals (copper), and industrial (gypsum, silica, locatable sands, Portland cement grade limestones, etc.).

4.3.3.4. Saleable Minerals

4.3.3.4.1. Summary

Saleable minerals (also referred to as mineral materials and common variety minerals) are among the most basic natural resources. These materials are used in everyday construction, agriculture, and decorative applications. Highways, bridges, power plants, dams, high-rise buildings, railroad beds, and airport runways, along with their foundations and sidewalks, all use saleable minerals. In agriculture, saleable minerals are used as soil conditioners and in decorative applications such as xeriscaping. Separating naturally occurring mineral materials from the earth is neither easy nor inexpensive. The sheer weight of these materials makes their transportation costs high. Therefore, adequate local supplies of these basic resources are vital to the economic life of every community. It is the BLM's policy to make these materials available to the public and governmental agencies whenever possible and wherever it is environmentally acceptable.

Saleable minerals consist of, but are not limited to, common varieties of sand, stone, gravel, cinders, clay, pumice, and pumicite. The BLM's authority to dispose of saleable minerals not subject to mineral leasing or location under the mining laws comes from the Act of July 31, 1947, as amended, commonly referred to as the Materials Act. Saleable minerals are disposed of in two ways: through free-use permits (FUP) and sales contracts. FUPs allow government entities and nonprofit organizations to use saleable minerals free of charge, provided the government entity and nonprofit do not use the mineral materials for commercial or industrial purposes. Sales contracts are an agreement between a purchaser and the BLM in which the BLM sells mineral materials, at fair market value, to the purchaser. The fair market value of mineral materials is determined through an appraisal-like process. FUPs and sales contracts give the permittee/purchaser a location to extract, process, stockpile, and dispose of the mineral materials, specify the volume or weight of mineral materials to be disposed of, specify the amount of time the permittee/purchaser has to dispose of the mineral materials, and include the terms and conditions of the permit/contract.

Saleable minerals can be closed through land-use planning. The main impacts from the RMP to saleable minerals involve the areas of critical environmental concern, land-use authorizations, and renewable energy. These special designations have closed hundreds of thousands of acres both through congressional and administrative actions. Saleable minerals are the most extensive resource in the planning area, and there is high potential for their development.

4.3.3.4.2. Methods of Analysis

Each of the other resources are evaluated and analyzed to determine if there is a competing use or impact that would affect the mineral resource from being developed. A determination has been made using the Qualitative Intensity Scale on the impact that resource has on mineral development.

4.3.3.4.3. Qualitative Intensity Scale

Evaluation of the impacts to the mineral programs is based on a four-point scale:

- **Negligible:** These are impacts that have little to no impact to the commodity as they tend to be solely stipulations or conditions that are required in permitting.

- **Low:** These are impacts that may require project scoping to address potentially unknown issues or conditions that may affect the resource's development.
- **Moderate:** These are impacts that will require project scoping to address known issues or conditions that may limit the resource's development potential. They may require avoidance, mitigation actions and will incorporate best management practices.
- **Major:** These are impacts that will require project scoping as there are major or significant issues or conditions that prevent or limit the resource's development potential. These may include closure of specific lands or pursuing mineral withdrawal as the only alternative. These impacts have mitigation factors and best management practices that must be incorporated into the permitting process.

4.3.3.4.4. Resources

4.3.3.4.4.1. Air Quality Impacts on Saleable Minerals

4.3.3.4.4.1.1. Impacts Common to All Alternatives

Air quality management actions have a negligible impact to saleable mineral development. All permitted activities typically over 0.25 acre of aggregated disturbance require operators get state and local air quality permits before they are allowed to begin their operations. The operator is required to make sure that permits are up to date. Any violation could result in noncompliance from local, state, or federal authorities. The BLM could issue noncompliance decisions and even terminate authorizations if unnecessary and undue degradation to public lands occurs or if public health and human safety are at risk.

4.3.3.4.4.1.2. Alternatives 1 through 4

There are no additional impacts to saleable mineral development.

4.3.3.4.4.2. Soil Resources Impacts on Saleable Minerals

4.3.3.4.4.2.1. Impacts Common to All Alternatives

Soil resources management actions have a moderate impact to saleable mineral development. Any impacts to soil resources are addressed during project review and scoping. All saleable mineral development activities are required to be reclaimed. Reclamation is the responsibility of the operator. Reclamation includes re-contouring, earthwork, stabilization, revegetation, and restoration. This is ensured through reclamation bonding that is evaluated and adjusted as new contracts are authorized, when mine plans are amended, and when existing contracts are renewed. These bonds are based on reclamation cost estimates that account for changes in inflation, materials, and wages.

4.3.3.4.4.2.2. Alternatives 1 through 4

There are no additional impacts to saleable mineral development.

4.3.3.4.4.3. Water Resources Impacts on Saleable Minerals

4.3.3.4.4.3.1. Impacts Common to All Alternatives

Water resources management actions have a moderate impact to saleable mineral development exploration and development by the protesting of water rights. Operators who need water rights for a new operation and operators who need additional water rights for their existing operation could be prohibited or limited in obtaining those water rights. Prohibiting and limiting access to water rights could limit an operator's ability to maintain, expand, or start their operation.

4.3.3.4.4.3.2. Alternatives 1 through 4

There are no additional impacts to saleable mineral development.

4.3.3.4.4.4. Integrated Vegetation Impacts on Saleable Minerals

4.3.3.4.4.4.1. Vegetation Impacts on Saleable Minerals

4.3.3.4.4.4.1.1. Impacts Common to All Alternatives

Vegetation management actions have a low impact to saleable mineral exploration and development. Unless it is unavoidable or not necessary, cactus and yucca are salvaged on all authorized saleable mineral exploration and development activities. Site reclamation is required on all associated surface-disturbing activities. Reclamation includes re-contouring topography, removal of equipment and structures, and revegetation of public lands. Operations are required to maintain a reclamation bond based on a reclamation estimate that accounts for changes in inflation, material costs, and wages. Specific seed mixes, approved by the BLM botanist, are used to re-vegetate the disturbed lands. Any impacts would be addressed during project evaluation and scoping. Appropriate BMPs are then incorporated into the stipulations attached to the contract or FUP.

4.3.3.4.4.4.1.2. Alternative 1

There are no additional impacts.

4.3.3.4.4.4.1.3. Alternatives 2 through 4

Vegetation management actions have a negligible impact to saleable mineral development. Native plant community connectivity is a regional issue that has the potential to impact local operations. Adaptive management of the native plant community would have a negligible impact to saleable minerals. Changes in adaptive management methodology and techniques will be incorporated into approved reclamation and restoration plans as needed to comply with resource needs. Existing operations would incorporate changes during mine plan amendments and contract renewals.

4.3.3.4.4.4.2. Riparian Areas and Wetlands Impacts on Saleable Minerals

4.3.3.4.4.4.2.1. Impacts Common to All Alternatives

Riparian and wetland management has a moderate impact to saleable mineral development. Any impacts associated with riparian and wetland management are similar to those addressed under the preceding Vegetation subsection of this resource. Any impacts would be addressed during project scoping. Appropriate BMPs are then incorporated into the stipulations attached to the contract or FUP. Avoidance may be recommended where feasible.

4.3.3.4.4.4.2.2. Alternatives 1 through 4

There are no additional impacts to saleable mineral development.

4.3.3.4.4.4.3. Weeds Impacts on Saleable Minerals

4.3.3.4.4.4.3.1. Impacts Common to All Alternatives

Weed management actions have a moderate impact to saleable mineral development. Operations would be required to incorporate weed plans and other mitigation measures identified during scoping.

4.3.3.4.4.4.3.2. Alternatives 1 through 4

There are no additional impacts to saleable mineral development.

4.3.3.4.4.4.4. Forests and Woodlands Impacts on Saleable Minerals

4.3.3.4.4.4.4.1. Impacts Common to All Alternatives

Forestry and woodland management actions have a negligible impacts to saleable mineral development. Any impacts associated with forestry and woodland management are similar to those addressed under the Vegetation subsection of this resource. Any impacts would be addressed during project scoping. Appropriate BMPs are then incorporated into the stipulations attached to the contract or FUP.

4.3.3.4.4.4.4.2. Alternatives 1 through 4

There are no additional impacts to saleable mineral development.

4.3.3.4.4.5. Fish and Wildlife Impacts on Saleable Minerals

4.3.3.4.4.5.1. Impacts Common to All Alternatives

Fish and wildlife management actions have a low impact to saleable mineral development. During nesting season, seasonal restrictions may impact operators by limiting when new disturbance can occur. Any impacts are addressed during individual project scoping on a project-by-project basis.

4.3.3.4.4.5.2. Alternatives 1 through 4

There are no additional impacts to saleable mineral development.

4.3.3.4.4.6. Special Status Species Impacts on Saleable Minerals

4.3.3.4.4.6.1. Impacts Common to All Alternatives

Special status species, such as desert tortoises and bighorn sheep, have a moderate impact on saleable mineral exploration and development. Impacts associated with special status species management may incorporate seasonal restrictions.

4.3.3.4.4.6.2. Alternatives 1 through 4

There are no additional impacts to saleable mineral development.

4.3.3.4.4.7. Wild Horse and Burro Impacts on Saleable Minerals

4.3.3.4.4.7.1. Impacts Common to All Alternatives

There are no impacts common to all alternatives.

4.3.3.4.4.7.2. Alternative 1

Management of wild horses and burros does not affect saleable mineral development under this alternative.

4.3.3.4.4.7.3. Alternative 2

Wild horse and burro management actions have a negligible impact to saleable mineral development. The Red Rock and Johnnie herd management areas (HMAs) surround the Pahrump Community Pit. The Pahrump Community Pit is a major source of saleable minerals used to support Pahrump. There will be a need for future contracts to new or existing operators and renewals of existing contracts to support the community. Denying those contracts would impact Pahrump as there are no other locations to acquire those resources. As long as the HMA does not restrict sales outside of the 700 acres of the 2,100-acre community pit that is currently fenced, the overall impact would be minor.

4.3.3.4.4.7.4. Alternatives 3 and 4

Wild horse and burro management actions have a low impact to saleable mineral development due to avoidance of surface-disturbing activities in HMAs. The Red Rock and Johnnie HMAs surround the Pahrump Community Pit, which is negatively impacted. There will be a need for future contracts to new or existing operators and renewals of existing contracts to support the community. Avoidance will allow for new contracts and renewals to maintain the needs of Pahrump.

4.3.3.4.4.8. Cave and Karst Management Impacts on Saleable Minerals

4.3.3.4.4.8.1. Impacts Common to All Alternatives

Cave and karst management actions have no impact on saleable mineral resources as they tend to be small, site-specific locations that can be avoided.

4.3.3.4.4.8.2. Alternatives 1 through 4

There are no additional impacts to saleable mineral development.

4.3.3.4.4.9. Wildland Fire Management Impacts on Saleable Minerals

4.3.3.4.4.9.1. Impacts Common to All Alternatives

Wildland fire management has a negligible impact on saleable mineral resources. Wildland fire management focuses on resource protection in response to fire on the landscape, health and human safety, and by decreasing fuel load. In times of emergency, the saleable minerals resource specialist can provide information about the region to aid in resource protection.

4.3.3.4.4.9.2. Alternatives 1 through 4

There are no additional impacts to saleable mineral development.

4.3.3.4.4.10. Cultural Resources Impacts on Saleable Minerals

4.3.3.4.4.10.1. Impacts Common to All Alternatives

There are no impacts common to all alternatives.

4.3.3.4.4.10.2. Alternative 1

The management of cultural resources in the planning area has a low impact on saleable mineral exploration and development. All impacts are addressed under project scoping, and applicable mitigation measures are added prior to authorization of any mineral material development.

4.3.3.4.4.10.3. Alternatives 2 through 4

The management of cultural resources in the planning area has a low impact on saleable mineral exploration and development. Any impacts of cultural resource management are addressed during project scoping. Any sensitive areas will be mitigated or avoided. Best management practices will be used.

4.3.3.4.4.11. Paleontological Resources Impacts on Saleable Minerals

4.3.3.4.4.11.1. Impacts Common to All Alternatives

Paleontological resources management actions have a negligible impact on saleable mineral resources. All impacts are addressed under project scoping, and applicable mitigation measures will be added prior to authorization of any mineral material development.

4.3.3.4.4.11.2. Alternatives 1 through 4

There are no additional impacts to saleable mineral development.

4.3.3.4.4.12. Visual Resource Management Impacts on Saleable Minerals

4.3.3.4.4.12.1. Impacts Common to All Alternatives

Visual resource management (VRM) actions have a low to major impact on saleable mineral development based on the VRM class assigned to the land.

Lands designated as Class I prevent all forms of surface disturbance that would lead to a change to the visual landscape by preserving the existing character of the landscape. Lands designated as Class I are wilderness and wilderness study areas (WSAs), which are closed to saleable mineral resources. If these lands are released, they would benefit the mineral resource in the district by potentially opening lands to a different VRM classification, thereby potentially allowing for their development. Designation of new WSAs would have an indirect negative impact to the resource through VRM classification as the lands would no longer be classified as their original class but as Class I, which prevents any changes to the visual landscape.

Lands listed as Class II can modify, limit, or prevent saleable mineral exploration and development as these lands will need to retain the existing character of the landscape. Exploration activities tend to be temporary, less impactive, and may be positioned to limit the visual impact. Class III lands have less of an impact as saleable mineral development as the lands need to partially retain the existing character of the landscape. Class III does not impact or hinder exploration activities due to their temporary nature. Class IV allows for surface-disturbing activity and is the least restrictive. Surface use stipulations under some VRM classes could cause operators to redesign or cancel operational plans, resulting in increased costs for all mineral activities. Each of the alternatives will address how each is impacted by the four VRM classes.

4.3.3.4.4.12.2. Alternative 1

Lands designated as VRM Class I account for approximately 2 percent of the planning area. These lands are closed to saleable mineral resources, which is a major impact.

Class II lands account for approximately 29 percent in the planning area. Most saleable mineral actions will be avoided in Class II due to identifiable visible changes to landform and to visual landscape. The impact of Class II would be moderate to major to saleable mineral exploration and development. The appropriate BMPs would be incorporated into permitting operations in Class II lands.

Class III lands account for approximately 52 percent of the planning area, which would have a low to moderate impact. All impacts related to saleable mineral activities would be analyzed during scoping. The appropriate BMPs will be incorporated into permitting the operation.

Class IV lands, accounting for approximately 17 percent, have low impacts to saleable mineral resources because VRM doesn't limit activity or disturbance in its effect to the visual landscape. The majority of these lands are in the alluvial valleys and many of the hard rock mining districts throughout the district and would be the primary locations for saleable mineral developments.

4.3.3.4.4.12.3. Alternative 2

Lands designated as VRM Class I account for approximately 12 percent of the planning area. The increase of nearly 10 percent under this alternative is attributed to incorporating the lands with wilderness characteristics, which need to maintain wilderness characteristics but do not go through congressional designation. These lands are closed to saleable mineral resources, which is a major impact.

Class II lands account for approximately 33 percent in the planning area. Most saleable mineral actions will be avoided in Class II due to identifiable visible changes to landform and to visual landscape. The impact of Class II would be moderate to major to saleable mineral exploration and development. The appropriate BMPs would be incorporated into permitting operations in Class II lands.

Class III lands account for approximately 27 percent of the planning area, which would have a low to moderate impact. All impacts related to saleable mineral activities would be analyzed during scoping, and the appropriate BMPs will be incorporated into permitting the operation. Lands with Class III with historic and active mining operations include but are not limited to Crescent Peak region; northern flank of Pahrump; Spirit Mountain area; and Bird Spring Valley.

Class IV lands, accounting for approximately 28 percent, have low impacts to saleable mineral resources because VRM doesn't limit activity or disturbance in its effect to the visual landscape. The majority of these lands are in the alluvial valleys and many of the hard rock mining districts throughout the district and would be the primary locations for saleable mineral developments.

4.3.3.4.4.12.4. Alternative 3

Lands designated as VRM Class I account for approximately 7 percent of the planning area. These lands are closed to saleable mineral resources, which is a major impact.

Class II lands account for approximately 37 percent in the planning area. Most saleable mineral actions will be avoided in Class II due to identifiable visible changes to landform and to visual landscape. The impact of Class II would be moderate to major to saleable mineral exploration and development. The appropriate BMPs would be incorporated into permitting operations in Class II lands.

Class III lands account for approximately 27 percent of the planning area, which would have a low to moderate impact. All impacts related to saleable mineral activities would be analyzed during scoping and the appropriate BMPs will be incorporated into permitting the operation. Lands with Class III with historic and active mining operations include but are not limited to Crescent Peak region; northern flank of Pahrump; Spirit Mountain area; and Bird Spring Valley.

Class IV lands, accounting for approximately 28 percent, have low impacts to saleable mineral resources because VRM doesn't limit activity or disturbance in its effect to the visual landscape. The majority of these lands are in the alluvial valleys and many of the hard rock mining districts throughout the district and would be the primary locations for saleable mineral developments.

4.3.3.4.4.12.5. Alternative 4

Lands designated as VRM Class I account for approximately 7 percent of the planning area. These lands are closed to saleable mineral resources, which is a major impact.

Class II lands account for approximately 29 percent in the planning area. Most saleable mineral actions will be avoided in Class II due to identifiable visible changes to landform and to visual landscape. The impact of Class II would be moderate to major to saleable mineral exploration and development. The appropriate BMPs would be incorporated into permitting these operations.

Class III lands account for approximately 27 percent of the planning area, which would have a low to moderate impact. All impacts related to saleable mineral activities would be analyzed during scoping and the appropriate BMPs will be incorporated into permitting the operation. Lands with Class III with active mining operations include but are not limited to the northern flank of Pahrump and the Spirit Mountain area.

Class IV lands, accounting for approximately 37 percent, have low impacts to saleable mineral resources because VRM doesn't limit activity or disturbance in its effect to the visual landscape. The majority of these lands are in the alluvial valleys and many of the hard rock mining districts throughout the district and would the primary locations for saleable mineral developments.

4.3.3.4.4.13. Lands with Wilderness Characteristics Impacts on Saleable Minerals

4.3.3.4.4.13.1. Impacts Common to All Alternatives

There are no impacts common to all alternatives.

4.3.3.4.4.13.2. Alternative 1

Lands with wilderness characteristics do not exist in the 1998 RMP.

4.3.3.4.4.13.3. Alternative 2

Lands with wilderness characteristics have a major impact on saleable mineral resources under this alternative and accounts for 147,697 acres in the district. Lands with wilderness characteristics need to maintain their current level of wilderness characteristics without being impaired. Lands with wilderness characteristics are designated at the land-use planning stage and given the same management directives as wilderness lands without congressional action. All saleable mineral resource development is closed within lands with wilderness characteristics. Under this alternative, 15 lands with wilderness characteristics are being proposed. Five of the lands with wilderness characteristics are inside existing ACECs that are currently closed to saleable mineral resource development. The remaining 10 account for approximately 118,000 acres on lands currently open to saleable mineral resource development. Under this alternative, those lands would be closed to saleable mineral resources. The exceptions are the McCullough parcels, which would have a significant impact to saleable resources as those lands would impact

existing operations, both on public and private lands, and encroach existing community pits. The loss of the lands, outside of the McCullough parcels, would have a moderate impact to saleable mineral resources in the planning area.

4.3.3.4.4.13.4. Alternative 3

Lands with wilderness characteristics have a negligible impact on saleable mineral resources under this alternative and account for approximately 35,851 acres in the district. Lands with wilderness characteristics need to maintain their current level of wilderness characteristics without being impaired. Lands with wilderness characteristics are designated at the land-use planning stage and given the same management directives as wilderness lands without congressional action. All saleable mineral resource development is closed within lands with wilderness characteristics. Under this alternative, eight lands with wilderness characteristics are being proposed. Six of the lands with wilderness characteristics are inside existing ACECs that are currently closed to saleable mineral resource development. The remaining two account for approximately 6,200 acres on lands currently open to saleable mineral resource development. Under this alternative, those lands would be closed to saleable mineral resources, but these lands with wilderness characteristics are small and far from existing markets. The loss of these lands would have a minor impact on saleable mineral resource development.

4.3.3.4.4.13.5. Alternative 4

Lands with wilderness characteristics have no impact on saleable mineral resources under this alternative and account for approximately 29,840 acres in the district. Lands with wilderness characteristics need to maintain their current level of wilderness characteristics without being impaired. Lands with wilderness characteristics are designated at the land-use planning stage and given the same management directives as wilderness lands without congressional action. All saleable mineral resource development is closed within lands with wilderness characteristics. Under this alternative, six lands with wilderness characteristics are being proposed. All six of the lands with wilderness characteristics are inside existing ACECs that are currently closed to saleable mineral resource development. The loss of these lands would have no impact on saleable mineral resources.

4.3.3.4.5. Resource Uses

4.3.3.4.5.1. Forestry and Woodland Products Impacts on Saleable Minerals

4.3.3.4.5.1.1. Impacts Common to All Alternatives

Forestry and woodland management has a negligible impact on saleable mineral resources. Salvage of cacti and yucca as it pertains to forestry and woodland products is currently addressed under the Integrated Vegetation under the Resources section of this mineral commodity.

4.3.3.4.5.1.2. Alternatives 1 through 4

There are no additional impacts to saleable mineral development.

4.3.3.4.5.2. Livestock Grazing Impacts on Saleable Minerals

4.3.3.4.5.2.1. Impacts Common to All Alternatives

Livestock grazing management has no impact on saleable mineral resources.

4.3.3.4.5.2.2. Alternatives 1 through 4

There are no additional impacts to saleable mineral development.

4.3.3.4.5.3. Minerals

4.3.3.4.5.3.1. Saleable Minerals

Benefits of the saleable minerals program were addressed under the resource summary at the beginning of this subsection.

4.3.3.4.5.4. Recreation Impacts on Saleable Minerals

4.3.3.4.5.4.1. Impacts Common to All Alternatives

There are no impacts common to all alternatives.

4.3.3.4.5.4.2. Alternative 1

Recreation management actions have a low impact on saleable mineral resource exploration and development. The existing SRMAs are open to saleable mineral resources with one exception; the Nellis Dunes SRMA. The Nellis Dunes SRMA is an extensively used recreation area near the Speedway Community Pit, northeast of the Las Vegas Valley. It is approximately 10,865 acres and open to saleable mineral resources. No development of saleable minerals has occurred within the Nellis Dunes SRMA due to the proximity of the Speedway Community Pit. Nellis Dunes is better suited for recreational uses over saleable mineral development. Closing these lands to saleable mineral resources will have a negligible impact.

4.3.3.4.5.4.3. Alternatives 2 through 4

Recreation management actions have negligible to moderate impacts to saleable mineral development.

There are negligible impacts to saleable mineral resources due to the closure created by ROWs granted to the BLM for recreational uses. These ROWs will enhance R&I values and provide a way to address specific recreational needs in a region. These ROWs are small, less than 100 acres, and typically confined to previously disturbed areas commonly used for recreational activities.

Management of recreational resources in the planning area have a negligible impact on saleable mineral resources where SRMAs and ERMAs will remain open to this resource. There are active saleable mineral operations in most of the SRMAs and ERMAs. Where there is a saleable mineral operation within a SRMA or ERMA, routes exist for recreationists that bypass the operation.

Management of recreational resources in the planning area has a low impact on saleable mineral resource where SRMAs are closed to this resource. The Logandale North RMZ and Nellis Dunes SRMA contain approximately 28,694 acres. The closure of these lands has a low impact on saleable minerals as the commodity occurs throughout the district and other nearby sources exist.

4.3.3.4.5.5. Travel and Transportation Impacts on Saleable Minerals

4.3.3.4.5.5.1. Impacts Common to All Alternatives

Travel management has negligible impacts to saleable mineral resource development in the planning area. Impacts from travel and transportation would involve access roads and routes associated with mining operations and exploration activities. Minerals will provide the necessary input during the development of travel management plans to mitigate any impacts.

4.3.3.4.5.5.2. Alternatives 1 through 4

There are no additional impacts to saleable mineral development.

4.3.3.4.5.6. Lands and Realty Impacts on Saleable Minerals

Lands and realty management has been subdivided into four categories under this section. Each category has its own impacts to saleable mineral resources. Many of the impacts are addressed during scoping for the individual action.

The broad scope of lands and realty management impacts saleable mineral resources, but these impacts tend to be site specific. There is no definable limit to the degree of the impact, and many of them can be addressed during project scoping.

4.3.3.4.5.6.1. Land Tenure (Disposals and Acquisitions) Impacts on Saleable Minerals

4.3.3.4.5.6.1.1. Impacts Common to All Alternatives

Land tenure management in the planning area has a low impact on saleable mineral resource exploration and development as the resource is heavily used for urban growth, development, and infrastructure. The majority of the disposal boundaries in the district are open to saleable mineral development to support community growth and material needs. Smaller disposal areas in the district are closed to saleable mineral development but are within the vicinity of existing, developable saleable mineral resources that can support those communities. Additionally, the disposal areas closed to saleable minerals will still allow for the removal of excess saleable mineral resources associated with other permitted actions and free-use permits.

Management of acquisitions in the planning area have a negligible impact on saleable mineral resource exploration and development. Acquisitions are analyzed on a case-by-case basis. Conflicts will be addressed during scoping.

4.3.3.4.5.6.1.2. Alternatives 1 through 4

There are no additional impacts to saleable mineral development.

4.3.3.4.5.6.2. Land-Use Authorizations (Right-of-Ways, Leases, Permits) Impacts on Saleable Minerals

4.3.3.4.5.6.2.1. Impacts Common to All Alternatives

Management of land-use authorizations in the planning area have a low impact on saleable mineral resource exploration and development. In cases where there are authorized existing saleable mineral operations and a proposed overlying ROW, the ROW applicant will need to make the appropriate adjustments to ensure conflicts are resolved. Saleable mineral operations that would occupy lands encumbered by an existing ROW would require the mineral operation to adjust its location or work out arrangements with the ROW holder to ensure that any conflicts are resolved. When ROWs are issued, excess saleable mineral resources will be disposed of as needed.

4.3.3.4.5.6.2.2. Alternatives 1 through 4

There are no additional impacts to saleable mineral development.

4.3.3.4.5.6.3. Renewable Energy Impacts on Saleable Minerals

4.3.3.4.5.6.3.1. Impacts Common to All Alternatives

Wind energy development has a low impact to saleable mineral resources in the planning area. Wind energy development right-of-ways are similar to linear type right-of-ways with turbines developed in arrays that branch out from access roads. Wind turbines can be micro-sited to avoid potential impacts to other resources during the planing process, that is, the position of each turbine can be adjusted. Adjusting tower locations can lower or remove the impact of wind energy development to the resource. Currently, there is one large-scale wind energy project in the planning area, Searchlight Wind. Impacts to saleable mineral resources were addressed in the EIS for the project.

Geothermal energy development has a negligible impact to saleable mineral resources in the planning area. The two forms of geothermal energy development, power generation through power plants and direct-use, have a small footprint generally less than 20 acres in size. There has been interest in the Crater Flats area in the district, presumably for power generation purposes. Direct-use geothermal energy developments are small-scale and site-specific developments that provide energy for single structures. The impacts associated with geothermal can be addressed during scoping.

4.3.3.4.5.6.3.2. Alternative 1

Solar energy development has a moderate to major impact to saleable mineral resources in the planning area. The Solar Programmatic Environmental Impact Statement (PEIS) contains guidance for the development of large-scale solar projects by splitting lands into three categories: solar energy zones (SEZs), variance, and exclusion. There are two existing SEZs in the planning area that cover approximately 14,128 acres. Saleable minerals remain open to development in a SEZ as long as they do not impact the future development of those lands for solar energy development. In addition to the development of SEZs, grandfathered solar projects will continue to be processed. Solar energy plants are single-use, large-scale developments. When these

projects are constructed, all lands under them will be inaccessible to saleable mineral development for as long as the solar energy plant exists. Some of these variance lands may contain high-quality saleable mineral resources. If only SEZs and grandfathered solar projects are developed the impacts to saleable mineral resources will be moderate. Variance lands are those where solar energy development can occur provided the applicant can justify the need to use those lands over SEZs. If variance lands are developed in addition to SEZs and grandfathered solar projects, impacts to saleable mineral resources will increase to major.

4.3.3.4.5.6.3.3. Alternative 2

Solar energy development has a moderate impact to saleable mineral resources in the planning area. The Solar PEIS contains guidance for the development of large-scale solar projects by splitting lands into three categories: solar energy zones (SEZs), variance, and exclusion. There are two existing SEZs in the planning area that cover approximately 14,128 acres. Saleable minerals remain open to development in a SEZ as long as they do not impact the future development of those lands for solar energy development. In addition to the development of SEZs, grandfathered solar projects will continue to be processed. Solar energy plants are single-use, large-scale developments. When these projects are constructed, all lands under them will be inaccessible to saleable mineral development for as long as the solar energy plant exists. Under this alternative, there are significantly fewer acres of variance lands.

4.3.3.4.5.6.3.4. Alternative 3

Solar energy development has a moderate impact to saleable mineral resources in the planning area. The Solar PEIS contains guidance for the development of large-scale solar projects by splitting lands into three categories: solar energy zones (SEZs), variance, and exclusion. There would be eight SEZs in the planning area that cover approximately 39,113 acres. Saleable minerals remain open to development in a SEZ as long as they do not impact the future development of those lands for solar energy development. Grandfathered solar projects will continue to be processed. Solar energy plants are single-use, large-scale developments. When these projects are constructed, all lands under them will be inaccessible to saleable mineral development for as long as the solar energy plant exists. Under this alternative, there are significantly fewer acres of variance lands.

4.3.3.4.5.6.3.5. Alternative 4

Solar energy development has a major impact to saleable mineral resources in the planning area. The Solar PEIS contains guidance for the development of large scale solar projects by splitting lands into three categories: SEZs, variance, and exclusion. There are two existing SEZs and four new proposed SEZs in the planning area that cover approximately 168,255 acres. Three of the SEZs are located in Nye County; three of the SEZs are in Clark County. The new SEZs are located along major transportation routes that may be ideal for the development of saleable mineral resources, particularly in situ limestone which tends to be less abundant in Clark County then other construction grade saleable mineral resources. The greatest expense to saleable mineral operators is transportation, making the availability of saleable mineral resources close to transportation routes and the communities they will serve important. Saleable minerals remain open to development in a SEZ as long as they do not impact the future development of those lands for solar energy development. Grandfathered solar projects will continue to be processed. Solar energy plants are single-use, large-scale developments. When these projects

are constructed, all lands under them will be inaccessible to saleable mineral development for as long as the solar energy plant exists.

4.3.3.4.5.6.4. Utility Corridors Impacts on Saleable Minerals

4.3.3.4.5.6.4.1. Impacts Common to All Alternatives

Utility corridor management in the planning area has a negligible impact on saleable mineral resource exploration and development. The designation of utility corridors does not pose an immediate impact to saleable resources as the purpose of these designations is to focus linear developments into a confined location. Saleable mineral development would require the need to dispose of excess saleable mineral resources associated with permitted actions and right-of-ways.

4.3.3.4.5.6.4.2. Alternatives 1 through 4

There are no additional impacts to saleable mineral development.

4.3.3.4.6. Special Designations

4.3.3.4.6.1. Areas of Critical Environmental Concern Impacts on Saleable Minerals

4.3.3.4.6.1.1. Impacts Common to All Alternatives

ACEC management actions have moderate to major impacts to saleable mineral exploration and development. There are 23 existing ACECs accounting for approximately 1,014,301 acres in the planning area. In 1998, these ACECs were closed for saleable mineral exploration and development. A mineral potential report, the Ludington Report, was done by the USGS (Ludington 2006) on all of the district's existing ACECs. Two of the ACECs in that report are outside the planning area of this RMP and occur within the boundaries of the district's national conservation areas; therefore, no further discussion of those resource areas is warranted.

The results of the Ludington Report (2006) documented that the majority of the remaining ACECs have potential for mineral resource development, see Table 4.20, "Summary of the saleable mineral resource findings within the Ludington (2006) Mineral Potential Report on the District's ACECs" (p. 1096). The majority of these ACECs have varying potentials for saleable mineral development.

Table 4.20. Summary of the saleable mineral resource findings within the Ludington (2006) Mineral Potential Report on the District's ACECs[ab]

ACEC	High potential		Moderate potential		Low potential	
	Ag	S&G	Ag	S&G	Ag	S&G
Amargosa Mesquite		X				X
Arden						
Arrow Canyon	X		X	X		
Ash Meadows	X	X	X		X	X
Big Dune				X	X	X
Coyote Springs	X	X			X	X
Crescent Townsite			X	X		

ACEC	High potential		Moderate potential		Low potential	
	Ag	S&G	Ag	S&G	Ag	S&G
Devil's Throat		X			X	
Gold Butte, Part A	X	X	X	X	X	X
Gold Butte, Part B	X	X	X	X	X	X
Gold Butte Townsite		X	X			
Hidden Valley			X		X	X
Keyhole Canyon	X	X	X	X	X	X
Mormon Mesa	X	X	X	X	X	X
Piute/Eldorado						
Rainbow Gardens	X	X	X		X	
Red Rock Spring		X			X	X
River Mountains	X	X	X		X	X
Stump Spring						X
Virgin Mountains	X	X	X	X	X	X
Virgin River		X			X	X
Whitney Pocket		X	X	X	X	X

[a]This table does not include the two ACECs inside the NCAs: Bird Spring and Sloan Rock Art.
[b]Abbreviations: Ag: Aggregate, S&G: Sand & Gravel

4.3.3.4.6.1.2. Alternative 1

ACEC management actions have moderate impacts to saleable mineral development as the lands are closed to resource development. This designation has impacted saleable mineral resources with the loss of over a third of planning area. The 1998 RMP estimated that less than 5,000 acres of disturbance was associated with saleable mineral development in the planning area.

Under this alternative, 100 percent of the ACECs are closed to saleable mineral development with the exception of the disposal of excess materials associated with authorized activities and FUPs. Saleable mineral resources constitute the largest mineral resource in the planning area in both location and volume with the majority of the district having moderate to high potential for its development. The majority of the ACECs and their associated acreages are beyond the transportable range to make these mineral deposits economical. The loss of those lands to saleable mineral exploration and development has reduced the total number of acres available for their development and created a moderate impact to the resource.

4.3.3.4.6.1.3. Alternative 2

ACEC management actions have major impacts to saleable mineral development. Under this alternative, there are 44 existing and proposed ACECs that account for approximately 1,444,548 acres of the public lands administered by the two field offices. This is an increase of 21 ACECs when compared to Alternative 1 and a 43 percent increase in acres closed to saleable mineral development, see Table 4.21, "Comparison of the ACECs Between Alternative 2 and Alternative 1" (p. 1098). The majority of the ACECs and their associated acreages make much of the district's remaining saleable resources beyond the transportable range to make these deposits economical. Therefore, the loss of these lands across the district creates a major impact to saleable mineral resources by removing a substantial number of acres available for development and the economic impact would be high as many communities are sustained by mining incomes. Under this alternative, the existing Arden and Crescent Townsite ACECs and their associated mineral closures would be released.

Table 4.21. Comparison of the ACECs Between Alternative 2 and Alternative 1

Alternative 1		
Total ACECs	Total acreage	Total percentage of district
23	1,014,301	33 percent
Alternative 2		
Total ACECs	Total acreage	Total percentage of district
44	1,444,548	47 percent

Under this alternative, all of the ACECs are closed to saleable mineral development with the exception of the disposal of excess materials associated with authorized activities and FUPs. The proposed ACECs will require some of the authorized community pits to have their boundaries modified and adjusted out of the new ACECs. As previously noted, saleable mineral resource development is a significant contributor to the local economy, particularly in Clark County and Pahrump, and the revenues generated from those sales via the contracts associated with operations feed back into the federal treasury. The only saleable mineral resource activity that is allowed in the ACECs is related to the disposal of excess mineral materials or free-use permits associated with other (non-mineral) BLM-permitted activities or trespasses.

This resource is the most heavily used and developed mineral commodity in the Las Vegas Field Office. The saleable minerals mined from the community pits are used in countless construction and infrastructure projects throughout Clark County. These sources need to be close to the markets they serve. Mesquite is surrounded by ACECs, and if mineable material is exhausted from the existing community pit 1) there will be little to no room to move or expand the search for those resources; and 2) transportation costs for material from Las Vegas would greatly increase the costs of any development. The proposed ACECs along the southern margin of Las Vegas Valley would limit material needs for urban growth and development and could impact Henderson directly. The Sloan Hills area was intended to be an alternate location of high quality limestone for urban and infrastructure uses on par with that of the Lone Mountain Community Pit and would have serviced the southern Las Vegas Valley and Henderson for decades. The decision terminating the proposed sales contracts puts added pressure on the remaining community pits to provide material for the valley area. The proposed Bird Spring ACEC, directly south of the valley, abuts the SNPLMA disposal boundary and under this alternative is closed to saleable mineral development that future urban needs for material would be required to look elsewhere in uneconomical regions for necessary material and those added costs will transfer to the communities paying for the improvements or developments, driving costs higher.

The Silver State South decision made the Ivanpah ACEC open to saleable mineral development on 1) a case-by-case basis for protection of health and human safety and protection of resource values; and 2) allows existing operations to maintain their activity.

Pahrump is serviced by one community pit, and the community would become nearly landlocked by ACECs, which would leave no place to look for needed material if the existing pit is exhausted. The remaining lands available to saleable resources may be sufficient to support the needs of their respective communities. The impact of the ACECs to saleable mineral development in the Pahrump Field Office has the potential to range from minor to moderate depending on the region within the county and would be noticeable to the local economies and communities that rely on mining.

4.3.3.4.6.1.4. Alternative 3

ACEC management actions have major impacts to saleable mineral development. The ACECs under this alternative account for approximately 1,292,216 acres of the public lands administered by the two field offices. When compared to the ACEC acreages associated with Alternative 1, this is an increase of approximately 42 percent (see Table 4.22, "Comparison of the ACECs Between Alternative 3 and Alternative 1" (p. 1099). Under this alternative, the existing Arden and Crescent Townsite ACECs and their associated mineral closures would be released. There are some additions and boundary adjustments to some of the existing ACECs that account for the majority of the additional acres under this alternative. The majority of the ACECs, along with their associated acreages, make much of the district's remaining saleable resource beyond the transportable range to make these deposits economical. Therefore, the loss of these lands across the district significantly impacts saleable mineral resources by removing a substantial number of acres available for development and the economic impact would be high as many communities are sustained by mining incomes or directly use the material.

Table 4.22. Comparison of the ACECs Between Alternative 3 and Alternative 1

Alternative 1		
Total ACECs	Total acreage	Total percentage of district
23	1,014,301	33 percent
Alternative 3		
Total ACECs	Total acreage	Total percentage of district
41	1,292,216	42 percent

The majority of the new ACECs are closed to saleable mineral development. As previously noted in Chapter 3, the resource potential for saleable minerals has been historically low in the district. As previously noted, saleable mineral resource development is a significant contributor to the local economy, particularly in Clark County and Pahrump, and the revenues generated from those sales via the contracts associated with operations feed back into the federal treasury. The only saleable mineral resource activity that is allowed in many of the ACECs is the related to the disposal of excess mineral materials or free-use permits associated with other (non-mineral) BLM-permitted activities or trespasses.

Saleable minerals are used in countless construction and infrastructure projects throughout Clark County. These sources need to be close to the markets that they serve. The proposed ACECs will sever the mineable areas within those markets. Mesquite could become the most impacted because it is surrounded by ACECs, and if mineable saleable mineral material is exhausted from the existing community pit 1) there will be little to no room to move or expand the search for those resources; and 2) transportation costs for material from Las Vegas would greatly increase the costs of any development that would be needed. The proposed ACECs along the southern margin of Las Vegas Valley would limit material needs for urban growth and development and could impact Henderson directly. The Sloan Hills area was intended to be an alternate location of high quality limestone for urban and infrastructure uses on par with that of the Lone Mountain Community Pit and would have serviced southern Las Vegas Valley and Henderson for decades. The decision terminating the proposed sales contracts does put added pressure on the remaining community pits to provide material for the valley area. Unlike Alternative 2, the proposed Bird Spring ACEC, directly south of the valley, abutting the SNPLMA disposal boundary is open to saleable mineral development under this alternative and would allow for future exploration and development of resources as urban needs increase. The Silver State South decision also made the Ivanpah ACEC open to saleable mineral development on 1) a case-by-case basis for protection of

health and human safety and protection of resource values; and 2) allow existing operations to maintain their activity. This decision retains the right to develop material from existing locations near Jean. The impact of the ACECs to saleable mineral development in Clark County has the potential to be substantial and negatively impact the economy of the county.

With smaller urban centers in Nye County, the impacts of the ACECs would less than what is in Clark County. The community of Pahrump would be impacted in a way similar to those described previously for Mesquite. The community of Pahrump is serviced by one community pit and the community would become nearly landlocked by ACECs that there would be no place to look for needed material if the existing pit is exhausted. The remaining lands available to saleable resources may be sufficient to support the needs of their respective communities. The impact of the ACECs to saleable mineral development in the Pahrump Field Office has the potential to range between minor to moderate impacts depending on the region within the county and would be noticeable to the local economies and communities that rely on mining.

4.3.3.4.6.1.5. Alternative 4

ACEC management actions have moderate impacts to saleable mineral development. Under this alternative, there are 25 existing and proposed ACECs which account for 1,021,365 acres of the public lands administered by the two field offices. This is a negligible increase to what is currently designated, see Table 4.23, "Comparison of the ACECs Between Alternative 4 and Alternative 1" (p. 1100). Under this alternative, the existing Arden and Crescent Townsite ACECs and their associated mineral closures would be released. There are four new proposed ACECs that would be designated under this alternative: Grapevine Spring, Jean Lake, Perkins Ranch, and Stuart Ranch ACECs would provide a small increase in the designated acreage.

Table 4.23. Comparison of the ACECs Between Alternative 4 and Alternative 1

Alternative 1		
Total ACECs	Total acreage	Total percentage of district
23	1,014,301	33 percent
Alternative 4		
Total ACECs	Total acreage	Total percentage of district
25	1,021,365	33 percent

Under this alternative, all of the designated acres of ACECs would be closed to saleable mineral development. This closure is a minimal increase in comparison to the existing environment (Alternative 1). Some of the proposed ACECs will require some of the authorized community pits to have their boundaries modified and adjusted to be outside of the new ACECs. As previously noted, saleable mineral resource development is a significant contributor to the local economy, and the revenues generated from those sales via the contracts associated with operations feed back into the federal treasury. The only saleable mineral resource activity that is allowed in the ACECs is the related to the disposal of excess mineral materials or free-use permits associated with other (non-mineral) BLM-permitted activities or trespasses.

This resource is the most heavily used and developed mineral commodity in that field office. Saleable minerals are used in countless construction and infrastructure projects throughout Clark County. These sources need to be close to the markets that they serve. Mesquite could become the most impacted as the community is surrounded by ACECs, and if mineable material is exhausted from the existing community pit 1) there will be little to no room to move or expand in search for those resources; and 2) transportation cost for material from Las Vegas would greatly increase

the costs of any development. The proposed Jean Lake ACEC will require the reduction or modification of the North Jean Community Pit to remove portions of the pit that would impact the sensitive resources present in the ACEC. As per the Silver State South decision, the Ivanpah ACEC is open to saleable mineral development on 1) a case-by-case basis for protection of health and human safety and protection of resource values; and 2) allow existing operations to maintain their activity. This decision retains the right to develop material from existing locations near Jean. The impact of the ACECs to saleable mineral development in Clark County has the potential to be substantial and negatively impact the economy.

With smaller urban centers in Nye County, the impacts of the ACECs would be less than what is in Clark County. None of the proposed ACECs in Nye County would pose an issue for the existing community pits or saleable operations. The impact of the ACECs to saleable mineral development in the PFO is considered to be minimal.

4.3.3.4.6.2. National Trails Impacts on Saleable Minerals

4.3.3.4.6.2.1. Impacts Common to All Alternatives

There are no impacts common to all alternatives.

4.3.3.4.6.2.2. Alternative 1

National trail management actions have a negligible impact to saleable mineral development. The Old Spanish Trail (OST) is the only national trail in the planning area. Currently, there are no specific management prescriptions for the OST in the district that would directly impact mineral resource development. Saleable minerals can avoid these lands and impacts would be addressed on a case-by-case basis as projects are submitted and evaluated.

4.3.3.4.6.2.3. Alternatives 2 and 3

The Old Spanish Trail is the only national trail in the planning area. Under this alternative, it has been designated as an ACEC.

4.3.3.4.6.2.4. Alternative 4

National trail management actions have a negligible impact to saleable mineral development. The Old Spanish Trail (OST) is the only national trail in the planning area. Under this alternative, the OST will not be designated as an ACEC and will be managed under prescriptions addressed under National Trails, see Chapter 2. As noted under Alternative 1, saleable minerals can avoid these lands, and impacts would be addressed on a case-by-case basis as projects are submitted and evaluated.

4.3.3.4.6.3. Wild and Scenic Rivers Impacts on Saleable Minerals

4.3.3.4.6.3.1. Impacts Common to All Alternatives

There are no impacts common to all alternatives.

4.3.3.4.6.3.2. Alternative 1

Wild and scenic river management has a negligible impact to saleable mineral resources in the planning area. Seven segments of river were found eligible and are awaiting a suitability determination. The 1998 RMP only listed the Virgin River, within the Virgin River ACEC, as eligible, but no additional action was taken. As part of the update to this RMP, a new eligibility determination was made with the results incorporated under this alternative as the existing condition on public lands. Six additional river segments were identified as eligible; therefore, they are included under this alternative. The 1998 RMP should have closed those lands to saleable mineral resources.

4.3.3.4.6.3.3. Alternative 2

Wild and scenic river management has a negligible impact to saleable mineral resources in the planning area. Management for wild and scenic rivers would close the lands within the buffer to saleable mineral resources. However, under this alternative, saleable mineral resources would be disposed of in cases where excess saleable mineral resources associated with permitted actions and approved free-use permits exist. Under this alternative, there are seven river segments that were found eligible and suitable for wild, scenic, or recreational qualities. The majority of those lands are associated with recreational rivers.

4.3.3.4.6.3.4. Alternative 3

Wild and scenic river management has no impact to saleable mineral resources in the planning area. One segment of river was found eligible and classified as recreational. The three-mile segment of the Meadow Valley Wash is located within the Mormon Mesa ACEC, which is closed to saleable mineral development. The wash and its associated management do not change the existing condition of the lands due to the overlapping ACEC.

4.3.3.4.6.3.5. Alternative 4

Wild and scenic river management have negligible impact to saleable mineral resources in the planning area. There are no eligible or suitable river segments under this alternative.

4.3.3.4.6.4. Wilderness Impacts on Saleable Minerals

4.3.3.4.6.4.1. Impacts Common to All Alternatives

Wilderness management actions have a major impact to saleable mineral development. Saleable mineral resources are impacted by wilderness and their management by limiting the availability of lands for mineral development. The 10 designated wildernesses account for approximately 183,000 acres within the planning area. Wilderness lands are designated by Congress and are closed to saleable mineral development.

4.3.3.4.6.4.2. Alternatives 1 through 4

There are no additional impacts to saleable mineral development.

4.3.3.4.6.5. Wilderness Study Areas Impacts on Saleable Minerals

4.3.3.4.6.5.1. Impacts Common to All Alternatives

Wilderness study area management actions have a major impact to saleable mineral development. These lands are also designated by Congress as lands awaiting final action by Congress. The majority of the WSA acreage is located within existing ACECs. Like wilderness, WSAs are closed to saleable mineral development. These lands remain open to location but are subject to non-impairment rules. In the case of congressional release of these lands, these lands could become open to all forms of saleable mineral development unless another special designation, i.e. ACECs with specific saleable mineral development protocols, overlays those lands.

4.3.3.4.6.5.2. Alternatives 1 through 4

There are no additional impacts to saleable mineral development.

4.3.3.4.7. Cumulative Impacts on Saleable Mineral Resources

4.3.3.4.7.1. Past and Present Actions/Impacts

The closure of the ACECs has had a major negative impact on saleable mineral development as it pushes resources farther and farther from their respective servicing communities. This in turn drives up the costs of necessary construction and infrastructure needs that are passed on down to the consumer (the public).

4.3.3.4.7.2. Reasonable Foreseeable Actions

Saleable mineral resources are the most extensive mineral commodity in the planning area, and the district is the largest saleable program in the BLM. Urban growth and infrastructure needs drive how and where these resources can be developed.

4.3.3.4.7.3. Cumulative Impact

Table 4.24. Comparison of Acreages for All Alternatives

Saleable mineral categories	Alternative 1	Alternative 2	Alternative 3	Alternative 4
	Acres	Acres	Acres	Acres
Ranking of alternative	1	4	3	2
Open	2,131,283	1,604,225	1,858,359	2,032,485
Closed	980,048	1,507,105	1,252,971	1,079,495

4.3.3.4.7.3.1. Alternative 1

This alternative has least impacts on saleable mineral resource development and leaves the most land open. This alternative leaves the majority of the planning area open to saleable mineral development and would allow for the growth of the resource as needed to maintain the support and service they provide to their respective communities. The cumulative impact of large undeveloped disposal areas and ACECs has impacted the resource the most under this alternative.

4.3.3.4.7.3.2. Alternative 2

This alternative would have most impacts on saleable mineral exploration and development. Over 48 percent of the planning area is closed to saleable mineral resource development. The designations (ACECs, lands with wilderness characteristics, etc.) strain existing resource developments and limit future growth that will be needed to maintain the communities that these developments serve. These designations push sources farther away from the markets they are servicing, making the resource less economical and potentially increasing the price for end users.

4.3.3.4.7.3.3. Alternative 3

This is the second most restrictive alternative to saleable mineral exploration and development. Several of the designations (ACECs, lands with wilderness characteristics, etc.) strain existing resource developments and limit future growth that will be needed to maintain the communities these developments serve. These designations push sources farther away from the markets they are servicing, making the resource less economical and potentially increasing the price for end users.

4.3.3.4.7.3.4. Alternative 4

This is the second most preferred alternative for saleable mineral exploration and development. Several of the designations (ACECs, lands with wilderness characteristics, etc.) will strain existing resource developments and limit future growth that will be needed to maintain the communities these developments serve. These designations push sources farther away from the markets they are servicing, making the resource less economical and potentially increasing the price for end users.

4.3.4. Recreation

4.3.4.1. Summary

Impacts from alternative strategies for management of recreation and visitor services ultimately are about trade-offs in the potential outcomes experienced by visitors. Outcomes range from individual benefits (such as developing outdoor skills and abilities, greater self-reliance, and improved physical fitness) to group and community benefits (such as greater appreciation of cultural heritage, less juvenile delinquency, and enhanced lifestyle), and are produced by visitor experiences during recreation activities. The BLM provides settings in response to demand for recreation experiences and the benefits such experiences generate. Trade-offs in potential outcomes may be inferred from (a) differences in opportunities and experiences anticipated to result from alternative management strategies; (b) the objectives established to achieve those management strategies; and (c) the varying setting characteristics designed to provide the physical, social, and administrative environment in which recreation opportunities are offered and outcomes produced.

Impacts on recreation resources from other resources, such as livestock grazing, designation of multiuse utility corridors, and wildlife habitat management, also affect visitor outcomes by influencing the settings in which recreation occurs. Setting characteristics may range from the most primitive and undisturbed natural landscape where encounters with other visitors are rare (back country) to areas of highly developed sites that include paved access and parking, visitor centers, and other amenities, and where encounters with other visitors are commonplace (community interface). A description of prescribed setting character is provided in Appendix F (p. 1805).

In the SNDO, more opportunities for beneficial outcomes would be produced through implementation of Alternatives 2 and 3 for the management of other resources, as well as recreation resources — particularly for benefits such as increased individual and community awareness of cultural heritage resources, enjoyment of natural landscapes, enjoying exploration and risk-taking, and appreciating easy access to recreation opportunities. Under these alternatives, allocations for management of other resources would be complemented by management of the recreation resource as SRMAs and ERMAs.

Implementation of management actions for recreation resources under Alternatives 2, 3, or 4 would produce outcomes in slightly varying degrees based on relative proportions of front country and back country settings. Sharply contrasting opportunities for beneficial outcomes would be produced by implementation of Alternatives 2 and 3 versus implementation of Alternative 4. Alternatives 2 and 3 would produce more opportunities for beneficial outcomes derived from development and interpretation of cultural heritage resources than Alternative 4, which would produce proportionately more opportunities derived from remote, undeveloped, back country experiences.

4.3.4.2. Methods of Analysis

Impact analysis and conclusions are based on interdisciplinary team knowledge of the planning area and review of literature. Impacts on recreation resources and travel management activities are discussed separately unless otherwise specified. Both effects are quantified where possible, and, in the absence of quantitative data, qualitative effects are presented based on professional judgment.

4.3.4.3. Qualitative Intensity Scale

Indicators

- Changes to the essential recreation opportunities and recreation-setting characteristics (RSCs).
- Impediments to defined recreation activities and the associated qualities and conditions.
- Management actions that result in long-term elimination or reduction of basic recreation and visitor services and resource stewardship needs.
- Change in the availability, or area of availability, of types of recreation opportunities, particularly motorized and non-motorized opportunities.

Assumptions

The following assumptions regarding the future management of recreation management are made:

- Over the planning period, demand for and use of recreational opportunities will increase on public lands. Motorized recreation would likely experience the greatest increase.
- The incidence of resource damage and conflicts among recreationists involved in mechanized, motorized, and non-motorized activities would increase with increasing use of public lands.
- Following completion of this RMP, comprehensive travel management plans would be prepared for the travel management areas and would include public involvement, NEPA analysis, and the designation of routes in limited areas.
- Alternative 1 impact analysis applies the management terminology from the older Recreation Management Manual. Impact analysis in Alternatives 2 through 4 applies the terminology from the current Recreation Manual.

4.3.4.4. Program Areas with No Impacts on Recreation Management

- Vegetation
- Weeds
- Forests & Woodlands
- National Trails

4.3.4.5. Resources

4.3.4.5.1. Air Quality Impacts on Recreation

4.3.4.5.1.1. Impacts Common to All Alternatives

Management of air resources could have a major impact on recreation opportunities, settings, use levels, and management. Management of air resources could restrict recreation uses and activities in localized areas and impact recreation opportunities, settings, use levels, and management. This would result from the emission of fugitive dust from unpaved roads that affect attainment of air quality standards in Clark and Nye counties. Mitigation, restriction, or closure to recreation entry and travel could be used to correct fugitive dust violations, especially where public land recreation uses are adjacent to communities and residences, resulting in moderate to major impacts on recreation benefits and outcomes.

Management of air resources may provide a benefit to nonmotorized users by providing clean air for viewsheds and photography.

4.3.4.5.1.2. Alternatives 1 through 4

There are no additional impacts on recreation.

4.3.4.5.2. Soil Resources Impacts on Recreation

4.3.4.5.2.1. Impacts Common to All Alternatives

Decisions related to avoiding and mitigating surface-disturbing activities to protect soil resources could restrict recreation uses and activities in localized areas. In the short term, major surface disturbances to soils and water could moderately impact the recreational experience; however, in the long term, impacts are expected to be negligible to minor.

4.3.4.5.2.2. Alternatives 1 through 4

There are no additional impacts on recreation.

4.3.4.5.3. Water Resources Impacts on Recreation

4.3.4.5.3.1. Impacts Common to All Alternatives

Decisions related to avoiding and mitigating surface-disturbing activities to protect water resources could restrict recreation uses and activities in localized areas. In the short term, major surface disturbances to soils and water could moderately impact the recreational experience; however, in the long term, impacts are expected to be negligible to minor.

4.3.4.5.3.2. Alternatives 1 through 4

There are no additional impacts on recreation.

4.3.4.5.4. Integrated Vegetation Impacts on Recreation

4.3.4.5.4.1. Vegetation Impacts on Recreation

4.3.4.5.4.1.1. Impacts Common to All Alternatives

There are no impacts to recreation.

4.3.4.5.4.1.2. Alternatives 1 through 4

There are no impacts to recreation.

4.3.4.5.4.2. Riparian Areas and Wetlands Impacts on Recreation

4.3.4.5.4.2.1. Impacts Common to All Alternatives

There are no impacts common to all alternatives.

4.3.4.5.4.2.2. Alternative 1

The effects of denying off-road vehicle events within one quarter mile of natural water sources is negligible to minor because events have been moved to other locations.

Designing new waters for livestock and wild horses and burros has had a negative effect on recreation over the life of the existing plan. New artificial water sources have been placed along routes in areas of high recreation use. The new water sources effectively limited and reduced the areas where permitted recreation could occur due to the one quarter mile buffer.

4.3.4.5.4.2.3. Alternative 2

Avoiding natural water sources by one half mile for all permitted activities may improve the recreation setting characteristics and increase opportunities for casual recreationists seeking to enjoy the naturalness of the area. Permitted uses such as off-road racing, commercial touring, and hunting guide services would be restricted, but would take place in other areas.

Minimizing impacts to artificial water sources within one quarter mile for all authorized activities would have negligible impacts to casual recreation use on public lands. This restriction may limit locations where BLM can permit off-road racing and commercial touring.

Allowing the construction of new artificial water sources for livestock and wild horses and burros as needed potentially impacts recreationists' primitive, unconfined experience in wilderness study areas (WSAs). Also, the construction of new guzzlers within one quarter mile of routes would negatively impact current permitted recreation use including commercial hunting permits. Designing new waters for livestock and wild horses and burros may have a negative effect on recreation over the life of the plan. As new artificial water sources are installed, they may be placed along routes in areas of high recreation use, which may limit and reduce the areas where permitted recreation could occur.

4.3.4.5.4.2.4. Alternative 3

Avoiding natural water sources by a quarter mile for all authorized activities may improve the recreation setting characteristics and increase opportunities for casual recreationists seeking to enjoy the naturalness of the area. Permitted use such as off-road racing, commercial touring, and hunting guide services would be restricted, but would take place in other areas.

Minimizing impacts to artificial water sources within one quarter mile for all authorized activities would have negligible impacts to casual recreation use on public lands. This restriction may limit locations where BLM can permit recreation activities such as off-road racing and commercial touring.

4.3.4.5.4.2.5. Alternative 4

Avoiding natural water sources by a quarter mile for all authorized activities may improve the recreation setting characteristics and increase opportunities for casual recreationists seeking to enjoy the naturalness of the area. Permitted use such as off-road racing, commercial touring, and hunting guide services would be restricted, but would take place in other areas.

4.3.4.5.4.3. Weeds Impacts on Recreation

4.3.4.5.4.3.1. Impacts Common to All Alternatives

There are no impacts to recreation.

4.3.4.5.4.3.2. Alternatives 1 through 4

There are no impacts to recreation.

4.3.4.5.4.4. Forests and Woodlands Impacts on Recreation

4.3.4.5.4.4.1. Impacts Common to All Alternatives

There are no impacts to recreation.

4.3.4.5.4.4.2. Alternatives 1 through 4

There are no impacts to recreation.

4.3.4.5.5. Fish and Wildlife Impacts on Recreation

4.3.4.5.5.1. Impacts Common to All Alternatives

There are no impacts common to all alternatives.

4.3.4.5.5.2. Alternative 1

Requiring a one quarter mile buffer from natural and artificial water sources for all permitted activities greatly impacts recreation use on public lands. This restriction severely limits locations where BLM can permit various recreation activities, including commercial hunting permits. Allowing the construction of new guzzlers as needed, including in wilderness study areas (WSAs), potentially impacts recreationists' primitive, unconfined experience in those WSAs. Also, the construction of new guzzlers within one quarter mile of routes would negatively impact current permitted recreation use including commercial hunting permits. Designing new waters for livestock and wild horses and burros has had a negative effect on recreation over the life of the existing plan. Artificial water sources have been installed along routes in areas of high recreation use, which effectively limited and reduced the areas where permitted recreation could occur due to the one quarter mile buffer required above.

4.3.4.5.5.3. Alternative 2

Avoiding natural and artificial water sources by one half mile and one quarter mile respectively for all permitted activities greatly impacts recreation use on public lands. This restriction severely limits locations where BLM can permit various recreation activities, including commercial hunting permits. Allowing the construction of new guzzlers as needed including in WSAs, potentially impacts recreationists' primitive, unconfined experience in those WSAs. Also, the construction of new guzzlers within one quarter mile of routes would negatively impact current

permitted recreation use including commercial hunting permits. Designing new waters for livestock and wild horses and burros has had a negative effect on recreation over the life of the existing plan. Artificial water sources have been installed along routes in areas of high recreation use, which effectively limited and reduced the areas where permitted recreation could occur due to the one quarter mile buffer required above.

4.3.4.5.5.4. Alternative 3

Avoiding natural water sources by a quarter mile for all authorized activities may improve the recreation setting characteristics and increase opportunities for recreationists seeking to enjoy the naturalness of the area. Permitted use such as off-road racing, commercial touring, and hunting guide services would be restricted, but would take place in other areas.

Minimizing impacts to artificial water sources within a quarter mile for all authorized activities impacts recreation use on public lands. This restriction may limit locations where BLM can permit various recreation activities, including commercial hunting permits.

Allowing the construction of new guzzlers as needed including in WSAs, potentially impacts recreationists' primitive, unconfined experience in those WSAs. Also, the construction of new guzzlers within one quarter mile of routes would negatively impact current permitted recreation use, including commercial hunting permits. Designing new waters for livestock and wild horses and burros has had a negative effect on recreation over the life of the existing plan. New artificial water sources have been placed along routes in areas of high recreation use. These new water sources limited and reduced the areas where permitted recreation could occur due to the one quarter mile buffer required above.

4.3.4.5.5.5. Alternative 4

Avoiding natural water sources by one quarter mile for all authorized activities may improve the recreation setting characteristics and increase opportunities for casual recreationists seeking to enjoy the naturalness of the area. Permitted use such as off-road racing, commercial touring, and hunting guide services would be restricted, but would take place in other areas.

4.3.4.5.6. Special Status Species Impacts on Recreation

4.3.4.5.6.1. Impacts Common to All Alternatives

The management actions in this section would provide a beneficial impact to general recreation through the improvement of habitats. The recreational activities benefitting from these actions could include but are not limited to bird watching, wildlife viewing, hiking, hunting, etc.

4.3.4.5.6.2. Alternatives 1 through 4

There are no additional impacts to recreation.

4.3.4.5.7. Wild Horse and Burro Impacts on Recreation

4.3.4.5.7.1. Impacts Common to All Alternatives

There are no impacts common to all alternatives.

4.3.4.5.7.2. Alternative 1

Designing new waters for wild horses and burros has had a negative effect on recreation over the life of the existing plan. New artificial water sources have been installed along routes in areas of high recreation use, which effectively limited and reduced the areas where permitted recreation could occur due to the quarter mile buffer required by the fish and wildlife management actions.

4.3.4.5.7.3. Alternative 2

Designing new waters for wild horses and burros would have a negative effect on recreation over the life of the existing plan. New artificial water sources have been installed along routes in areas of high recreation use, which effectively limited and reduced the areas where permitted recreation could occur due to the quarter mile buffer required by the fish and wildlife management actions.

4.3.4.5.7.4. Alternative 3

Designing new waters for wild horses and burros would have a negative effect on recreation over the life of the existing plan. New artificial water sources have been installed along routes in areas of high recreation use, which effectively limited and reduced the areas where permitted recreation could occur due to the quarter mile buffer required above.

4.3.4.5.7.5. Alternative 4

There are no impacts to recreation.

4.3.4.5.8. Cave and Karst Management Impacts on Recreation

4.3.4.5.8.1. Impacts Common to All Alternatives

Decisions to protect unique or significant cave and cave resources (if such resources are found) may increase opportunities for users to visit and learn about these resources. Certain localized areas could have specific restrictions intended to protect such resources that could restrict or displace certain uses. Overall impacts would be negligible over the long term.

4.3.4.5.8.2. Alternatives 1 through 4

There are no additional impacts on recreation.

4.3.4.5.9. Wildland Fire Management Impacts on Recreation

4.3.4.5.9.1. Impacts Common to All Alternatives

Managing for full suppression of all fires in accordance with applicable conservation measures would help maintain existing recreational settings, as would implementation of programs to reduce unwanted ignitions and emphasize wildfire prevention. Closures of localized areas during fire suppression activities and seasonally required special fire restrictions could limit recreational opportunities and uses in the short term. When such restrictions or closures are ordered, recreation opportunities are displaced or diminished, including public access, the use of vehicles, campfires, and certain types of ammunitions and targets. Impacts would be minor over the long term; however, depending on the number of acres that are affected, this intensity could change. Fire prevention in general benefits recreation by preserving scenic values and protecting human health and safety.

4.3.4.5.9.2. Alternatives 1

There are no additional impacts on recreation.

4.3.4.5.9.3. Alternatives 2

Issuing a two-year area closure to all activities on lands impacted by wildfire within the planning area would have a negative effect on recreation. It would displace all recreationists and would force the use to move to other locations. This significant increase to the use already occurring in these areas would create new environmental damage including potential loss of habitats for the threatened desert tortoise and rare plant species.

The areas or the amount of use that would be affected by this management action cannot be determined because fire is unpredictable. In a worst case scenario, there could be an extremely bad fire season, and potentially all SRMAs and ERMAs could be closed to all uses for two years. This would prevent BLM from serving the public and from meeting the agency's multiple-use mission.

4.3.4.5.9.4. Alternatives 3

Implementing area closures to activities on lands impacted by wildfire on a case-by-case basis could have a negative effect on recreation. It could displace all recreationists and would force the use to move to other locations. This significant increase to the use already occurring in these areas would create new and additional environmental damage including potential loss of habitats for the threatened desert tortoise and rare plant species.

The areas or the amount of use that would be affected by this management action cannot be determined because fire is unpredictable. In a worst case scenario, there could be an extremely bad fire season, and potentially all SRMAs and ERMAs could be closed to all uses for two years. This would prevent BLM from serving the public and from meeting the agency's multiple-use mission. The impact could be mitigated through the implementation process by ensuring that recreation resources are represented when determining the case-by-case closures.

4.3.4.5.9.5. Alternatives 4

Implementing area closures to activities on lands impacted by wildfire on a case-by-case basis within the planning area, could have a negative effect on recreation. It could displace all recreationists and would force the use to move to other locations. This significant increase to the use already occurring in these areas would create new and additional environmental damage including potential loss of habitat for the threatened desert tortoise, and rare plant species.

The areas or the amount of use that would be affected by this management action cannot be determined because fire is unpredictable. In a worst case scenario, there could be an extremely bad fire season, and potentially all SRMAs and ERMAs could be closed to all uses for two years. This would prevent BLM from serving the public and from meeting the agency's multiple-use mission. The impact could be mitigated through the implementation process by ensuring that recreation resources are represented when determining the case-by-case closures.

4.3.4.5.10. Cultural Resources Impacts on Recreation

4.3.4.5.10.1. Impacts Common to All Alternatives

Decisions to protect unique or important cultural resources would increase opportunities for users to visit and learn about these resources. On the other hand, specific restrictions could be imposed in localized areas that are intended to protect these resources. This could restrict or displace certain uses. Impacts on cultural resources management are expected to be negligible over the long term.

4.3.4.5.10.2. Alternatives 1 through 4

There are no additional impacts on recreation.

4.3.4.5.11. Paleontological Resources Impacts on Recreation

4.3.4.5.11.1. Impacts Common to All Alternatives

Decisions to protect unique or important paleontological resources would increase opportunities for users to visit and learn about these resources. On the other hand, localized areas could have specific restrictions imposed that are intended to protect these resources that could restrict or displace certain uses. Impacts on cultural resources management are expected to be negligible over the long term.

4.3.4.5.11.2. Alternatives 1 through 4

There are no additional impacts on recreation.

4.3.4.5.12. Visual Resource Management Impacts on Recreation

4.3.4.5.12.1. Impacts Common to All Alternatives

Impacts from allocating designated wilderness to VRM Class I would be negligible. These areas are allocated to the back country setting and the degree of development for facilitated recreation opportunities would be low to none.

4.3.4.5.12.2. Alternatives 1 through 4

There are no additional impacts to recreation.

4.3.4.5.13. Lands with Wilderness Characteristics Impacts on Recreation

4.3.4.5.13.1. Impacts Common to All Alternatives

There are no impacts common to all alternatives.

4.3.4.5.13.2. Alternative 1

There are no additional impacts to recreation.

4.3.4.5.13.3. Alternative 2

Under this alternative, lands with wilderness characteristics would be closed to motorized and mechanized vehicles. This would reduce the miles of routes available to recreationists, including routes already designated in ACEC plans. In some cases, this will cause visitors to be displaced and cause crowding in other popular areas. The majority of these impacts occur in Muddy Mountains East and West, the McCulloughs, and Resting Springs.

The recreation setting characteristics for visitors looking for a primitive and unconfined experience would be enhanced by the following lands with wilderness characteristics: Garret Butte, Lime Canyon, Arrow Canyon, Muddy Mountains South, and Ireteba Peaks.

4.3.4.5.13.4. Alternative 3

The recreation setting characteristics for visitors looking for a primitive and unconfined experience would be enhanced by the following lands with wilderness characteristics: Garret Butte, Lime Canyon, Arrow Canyon, and Ireteba Peaks.

4.3.4.5.13.5. Alternative 4

The recreation setting characteristics for visitors looking for a primitive and unconfined experience would be enhanced by the following lands with wilderness characteristics: Garret Butte, Lime Canyon, and Arrow Canyon.

4.3.4.6. Resource Uses

4.3.4.6.1. Forestry and Woodland Products Impacts on Recreation

4.3.4.6.1.1. Impacts Common to All Alternatives

Limiting firewood cutting and gathering would have both a positive and negative impact on recreation use. The recreation visitor would not be allowed the natural experience of collecting firewood for campfires in some areas. Preserving these areas would allow the visitor to enjoy the limited inventory of natural wooded areas in the desert.

4.3.4.6.1.2. Alternatives 1 through 4

There are no additional impacts on recreation.

4.3.4.6.2. Livestock Grazing Impacts on Recreation

4.3.4.6.2.1. Impacts Common to All Alternatives

Having active allotments in recreation areas has the potential to create conflicts between users and stock animals, in addition to creating a human health and safety issue. Closing some allotments to livestock would provide a benefit to recreation through the elimination of user conflicts.

4.3.4.6.2.2. Alternatives 1 through 4

There are no additional impacts on recreation.

4.3.4.6.3. Minerals Impacts on Recreation

4.3.4.6.3.1. Fluid Leasable Minerals Impacts on Recreation

4.3.4.6.3.1.1. Impacts Common to All Alternatives

In SRMAs, leasable and mineral material disposal activities would need to comply with prescribed setting prescriptions. Depending on the size and scale of the operation, impacts could range from minimal to severe.

Managing lands released from withdrawal or special designations to allow for mineral exploration and development would negatively impact recreation use in areas that were designated as WSAs, instant study areas (ISAs), and ACECs. Primitive and unconfined recreation experiences would be eliminated or diminished in these areas.

4.3.4.6.3.1.2. Alternatives 1 through 4

There are no additional impacts on recreation.

4.3.4.6.3.2. Solid Leasable Minerals Impacts on Recreation

4.3.4.6.3.2.1. Impacts Common to All Alternatives

In SRMAs, leasable and mineral material disposal activities would need to comply with prescribed setting prescriptions. Depending on the size and scale of the operation, impacts could range from minimal to severe.

Managing lands released from withdrawal or special designations to allow for mineral exploration and development would negatively impact recreation use in areas that were designated as WSAs, ISAs, and ACECs. Primitive and unconfined recreation experiences would be eliminated or diminished in these areas.

4.3.4.6.3.2.2. Alternatives 1 through 4

There are no additional impacts on recreation.

4.3.4.6.3.3. Locatable Minerals Impacts on Recreation

4.3.4.6.3.3.1. Impacts Common to All Alternatives

Most of the planning area would remain open for locatable mineral resource development. In ERMAs and public lands not designated as recreation management areas, mining could impact the BLM's ability to support and sustain the principal recreation activities and the associated qualities and conditions of the ERMA as a result of surface disturbance. Recreation settings could change corresponding to the scale of mining landscape modifications; however, site-specific mitigation measures identified during NEPA analysis could reduce long-term impacts on the natural landscape and restore recreational settings and related opportunities when the mining activity is completed.

Managing lands released from withdrawal or special designations to allow for mineral exploration and development would negatively impact recreation use in areas that were designated as WSAs, ISAs, and ACECs. Primitive and unconfined recreation experiences would be eliminated or diminished in these areas.

4.3.4.6.3.3.2. Alternatives 1 through 4

There are no additional impacts on recreation.

4.3.4.6.3.4. Saleable Minerals Impacts on Recreation

4.3.4.6.3.4.1. Impacts Common to All Alternatives

Most of the planning area would remain open for saleable mineral resource development. In ERMAs and public lands not designated as recreation management areas, mining could impact the BLM's ability to support and sustain the principal recreation activities and the associated qualities and conditions of the ERMA as a result of surface disturbance. Recreational settings could change corresponding to the scale of mining landscape modifications; however, site-specific

mitigation measures identified during NEPA analysis could reduce long-term impacts on the natural landscape and restore recreational settings and related opportunities when the mining activity is completed.

Managing lands released from withdrawal or special designations to allow for mineral exploration and development would negatively impact recreation use in areas that were designated as WSAs, ISAs, and ACECs. Primitive and unconfined recreation experiences would be eliminated or diminished in these areas.

4.3.4.6.3.4.2. Alternatives 1 through 4

There are no additional impacts on recreation.

4.3.4.6.4. Recreation Impacts on Recreation

4.3.4.6.4.1. Impacts Common to All Alternatives

Recreation users may experience crowding due to heavy use by casual and commercial users in popular areas.

4.3.4.6.4.2. Alternative 1

This alternative retains all eight existing SRMAs and the existing ERMA.

This alternative provides the third greatest acreage of SRMAs and allows recreation to be the primary focus in a larger percentage of the planning area than in Alternative 4 but less than in Alternatives 2 and 3, thus reducing resource uses such as land disposals and renewable energy projects that have the ability to dominate the landscape. With larger parcels of land available, recreationists would be less likely to experience overcrowding. Management of the larger RMAs will lead to increased diversity and the ability to protect the recreation settings, characteristics, and experiences.

4.3.4.6.4.3. Alternative 2

This alternative retains five existing SRMAs and proposes two new SRMAs, eight RMZs, and seven new ERMAs.

This alternative provides the second greatest acreage of SRMAs and allows recreation to be the primary focus in a larger percentage of the planning area than in Alternatives 1 and 4 but less than Alternative 3, thus reducing other resource uses such as land disposals and renewable energy projects that have the ability to dominate the landscape. With larger parcels of land available, recreationists would be less likely to experience overcrowding. Management of the larger RMAs will lead to increased diversity and the ability to protect the recreation settings, characteristics, and experiences.

4.3.4.6.4.4. Alternative 3

This alternative retains five existing SRMAs and proposes two new SRMAs, four RMZs, and seven new ERMAs.

This alternative provides the greatest acreage of SRMAs and allows recreation to be the primary focus in a larger percentage of the planning area, thus reducing other resource uses such as land disposals and renewable energy projects that have the ability to dominate the landscape. With larger parcels of land available, recreationists would be less likely to experience overcrowding. Management of the larger RMAs will lead to increased diversity and the ability to protect the recreation settings, characteristics, and experiences.

4.3.4.6.4.5. Alternative 4

This alternative retains one existing SRMA and proposes one new SRMA and three new ERMAs. Approximately 70 percent of the planning area would not be designated as recreation management areas.

Public lands not designated as recreation management areas would not be actively managed for recreation. This would allow other resource uses such as land disposals and renewable energy projects to dominate the landscape in the majority of the planning area, resulting in a net loss of area available for recreation use. With smaller parcels of land available, recreationists would experience overcrowding, and the recreation settings, characteristics, and experiences would be degraded.

4.3.4.6.5. Travel and Transportation Impacts on Recreation

4.3.4.6.5.1. Impacts Common to All Alternatives

There are no impacts common to all alternatives.

4.3.4.6.5.2. Alternative 1

In this alternative, approximately 1.6 million acres will remain limited to existing roads, trails, and dry washes. Routes would not be analyzed. No foreseeable reduction in routes would occur.

4.3.4.6.5.3. Alternatives 2 through 4

The planning area would be limited to designated roads, primitive roads, and trails. All of the routes would be analyzed based on management actions for recreation, wildlife, vegetation, cultural resources, lands/realty, mining, and other resources or resource uses as appropriate. There may be a reduction in the number of miles of routes remaining open for use. In some cases, there may be decreased access and opportunities for recreation users.

4.3.4.6.6. Lands and Realty Impacts on Recreation

4.3.4.6.6.1. Land Tenure (Disposals and Acquisitions) Impacts on Recreation

4.3.4.6.6.1.1. Impacts Common to All Alternatives

Under all alternatives, there is a potential for conflict between the purpose of individual land-use authorizations and the specific objectives of SRMAs and ERMAs.

4.3.4.6.6.1.2. Alternative 1

The Laughlin disposal boundary overlaps almost exactly with the only area in the Las Vegas Field Office that is available for high-speed competitive events to occur year-round with no seasonal restrictions due to desert tortoise protection. In addition to the high-speed events, this area is used for several other types of permitted activities. If this area is disposed of, it would no longer be available for these activities, and recreationists would be displaced to other areas. High-speed events could not occur anywhere within the planning area from March 16 through the end of May, and during September.

4.3.4.6.6.1.3. Alternative 2

There are no additional impacts in this alternative.

4.3.4.6.6.1.4. Alternative 3

The Laughlin disposal boundary overlaps almost exactly with the only area in the Las Vegas Field Office that is available for high-speed competitive events to occur year-round with no seasonal restrictions due to desert tortoise protection. In addition to high-speed events, this area is used for several other types of permitted activities. If this area is disposed of, high-speed events could not occur anywhere within the planning area from March 16 through the end of May, and during September.

4.3.4.6.6.1.5. Alternative 4

The Laughlin disposal boundary overlaps almost exactly with the only area in the Las Vegas Field Office that is available for high-speed competitive events to occur year-round with no seasonal restrictions due to desert tortoise protection. In addition to the high-speed events, this area is used for several other types of permitted activities. If this area is disposed of, it would no longer be available for these activities, and recreationists would be displaced to other areas. High-speed events could not occur anywhere within the planning area from March 16 through the end of May, and during September.

The Ivanpah Airport Environs Overlay District and the Primm disposal boundaries greatly reduce the number of acres available to recreationists in the Jean Roach ERMA. The following types of permitted recreation activities would be restricted or eliminated: commercial touring, competitive events, model rocketry, launching and landing of glider airplanes, and bird dog trials.

4.3.4.6.6.2. Land-Use Authorizations (Right-of-Ways, Leases, Permits) Impacts on Recreation

4.3.4.6.6.2.1. Impacts Common to All Alternatives

Under all alternatives, there is a potential for conflict between the purpose of individual land-use authorizations and the specific objectives of SRMAs and ERMAs.

4.3.4.6.6.2.2. Alternative 1

Under the current management, the Logandale Trails area is not an exclusion area for linear rights-of-way. This could have a major impact on recreation as linear rights-of-way would change the recreation setting characteristics and detract from the naturalness and remoteness of the area.

4.3.4.6.6.2.3. Alternatives 2 through 4

There are no additional impacts on recreation.

4.3.4.6.6.3. Renewable Energy Impacts on Recreation

4.3.4.6.6.3.1. Impacts Common to All Alternatives

In the planning area, utility-scale development of renewable energy projects would occur within solar energy zones and on a case-by-case basis. It has the potential to displace recreational uses from public lands over the life of the plan.

4.3.4.6.6.3.2. Alternative 1

SRMAs are in place to focus on recreation as the primary use in that area. Solar developments are incompatible with recreation because they remove large tracts of land from other uses, block access and vehicle routes, degrade scenic qualities, displace users to other busy areas, and degrade recreation setting characteristics. The following SRMAs are affected by the current variance areas: Laughlin, Big Dune, Muddy Mountains, Las Vegas Valley, Nelson/Eldorado, and Nellis Dunes.

Impacts to recreation from solar development would be the same in ERMAs as they are in SRMAs, but the management focus on BLM-administered programs in ERMAs is equally distributed between programs. Existing variance areas will impact recreation in portions of the Southern Nevada ERMA, including the following areas: Lower Mormon Mesa, Logandale, area northeast of the Muddy Mountains SRMA, area around Sandy Valley, and the Mesquite area.

Impacts from wind development negatively affect the variety, quality, and type of experiences available to the public land visitor. Recreation activities can still occur, however, the physical and social characteristic levels would be diminished. These characteristics include remoteness, naturalness, and evidence of use. These impacts are greater in areas with moderate to heavy recreation use that are found in all of the existing SRMAs and in the following portions of the ERMA: Lower Mormon Mesa, Logandale area, the area northeast of the Muddy Mountain SRMA, area around Sandy Valley, and the Mesquite area.

Wind development would also affect noise levels, the scenic quality enjoyed by recreationists, and in some cases will cause the visitor to be displaced and cause crowding in other popular areas. Impacts to recreation from utility corridor development in the Rainbow Gardens area negatively affect recreation. Impacts to the physical and social characteristics are the same as the impacts stated in the wind development paragraph above.

4.3.4.6.6.3.3. Alternative 2

SRMAs are in place to focus on recreation as the primary use in that area. Solar developments are incompatible with recreation because they remove large tracts of land from other uses, block access and vehicle routes, degrade scenic qualities, displace users to other busy areas, and degrade recreation setting characteristics. The Gold Butte and Las Vegas Valley SRMAs are affected by the proposed variance areas.

Impacts to recreation from solar development are the same in ERMAs as they are in SRMAs, but the management focus on BLM-administered programs in ERMAs is equally distributed between programs. Proposed variance areas will impact recreation in portions of the Muddy Mountains, Clark County West, Clark County South, Las Vegas Valley, and Amargosa.

Impacts to recreation from wind development negatively affect the variety, quality, and type of experiences available to the public land visitor. Recreation activities can still occur, but the physical and social characteristic levels would be diminished. These characteristics include remoteness, naturalness, and evidence of use. These impacts are greater in areas with moderate to heavy recreation use such as the Las Vegas Valley SRMA and in the following ERMAs: Clark County South, Clark County West, Pahrump Valley, and Amargosa. Wind development would also affect noise levels, the scenic quality enjoyed by recreationists, and in some cases, it will cause the visitor to be displaced and cause crowding in other popular areas.

4.3.4.6.6.3.4. Alternative 3

SRMAs are in place to focus on recreation as the primary use in that area. Solar developments are incompatible with recreation because they remove large tracts of land from other uses, block access and vehicle routes, degrade scenic qualities, displace users to other busy areas, and degrade recreation setting characteristics. The Gold Butte SRMA is affected by the proposed variance area.

Impacts to recreation from solar development are the same in ERMAs as they are in SRMAs, but the management focus on BLM-administered programs in ERMAs is equally distributed between programs. Proposed variance areas will impact recreation in portions of the Muddy Mountains, Clark County North, Clark County West, Amargosa, and Pahrump Valley ERMAs.

Impacts to recreation from wind development negatively affect the variety, quality, and type of experiences available to the public land visitor. Recreation activities can still occur, however, the physical and social characteristic levels would be diminished. These characteristics include remoteness, naturalness, and evidence of use. These impacts are greater in areas with moderate to heavy recreation use such as the Las Vegas Valley SRMA and in the following ERMAs: Clark County South, Clark County West, Pahrump Valley, and Amargosa. Wind development would also affect noise levels, the scenic quality enjoyed by recreationists, and in some cases, it will cause the visitor to be displaced and cause crowding in other popular areas.

4.3.4.6.6.3.5. Alternative 4

Solar developments are incompatible with recreation because they remove large tracts of land from other uses, block access and vehicle routes, degrade scenic qualities, displace users to other busy areas, and degrade recreation setting characteristics. The following areas are affected by the proposed variance areas and new solar energy zones: Gold Butte, Las Vegas Valley, Jean Roach, and Muddy Mountains ERMAs, areas surrounding the Moapa River Indian Reservation, Lower

Mormon Mesa area, Nelson area, Crescent Peak area, Laughlin area, Goodsprings / Sandy Valley area, north of Sandy Valley to Nye County, and Nye County.

Impacts to recreation from wind development negatively affect the variety, quality, and type of experiences available to the public land visitor. Recreation activities can still occur, however, the physical and social characteristic levels would be diminished. These characteristics include remoteness, naturalness and evidence of use. These impacts are greater in areas with moderate to heavy recreation use such as the Logandale SRMA, Gold Butte, Las Vegas Valley, Jean Roach, and Muddy Mountains ERMAs, areas surrounding the Moapa River Indian Reservation, Lower Mormon Mesa area, Bitter Springs area, Nelson area, Searchlight area, Laughlin area, Goodsprings / Sandy Valley area, north of Sandy Valley to Nye County, and Nye County.

Wind development would also affect noise levels, the scenic quality enjoyed by the recreationist, and in some cases, will cause the visitor to be displaced and cause crowding in other popular areas. Impacts from utility corridor development in the Rainbow Gardens area also would negatively affect recreation. Impacts to the physical and social characteristics are the same as the impacts stated in the wind development paragraph above.

4.3.4.6.6.4. Utility Corridors Impacts on Recreation

4.3.4.6.6.4.1. Impacts Common to All Alternatives

Under all alternatives, there is a potential for conflict between the purpose of individual land-use authorizations and the specific objectives of SRMAs and ERMAs.

4.3.4.6.6.4.2. Alternative 1

Impacts to recreation from the proposed alignment of the West-Wide Energy Corridor in the Jean/Roach SRMA place a 3,500-foot-wide path through the Jean Dry Lake bed. This dry lake bed is used for many recreational activities that are incompatible with power lines such as a landing zone for hang gliders and paragliders, model rocketry, launching of glider planes, and kite flying.

New utility corridor development negatively impacts recreation physical settings including; remoteness, naturalness, and evidence of use. The “corridor of concern” that bisects the Bittersprings Back Country Byway and a small area north of Logandale Trails directly affects the scenic quality and level of development in an area where high-quality scenery is important for the recreation experience.

4.3.4.6.6.4.3. Alternative 2

Impacts to recreation from utility corridor development in the Rainbow Gardens area negatively affect recreation. Impacts to the physical and social characteristics are the same as the impacts stated in the wind development paragraph above.

4.3.4.6.6.4.4. Alternative 3

Impacts to recreation from utility corridor development in the Rainbow Gardens area negatively affect recreation. Impacts to the physical and social characteristics are the same as the impacts stated in the wind development paragraph above.

Impacts to recreation from the proposed realignment of the West-Wide Energy Corridor in the Jean/Roach SRMA removes a 3,500–foot-wide path through the Jean Dry Lake bed. This dry lake bed is used for many recreational activities that are incompatible with power lines such as a landing zone for hang gliders and para-gliders, model rocketry, launching of glider planes, and kite flying. The proposed realignment benefits recreation by allowing the continued use of this lake bed.

New utility corridor development negatively impacts recreation physical settings including remoteness, naturalness, and evidence of use. The proposed corridor that bisects the Bittersprings Back Country Byway directly affects the scenic quality and level of development in an area where high-quality scenery is important for the recreation experience.

4.3.4.6.6.4.5. Alternative 4

Impacts to recreation from the proposed realignment of the West-Wide Energy Corridor in the Jean/Roach SRMA removes a 3,500-foot-wide path through the Jean Dry Lake bed. This dry lake bed is used for many recreational activities that are incompatible with power lines such as a landing zone for hang gliders and paragliders, model rocketry, launching of glider planes, and kite flying. The proposed realignment benefits recreation by allowing the continued use of this lake bed.

New utility corridor development negatively impacts recreation physical settings including remoteness, naturalness, and evidence of use. The proposed corridor that bisects the Bittersprings Back Country Byway directly affects the scenic quality and level of development in an area where high-quality scenery is important for the recreation experience.

4.3.4.7. Special Designations

4.3.4.7.1. Areas of Critical Environmental Concern Impacts on Recreation

4.3.4.7.1.1. Impacts Common to All Alternatives

There are no impacts common to all alternatives.

4.3.4.7.1.2. Alternative 1

Limiting recreation facility development in ACECs for resource protection will affect recreation by preventing the BLM from improving the recreation experiences by providing facilities for the users.

The 23 existing ACECs make up a total of 1,014,301 acres of BLM-managed lands in the planing area. OHV racing and other speed-based events are prohibited in all of these ACECs, limiting where this activity can occur.

In addition, the four desert tortoise critical habitat ACECs totaling 712,314 acres restrict all other permitted activities by setting limits on the number that can occur in any given year.

Some recreationists may benefit from the restrictions in place to protect the ACECs. These restrictions not only protect R&I values but also protect RSCs, especially in Rainbow Gardens, River Mountains, and the Gold Butte complex.

4.3.4.7.1.3. Alternative 2

Limiting authorized recreation use and facility development in ACECs for resource protection will affect recreation by preventing the BLM from improving the recreation experiences by providing facilities for the users.

The 44 existing and proposed ACECs make up a total of 1,444,548 acres of BLM-managed lands in the planing area. The size and type of vehicles allowed for OHV racing and other speed-based events are restricted in most of these ACECs, severely limiting where this activity can occur.

In addition, the four desert tortoise critical habitat ACECs totaling 754,371 acres prohibit all speed-based events and restrict all other permitted activities by setting limits on the number that can occur in any given year.

The Bird Springs Valley, Bitter Springs, California Wash, Jean Lake, and Muddy Mountains ACECs totaling 200,492 acres also prohibit all speed-based events, leaving 954,863 acres closed to all speed-based events. All five of these ACECs are either new or have increased in size from the current condition. In addition, all five of these areas currently are utilized by recreationists for speed-based events (predominately motorcycle racing); prohibiting this use in these areas would force the use to move to another location, most likely either the Jean/Roach or Laughlin SRMAs. This significant increase to the use already occurring in these areas would create new and additional environmental damage, including potential loss of habitats for the threatened desert tortoise and rare plant species.

Some recreationists may benefit from the restrictions in place to protect the ACECs. These restrictions not only protect R&I values, but also RSCs, especially in Rainbow Gardens, River Mountains, and the Gold Butte complex.

4.3.4.7.1.4. Alternative 3

Limiting authorized recreation use and facility development in ACECs for resource protection will affect recreation by preventing the BLM from improving the recreation experiences by providing facilities for the users.

The 41 existing and proposed ACECs make up a total of 1,292,216 acres of 3,256,276 acres of BLM-managed lands in the planing area. OHV racing and other speed-based events are restricted in most of these ACECs, severely limiting where this activity can occur.

In addition, the four desert tortoise critical habitat ACECs totaling 751,747 acres prohibit all speed-based events and restrict all other permitted activities by setting limits on the number that can occur in any given year.

Some recreationists will benefit from the restrictions to protect the ACECs. These restrictions not only protect R&I values, but also RSCs, especially in Rainbow Gardens, River Mountains, and the Gold Butte complex.

4.3.4.7.1.5. Alternative 4

Limiting authorized recreation use and facility development in ACECs for resource protection will affect recreation by preventing the BLM from improving the recreation experiences by providing facilities for the users.

The 25 existing and proposed ACECs make up a total of 1,021,365 acres of 3,256,276 acres of BLM-managed lands in the planing area. OHV racing and other speed-based events are prohibited in most of these ACECs, severely limiting where this activity can occur.

In addition, the four desert tortoise critical habitat ACECs totaling 734,936 acres prohibit all speed-based events and restrict all other permitted activities by setting limits on the number that can occur in any given year.

These restrictions not only protect R&I values, but also RSCs, especially in Rainbow Gardens, River Mountains, and the Gold Butte complex.

4.3.4.7.2. National Trails Impacts on Recreation

4.3.4.7.2.1. Impacts Common to All Alternatives

There are no impacts on recreation.

4.3.4.7.2.2. Alternatives 1 through 4

There are no impacts on recreation.

4.3.4.7.3. Wild and Scenic Rivers Impacts on Recreation

4.3.4.7.3.1. Impacts Common to All Alternatives

There are no impacts common to all alternatives.

4.3.4.7.3.2. Alternative 1

Managing the Virgin River and Hiko Wash as eligible for inclusion in the National Wild and Scenic Rivers System will protect recreation setting characteristics and scenic quality, and benefit recreation activities such as hiking and bird watching.

4.3.4.7.3.3. Alternative 2

Managing the Virgin River and Hiko Wash as suitable for inclusion in the National Wild and Scenic Rivers System will protect recreation setting characteristics and scenic quality, and benefit recreation activities such as hiking and bird watching.

4.3.4.7.3.4. Alternative 3

The Virgin River and Hiko Wash would not be managed as suitable for inclusion in the National Wild and Scenic Rivers System. However, the recreation setting characteristics, scenic quality, and benefits to recreation activities such as hiking and bird watching would still be protected by ACEC designation under this alternative.

4.3.4.7.3.5. Alternative 4

The Virgin River and Hiko Wash would not be managed as suitable for inclusion in the National Wild and Scenic Rivers System. However, for the Virgin River, the recreation setting characteristics, scenic quality, and benefits to recreation activities such as hiking and bird watching would still be protected by ACEC designation under this alternative. These qualities would not be protected in Hiko Wash.

4.3.4.7.4. Wilderness Impacts on Recreation

4.3.4.7.4.1. Impacts Common to All Alternatives

The wilderness areas provide opportunities for solitude and primitive, unconfined recreation. Recreationists benefit from an area free from motorized activities and landscapes free of surface-disturbing activities and the sights and sounds of human uses and their developments.

4.3.4.7.4.2. Alternatives 1 through 4

No additional impacts in this alternative.

4.3.4.7.5. Wilderness Study Areas Impacts on Recreation

4.3.4.7.5.1. Impacts Common to All Alternatives

The wilderness study areas provide opportunities for solitude and primitive, unconfined recreation. Recreationists benefit from an area free from motorized activities and landscapes free of surface-disturbing activities and the sights and sounds of human uses and their developments.

4.3.4.7.5.2. Alternatives 1 through 4

There are no additional impacts on recreation.

4.3.4.8. Social and Economic Impacts on Recreation

4.3.4.8.1. Tribal Interests Impacts on Recreation

4.3.4.8.1.1. Impacts Common to All Alternatives

The Moapa Band of Paiutes has on several occasions authorized high-speed and touring OHV activities on their lands. This has an impact on recreation by reducing demand for use on BLM lands.

4.3.4.8.1.2. Alternatives 1 through 4

There are no additional impacts on recreation.

4.3.4.9. Cumulative Impacts on Recreation

4.3.4.9.1. Past and Present Actions/Impacts

Past and present actions that have had and are having impacts on recreation include mineral development, wildland fire suppression and fuels treatments, increased OHV travel, utility corridor development, land disposals, renewable energy development, ACEC management prescriptions, management prescriptions for the protection of special status species, and management within SRMAs and ERMAs.

4.3.4.9.2. Reasonable Foreseeable Actions

Reasonably foreseeable future or potential prescriptions and impacts on recreation are included in each of the resources discussed in this section.

4.3.4.9.3. Cumulative Impact

4.3.4.9.3.1. Impacts Common to All Alternatives

There are no impacts common to all alternatives.

4.3.4.9.3.2. Alternative 1

Alternative 1 would have the second greatest overall cumulative impacts to recreation opportunities, settings, and experiences. In addition to the effects listed above, there are fewer restrictions on the development of solar, wind, and utility corridors. The proposed areas for development and acres of land proposed for disposal are larger than in Alternative 2 and less than Alternative 4.

4.3.4.9.3.3. Alternative 2

Alternative 2 would have greater cumulative impacts on recreation opportunities, settings, and experiences than Alternative 3, but fewer than Alternatives 1 and 4. In this alternative, ACEC management prescriptions restrict recreation activities, but recreation can still occur, and in some areas, recreation activities would be enhanced. Fewer areas are threatened by exclusions caused from renewable energy projects and land disposals.

4.3.4.9.3.4. Alternative 3

Alternative 3 would have the least overall cumulative impacts on recreation opportunities, settings, and experiences. In this alternative, SRMAs with more acreage and ACECs protect the recreation resource, therefore, there are fewer conflicts with the impacts listed above.

4.3.4.9.3.5. Alternative 4

Alternative 4 would have the greatest overall cumulative impacts on recreation opportunities, settings, and experiences. In this alternative, in addition to the affects listed above, there are fewer

restrictions on the development of solar, wind, and utility corridors. The proposed areas for development are larger, and acreage of land proposed for disposal is greater.

4.3.5. Travel and Transportation

4.3.5.1. Summary

Issues that affect management of the route system include legal public access to BLM-managed public lands, compliance with the route designations, effects of the route-area footprint, direct and indirect effects of using routes, serving allowable uses in a sustainable manner, and managing traffic and resource conditions near routes. Routes will be specifically designated through subsequent planning, but the area designations will be established in this plan. The effects of resource allocations and decisions on the travel system are discussed in this section.

The authorized officer shall designate public lands as open, limited, or closed to off-road vehicles. All designations shall be based on the protection of the resources of the public lands, the promotion of the safety of all the users of public lands, and the minimization of conflicts among various uses of the public lands; and in accordance with the following criteria:

- Areas and trails shall be located to minimize damage to soils, watersheds, vegetation, air, or other resources of the public lands, and to prevent impairment of wilderness suitability.
- Areas and trails shall be located to minimize harassment of wildlife or significant disruption of wildlife habitats. Special attention will be given to protect endangered or threatened species and their habitats.
- Areas and trails shall be located to minimize conflicts between off-road vehicle use and other existing or proposed recreational uses of the same or neighboring public lands, and to ensure the compatibility of such uses with existing conditions in populated areas, taking into account noise and other factors.
- Areas and trails shall not be located in officially designated wilderness areas or primitive areas. Areas and trails shall be located in natural areas only if the authorized officer determines that off-road vehicle use in such locations will not adversely affect natural, esthetic, scenic, or other values for which such areas are established.

4.3.5.2. Methods of Analysis

The management approach and assumptions for each alternative will guide the route designations and set the stage for future route designations in the planning area. Legal access points and enforceability would be altered by the management philosophy and resource allocations in each alternative. The number of acres that are open, closed, or limited in the planning area indicate the impacts.

4.3.5.3. Qualitative Intensity Scale

When referring to the intensity of an action, the terms negligible, minor, moderate, and major are used. There is a common definition of the way these terms are used in this chapter, yet some additional detail on these terms is given below:

- **Negligible:** Actions that cause an insignificant change to accessing desired locations and effects to access would be unnoticeable to most people.
- **Minor:** Actions that affect the travel system in only one area, such as a specific route closure, would be considered minor. A specific travel mode or experience may be affected heavily in one area, but not in the entire planning area.

- **Moderate:** These actions are widespread or affect routes for a specific geographic area or specific issue.
- **Major:** Direct effects would affect more of the routes, experiences, or destinations across the planning area.

4.3.5.4. Assumptions

Use levels will not decrease. Use type may shift, but use will increase over time, likely keeping pace with population growth in the state.

Improving the condition of access roads will concentrate uses, especially when combined with a reduction of primitive roads.

Barriers to wildlife movement develop when intensity of use reaches a threshold. Density of routes is less important than high-use levels of routes and areas.

Infrequent human visitation of wildlife waters does not deter wildlife from using them.

4.3.5.5. Program Areas with No Impacts on Travel Management

- Wild Horses and Burros
- Forestry and Woodland Projects
- Livestock Grazing
- Minerals
- Recreation
- Areas of Critical Environmental Concern
- National Trails
- Wilderness
- Wilderness Study Areas

4.3.5.6. Resources

4.3.5.6.1. Air Quality Impacts on Travel and Transportation

4.3.5.6.1.1. Impacts Common to All Alternatives

There are no impacts common to all alternatives.

4.3.5.6.1.2. Alternative 1

There are no additional impacts to travel and transportation.

4.3.5.6.1.3. Alternative 2 through 4

Vehicle route and OHV area closures on BLM-administered lands, required for protecting and mitigating damage or adverse effects to air resources, could diminish the motorized route network over the life of the plan, especially near private property, residential and commercial land developments, and state lands.

4.3.5.6.2. Soil Resources Impacts on Travel and Transportation

4.3.5.6.2.1. Impacts Common to All Alternatives

There are no impacts common to all alternatives.

4.3.5.6.2.2. Alternative 1

There are no additional impacts to travel and transportation.

4.3.5.6.2.3. Alternatives 2 through 4

Vehicle route and OHV area closures on BLM-administered lands, required for protecting and mitigating damage or adverse effects to resources, could diminish the motorized route network over the life of the plan, especially near private property, residential and commercial land developments, and state lands.

4.3.5.6.3. Water Resources Impacts on Travel and Transportation

4.3.5.6.3.1. Impacts Common to All Alternatives

There are no impacts common to all alternatives.

4.3.5.6.3.2. Alternative 1

There are no additional impacts to travel and transportation.

4.3.5.6.3.3. Alternative 2 through 4

Vehicle route and OHV area closures on BLM-administered lands, required for protecting and mitigating damage or adverse effects to resources, could diminish the motorized route network over the life of the plan, especially near private property, residential and commercial land developments, and state lands.

4.3.5.6.4. Integrated Vegetation Impacts on Travel and Transportation

4.3.5.6.4.1. Vegetation Impacts on Travel and Transportation

4.3.5.6.4.1.1. Impacts Common to All Alternatives

There are no impacts common to all alternatives.

4.3.5.6.4.1.2. Alternative 1

There are no additional impacts to travel and transportation.

4.3.5.6.4.1.3. Alternative 2 through 4

Vehicle route and OHV area closures on BLM-administered lands, required for protecting and mitigating damage or adverse effects to resources, could diminish the motorized route network over the life of the plan, especially near private property, residential and commercial land developments, and state lands.

4.3.5.6.4.2. Riparian Areas and Wetlands Impacts on Travel and Transportation

4.3.5.6.4.2.1. Impacts Common to All Alternatives

There are no impacts common to all alternatives.

4.3.5.6.4.2.2. Alternative 1

There are no additional impacts to travel and transportation.

4.3.5.6.4.2.3. Alternative 2 through 4

Vehicle route and OHV area closures on BLM-administered lands, required for protecting and mitigating damage or adverse effects to resources, could diminish the motorized route network over the life of the plan, especially near private property, residential and commercial land developments, and state lands.

4.3.5.6.4.3. Weeds Impacts on Travel and Transportation

4.3.5.6.4.3.1. Impacts Common to All Alternatives

There are no impacts common to all alternatives.

4.3.5.6.4.3.2. Alternative 1

There are no additional impacts to travel and transportation.

4.3.5.6.4.3.3. Alternative 2 through 4

Vehicle route and OHV area closures on BLM-administered lands, required for protecting and mitigating damage or adverse effects to resources, could diminish the motorized route network over the life of the plan, especially near private property, residential and commercial land developments, and state lands.

4.3.5.6.4.4. Forests and Woodlands Impacts on Travel and Transportation

4.3.5.6.4.4.1. Impacts Common to All Alternatives

There are no impacts common to all alternatives.

4.3.5.6.4.4.2. Alternative 1

There are no additional impacts to travel and transportation.

4.3.5.6.4.4.3. Alternative 2 through 4

Vehicle route and OHV area closures on BLM-administered lands, required for protecting and mitigating damage or adverse effects to resources, could diminish the motorized route network over the life of the plan, especially near private property, residential and commercial land developments, and state lands.

4.3.5.6.5. Fish and Wildlife Impacts on Travel and Transportation

4.3.5.6.5.1. Impacts Common to All Alternatives

Not impacted by this resource.

4.3.5.6.5.2. Alternative 1

Fish and wildlife would not impact travel because route designations would not be made under this alternative.

4.3.5.6.5.3. Alternatives 2 through 4

Managing wildlife habitats to limit fragmentation will affect route evaluation criteria and may limit designation of some routes.

4.3.5.6.6. Special Status Species Impacts on Travel and Transportation

4.3.5.6.6.1. Impacts Common to All Alternatives

There are no impacts common to all alternatives.

4.3.5.6.6.2. Alternative 1

Special status species would not impact travel because route designations would not be made under this alternative.

4.3.5.6.6.3. Alternatives 2 through 4

Managing to protect special status species and their habitats will affect route evaluation criteria and may limit designation of some routes.

4.3.5.6.7. Wild Horse and Burro Impacts on Travel and Transportation

4.3.5.6.7.1. Impacts Common to All Alternatives

Not impacted by this resource.

4.3.5.6.7.2. Alternatives 1 through 4

Not impacted by this resource.

4.3.5.6.8. Cave and Karst Management Impacts on Travel and Transportation

4.3.5.6.8.1. Impacts Common to All Alternatives

Decisions to protect unique or significant cave and cave resources (if such resources are found) may result in specific restrictions that could restrict travel in some localized areas. Overall impacts would be negligible over the long term.

4.3.5.6.8.2. Alternatives 1 through 4

There are no additional impacts to travel and transportation.

4.3.5.6.9. Wildland Fire Management Impacts on Travel and Transportation

4.3.5.6.9.1. Impacts Common to All Alternatives

Managing for full suppression of all fires, in accordance with applicable conservation measures, would help maintain existing recreational settings, as would implementation of programs to reduce unwanted ignitions and emphasize wildfire prevention. Closures of localized areas during and after fire suppression activities could limit the number and quality of travel routes for the short term. When such restrictions or closures are ordered, travel opportunities are displaced or diminished, including public access and the use of vehicles. Impacts would be minor over the long term; however, depending on the number of acres that are affected, this intensity could change.

4.3.5.6.9.2. Alternatives 1 through 4

There are no additional impacts to travel and transportation.

4.3.5.6.10. Cultural Resource Impacts on Travel and Transportation

4.3.5.6.10.1. Impacts Common to All Alternatives

Decisions to protect unique or important cultural resources may result in specific restrictions that could restrict travel in some localized areas. Impacts on cultural resources management are expected to be negligible over the long term.

4.3.5.6.10.2. Alternatives 1 through 4

There are no additional impacts to travel and transportation.

4.3.5.6.11. Paleontological Resources Impacts on Travel and Transportation

4.3.5.6.11.1. Impacts Common to All Alternatives

Decisions to protect unique or important paleontological resources may result in specific restrictions that could restrict travel in some localized areas. Impacts on cultural resources management are expected to be negligible over the long term.

4.3.5.6.11.2. Alternatives 1 through 4

There are no additional impacts to travel and transportation.

4.3.5.6.12. Visual Resource Management Impacts on Travel and Transportation

4.3.5.6.12.1. Impacts Common to All Alternatives

Impacts from allocating areas as different VRM classes would be negligible. Class I and II areas are allocated to the more backcountry settings, and the degree of development would be low to none. Class III and IV areas would be more developed and potentially require more routes.

4.3.5.6.12.2. Alternatives 1 through 4

There are no additional impacts to travel and transportation.

4.3.5.6.13. Lands with Wilderness Characteristics Impacts on Travel and Transportation

4.3.5.6.13.1. Impacts Common to All Alternatives

There are no impacts common to all alternatives.

4.3.5.6.13.2. Alternative 1

There are no additional impacts to travel and transportation.

4.3.5.6.13.3. Alternative 2

Areas designated as lands with wilderness characteristics are closed to all motorized and mechanized uses, which will limit the ability to designate routes already in use by the public.

4.3.5.6.13.4. Alternatives 3 and 4

There are no additional impacts to travel and transportation.

4.3.5.7. Resource Uses

4.3.5.7.1. Forestry and Woodland Products Impacts on Travel and Transportation

4.3.5.7.1.1. Impacts Common to All Alternatives

There are no impacts common to all alternatives.

4.3.5.7.1.2. Alternatives 1 through 4

There are no additional impacts to travel and transportation.

4.3.5.7.2. Livestock Grazing Impacts on Travel and Transportation

4.3.5.7.2.1. Impacts Common to All Alternatives

There are no impacts common to all alternatives.

4.3.5.7.2.2. Alternatives 1 through 4

There are no additional impacts to travel and transportation.

4.3.5.7.3. Minerals Impacts on Travel and Transportation

4.3.5.7.3.1. Fluid Leasable Minerals Impacts on Travel and Transportation

4.3.5.7.3.1.1. Impacts Common to All Alternatives

There are no impacts common to all alternatives.

4.3.5.7.3.1.2. Alternatives 1 through 4

There are no additional impacts to travel and transportation.

4.3.5.7.3.2. Solid Leasable Minerals Impacts on Travel and Transportation

4.3.5.7.3.2.1. Impacts Common to All Alternatives

There are no impacts common to all alternatives.

4.3.5.7.3.2.2. Alternatives 1 through 4

There are no additional impacts to travel and transportation.

4.3.5.7.3.3. Locatable Minerals Impacts on Travel and Transportation

4.3.5.7.3.3.1. Impacts Common to All Alternatives

There are no impacts common to all alternatives.

4.3.5.7.3.3.2. Alternatives 1 through 4

There are no additional impacts to travel and transportation.

4.3.5.7.3.4. Saleable Minerals Impacts on Travel and Transportation

4.3.5.7.3.4.1. Impacts Common to All Alternatives

There are no impacts common to all alternatives.

4.3.5.7.3.4.2. Alternatives 1 through 4

There are no additional impacts to travel and transportation.

4.3.5.7.4. Recreation Impacts on Travel and Transportation

4.3.5.7.4.1. Impacts Common to All Alternatives

There are no impacts common to all alternatives.

4.3.5.7.4.2. Alternatives 1 through 4

There are no additional impacts to travel and transportation.

4.3.5.7.5. Travel and Transportation Impacts on Travel and Transportation

4.3.5.7.5.1. Impacts Common to All Alternatives

There are no impacts common to all alternatives.

4.3.5.7.5.2. Alternatives 1

Approximately 1.6 million acres would remain limited to existing roads, trails, and dry washes. Route proliferation would continue to occur. No travel planning would take place under this alternative.

4.3.5.7.5.3. Alternatives 2 through 4

No lands would remain designated as limited to existing roads, trails, and dry washes. The majority of the planning area would be limited to designated roads and trails. Travel planning would take place, and route proliferation would be reduced.

4.3.5.7.6. Lands and Realty Impacts on Travel and Transportation

4.3.5.7.6.1. Land Tenure (Disposals and Acquisitions) Impacts on Travel and Transportation

4.3.5.7.6.1.1. Impacts Common to All Alternatives

Land that is disposed of will impact the travel network due to loss of route segments, ultimately resulting in loss of access in some areas.

4.3.5.7.6.1.2. Alternatives 1

This alternative causes the third-greatest impact to travel due to the third-greatest number of acres proposed for disposal.

4.3.5.7.6.1.3. Alternatives 2

This alternative causes the least impact to travel as it proposes the least number of acres proposed for disposal.

4.3.5.7.6.1.4. Alternatives 3

This alternative causes the second-greatest impact to travel due to the second-greatest number of acres proposed for disposal.

4.3.5.7.6.1.5. Alternatives 4

This alternative causes the greatest impact to travel due the greatest number of acres proposed for disposal.

4.3.5.7.6.2. Land-Use Authorizations (Right-of-Ways, Leases, Permits) Impacts on Travel and Transportation

4.3.5.7.6.2.1. Impacts Common to All Alternatives

Under all alternatives, there is a potential for conflict between the purpose of individual land-use authorizations and travel routes. In the planning area, development would occur on a case-by-case basis and has the potential to displace recreational uses from some travel routes and increase the use.

4.3.5.7.6.2.2. Alternatives 1 through 4

There are no additional impacts to travel and transportation.

4.3.5.7.6.3. Renewable Energy Impacts on Travel and Transportation

4.3.5.7.6.3.1. Impacts Common to All Alternatives

Under all alternatives, there is a potential for conflict between the purpose of individual land-use authorizations and travel routes. In the planning area, development would occur on a case-by-case basis and has the potential to displace recreational uses from some travel routes and increase use on others.

4.3.5.7.6.3.2. Alternatives 1

Alternatives 1 and 4 have the largest acreage available for renewable energy development. Energy projects would be addressed on a case-by-case basis. The larger the area allowed for projects, the more conflict there will be with travel routes.

4.3.5.7.6.3.3. Alternatives 2

This alternative has the least amount of acreage that allows for renewable energy development and would have the least impact on travel access.

4.3.5.7.6.3.4. Alternatives 3

This alternative has the second-largest acreage allowed for renewable energy development and would have the second-largest amount of conflict for access routes.

4.3.5.7.6.3.5. Alternatives 4

Alternatives 1 and 4 have the largest acreage available for renewable energy development. Energy projects would be addressed on a case-by-case basis. The larger the area allowed for projects, the more conflict there will be with travel routes.

4.3.5.7.6.4. Utility Corridors Impacts on Travel and Transportation

4.3.5.7.6.4.1. Impacts Common to All Alternatives

There are no impacts common to all alternatives.

4.3.5.7.6.4.2. Alternatives 1 through 4

There are no additional impacts to travel and transportation.

4.3.5.8. Special Designations

4.3.5.8.1. Areas of Critical Environmental Concern Impacts on Travel and Transportation

4.3.5.8.1.1. Impacts Common to All Alternatives

There are no impacts common to all alternatives.

4.3.5.8.1.2. Alternatives 1 through 4

There are no additional impacts to travel and transportation.

4.3.5.8.2. National Trails Impacts on Travel and Transportation

4.3.5.8.2.1. Impacts Common to All Alternatives

See Cultural Resources for impacts to travel and transportation.

4.3.5.8.3. Wild and Scenic Rivers Impacts on Travel and Transportation

4.3.5.8.3.1. Impacts Common to All Alternatives

There are no impacts common to all alternatives.

4.3.5.8.3.2. Alternative 1

Eligibility would affect the density of routes allowed within river corridors. Route designations may reduce user conflicts by separating use types.

4.3.5.8.3.3. Alternatives 2 and 3

Suitability would affect the density of routes allowed within river corridors. Route designations may reduce user conflicts by separating use types.

4.3.5.8.3.4. Alternative 4

There are no additional impacts to travel and transportation.

4.3.5.8.4. Wilderness Impacts on Travel and Transportation

4.3.5.8.4.1. Impacts Common to All Alternatives

There are no impacts common to all alternatives.

4.3.5.8.4.2. Alternatives 1 through 4

There are no additional impacts to travel and transportation.

4.3.5.8.5. Wilderness Study Areas Impacts on Travel and Transportation

4.3.5.8.5.1. Impacts Common to All Alternatives

There are no impacts common to all alternatives.

4.3.5.8.5.2. Alternatives 1 through 4

There are no additional impacts to travel and transportation.

4.3.5.9. Cumulative Impacts on Travel and Transportation

4.3.5.9.1. Past and Present Actions/Impacts

Past and present actions impacting travel management include the addition of routes for lands and realty actions such as rights-of-ways, vegetation treatments to control invasive species, new minerals exploration and development routes, managing for increasing recreational demand and visitation by adding new routes, and other changes in travel management; however, these actions would likely be minor.

4.3.5.9.2. Reasonable Foreseeable Actions

Reasonably foreseeable future actions impacting travel management include the continued addition of routes for lands and realty actions such as rights-of-ways, vegetation treatments to control invasive species, new minerals exploration and development routes, managing for increasing recreational demand and visitation by adding new routes, and other changes in travel management. Some routes may be eliminated due to the addition of new ACECs and other resource concerns such as wildlife, special status species, cultural resources, endangered plants, etc.

4.3.5.9.3. Cumulative Impact

4.3.5.9.3.1. Alternatives 1 through 4

Transportation and road networks adjacent to BLM lands include routes shared with other federal agencies, state lands, local municipalities, and private landowners. Cumulative impacts to transportation and access would occur primarily from actions that facilitate, restrict, or preclude motorized access, including the designation of routes on BLM land. Management actions that restrict OHV use would limit the degree of travel opportunities and the ability to access certain portions of the planning area. The continued maintenance of federal and state highways would provide arterial connections to BLM roads. County-maintained routes that connect federal and state highways to BLM-system routes would maintain and improve access to the planning area resources.

Therefore, the incremental contribution of all alternatives to the cumulative impacts on travel management is expected to be minimal because the alternatives and designated routes under the proposed plan provide sufficient travel opportunities throughout the planning area.

4.3.6. Lands and Realty

4.3.6.1. Summary

The lands and realty program includes land tenure adjustments (e.g., disposals and acquisitions); withdrawals; land-use authorizations (i.e., rights-of-way, permits, leases) to include the management of renewable energy development, and the designation of rights-of-way transportation and utility corridors. Impacts to lands and realty are a result of the management actions of all resource programs. The discussion of the impacts to lands and realty under each alternative is limited to the effects to authorized uses such as restrictions, costs and time frames to complete lands and realty actions and authorizations or denial of applications. In general, impacts common to all alternatives involve actions that continue to both allow and restrict certain land uses, depending on local resource conditions and opportunities for resource use and consumption. Reasonably foreseeable developments also influence actions that allow and restrict certain land uses. Individual impacts under Alternative 1 would continue to rely on the 1998 RMP, as amended, to manage land use and land designations.

4.3.6.2. Methods of Analysis

The analysis of impacts on lands and realty are based on interdisciplinary team knowledge of the resources and the planning area and information gathered from the cooperating agencies and the public during the planning process. Impact analysis and conclusions focus on two distinctive areas. The area of analysis for land tenure can include the entire planning area, including both public lands and federal mineral estate; while the area of analysis for land-use authorizations consists of public lands (surface).

Direct impacts to lands and realty are considered to be those that either reduce or enlarge the location upon which land tenure and use authorizations can occur (e.g., identification of exclusion areas reduces the locations where use authorizations may be issued). As such, the number of acres where lands and realty actions are potentially restricted is used to indicate the impact of management actions and decisions.

Indirect impacts would potentially occur from restrictions that limit the type of development allowed by a specific use authorization. Such restrictions could include compliance requirements with best management practices and standard operating procedures, which may make projects not feasible. This principally occurs through the application of stipulations and terms and conditions, which would be applied to all use authorizations within avoidance areas and to meet other resource objectives (such as visual resource management, desired habitat condition, or dust control measures) outside of avoidance areas. These would be established based on the proposed action through a site-specific NEPA analysis.

The lack of site-specific information for lands meeting the criteria for disposal or acquisition, details of future proposal for rights-of-way development, and the incomplete inventory of cultural resources limits the ability to perform quantitative analysis of these elements as they relate to land tenure and use authorizations. This information, however, will be included in the site-specific analysis at the project level.

Withdrawals related to mineral entry and leasing are analyzed under the Minerals section (p. 1009).

4.3.6.3. Qualitative Intensity Scale

The following analysis discusses the impacts on lands and realty from the proposed alternatives and the management actions in Chapter 2 (p. 158). Impacts may result from actions that effect land tenure (ownership), or opportunities for land-use authorizations (including utility-scale renewable energy development) within the planning areas of the Las Vegas and Pahrump field offices.

The following assumptions regarding the future management of lands and realty are made:

1. Alternatives 1, 2, 3, and 4 identify congressionally designated disposal areas and lands identified as suitable for disposal. Identifying lands for disposal does not entail that these lands will be conveyed. However, over the next 20 years, all acres identified for disposal could potentially be conveyed out of federal ownership.
2. Prior to any disposal, a site-specific analysis must determine that the lands considered contain no significant wildlife, recreation, or other resource values, the loss of which could not be mitigated; have no overriding public values; and represent no substantial public investments. Disposals must serve the public interest.
3. Lands not designated as suitable for disposal will be retained unless there is a land-use plan amendment.
4. Consolidating public lands and eliminating scattered parcels of public land that lack access and are difficult to manage is beneficial to the BLM and the public.
5. BLM would use proactive approaches to acquire lands and interests in lands from willing sellers.
6. Withdrawals are completed for many types of uses, including administrative sites, power-site reserves, power projects, and irrigation projects. In some cases, other federal agencies pursue and hold withdrawals, including the Bureau of Indian Affairs, U.S. Department of Defense; U.S. Department of Energy; U.S. Department of Agriculture Forest Service; Interior departments such as the Bureau of Reclamation and the National Park Service; and the Federal Energy Regulatory Commission. With such withdrawals, surface management jurisdiction may actually be transferred to the other federal agency. However, for the purposes of analysis, only the acres of public lands (withdrawals) retained under BLM administration are analyzed or used as an indicator to determine availability of public land for multiple-use purposes in this document.
7. Access to public lands, for both the public and BLM, and availability of public lands to meet public demands is a high priority for the lands and realty program.
8. Land-use authorizations (i.e., ROW, leases, permits) are used for purposes such as roads, water pipelines, natural gas pipelines, power lines, telephone lines, fiber-optic cables, railroads, highways, canals, ditches, renewable energy development (i.e., solar, wind), and communications sites. Acres of open, avoidance, and exclusion areas are used as indicators to determine the availability for land-use authorizations. Site-specific reviews would be conducted.
9. Lands that fall within solar energy zones are expected to be fully developed over the next 20 years.
10. The effects of developing utility and transportation systems would be mitigated individually. Generally, this would be accomplished by consolidating new developments along existing routes, or by innovative construction techniques that disturb less land and improve reclamation success.

Evaluation of the impacts to lands and realty programs are based on a four-point scale:

- **Neglible:** These are impacts that have little to no effect the lands and realty program.

- **Minor/Low:** These are impacts that may require project-level analysis to address potentially unknown issues or conditions that may affect the resource's development. Conflicts to the realty program would be limited and/or subject to standard stipulations.
- **Moderate:** These are impacts that will require project-level analysis to address potentially unknown issues or conditions that may limit the resource development potential. These impacts include avoidance areas and potential conflicts with lands and realty actions that would occur but could be mitigated.
- **Major:** These are impacts that will require project-level analysis as there are major or significant issues or conditions that prevent or limit the resource's development potential. These impacts include exclusion areas. Potential conflicts with lands and realty actions would be of concern.

4.3.6.4. Land Tenure (Disposals and Acquisitions)

Pursuant to FLPMA, Congress declared that it is the policy of the United States that public lands shall be retained in federal ownership unless as a result of land-use planning it is determined that disposal of a particular parcel will serve the national interest. Consistent with FLPMA, BLM's land tenure goals are to dispose of lands that are difficult or uneconomical to manage or are no longer needed for federal purposes; to retain public lands or interests in lands that enhance multiple-use management; and to acquire lands and/or interests in lands (i.e., water rights, mineral rights, access easements) that complement resource values and further management objectives. Although the disposal of public land and the acquisition of land and/or interest in land is an administrative action to transfer of title only, there could be potential indirect impacts.

4.3.6.4.1. Resources

4.3.6.4.1.1. Air Quality Impacts on Land Tenure (Disposals and Acquisitions)

4.3.6.4.1.1.1. Impacts Common to All Alternatives

Air quality management has negligible to no impacts on land tenure. The disposal of public land and the acquisition of land and/or interest in land is an administrative action of transfer of title. Land disposal actions are not subject to conformity with existing state implementation plans because land disposal does not create or increase sources of pollutants or emission rates (40 CFR 93.153(c)(2)(xiv)). Federal agencies are not responsible for activities that occur subsequent to transfer of title. Acquisition could further the objectives of air quality by enhancing the protection of lands and/or interests in land from development and/or degradation. Impacts to land tenure would be negligible.

4.3.6.4.1.1.2. Alternatives 1 through 4

The are no additional impacts to land tenure..

4.3.6.4.1.2. Soil Resources Impacts on Land Tenure (Disposals and Acquisitions)

4.3.6.4.1.2.1. Impacts Common to All Alternatives

A disposal action is only a transfer of title — no ground-disturbing activity occurs under this type of administrative transaction. However, soil resource management may have minor impacts on land disposals should avoidance areas be determined during project-level analysis. For example, a transfer of title action may be disallowed if it is determined during project-level analysis that certain lands within a disposal area should be retained in federal ownership to protect and manage riparian components of watersheds. Such determination could potentially inhibit or limit availability of lands suitable for disposal, thus impacting the potential for community expansion and/or economic development. Acquisition could further the objectives of soil resources by enhancing the protection and/or recovery of sensitive soils and watersheds from potential development and/or degradation.

4.3.6.4.1.2.2. Alternative 1

Soil management impacts to land tenure may be moderate.

4.3.6.4.1.2.3. Alternatives 2 through 4

Soil management may have a moderate impact on land disposals if avoidance areas are determined for sensitive or fragile soils. Such avoidance areas could limit the availability of lands suitable for conveyance during project-level analysis. Furthermore, soil management could have an effect because travel and transportation routes could be segmented by land disposals, thereby affecting access to disposal lands and acquired lands.

4.3.6.4.1.3. Water Resources Impacts on Land Tenure (Disposals and Acquisitions)

4.3.6.4.1.3.1. Impacts Common to All Alternatives

Disposal of public land is an administrative action to transfer of title only — there is no development or ground-disturbing activities. However, impacts to land disposals (post title transfer) from water resources could be major as the result of Nevada State Engineer Order No. 1169 dated March 8, 2002, and the January 29, 2014, order regarding rulings on hydrographic basins 218, 219, and 220; and Order No. 1197 dated November 4, 2008, regarding hydrographic basin 230. Order No. 1197 greatly restricts the availability of new water rights and even the relocation of existing water rights within basin 230. Any proposed groundwater development or groundwater change application that conflicts with these orders could be protested. Such protest could be on federal and non-federal lands, as well as lands conveyed out of federal ownership that may require water rights for development purposes. To potentially protest water right applications post disposal actions could put a financial hardship on the new property owner. The property owner could find it difficult to obtain financial support for land development if water rights are needed and/or if development would be suspended while responding to water rights protests. The protest process could take an undetermined amount of time. The BLM is prohibited by federal law to allow actions that would threaten or endanger a listed species or would cause a trend toward the listing of a species. Hence, the impacts from water resources are considered major. Acquisition could benefit the land tenure program through special legislation and/or

resource funding to further the objectives of water resources (and related wetlands, riparian areas, and wildlife habitats) by enhancing the protection and/or recovery of lands and/or interests in lands from potential development and/or degradation. Further, a lack of water resources and suitable soils for agricultural development has deemed public lands within the planning area as unsuitable for disposal subject to the Indian Allotment, Desert Land Entry, or Carey Act, and therefore disposals would not occur through those authorities.

The below table describes the respective disposal acreage by alternative that could be impacted by water resources. Refer to Chapter 2 (p. 29) for the water resource management prescriptions that could impact land disposals (post title transfer).

Table 4.25. Disposal Acreage that Could be Impacted by Water Resources (Clark County)

State Engineer Order No. 1169	**Clark County Area Moapa/Glendale Disposal Area** (approximate acres that could be impacted)			
Hydrographic basin	**Alternative 1**	**Alternative 2**	**Alternative 3**	**Alternative 4**
218	13,867	120	120	120
219	569	0	0	0
220	11,423	0	12,300	12,300
Total acreage by alternative	**25,859**	**120**	**12,420**	**12,420**

Table 4.26. Disposal Areas that Could be Impacted by Water Resources (Nye County)

PFO Disposal Areas Affected in Nye County	**State Engineer Order No. 1197 Hydrographic Basin 230** (approximate acres that could be impacted)			
	Alternative 1	**Alternative 2**	**Alternative 3**	**Alternative 4**
Amargosa Valley	27,639	0	25,863	27,720
Von Schmidt	0	0	122	122
Hwy-95/160 Interstate	0	0	204	652
Lathrop Wells	5,628	2,572	5,628	7,550
Mercury	0	0	313	2,658
Last Chance Basin	0	0	3,921	4,486
South Beatty	0	0	491	2,838
Stateline 13 Acres	0	0	13	13
Nye County 2	0	400	400	400
Total Acreage by Alternative	**33,288**	**2,971**	**37,093**	**18,358**

4.3.6.4.1.3.2. Alternative 1

Water resource management impacts to land tenure may be major. See Impacts Common to all Alternatives.

4.3.6.4.1.3.3. Alternatives 2, 3, and 4

Water resources may also have major impacts on public lands within the planning area that were leased pursuant to the Recreation and Public Purpose (R&PP) Act of 1929, as amended. BLM grants R&PP leases for property development to governmental agencies and nonprofits at a reduced price with the intention to transfer title of the land by patent or deed after development for the specified purpose. The process involves a cooperative effort of the project plan of development and management between the proponent and BLM. Water resources could impact

the development of water facilities for such uses as parks. Furthermore, BLM may not be able to dispose of land where BLM holds appropriated water rights or a federally reserved claim or where reasonable and foreseeable future development would negatively impact a federally reserved claim. This has a significant impact on the BLM because revenue from the conveyance of public lands supports the bureau's budget for the lands and realty program.

4.3.6.4.1.4. Integrated Vegetation Impacts on Land Tenure (Disposals and Acquisitions)

4.3.6.4.1.4.1. Riparian Areas and Wetlands and Vegetation Impacts on Land Tenure (Disposals and Acquisitions)

4.3.6.4.1.4.1.1. Impacts Common to All Alternatives

Integrated vegetation such as riparian areas and wetlands, and vegetation resource management may have major impacts on land disposals. Management prescription RIP-02 (p. 33) would require retention of wetlands, riparian woodlands, and mesquite and acacia woodlands in federal ownership unless their disposal is in the public interest. This could have a significant impact on lands identified as suitable for disposal, such as the area south of Pahrump where mesquite and acacia woodlands are prevalent. BLM policy is to retain wetland and riparian areas in federal ownership unless federal, state, public, and private entities have demonstrated the ability to maintain, restore, and protect wetlands and riparian habitats on a continuous basis (BLM Manual 6740). Prior to any disposal, a site-specific analysis must determine that the lands considered contain no significant wildlife, recreation, or other resource values, the loss of which could not be mitigated; have no overriding public values; and represent no substantial public investments. Acquisition could further the objectives of integrated vegetation resources by enhancing the protection and/or recovery of land health and ecosystem services provided by native plant communities.

4.3.6.4.1.4.1.2. Alternative 1

Under this alternative, over 57,000 acres of lands identified as suitable for disposal in LVFO (Clark County) and over 36,000 acres of lands identified as suitable for disposal in PFO (Nye County) may be impacted by integrated vegetation resource management. The respective field office disposal areas that may be impacted are identified below:

- **LVFO:** Mesquite/Bunkerville, Moapa/Glendale, Nelson, Sandy Valley, Laughlin, and Searchlight.
- **PFO:** Amargosa Valley and Pahrump.

4.3.6.4.1.4.1.3. Alternative 2

Under this alternative, over 8,300 acres of lands identified as suitable for disposal in LVFO (Clark County), and over 2,700 acres of lands identified as suitable for disposal in PFO (Nye County) may be impacted by integrated vegetation resource management. The respective field office disposal areas that may be impacted are identified below:

- **LVFO:** Mesquite/Bunkerville, Moapa/Glendale, Nelson, Sandy Valley, and Searchlight.
- **PFO:** Pahrump.

Under a no-net loss standard, lands identified as suitable for disposal may potentially be unacceptable for conveyance. Further, BLM grants R&PP leases for property development to governmental agencies and nonprofits at a reduced price with the intention to transfer title of the land by patent or deed after development for the specified purpose (if the project is in compliance). The process involves a cooperative effort of the project plan of development and management between the proponent and BLM. Restrictions on the use of land as established under Integrated Vegetation Management Actions (p. 32), could impact the development of facilities for R&PP leases that would go to patent, which could increase the costs of development, management, and monitoring for the BLM and the proponent.

4.3.6.4.1.4.1.4. Alternative 3

Under this alternative, over 37,000 acres of lands identified as suitable for disposal in LVFO (Clark County), and over 34,000 acres of lands identified as suitable for disposal in PFO (Nye County) may be impacted by integrated vegetation resource management. The respective field office disposal areas that may be impacted are identified below:

- **LVFO:** Mesquite/Bunkerville, Moapa/Glendale, Nelson, Sandy Valley, Laughlin, and Searchlight.
- **PFO:** Amargosa Valley, Pahrump, Last Chance Range, Southern Pahrump Off the Grid, and Southern Pahrump Connection.

Under a no-net loss standard, lands identified as suitable for disposal may potentially be unacceptable for conveyance. Further, BLM grants R&PP leases for property development to governmental agencies and nonprofits at a reduced price with the intention to transfer title of the land by patent or deed after development for the specified purpose (if the project is in compliance). The process involves a cooperative effort of the project plan of development and management between the proponent and BLM. Restrictions on the use of land as established under Integrated Vegetation Management Actions (p. 32), could impact the development of facilities for R&PP leases that would go to patent, which could increase the costs of development, management, and monitoring for the BLM and the proponent.

4.3.6.4.1.4.1.5. Alternative 4

Under this alternative, over 38,000 acres of lands identified as suitable for disposal in LVFO (Clark County), and over 51,000 acres of lands identified as suitable for disposal in PFO (Nye County) may be impacted by integrated vegetation resource management. The respective field office disposal areas that may be impacted are identified below:

- **LVFO:** Mesquite/Bunkerville, Moapa/Glendale, Nelson, Sandy Valley, Laughlin, and Searchlight.
- **PFO:** Amargosa Valley, Pahrump, Von Schmidt, Last Chance Range, Pahrump Stateline, Southern Pahrump Off the Grid, and Southern Pahrump Connection.

Under a no-net loss standard, lands identified as suitable for disposal may potentially be unacceptable for conveyance. Further, BLM grants R&PP leases for property development to governmental agencies and nonprofits at a reduced price with the intention to transfer title of the land by patent or deed after development for the specified purpose (if the project is in compliance). The process involves a cooperative effort of the project plan of development and management between the proponent and BLM. Restrictions on the use of land as established under Integrated Vegetation Management Actions (p. 32), could impact the development of facilities for R&PP

leases that would go to patent, which could increase the costs of development, management, and monitoring for the BLM and the proponent.

4.3.6.4.1.4.2. Weeds Impacts on Land Tenure (Disposals and Acquisitions)

4.3.6.4.1.4.2.1. Impacts Common to All Alternatives

Weeds management may have negligible impacts to land disposals or acquisitions. The disposal of public land and the acquisition of land and/or interest in land is an administrative action to transfer of title.

4.3.6.4.1.4.2.2. Alternative 1 through 4

There are no additional impacts to land tenure.

4.3.6.4.1.5. Fish and Wildlife Impacts on Land Tenure (Disposals and Acquisitions)

4.3.6.4.1.5.1. Impacts Common to All Alternatives

Fish and wildlife management may have moderate impacts to disposals during project-level analysis if it is determined that the conveyance would have adverse impacts to fish and wildlife resources. Such determination could inhibit or limit lands available for conveyance, thus impacting the potential for community expansion and/or economic development. Acquisition could be a benefit to this resource by further enhancing the protection and recovery of wildlife habitats.

4.3.6.4.1.5.2. Alternatives 1 and 4

Fish and wildlife resource management impacts on land tenure could be moderate.

4.3.6.4.1.5.3. Alternatives 2 and 3

Under this alternative, fish and wildlife management may have moderate impacts on land disposals. BLM-authorized activities would have to be avoided within a half mile of artificial water sources, which could significantly impact any issues related with the Stateline 13 Acres disposal area in the Pahrump Field Office.

4.3.6.4.1.6. Special Status Species Impacts on Land Tenure (Disposals and Acquisitions)

4.3.6.4.1.6.1. Impacts Common to All Alternatives

Special status species management may have moderate impacts to disposals during project-level analysis if it is determined that the conveyance would have adverse impacts to the resource. Impacts could include relocation of the disposal project, avoidance of the species, or even denial of the lands action, thus impacting the potential for community expansion and/or economic development. Additional coordination with the Nevada Division of Wildlife would be required for species identified as endangered by state law. Land disposal proposals/applications may

be subject to Section 7 consultation. Such potential impacts could cause delays in application processing, potentially resulting in project time line overruns, development of species-specific mitigation measures, and increased expenses for the proponent. Acquisition could enhance the protection and recovery of habitats for threatened and endangered and sensitive species.

4.3.6.4.1.6.2. Alternatives 1 through 4

There are no additional impacts to land tenure.

4.3.6.4.1.7. Wild Horse and Burro Impacts on Land Tenure (Disposals and Acquisitions)

4.3.6.4.1.7.1. Impacts Common to All Alternatives

Wild horse and burro management may have major impacts to land tenure (e.g., disposal areas). Specially designated areas such as herd management areas (HMAs) are designated for their key habitat components (forage, water, cover, and space) to maintain a thriving natural ecological balance and multiple-use relationships on public lands. Any changes to HMA boundaries may be done through a land-use plan amendment/revision, or if a new resource management plan provides that the land is no longer needed for wild horse and burro management as defined by the HMA plan, in accordance with the Wild Free-Roaming Horses and Burros Act of 1971 and BLM regulations and policy. Retention provides less land suitable for disposal, thus impacting the potential for community expansion and/or economic development. Furthermore, a conveyance request would have to meet the disposal criteria under Section 203 of FLPMA. Acquiring lands and/or interests in lands within and/or contiguous to HMAs could further enhance habitat components for wild horses and burros. There would be no impacts to legislative disposal areas.

4.3.6.4.1.7.2. Alternative 1

Wild horse and burro management impacts to the following designated disposal areas under this alternative would be negligible. These public lands were evaluated as suitable for disposal and designated as a disposal area under the 1998 RMP. However, impacts would be major to any request for disposal/conveyance of lands located outside of a designated disposal area since these requests may be subject to a land-use plan amendment/revision.

- Goodsprings (960 acres).
- Indian Springs (384 acres).
- Indian Springs Prison (1,301 acres).
- Pahrump (8,777 acres).

4.3.6.4.1.7.3. Alternative 2

Wild horse and burro management may have major impacts to the following proposed disposal areas:

- Goodsprings (960 acres).
- Indian Springs (384 acres).
- Indian Springs Prison (1,301 acres).
- Pahrump (2,705 acres).

- Belle Vista (355 acres).

4.3.6.4.1.7.4. Alternative 3

Wild horse and burro management may have major impacts to the following proposed disposal areas:

- Goodsprings (960 acres).
- Indian Springs (384 acres).
- Indian Springs Prison (1,301 acres).
- Pahrump (3,515 acres).
- Belle Vista (355 acres).
- Hwy 95/160 Interstate (204 acres).
- Last Chance Basin (3,921 acres).
- Last Chance Range (191 acres).
- Pahrump East (418 acres).

4.3.6.4.1.7.5. Alternative 4

Wild horse and burro management may have major impacts to the following proposed disposal areas:

- Goodsprings (960 acres).
- Indian Springs (384 acres).
- Indian Springs Prison (1,301 acres).
- Pahrump (6,677 acres).
- Belle Vista (355 acres).
- Hwy 95/160 Interstate (204 acres).
- Last Chance Basin (3,921 acres).
- Last Chance Range (191 acres).
- Pahrump East (418 acres).
- Mercury (2,658 acres).
- Southern Pahrump/Off the Grid (11,144 acres).

4.3.6.4.1.8. Cave and Karst Management Impacts on Land Tenure (Disposals and Acquisitions)

4.3.6.4.1.8.1. Impacts Common to All Alternatives

Cave and karst management may have moderate impacts to disposals during project-level analysis if it is determined that the conveyance would have adverse impacts to the resource and that retention of the subject land would be in the public's best interest. Such determination could potentially inhibit or limit availability of lands suitable for disposal, thus impacting the potential for community expansion and/or economic development. Acquisition could enhance the protection and preservation of this resource.

4.3.6.4.1.8.2. Alternatives 1 through 4

The are no additional impacts to land tenure.

4.3.6.4.1.9. Wildland Fire Management Impacts on Land Tenure (Disposals and Acquisitions)

4.3.6.4.1.9.1. Impacts Common to All Alternatives

There are no impacts common to all alternatives.

4.3.6.4.1.9.2. Alternative 1

Wildland fire management may have negligible impacts to land tenure because there are no management prescriptions under this alternative that would preclude a disposal action.

4.3.6.4.1.9.3. Alternative 2

Wildland fire management may have major impacts on disposals. Under this alternative, BLM would issue a two-year area closure to all activities on lands impacted by wildland fire within the planning area. This closure could delay BLM's ability to dispose of lands.

4.3.6.4.1.9.4. Alternatives 3 and 4

Wildland fire management may have moderate impacts to disposals because BLM would implement area closures to activities on lands impacted by wildfires on a case-by-case basis. Potential closures could delay BLM's ability to dispose of lands.

4.3.6.4.1.10. Cultural Resources Impacts on Land Tenure (Disposals and Acquisitions)

4.3.6.4.1.10.1. Impacts Common to All Alternatives

Cultural resources may have moderate impacts to disposals during project-level analysis if it is determined that the conveyance would have adverse impacts to the resource after the transfer of title. Lands and realty actions are considered federal undertakings and must avoid inadvertent damage to federal and non-federal cultural resources through compliance with Section 106 of the National Historic Preservation Act. Tribal consultation may provide BLM additional information regarding the sensitivity of cultural values. Any adverse impact determination regarding cultural resources could inhibit or limit lands available for conveyance, thus impacting the potential for community expansion and/or economic development. Acquisition could enhance the protection and preservation of National Register-eligible cultural resources.

4.3.6.4.1.10.2. Alternatives 1 through 4

There are no additional impacts to land tenure.

4.3.6.4.1.11. Paleontological Resources Impacts on Land Tenure (Disposals and Acquisitions)

4.3.6.4.1.11.1. Impacts Common to All Alternatives

Paleontological resource management may have a major impact to disposals. Paleontological resources (fossils) are remains or traces of plants and animals that existed during the 600 million-year geological history of southern Nevada. During project-level analysis, if it is determined that a proposed disposal action would have an adverse impact on the resource, such determination would inhibit or limit lands available for conveyance. Acquisitions could be a benefit by further enhancing the protection and preservation of paleontological resources.

4.3.6.4.1.11.2. Alternatives 1 through 4

Paleontological resource management impacts on land tenure may be moderate.

4.3.6.4.1.12. Visual Resource Management Impacts on Land Tenure (Disposals and Acquisitions)

4.3.6.4.1.12.1. Impacts Common to All Alternatives

Visual resource management may have minor impacts to disposals during project-level analysis if it is determined that the conveyance would have an adverse indirect impact to viewsheds after transfer of title. Such determination could inhibit or limit lands available for conveyance, thus impacting the potential for community expansion and/or economic development. Acquisition could enhance the protection and preservation of visual and aesthetic resource values.

4.3.6.4.1.12.2. Alternatives 1 through 4

Visual resource management impacts on land tenure may be moderate.

4.3.6.4.1.13. Lands with Wilderness Characteristics Impacts on Land Tenure (Disposals and Acquisitions)

4.3.6.4.1.13.1. Impacts Common to All Alternatives

There would be no impacts common to all alternatives.

4.3.6.4.1.13.2. Alternative 1

There are no impacts to land tenure under this alternative because there are no designated lands with wilderness characteristics.

4.3.6.4.1.13.3. Alternatives 2 through 4

Management of lands with wilderness characteristics may have minor impacts to disposals. Although land would be retained in federal ownership, there are no overlapping conflicts with disposal areas and lands with wilderness characteristics. Acquisition could enhance the protection

and preservation of wilderness characteristics and/or to secure legal public and administrative access to otherwise inaccessible public lands.

4.3.6.4.2. Resource Uses

4.3.6.4.2.1. Forestry and Woodland Products Impacts on Land Tenure (Disposals and Acquisitions)

4.3.6.4.2.1.1. Impacts Common to All Alternatives

Forestry and woodlands products management would have negligible impacts to disposals. Acquisition could enhance the protection and preservation of ecological health for this resource.

4.3.6.4.2.1.2. Alternatives 1 through 4

There are no additional impacts to land tenure.

4.3.6.4.2.2. Livestock Grazing Impacts on Land Tenure (Disposals and Acquisitions)

4.3.6.4.2.2.1. Impacts Common to All Alternatives

Livestock grazing management may have minor impacts to disposals. Land disposal areas are closed to livestock grazing. However, should there be a grazing lease or permit where lands are proposed for disposal, there could be a delay in conveyance due to a notification requirement to grazing lessees or permittees of not less than two years prior to cancelling such leases and permits, as appropriate. Acquisition could enhance the protection and preservation of rangelands.

4.3.6.4.2.2.2. Alternatives 1 through 4

Livestock grazing management impacts on land tenure may be moderate.

4.3.6.4.2.3. Minerals Impacts on Land Tenure (Disposals and Acquisitions)

4.3.6.4.2.3.1. Leasable, Saleable, and Locatable Minerals Impacts on Land Tenure (Disposals and Acquisitions)

4.3.6.4.2.3.1.1. Impacts Common to All Alternatives

Mineral resource management may have moderate impacts on disposals during project-level analysis. Mineral entry and development that encumbers the land could lower the appraisal values. High potential mineral value could also preclude disposal of the lands. Other important impacts toward the lands disposal program include so-called “nuisance” claims, filed on lands known for their high value. In cases where the mining claimant refuses to relinquish the claims, the individual or agency applying for the land disposal may be forced to buy out the claimant. Processing of conducting validity tests is a mechanism used for ruling out “nuisance” claims from sale parcels. This process would be expensive and time-consuming. Until lands are congressionally or administratively classified and segregated, or withdrawn for disposal, mineral

resource management could inhibit or postpone conveyances. There would be no impacts to the congressionally designated disposal areas (i.e., SNPLMA, Ivanpah Airport Environs Overlay District) as these legislative disposal areas are withdrawn from mineral entry under the mining laws. Withdrawals related to mineral entry and leasing are analyzed under the Minerals section (p. 1009). Acquired lands would be managed consistent with the authority for acquisition and the surrounding land management prescriptions.

4.3.6.4.2.3.1.2. Alternatives 1 through 4

Mineral resource management impacts on land tenure may be moderate.

4.3.6.4.2.4. Recreation Impacts on Land Tenure (Disposals and Acquisitions)

4.3.6.4.2.4.1. Impacts Common to All Alternatives

Recreation resource management may have major impacts to disposals. Disposal areas that are encumbered by a special recreation management area (SRMA) will be managed consistent with the SRMA regulation and policy until conveyance. SRMAs are to be retained in federal ownership unless the lands are congressionally designated for disposal, or if during project-level analysis it is determined that the lands are suitable for conveyance. Retention provides less land suitable for disposal, thus impacting the potential for community expansion and/or economic development. Other recreational areas will be managed accordingly until lands are disposed of. Public lands that are encumbered by an existing recreation permit or lease could preclude or extend the timing for a disposal action. The below alternatives describe those SRMAs that overlap disposal areas. Acquiring lands and/or interests in lands could further enhance recreational opportunities.

4.3.6.4.2.4.2. Alternative 1

Under this alternative, disposal areas that overlap the SRMAs identified below would be considered during project-level analysis to determine suitability for disposal. All other lands outside of established disposal areas may be considered for conveyance, taking into consideration that lands to be disposed of are located outside any special recreation management area.

Table 4.27. Alternative 1 Overlapping Disposal Areas and SRMAs

SRMA	Disposal Area (* denotes congressionally designated disposal areas)
Las Vegas Valley	● Valley West ● SNPLMA*
Jean/Roach	● Goodsprings ● Ivanpah Airport Environs Overlay District*
Sunrise Mountain	● Sunrise Landfill
Nellis Dunes	● Apex*

4.3.6.4.2.4.3. Alternative 2

Under this alternative, disposal areas that overlap the SRMAs identified below would be considered during project-level analysis to determine suitability for disposal. All other lands outside of established disposal areas may be considered for conveyance, taking into consideration that lands to be disposed of are located outside any special recreation management area.

Table 4.28. Alternative 2 Overlapping Disposal Areas and SRMAs

SRMA	Disposal Area (* denotes congressionally designated disposal areas)
Las Vegas Valley	● Sunrise Landfill ● SNPLMA*
Gold Butte	● Mesquite-Bunkerville ● Ivanpah Airport Environs Overlay District*
Big Dune	● Nye County 1 ● Nye County 2

4.3.6.4.2.4.4. Alternative 3

Under this alternative, disposal areas that overlap the SRMAs identified below would be considered during project-level analysis to determine suitability for disposal. All other lands outside of established disposal areas may be considered for conveyance, taking into consideration that lands to be disposed of are located outside any special recreation management area.

Table 4.29. Alternative 3 Overlapping Disposal Areas and SRMAs

SRMA	Disposal Area (* denotes congressionally designated disposal areas)
Las Vegas Valley	● Sunrise Landfill ● SNPLMA*
Jean/Roach	● Goodsprings ● Ivanpah Airport Environs Overlay District*
Gold Butte	● Mesquite-Bunkerville
Nellis Dunes	● Apex*
Laughlin	● Laughlin
Big Dune	● Nye County 1 ● Nye County 2

4.3.6.4.2.4.5. Alternative 4

Under this alternative, disposal areas that overlap the SRMAs identified below would be considered during project-level analysis to determine suitability for disposal. All other lands outside of established disposal areas may be considered for conveyance, taking into consideration that lands to be disposed of are located outside any special recreation management area.

Table 4.30. Alternative 4 Overlapping Disposal Areas and SRMAs

SRMA	Disposal Area (* denotes congressionally designated disposal areas)
Nellis Dunes	● Apex*

4.3.6.4.2.5. Travel and Transportation Impacts on Land Tenure (Disposals and Acquisitions)

4.3.6.4.2.5.1. Impacts Common to All Alternatives

Travel and transportation management may have minor impacts to disposals. Managing area-specific travel issues could potentially postpone or inhibit conveyance due to access issues. Acquisition could be a benefit by eliminating access issues.

4.3.6.4.2.5.2. Alternative 1

Travel and transportation management impacts on land tenure may be minor.

4.3.6.4.2.5.3. Alternatives 2 through 4

There may be a need for acquisition of easements to create travel connectivity on private land.

4.3.6.4.2.6. Lands and Realty Impacts on Land Tenure (Disposals and Acquisitions)

4.3.6.4.2.6.1. Land Tenure (Disposals and Acquisitions) Impacts on Land Tenure (Disposals and Acquisitions)

4.3.6.4.2.6.1.1. Impacts Common to All Alternatives

Land tenure management may have major impacts on land tenure. Congressionally designated disposals can only be conveyed consistent with the respective legislation. Withdrawals are segregated from public land laws and cannot be used for any other purpose until it is formally determined that the withdrawal is no longer needed. Section 204(l) of FLPMA requires the review of existing withdrawals to determine whether they are still serving the purposes for which they were made. While the BLM can make recommendations to designate, revoke, or extend withdrawals, only the Secretary has the authority to actually take these actions. Public lands within the planning area may not be suitable for entry under Indian Allotment, Desert Land Entry, or the Carey Act and would not be disposed of through those authorities. Public lands outside of established disposal areas would only be considered for disposal if specific criteria are met. Lands acquired under special legislation will be managed consistent to the legislation and the land-use plan. This could preclude acquired lands from disposal.

4.3.6.4.2.6.1.2. Alternative 1

Land tenure management impacts on land tenure may be major.

4.3.6.4.2.6.1.3. Alternative 2

Land tenure impacts on land tenure may be major as described under Impacts Common to All Alternatives. There would not be any impacts for the removal of the management prescription to resolve potential unauthorized uses (trespass actions) by direct sale. Furthermore, there is a management prescription regarding unauthorized public land uses (trespass) outside established disposal areas that is not being carried forward under this alternative. BLM's regulations and policies are to prevent trespass; investigate suspected trespass; terminate trespass; recover full compensation; and report criminal action, where applicable. Should conveyance by direct sale be appropriate, it would require approval by the state director and may require a land-use plan amendment. Removal of this management prescription would have a negligible impact to the disposals program.

4.3.6.4.2.6.1.4. Alternative 3

Land tenure impacts on land tenure may be major as described under Impacts Common to all Alternatives, including impacts to disposals regarding the Amargosa Valley (25,863 acres) disposal area. BLM would only seek a biological opinion from the U.S. Fish and Wildlife Service for evaluation of 552 acres of the Amargosa Valley disposal area. All further disposals would be evaluated under NEPA on a case-by-case basis. This action may have significant impacts on disposals in the Amargosa Valley disposal area as it would require project-specific biological opinions that would hold up environmental review of the disposal of these lands. There may also be significant impacts on applicants requesting conveyance of lands within the proposed South Beatty disposal area. These lands identified as suitable for disposal are located within an unsurveyed township. Prior to conveyance of these unsurveyed lands, the proponent/applicant will be responsible for the cost of having the land surveyed. Surveys are costly and can take years to be completed, reviewed, and approved by the BLM Nevada Cadastral Office.

Furthermore, there is a management prescription regarding unauthorized public land uses (trespass) outside established disposal areas that is not being carried forward under this alternative. BLM's regulations and policies are to prevent trespass; investigate suspected trespass; terminate trespass; recover full compensation; and report criminal action, where applicable. Should conveyance by direct sale be appropriate, it would require approval by the state director and may require a land-use plan amendment. Removal of this management prescription would have a negligible impact to the disposals program.

4.3.6.4.2.6.1.5. Alternative 4

Land tenure impacts on land tenure may be major as described under Impacts Common to all Alternatives. There may also be significant impacts requests for conveyance of lands within the proposed South Beatty disposal area. These lands identified as suitable for disposal are located within an unsurveyed township. Prior to conveyance to any conveyance of these lands, the proponent/applicant will be responsible for the cost of having the lands surveyed. Surveys are costly and can take a year or more to be completed, reviewed, accepted and approved by the BLM Nevada Cadastral Office.

Furthermore, there is a management prescription regarding unauthorized public land uses (trespass) outside established disposal areas that is not being carried forward under this alternative. BLM's regulations and policies are to prevent trespass; investigate suspected trespass; terminate trespass; recover full compensation; and report criminal action, where applicable. Should conveyance by direct sale be appropriate, it would require approval by the state director and may require a land-use plan amendment. Removal of this management prescription would have a negligible impact to the disposals program.

4.3.6.4.2.6.2. Land-Use Authorizations (Right-of-Ways, Leases, Permits) Impacts on Land Tenure (Disposals and Acquisitions)

4.3.6.4.2.6.2.1. Impacts Common to All Alternatives

Land-use authorizations may have moderate impacts on disposals. Valid existing rights on public lands are encumbrances that could impact the appraisal value of the lands proposed for disposal. Furthermore, public land encumbrances could require additional costs and extend processing time

frames for a disposal action should valid existing rights holders choose to convert their compliant right-of-way to an easement prior to the conveyance. Acquisition of non-federal lands would result in a positive impact by increasing the land base within the planning area, thus increasing the potential for more land-use authorizations. Although acquired lands would be managed consistent with the acquisition authority and any special designation, the acquired lands would be incorporated and managed consistent to the planning area.

4.3.6.4.2.6.2.2. Alternatives 1 through 4

There are no additional impacts to land tenure.

4.3.6.4.2.6.3. Renewable Energy Impacts on Land Tenure (Disposals and Acquisitions)

4.3.6.4.2.6.3.1. Impacts Common to All Alternatives

Renewable energy management may have a major impact on disposals. Renewable energy development on public lands is closely tied to land availability, power line access, and reasonable access to utility markets. Not all public lands within the planning area are open to renewable energy development. Those lands identified as a solar energy zone (or SEZ) would preclude disposal. Valid existing rights-of-way for renewable energy (i.e. solar, wind) within open or avoidance areas could impact the appraisal value of lands proposed for disposal. Furthermore, public land encumbrances could require additional costs and extend processing time frames for a disposal action should valid existing rights holders choose to convert their compliant right-of-way to an easement prior to the conveyance. Impacts from the potential acquisition of non-federal lands would result in a positive impact as the BLM-administered lands in the planning area would be increased, thus increasing the potential for more land-use authorizations. Refer to the Renewable Energy section in Chapter 2, Lands and Realty Management (p. 172), for the acres described under the range of alternatives for existing and proposed SEZs, and open and avoidance areas for solar and wind. Acquired lands would be managed consistent with the acquisition authority and any special designation that the acquired lands would be incorporated into (e.g., ACEC).

4.3.6.4.2.6.3.2. Alternative 1

There are two SEZs within the planning area, totaling approximately 14,124 acres, where lands may not be available for disposal. Also within the planning area, there are over 900,000 acres identified as solar avoidance (variance) areas and over 2 million acres open for wind development, all of which could have a major impact on land disposals.

4.3.6.4.2.6.3.3. Alternative 2

This alternative is the least restrictive to disposals, but it may still have a significant impact. There are two SEZs proposed in the planning area totaling approximately 13,921 acres where lands would not be available for disposal. There are also over 318,000 acres proposed as solar avoidance (variance) areas and over 178,000 acres open for wind development, all of which could have a major impact on land disposals.

4.3.6.4.2.6.3.4. Alternative 3

This alternative is more restrictive than Alternatives 1, 2, and 4 but may still have a significant impact. There are seven SEZs proposed in the planning area totaling approximately 37,998 acres where lands would not be available for disposal. There are also over 695,000 acres proposed as solar avoidance (variance) areas, over 262,000 acres open for wind development, and over 500,000 acres of avoidance areas for wind development, all of which could have a major impact on land disposals.

4.3.6.4.2.6.3.5. Alternative 4

This alternative is more restrictive to disposals than Alternatives 1 and 2, and less restrictive than Alternative 3, but it may still have a significant impact. There are six SEZs proposed in the planning area totaling approximately 167,949 acres where lands would not be available for disposal. There are also over 853,000 acres proposed as solar avoidance (variance) areas, over 1,654,000 acres open for wind development, and over 1,060,000 acres of avoidance areas for wind development, all of which could have a major impact on land disposals.

4.3.6.4.2.6.4. Transportation and Utility Corridors Impacts on Land Tenure (Disposals and Acquisitions)

4.3.6.4.2.6.4.1. Impacts Common to All Alternatives

Transportation and utility corridors may have major impacts to disposals. Designated corridors will be "excepted and reserved" to the United States upon conveyance of public land. This could impact the appraisal value of the land to be conveyed and potentially inhibit or require disposal relocation should the disposal have an adverse conflict with the corridor. Acquisition of private lands would benefit the land tenure program by enhancing and improving transportation and utility corridor connectivity.

4.3.6.4.2.6.4.2. Alternative 1

Under this alternative, corridors range in width from 500 feet to 3,500 feet. The following disposal areas (by field office) are encumbered by a corridor:

- **LVFO:** Moapa-Glendale, Apex, SNPLMA, Laughlin, Ivanpah Valley Environs Overlay District, Goodsprings, Indian Springs Prison, and Indian Springs.
- **PFO:** Pahrump, Lathrop Wells, and Amargosa Valley.

4.3.6.4.2.6.4.3. Alternative 2

Under this alternative, corridors range in width from 2,000 feet to 3,500 feet. The following disposal areas (by field office) are encumbered by a corridor:

- **LVFO:** Moapa-Glendale, Apex, SNPLMA, Searchlight, Ivanpah Valley Environs Overlay District, Goodsprings, and Indian Springs.
- **PFO:** Pahrump and Lathrop Wells.

4.3.6.4.2.6.4.4. Alternative 3

Under this alternative, corridors range in width from 2,000 feet to 3,500 feet. The following disposal areas (by field office) are encumbered by a corridor:

- **LVFO:** Moapa-Glendale, Apex, SNPLMA, Searchlight, Laughlin, Ivanpah Valley Environs Overlay District, Goodsprings, North Las Vegas, City of Las Vegas, and Desert Tortoise Conservation Center.
- **PFO:** Pahrump, Lathrop Wells, and Hwy-95/160 Interstate.

4.3.6.4.2.6.4.5. Alternative 4

Under this alternative, corridors range in width from 2,000 feet to 5,280 feet. The following disposal areas (by field office) are encumbered by a corridor:

- **LVFO:** Moapa-Glendale, Apex, SNPLMA, Searchlight, Laughlin, Ivanpah Valley Environs Overlay District, Goodsprings, North Las Vegas, and City of Las Vegas.
- **PFO:** Pahrump, Nye County 1, Lathrop Wells, Mercury, Pahrump Stateline, Southern Pahrump Off the Grid, and Pahrump East.

Corridors under this alternative may have significant impacts to disposal areas such as the Pahrump Stateline disposal area. The Amargosa-Roach (5,280 feet. wide) corridor breaks up into two routes just south of the Town of Pahrump. The first corridor route traverses the Pahrump Stateline disposal area while the second route avoids traversing the dipsosal area as it extends along the northerly and easterly exterior boundaries of the disposal area. Since corridors would be excepted and reserved to the United States upon title transfer of the land, this may limit development by the new property owner.

4.3.6.4.3. Special Designations

4.3.6.4.3.1. Areas of Critical Environmental Concern Impacts on Land Tenure (Disposals and Acquisitions)

4.3.6.4.3.1.1. Impacts Common to All Alternatives

Areas of critical and environmental concern may have major impacts to disposals, specifically to any request for conveyance of lands located outside of a disposal area. Specially designated areas, such as an ACEC, are to be retained in federal ownership. This provides less land suitable for disposal and therefore impacts community expansion and economic development. There are no overlapping conflict areas between ACECs and disposals. Acquisition could be a benefit by adding more lands and/or an access easement to further enhance the goals of ACECs for the protection and preservation of important and sensitive resource values.

4.3.6.4.3.1.2. Alternative 1

There may be more lands available for disposal under this alternative than in Alternatives 2 and 3. There are 23 existing ACECs totaling over 1.01 million acres to be retained in federal ownership. ACECs inhibit disposals, which continue to have a major impact on the ability to convey such lands if they are requested for disposal.

4.3.6.4.3.1.3. Alternative 2

There may be fewer lands available for disposal than in Alternatives 1, 3, and 4. There are 43 proposed ACECs totaling over 1.4 million acres, which provides significantly fewer lands available for disposal. All lands acquired within or adjacent to ACECs for the purpose of conservation of relevant and important values would be incorporated into the ACEC at the time of acquisition.

4.3.6.4.3.1.4. Alternative 3

There may be more lands available for disposal under this alternative than Alternative 2. There are 41 proposed ACECs totaling approximately 1.3 million acres. ACECs would have a major impact on disposals because disposals are not available in these areas. All lands acquired within or adjacent to ACECs for the purpose of conservation of relevant and important values will be incorporated into the ACEC at the time of acquisition.

4.3.6.4.3.1.5. Alternative 4

There may be more lands available for disposal under this alternative than Alternatives 2 and 3. There are 25 proposed ACECs totaling over 1.02 million acres, which has major impacts to disposals. All lands acquired within or adjacent to ACECs for the purpose of conservation of relevant and important values will be incorporated into the ACEC at the time of acquisition.

4.3.6.4.3.2. National Trails Impacts on Land Tenure (Disposals and Acquisitions)

4.3.6.4.3.2.1. Impacts Common to All Alternatives

National trails may have major impacts on land disposals. The only National Historic Trail in Southern Nevada is the Old Spanish Trail, which was designated on December 4, 2002. There are several segments or routes of the trail that traverse through disposal areas (both congressionally mandated and lands identified as suitable for disposal). Regulations under Section 106 of the National Historic Preservation Act (NHPA) disallows disposal of public lands without conducting a cultural inventory to determine eligibility of historic properties. Special mitigation or alternative locations for disposal may be required, which could add time and cost to projects.

4.3.6.4.3.2.2. Alternatives 1 through 4

Public lands within the SNPLMA disposal boundary were previously analyzed under the 2004 Las Vegas Valley Disposal Boundary Disposal EIS. There should be no further review necessary under Section 106 of the NHPA and the BLM Nevada SHPO Protocol Agreement.

4.3.6.4.3.3. Wild and Scenic Rivers Impacts on Land Tenure (Disposals and Acquisitions)

4.3.6.4.3.3.1. Impacts Common to All Alternatives

Wild and scenic rivers (WSR) management actions may have negligible impacts on disposals. Although managing wild and scenic rivers may affect disposals by potentially inhibiting or

requiring relocation of a proposed conveyance should there be a determination to preserve lands eligible for the protection of this resource, there are no disposal areas proposed in conflict with WSRs. Disposal of land within the one quarter mile corridor of any eligible WSR would be in violation of the Wild and Scenic Rivers Act. The impact to acquisitions would be beneficial to further enhance and protect wild and scenic river resource values.

4.3.6.4.3.3.2. Alternative 1

There are seven eligible river segments determined suitable for inclusion in the National Wild and Scenic Rivers System. The Meadow Valley Wash and Muddy River river segments are located adjacent to the Moapa-Glendale disposal area.

4.3.6.4.3.3.3. Alternative 2

This alternative may have negligible impacts to disposals. There are seven eligible river segments determined suitable for WSR designation located adjacent to the following disposal areas: Mesquite-Bunkerville, Moapa/Glendale, and Laughlin.

4.3.6.4.3.3.4. Alternative 3

This alternative may have negligible impacts to disposals. There is one eligible river segment determined suitable for WSR designation located adjacent to the Moapa-Glendale disposal area.

4.3.6.4.3.3.5. Alternative 4

There are no impacts under this alternative. There are no river segments determined suitable for WSR designation.

4.3.6.4.3.4. Wilderness Impacts on Land Tenure (Disposals and Acquisitions)

4.3.6.4.3.4.1. Impacts Common to All Alternatives

Wilderness areas may have major impacts to disposals. Wilderness areas are congressionally designated areas and will be retained in federal ownership. Restricted and protected areas affect disposals by limiting available lands for conveyance. Acquisitions could further enhance wilderness areas by providing legal public access.

4.3.6.4.3.4.2. Alternatives 1 through 4

There are over 180,000 acres of congressionally designated wilderness areas that would inhibit any disposals.

4.3.6.4.3.5. Wilderness Study Areas Impacts on Land Tenure (Disposals and Acquisitions)

4.3.6.4.3.5.1. Impacts Common to All Alternatives

Wilderness study areas may have major impacts to dispoals. Management is to maintain the areas' suitability for preservation as wilderness until Congress acts on the WSA by either designating it or releasing the area for other purposes. Until such time, WSAs will be restricted and protected areas and retained in federal ownership. Acquisitions could further enhance wilderness areas by providing legal public access.

4.3.6.4.3.5.2. Alternatives 1 through 4

There are over 48,000 acres of congressionally designated wilderness study areas that would inhibit any disposals.

4.3.6.4.4. Cumulative Impacts

The cumulative impacts are presented at the end of the Lands and Realty section (p. 1217).

4.3.6.5. Land-Use Authorizations (Right-of-Ways, Leases, Permits)

4.3.6.5.1. Summary

Land-use authorizations (including utility-scale renewable energy development) consist of rights-of-way (ROW), permits, leases, and easements to occupy, use, or traverse public land. A ROW is typically authorized through a grant, although sometimes a permit or lease may be issued. Permits are generally short-term authorizations (not to exceed three years) that have a negligible impact on the land. Leases are usually long-term authorizations requiring a significant capital investment. Generally, all public lands unless otherwise classified, segregated, or withdrawn are available at the BLM's discretion for land-use authorizations, which are processed on a case-by-case basis as proposals are received. The authorization process involves project-level analysis of potential impacts to the environment that could result from the proposed action. This section will analyze potential impacts to land-use authorizations from other resources, resource uses, and special designations. Any impacts would be addressed during project-level analysis and best management practices with avoidance would be implemented where feasible.

4.3.6.5.2. Resources

4.3.6.5.2.1. Air Quality Impacts on Land-Use Authorizations (Right-of-Ways, Leases, Permits)

4.3.6.5.2.1.1. Impacts Common to All Alternatives

Air quality management may have minor impacts on land-use authorizations. Activities on BLM-administered land require compliance with air quality standards or related facility siting standards established by or pursuant to applicable federal, state, or local laws and regulations. Such requirements could influence, for example, the timing, location, and mitigation associated with certain land uses, such as ROWs, leases, and permits.

4.3.6.5.2.1.2. Alternatives 1 through 4

The are no additional impacts to land-use authorizations.

4.3.6.5.2.2. Soil Resources Impacts on Land-Use Authorizations (Right-of-Ways, Leases, Permits)

4.3.6.5.2.2.1. Impacts Common to All Alternatives

Soil management may have moderate impacts on land-use authorizations. Improving, maintaining, and/or preserving soil resources may affect land-use authorizations through mitigation requirements and potential relocation of proposed land uses.

4.3.6.5.2.2.2. Alternative 1

The are no additional impacts to land-use authorizations.

4.3.6.5.2.2.3. Alternatives 2 through 4

Soil resource management may have moderate impacts on land-use authorizations. Disturbance of sensitive soil surfaces is to be avoided. Avoidance areas limit availability of land for development purposes and could require use restrictions and mitigation for disturbed and/or damaged areas. Potential project relocation, use restrictions, and mitigation requirements of proposed land uses could impact project scope and increase processing time and costs. Under this alternative, soil management calls for developments and ground-disturbing activities to be located away from areas of significant desert pavement and other sensitive or fragile soils that are vulnerable to disruption or have high wind or water erosion potential. This could affect land-use authorizations and BLM's actions to obtain physical and legal access. Proposals for actions that could potentially impact these soil types could require mitigation or relocation, which could result in increased project costs and time.

4.3.6.5.2.3. Water Resources Impacts on Land-Use Authorizations (Right-of-Ways, Leases, Permits)

4.3.6.5.2.3.1. Impacts Common to All Alternatives

Water resources may have moderate impacts on land-use authorizations. Proposed projects within ephemeral channels could require standard consultation requirements with Army Corps of Engineers and Nevada Department of Environmental Protection. Mitigation or relocation could be required for proposed facilities and use authorizations to avoid adverse effects to water resources. Nevada State Engineer Order No. 1169, dated March 8, 2002; the January 29, 2014, rulings (Clark County-specific basins 210, 215, 217, 218, 219, and 220; and Order No. 1197, dated November 4, 2008 (Nye County-specific basin 230), could also require proposed projects to prove water rights, impose additional mitigation, and/or require project relocation to avoid adverse impacts to endangered species and/or other public interests. Such impacts would be the result of project-level implementation, which could impose project scope change and additional processing time and costs.

4.3.6.5.2.3.2. Alternative 1

Water resource management impacts to land-use authorizations may be minor. See Impacts Common to all Alternatives.

4.3.6.5.2.3.3. Alternatives 2 through 4

Under this alternative, water resources may have major impacts to land-use authorizations. Water resource management prescriptions provide that the BLM will pursue options to minimize changes to natural water flow and watershed dynamics. Existing facilities could be relocated or modified if they are significantly affecting hydrologic, watershed, or floodplain function. This would impose extraordinary restrictions on land-use authorizations that would require the lands program to find the legal basis for enforcement. Impacts also include the potential for BLM to protest water rights for the protection of federal resources and management objectives. To protest water rights applications, post-grant/approval of a land-use authorization could have financial effects on a holder. The holder could have to suspend operations, including labor, while responding to water rights protests. This process could take an undetermined amount of time.

4.3.6.5.2.4. Integrated Vegetation Impacts on Land-Use Authorizations (Right-of-Ways, Leases, Permits)

4.3.6.5.2.4.1. Riparian and Wetlands and Vegetation Impacts on Land-Use Authorizations (Right-of-Ways, Leases, Permits)

4.3.6.5.2.4.1.1. Impacts Common to All Alternatives

Integrated vegetation (riparian and wetlands and vegetation) management may have major impacts on land-use authorizations. Managing vegetation to ensure sustainability and resilience, where feasible, would require rehabilitating, reclaiming, or re-vegetating areas subjected to surface-disturbing activities (which include any development related to use authorizations).

4.3.6.5.2.4.1.2. Alternative 1

Integrated vegetation management impacts to land-use authorizations may be major. See Impacts Common to all Alternatives.

4.3.6.5.2.4.1.3. Alternatives 2 through 4

This alternative may be more restrictive to land-use authorizations than Alternative 1. No net unmitigated loss would require more stringent mitigation, sometimes doubling project review time (and cost); once for the proposed project, and a second time for the off-site mitigation. Mitigation techniques may require unique, out-of-the-box solutions and specialized skills, including professional assistance from third parties.

4.3.6.5.2.4.2. Weeds Impacts on Land-Use Authorizations (Right-of-Ways, Leases, Permits)

4.3.6.5.2.4.2.1. Impacts Common to All Alternatives

Weeds management may have moderate impacts on land-use authorizations. Managing weed control to ensure sustainability and resilience where feasible would require rehabilitating, reclaiming, or re-vegetating areas subjected to surface-disturbing activities, which includes development related to land-use authorizations. Mitigation measures could impose additional time and costs to project applicants.

4.3.6.5.2.4.2.2. Alternative 1

Weeds management impacts to land-use authorizations may be moderate. See Impacts Common to all Alternatives.

4.3.6.5.2.4.2.3. Alternative 2

Weeds management impacts on land-use authorizations may be the most restrictive under this alternative. A BLM-approved project-specific weed management plan would be required for all federal actions involving a disturbance footprint greater than one acre, unless otherwise

determined by the BLM weeds specialist. More restrictive management of weeds would create a higher moderate impact as time and cost of monitoring would increase.

4.3.6.5.2.4.2.4. Alternative 3

Weeds impacts on land-use authorizations would be less restrictive than Alternative 2. Under this alternative, a BLM-approved, project-specific weed management plan would be required for all federal actions involving a disturbance footprint greater than five acres, unless otherwise determined by the BLM weeds specialist. More restrictive management of weeds would create a higher moderate impact as time and cost of monitoring would increase.

4.3.6.5.2.4.2.5. Alternative 4

Weeds impacts on land-use authorizations would be less restrictive than Alternatives 2 and 3. Under this alternative, a BLM-approved, project-specific weed management plan would be required for all federal actions involving a disturbance footprint greater than 10 acres, unless otherwise determined by the BLM weeds specialist. More restrictive management of weeds would create a higher moderate impact as time and cost of monitoring would increase.

4.3.6.5.2.5. Fish and Wildlife Impacts on Land-Use Authorizations (Right-of-Ways, Leases, Permits)

4.3.6.5.2.5.1. Impacts Common to All Alternatives

Fish and wildlife resource management may have major impacts on land-use authorizations. Improving, maintaining, and/or preserving habitats for fish and wildlife in areas proposed for land-use authorizations may create significant project-level mitigation requirements. Proposed projects may require alternate locations, which would impact project scope, time, and costs.

4.3.6.5.2.5.2. Alternative 1

Under this alternative, impacts from fish and wildlife resource management may prohibit land-use authorization projects to avoid adverse impacts to the water table supporting plant communities, or require project avoidance areas at a minimum buffer of one quarter mile from artificial and natural waters that provide benefits to wildlife.

4.3.6.5.2.5.3. Alternative 2

Fish and wildlife resource management impacts to land-use authorizations under this alternative may be the most restrictive. Avoidance areas for use authorizations could require a minimum buffer of one half mile from natural waters and associated riparian areas, and one quarter mile of artificial water sources. Use authorizations would need to adhere to the resource-specific program management plan, or a plan from another agency, such as the Nevada Department of Wildlife Action Plan, including adherence to best management practices, standard operating procedures, buffers, use and timing restrictions, or mitigation measures. These requirements and/or restrictions may have major impacts during project-level analysis.

4.3.6.5.2.5.4. Alternative 3

Fish and wildlife resource management impacts to land-use authorizations under this alternative may be the same as Alternative 2, but less restrictive. Avoidance areas for use authorizations could require a minimum buffer of one quarter mile from natural waters and associated riparian areas, and one quarter mile from artificial water sources. Use authorizations would need to adhere to the resource-specific program management plan or a plan from another agency, such as the Nevada Department of Wildlife Action Plan, including adherence to best management practices, standard operating procedures, buffers, use and timing restrictions, or mitigation measures. These requirements and/or restrictions may have major impacts during project-level analysis.

4.3.6.5.2.5.5. Alternative 4

Fish and wildlife resource management impacts to land-use authorizations under this alternative may be the same as Alternative 2, but less restrictive than Alternatives 1, 2, and 3. Avoidance areas for use authorizations could require a minimum buffer of one quarter mile from natural waters and associated riparian areas. Use authorizations would need to adhere to the resource-specific program management plan or a plan from another agency, such as the Nevada Department of Wildlife Action Plan, including adherence to best management practices, standard operating procedures, buffers, use and timing restrictions, or mitigation measures. These requirements and/or restrictions could have moderate impacts during project-level analysis and scoping.

4.3.6.5.2.6. Special Status Species Impacts on Land-Use Authorizations (Right-of-Ways, Leases, Permits)

4.3.6.5.2.6.1. Impacts Common to All Alternatives

Special status species management may have major impacts on land-use authorizations. Special status species include all plant and animal species that are federally listed as threatened or endangered under the Endangered Species Act of 1973 (ESA), as amended. Candidate species under the ESA include state-listed species or other special status species as identified by the BLM state director. Proposed projects may be disallowed or require alternative locations and adherence to a resource specific management plan, which may impose additional mitigation requirements. For example, development may be impacted by big game species, particularly bighorn sheep, through seasonal (timing) restrictions as lands would be designated as controlled surface use. Proposed projects would require Section 7 consultation to reduce impacts to threatened and endangered species and their habitats. Such adherence and requirements may significantly impact land-use authorizations' project scope, time, and cost.

4.3.6.5.2.6.2. Alternative 1

Special status species resource management impacts on land tenure may be moderate. See Impacts Common to all Alternatives.

4.3.6.5.2.6.3. Alternative 2

Under this alternative, special status species management may impact land-use authorizations more than Alternatives 1, 3, and 4. A no net unmitigated loss management prescription may

require significant mitigation, sometimes doubling project review time and costs — once for the proposed project and a second time for the off-site mitigation. Mitigation techniques may require unique, out-of-the-box solutions and specialized skills, including third parties. This alternative also includes areas of ecological importance (AEI) in Nye County that include avoidance and exclusion management prescriptions on land-use authorizations. Closing land areas within AEIs for new renewable energy development that were previously avoidance (variance) would create significantly less space for renewable energy development. AEIs would also exclude new site-type land-use authorizations greater than 5 acres. However, AEIs could be used as off-site mitigation for projects. In this instance, special status species management (i.e., AEI) would be a positive impact to the land-use authorizations program unless there are formerly used defense (FUD) zones. FUDs have safety issues that may prohibit the use of those lands for mitigation purposes. Furthermore, any actions that would sever connectivity through an identified genetic and demographic corridor would not be authorized.

4.3.6.5.2.6.4. Alternative 3

Special status species management impacts under this alternative may be less restrictive than Alternative 2 since there are no AEIs that would be managed as avoidance or exclusion areas to land-use authorizations (e.g., new renewable energy development). However, this alternative would still have major impacts on land-use authorizations as it would require a no net unmitigated loss management prescription that may require significant mitigation, sometimes doubling project review time and costs — once for the proposed project and a second time for the off-site mitigation. Mitigation techniques may require unique, out-of-the-box solutions and specialized skills, including third parties. Furthermore, any actions that would sever connectivity through an identified genetic and demographic corridor would not be authorized.

4.3.6.5.2.6.5. Alternative 4

Special status species management impacts under this alternative may be less restrictive than Alternatives 2 and 3. Impacts would still be major to land-use authorizations. Proposed projects would be required to minimize impacts to BLM sensitive species habitats on a case-by-case basis. Furthermore, any actions that would sever connectivity through an identified genetic and demographic corridor would not be authorized.

4.3.6.5.2.7. Wild Horse and Burro Impacts on Land-Use Authorizations (Right-of-Ways, Leases, Permits)

4.3.6.5.2.7.1. Impacts Common to All Alternatives

Wild horse and burro resource management may have moderate impacts on land-use authorizations. There are four established herd management areas (Johnnie, Wheeler Pass, Red Rock, and Gold Butte) that encompass approximately 23 percent of lands within the planning area. Improving, maintaining, and/or preserving habitat for wild horses and burros in areas proposed for land-use authorizations may create mitigation requirements.

4.3.6.5.2.7.2. Alternative 1

There are no additional impacts to land-use authorizations.

4.3.6.5.2.7.3. Alternative 2

Under this alternative, wild horse and burro impacts to land-use authorizations may be most restrictive. Excluding site-type ROWs of more than 5 acres from herd management areas could impact land-use authorizations, specifically renewable energy development (i.e. solar and wind). Exclusion areas would prohibit the highest and best use of a particular parcel for development and may reduce the amount of area available for development.

4.3.6.5.2.7.4. Alternative 3

Under this alternative, wild horse and burro impacts to land-use authorizations may be less restrictive than Alternative 2. Land-use authorization avoidance areas of more than five acres from key habitat components (forage, water, cover, and space) may prohibit the highest and best use of a particular parcel for development and may reduce the amount of area available for development.

4.3.6.5.2.7.5. Alternative 4

Under this alternative, wild horse and burro impacts to land-use authorizations may be less restrictive than Alternatives 2 and 3. Land-use authorization avoidance areas of more than five acres would be addressed on a case-by-case basis within HMAs, which may prohibit the highest and best use of a particular parcel for development and may reduce the amount of area available for development.

4.3.6.5.2.8. Cave and Karst Management Impacts on Land-Use Authorizations (Right-of-Ways, Leases, Permits)

4.3.6.5.2.8.1. Impacts Common to All Alternatives

Cave and karst resource management may have moderate impacts on land-use authorizations. A cave is defined as any naturally occurring void, cavity, recess, or system of interconnected passages occurring beneath the surface of the Earth or within a cliff or ledge large enough to permit an individual to enter, whether the entrance is naturally formed or man-made. Caves were often used by Native Americans as temporary living quarters, storage areas, shelter, and game traps. Karsts are defined as an irregular limestone region with sinkholes, underground streams, and caverns. The planning area does have limestone deposits, but lacks water to develop karsts, so no actual karsts are present. To secure, protect, and preserve cave and karst resources in areas where there are proposed land-use authorizations may create special mitigation requirements. New project applications may require alternate locations. Land-use authorization avoidance areas may prohibit the highest and best use of a particular parcel for development and may reduce the amount of area available for development. Any impacts would be addressed during project-level analysis and implement best management practices with avoidance where feasible.

4.3.6.5.2.8.2. Alternative 1

There are no additional impacts to land-use authorizations.

4.3.6.5.2.8.3. Alternative 2

Cave and karst resource management impacts to land-use authorizations under this alternative may be the most restrictive. Designating ROW avoidance areas within one half mile of significant caves, exclusive of any designated corridors, could impact land-use authorizations. Avoidance areas would prohibit the highest and best use of a particular parcel for development and may reduce the amount of area available for development.

4.3.6.5.2.8.4. Alternative 3

Cave and karst resource management impacts to land-use authorizations under this alternative may be less restrictive than Alternative 2. Designating ROW avoidance areas within one quarter mile of significant caves, exclusive of any designated corridors, could impact land-use authorizations. Avoidance areas would prohibit the highest and best use of a particular parcel for development and may reduce the amount of area available for development.

4.3.6.5.2.8.5. Alternative 4

Cave and karst resource management impacts to land-use authorizations under this alternative may be the least restrictive. ROWs would be allowed near cave sites except when it prohibits access or compromises sensitive resource values. Avoidance areas would prohibit the highest and best use of a particular parcel for development and may reduce the amount of area available for development.

4.3.6.5.2.9. Wildland Fire Management Impacts on Land-Use Authorizations (Right-of-Ways, Leases, Permits)

4.3.6.5.2.9.1. Impacts Common to All Alternatives

Wildland fire management may have moderate impacts on land-use authorizations. Under all alternatives, fire management would protect facilities on public lands authorized through the lands and realty program by reducing fuel loads and suppressing fires. New project applications may require alternate locations as the result of fires should land closures be enforced.

4.3.6.5.2.9.2. Alternative 1

There are no additional impacts to land-use authorizations.

4.3.6.5.2.9.3. Alternative 2

Wildland fire management may be the most restrictive to land-use authorizations under this alternative. Under this alternative, issuance of a two-year area closure after fire on all lands within the planning area may have major impacts on land-use authorizations. Closures would be evaluated on a two-year basis to determine whether the closure continues to meet management objectives. Further, by following a fire management plan or similar, lands and realty development may be affected by additional mitigation requirements. Land-use authorizations exclusion and avoidance areas may prohibit the highest and best use of a particular parcel for development and may reduce the amount of area available for development.

4.3.6.5.2.9.4. Alternative 3

Wildland fire management may be less restrictive to land-use authorizations under this alternative than Alternative 2. Implementing area closures after fire on a case-by-case basis would have a moderate impact on land-use authorizations. Closures would be evaluated on a two-year basis to determine whether the closures continue to meet management objectives. By following a fire management plan or similar, lands and realty development may be affected by additional mitigation requirements. Land-use authorization exclusion and avoidance areas may prohibit the highest and best use of a particular parcel for development and may reduce the amount of area available for development.

4.3.6.5.2.9.5. Alternative 4

Wildland fire management may be the least restrictive under this alternative. Implementing area closures after fire in only ACECs would have a moderate impact on land-use authorizations. There are 25 ACECs proposed under this alternative, which encompasses approximately 34 percent of lands within the planning area. Land-use authorizations may be impacted by both fire management and ACEC avoidance areas. On a case-by-case basis, all other areas would be considered for closure after a fire. Closures would be evaluated on a two-year basis to determine whether the closure continues to meet management objectives. By following a fire management plan or similar, lands and realty development may be affected by additional mitigation requirements. Land-use authorization exclusion and avoidance areas may prohibit the highest and best use of land for development and may reduce the amount of area available for development.

4.3.6.5.2.10. Cultural Resources Impacts on Land-Use Authorizations (Right-of-Ways, Leases, Permits)

4.3.6.5.2.10.1. Impacts Common to All Alternatives

Cultural resource management could have moderate impacts on land-use authorizations. Lands and realty actions are considered federal undertakings and must avoid inadvertent damage to federal and non-federal cultural resources through compliance with Section 106 of the National Historic Preservation Act. When a lands action is proposed, an inventory is conducted, and impacts on important cultural sites are avoided by project redesign/rerouting, or mitigation of adverse impacts through data recovery. Such actions to avoid adverse impacts could increase processing costs and processing time for both federal and non-federal parties. Increased costs could dissuade the proponent from utilizing federal lands for their proposed project if the suggested mitigation strategies are too cumbersome. Opening land areas for development that were previously closed would create more space for applicants to apply for lands and realty development.

4.3.6.5.2.10.2. Alternative 1

There are no additional impacts to land-use authorizations.

4.3.6.5.2.10.3. Alternative 2

Cultural resource management may be the most restrictive to land-use authorizations under Alternative 2. Under this alternative, surface-disturbing activities and disruptive activities within 500 feet of any cultural or historic resource within ACECs would be land-use authorization exclusion areas. Not only are ACECs avoidance areas, but cultural resources would impose exclusion areas, which could prohibit the highest and best use of a particular parcel for development and may reduce the amount of area available for development.

4.3.6.5.2.10.4. Alternatives 3 and 4

Cultural resource management may be least restrictive to land-use authorizations under these alternatives. Surface-disturbing activities and disruptive activities within 100 feet of any cultural or historic resource within ACECs would be land-use authorization exclusion areas. Not only are ACECs avoidance areas, but this resource would impose exclusion areas, which could prohibit the highest and best use of a particular parcel for development and may reduce the amount of area available for development.

4.3.6.5.2.11. Paleontological Resources Impacts on Land-Use Authorizations (Right-of-Ways, Leases, Permits)

4.3.6.5.2.11.1. Impacts Common to All Alternatives

Paleontological resource management may have minor impacts on land-use authorizations. Management and/or identification of paleontological sites within the planning area could potentially limit or prevent land-use authorizations in site-specific areas. However, due to the relatively small scale of these sites, impacts on lands and realty would be minor.

4.3.6.5.2.11.2. Alternative 1

There are no additional impacts to land-use authorizations.

4.3.6.5.2.11.3. Alternative 2

Paleontological resource management would be more restrictive to land-use authorizations under this alternative. To preclude activities that could destroy, damage, or reduce the data potential of the paleontological resources could impact land-use authorizations' project scope.

4.3.6.5.2.11.4. Alternative 3

Paleontological resource management may be less restrictive than Alternative 2. Developing on-site or community-based interpretation for important sites/specimens to foster an appreciation for the unique nature of the resource and to create opportunities for public access to such resources could impact land-use authorizations' project scope.

4.3.6.5.2.11.5. Alternative 4

Under this alternative, paleontological resource management may be the least restrictive to land-use authorizations. Activities that have the potential to impact paleontological resources could be permitted following paleontological inventories (field surveys) and data collection prior to any surface-disturbing activities.

4.3.6.5.2.12. Visual Resource Management Impacts on Land-Use Authorizations (Right-of-Ways, Leases, Permits)

4.3.6.5.2.12.1. Impacts Common to All Alternatives

Visual resources management (VRM) may have major impacts on land-use authorizations. VRM classifications could significantly affect the location of new land-use authorizations and require certain mitigation requirements to avoid adverse impacts to visual resources. Mitigation could include project relocation, burying, and/or color compatibility painting of the project with its surroundings to ensure scenic integrity. Projects would need to be designed to meet the objectives of the established VRM class for the project area. Class I is designed for preservation, and Class II is designed for retention of landscape character. Generally, land-use authorizations fall under the requirement for compatibility with Class III (partial retention of the landscape character), and Class IV (modification of the landscape character). Such VRM class levels would be determined during project-level analysis.

Table 4.31. Percentage of Land Classified under VRM Level That Would Impact Land-Use-Authorizations

VRM class level	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Class I	1.6 percent	12.1 percent	7.7 percent	7.6 percent
Class II	30.6 percent	34.6 percent	38.3 percent	29.9 percent
Class III	54.1 percent	27.9 percent	28.4 percent	27.9 percent
Class IV	17.4 percent	29.1 percent	29.3 percent	38.3 percent

4.3.6.5.2.12.2. Alternative 1

VRM impacts to land-use authorizations may be minor. See Impacts Common to all Alternatives.

4.3.6.5.2.12.3. Alternative 2

Under this alternative, VRM may be more restrictive to land-use authorizations. Specific impacts would be for solar renewable energy projects as it requires adherence to Class IV. ROW corridors for transportation and utility purposes are required to adhere to Class III. This would be a significant impact on processing of land-use applications for major transmission lines, which siting of such energy generating facilities would be preferred within a designated utility corridor. All other land-use authorizations would need to maintain the VRM objectives and mitigation measures determined during project-level analysis; such determination would be stipulated in the use authorization.

4.3.6.5.2.12.4. Alternative 3

VRM under this alternative may be less restrictive to land-use authorizations than Alternative 2, but more restrictive than Alternatives 1 and 4. Closing land areas for renewable energy development that were previously avoidance (variance) areas would create significantly less space for renewable energy development. ROW corridors for transportation and utility purposes are required to adhere to Class III. This would have a significant impact on the processing of land-use applications for major transmission lines. Siting of such energy-generating facilities would be preferred within a designated utility corridor.

4.3.6.5.2.12.5. Alternative 4

VRM may be less restrictive to land-use authorizations under this alternative than Alternatives 2 and 3, but more restrictive than Alternative 1. This is due to the additional acres open for use authorizations and renewable energy development in new solar energy zones, but it will still significantly reduce the land available for renewable energy development. Solar renewable energy projects would be required to adhere to Class IV, while ROW corridors for transportation and utility purposes would be required to adhere to Class III. This would have a significant impact on processing of land-use applications for major transmission lines because siting of such energy-generating facilities would be preferred within a designated utility corridor. All other land-use authorizations would need to maintain the VRM objectives and mitigation measures determined during project-level analysis; such determination would be stipulated in the use authorization.

4.3.6.5.2.13. Lands with Wilderness Characteristics Impacts on Land-Use Authorizations (Right-of-Ways, Leases, Permits)

4.3.6.5.2.13.1. Impacts Common to All Alternatives

Lands with wilderness characteristics may have moderate impacts on land-use authorizations. Improving, maintaining, and/or preserving lands with wilderness characteristics in areas proposed for land-use authorizations and renewable energy development could limit availability. However, due to the relatively small scale of these sites, impacts on lands and realty could be minor to moderate. New project applications may require alternative locations.

4.3.6.5.2.13.2. Alternative 1

Lands with wilderness characteristics would have negligible impacts on land-use authorizations under this alternative. There are no designated lands with wilderness characteristics under this alternative.

4.3.6.5.2.13.3. Alternative 2

Under this alternative, lands with wilderness characteristics may be more restrictive on land-use authorizations than Alternatives 1, 3, and 4. Approximately 4.9 percent of lands within the planning area would be managed as lands with wilderness characteristics. Lands with wilderness characteristics management would exclude ROWs (including renewable energy development) and restrict construction of new structures and facilities that are unrelated to the preservation or

enhancement of wilderness characteristics. Structures and facilities should be necessary for wilderness management. Closing land areas for all development that were previously avoidance (or variance) areas would create significantly less space available for all development. Exclusion areas provide less land available for land-use authorizations, which would impact community expansion and economic development.

4.3.6.5.2.13.4. Alternative 3

Lands with wilderness characteristics may be less restrictive on land-use authorizations under this alternative than Alternative 2. Under this alternative, approximately 1.2 percent of lands within the planning area would be managed as lands with wilderness characteristics. Lands with wilderness characteristics management would include ROW avoidance areas and restricting construction of new structures and facilities that are unrelated to the preservation or enhancement of wilderness characteristics. Structures and facilities should be necessary for wilderness management. Avoidance areas could result in project relocation and mitigation, which would impact project scope and cost.

4.3.6.5.2.13.5. Alternative 4

This alternative may be less restrictive than Alternatives 2 and 3. Under this alternative, approximately 1 percent of lands within the planning area would be managed as lands with wilderness characteristics. Lands with wilderness characteristics management would include ROW avoidance areas and restricting construction of new structures and facilities that are unrelated to the preservation or enhancement of wilderness characteristics. Structures and facilities should be necessary for wilderness management. The effects to renewable energy would be less due to the additional acres open for renewable energy development in new solar energy zones but would still significantly reduce the land available for renewable energy development. Avoidance areas could result in project relocation and mitigation, which would impact project scope and cost.

4.3.6.5.3. Resource Uses

4.3.6.5.3.1. Forestry and Woodland Products Impacts on Land-Use Authorizations (Right-of-Ways, Leases, Permits)

4.3.6.5.3.1.1. Impacts Common to All Alternatives

Forestry and woodland products management may have negligible impacts on land-use authorizations. Improving, maintaining, and/or preserving forestry and woodlands in areas of proposed land-use authorizations could create mitigation requirements. Any impacts would be addressed during project evaluation and scoping with the incorporation of the appropriate BMPs.

4.3.6.5.3.1.2. Alternatives 1 through 4

There are no additional impacts to land-use authorizations.

4.3.6.5.3.2. Livestock Grazing Impacts on Land-Use Authorizations (Right-of-Ways, Leases, Permits)

4.3.6.5.3.2.1. Impacts Common to All Alternatives

Livestock grazing resource management may have moderate impacts on land-use authorizations. Improving and/or maintaining areas for domestic livestock grazing in areas of proposed land-use authorizations could create mitigation requirements. Land-use authorizations that traverse areas where livestock grazing occurs could require mitigation excluding livestock grazing during the construction and rehabilitation phases of the project. Mitigation could also be required to facilitate livestock movement or provide for public safety (e.g., fencing and cattle guards) throughout the effective period of the authorization. New project applications could require alternative locations due to grazing allotments. However, livestock grazing would not be expected to prohibit land-use authorizations or disposals. Any impacts would be addressed during project-level analysis, and best management practices with avoidance would be implemented where feasible.

4.3.6.5.3.2.2. Alternatives 1 through 4

There are no additional impacts to land-use authorizations.

4.3.6.5.3.3. Minerals Impacts on Land-Use Authorizations (Right-of-Ways, Leases, Permits)

4.3.6.5.3.3.1. Fluid Leasable Minerals Impacts on Land-Use Authorizations (Right-of-Ways, Leases, Permits)

4.3.6.5.3.3.1.1. Impacts Common to All Alternatives

Impacts from fluid leasable minerals management on land-use authorizations may be moderate. Fluid leasable minerals include underground uses such as oil, gas, and geothermal resources. Land-use authorizations including renewable energy development projects could overlap such underground uses as long as there are no adverse impacts to the mineral operation. Relocation of newly proposed land-use authorizations (i.e. pipelines, underground transmission lines) may be required. Relocation could impact project scope, time, and cost. Minerals may also result in requests for ROWs and permits for utilities and access roads. The more lands available to mineral entry, the greater the potential for land-use authorizations. BLM would ensure that occupancy does not hinder previously existing access to public lands. BLM would continue to ensure that previously existing routes would continue to be available for accessing public lands during the development of mineral resources. Fluid leasable minerals could also create a greater network of roads and opportunities for the public to use them.

4.3.6.5.3.3.1.2. Alternative 1

Impacts to land-use authorizations may be minor and would be determined on a case-by-case basis during project-level analysis. See Impacts Common to all Alternatives.

4.3.6.5.3.3.1.3. Alternative 2

Fluid leasable minerals may have more impacts on land-use authorizations under this alternative than Alternative 1, but less than Alternatives 3 and 4. There are approximately 1.2 million acres (or 39.8 percent of lands within the planning areas) identified as open to fluid leasable where there could be potential conflicts with proposed land-use authorizations that may require negotiation of siting of facilities. Fluid leasable minerals management impacts to land-use authorizations would be determined on a case-by-case basis during project-level analysis.

4.3.6.5.3.3.1.4. Alternative 3

Fluid leasable minerals may have more impacts on land-use authorizations under this alternative than Alternatives 1 and 2, but less than Alternative 4. There are approximately 1.3 million acres (or 43.1 percent of lands within the planning areas) identified as open to fluid leasable where there could be potential conflicts with proposed land-use authorizations that may require negotiation of siting of facilities. Fluid leasable minerals management impacts to land-use authorizations would be determined on a case-by-case basis during project-level analysis.

4.3.6.5.3.3.1.5. Alternative 4

Fluid leasable minerals may have the most impacts on land-use authorizations under this alternative than Alternatives 1, 2, and 3. There are over 1.8 million acres (or 60.6 percent of lands within the planning areas) identified as open to fluid leasable where there could be potential conflicts with proposed land-use authorizations that could require negotiation of siting of facilities. Fluid leasable minerals management impacts to land-use authorizations would be determined on a case-by-case basis during project-level analysis.

4.3.6.5.3.3.2. Solid Leasable Minerals Impacts on Land-Use Authorizations (Right-of-Ways, Leases, Permits)

4.3.6.5.3.3.2.1. Impacts Common to All Alternatives

Impacts to land-use authorizations may be moderate. Solid leasable minerals are split into energy and non-energy minerals. Coal is the predominant energy solid leasable mineral. Non-energy solid leasable minerals such as phosphates, potassium, and sodium salts tend to be used in the agricultural industries. The potential for development of a solid leasable mineral resource within the planning area is low. However, where a proposed land-use authorization conflicts with a mineral operation, relocation of the proposed project may be required. Relocation could impact project scope, time, and cost.

4.3.6.5.3.3.2.2. Alternative 1

There are over 1.9 million acres (or 63.9 percent of lands within the planning area) identified for solid mineral leasing under this alternative. Solid leasable minerals management impacts to land-use authorizations may be determined on a case-by-case basis during project-level analysis.

4.3.6.5.3.3.2.3. Alternative 2

Under this alternative, solid leasable minerals management may have fewer impacts to land-use authorizations than Alternatives 1, 3, and 4. There are over 1.3 million acres (or 45.8 percent of lands within the planning area) open for solid mineral leasing under this alternative. Impacts to land-use authorizations would include siting of proposals and would be determined on a case-by-case basis during project-level analysis.

4.3.6.5.3.3.2.4. Alternative 3

Solid leasable minerals management may have more impacts to land-use authorizations under this alternative than Alternative 2, but less than Alternatives 1 and 4. There are over 1.7 million acres (or 56.8 percent of lands within the planning area) open for solid mineral leasing under this alternative. Impacts to land-use authorizations would include siting of proposals and would be would be determined on a case-by-case basis during project-level analysis.

4.3.6.5.3.3.2.5. Alternative 4

Alternative 4 may have the most impacts on land-use authorizations. There are approximately 1.8 million acres (or 59.7 percent of lands within the planning area) open for solid mineral leasing under this alternative. Impacts to land-use authorizations would include siting of proposals and would be determined on a case-by-case basis during project-level analysis.

4.3.6.5.3.3.3. Locatable Minerals Impacts on Land-Use Authorizations (Right-of-Ways, Leases, Permits)

4.3.6.5.3.3.3.1. Impacts Common to All Alternatives

Locatable minerals management may have moderate impacts on land-use authorizations. Locatable minerals include gold, silver, and gypsum. Miners locate mining claims to acquire the right to develop mineral values on lands open to mineral entry, under the provisions of the General Mining Law of 1872, as amended. Mining lode claims including gold and silver are usually underground, while placer claims are for surface mining and can range. Depending on the type of mining claim (underground or surface) these types of uses could impact lands available for land-use authorizations such as pipelines, underground transmission lines, communication sites, and renewable energy development projects. Where a proposed land-use authorization could potentially adversely impact a mineral operation, relocation of the proposed project may be required. Relocation could impact project scope, time, and cost.

4.3.6.5.3.3.3.2. Alternative 1

Under this alternative, there are over 1.9 million acres (or 65.2 percent of lands within the planning areas) that would remain open for potential future exploration and development. Impacts to land-use authorizations may include siting of proposals and would be determined on a case-by-case basis during project-level analysis.

4.3.6.5.3.3.3.3. Alternative 2

Locatable minerals management may have fewer moderate impacts on land-use authorizations under this alternative than Alternatives 1, 3, and 4. There are over 1.3 million acres (or 45.2 percent of lands within the planning area) that would remain open for mining, subject to mining laws, after withdrawals for military uses, industrial sites, ACECs, wilderness (including WSAs), SRMAs, and power sites. Impacts would include siting of proposals and would be determined on a case-by-case basis during project-level analysis.

4.3.6.5.3.3.3.4. Alternative 3

This alternative may have more impacts to land-use authorizations than Alternatives 2 and 4, but less than Alternative 1. Under this alternative, there are over 1.8 million acres (or 60.3 percent of lands within the planning area) that would remain open for mining, subject to mining laws, after withdrawals for military uses, industrial sites, ACECs, wilderness (including WSAs), SRMAs, and power sites. Impacts would include siting of proposals and would be determined on a case-by-case basis during project-level analysis.

4.3.6.5.3.3.3.5. Alternative 4

This alternative would have more impacts on land-use authorizations than Alternative 2, but less than Alternatives 1 and 3. Under this alternative, there are over 1.5 million acres (or 52.5 percent of lands within the planning area) that would remain open for mining, subject to mining laws, after withdrawals for military uses, industrial sites, ACECs, wilderness (including WSAs), SRMAs, and power sites. Impacts would include siting of proposals and would be determined on a case-by-case basis during project-level analysis.

4.3.6.5.3.3.4. Saleable Minerals Impacts on Land-Use Authorizations (Right-of-Ways, Leases, Permits)

4.3.6.5.3.3.4.1. Impacts Common to All Alternatives

Saleable minerals management may have moderate impacts to land-use authorizations. Saleable minerals can be large sand and gravel mining operations (such as the following community pits: Pahrump, Mesquite, Speedway, Lone Mountain, North Jean Dry Lake, and South Jean Dry Lake), which could impact land-use authorizations such as pipelines, transmission lines, substations, communication sites, and renewable energy development projects by requiring relocation of proposed projects. Relocation of proposed land-use authorization development projects would impact project scope, time, and cost.

4.3.6.5.3.3.4.2. Alternatives 1 through 4

Table 4.32. Saleable Minerals Impacts to Land-Use Authorizations

Open areas for saleable minerals	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Acres	2.1 million	1.6 million	1.8 million	2.0 million
Percent of land within planning area	71.0 percent	53.5 percent	61.9 percent	67.7 percent

4.3.6.5.3.4. Recreation Impacts on Land-Use Authorizations (Right-of-Ways, Leases, Permits)

4.3.6.5.3.4.1. Impacts Common to All Alternatives

Recreation management could have moderate impacts on land-use authorizations. Public lands are designated as a special recreation management area (SRMA) or an extensive recreation management area (ERMA). SRMAs require a recreation investment where more intensive recreation management is needed and where recreation is a principal management objective. These areas often have high levels of recreation activity, contain valuable natural resources, or require recreational settings that need special management. ERMAs are areas where recreation is non-specialized, dispersed, and does not require intensive management. Improving, maintaining, and/or preserving recreational resource values in areas of proposed land-use authorizations may create significant mitigation requirements. These areas may impose avoidance or exclusion to land-use authorizations. The placement of land-use authorizations such as renewable energy development projects, power lines, pipelines, or communication facilities could be restricted to specific locations or excluded from certain locations within the SRMAs to support maintaining the desired recreational setting, accommodate recreation facilities and developments, or avoid public safety concerns. Avoidance areas could result in proposed project relocation and mitigation that could significantly impact project scope and cost. Refer to Chapter 2 of the Recreation section (p. 104) for specific avoidance and exclusion areas to land-use authorizations.

4.3.6.5.3.4.2. Alternative 1

Under this alternative, there are eight SRMAs totaling over 590,000 acres (or 19.8 percent of the lands within the planning area); and one ERMA totaling over 2.5 million acres (or 83.9 percent of the lands within the planning area). Recreation management impacts on land-use authorizations under this alternative would be less restrictive than Alternatives 2, 3, and 4.

4.3.6.5.3.4.3. Alternative 2

Recreation management impacts under this alternative may be less restrictive to land-use authorizations than Alternative 3 and more restrictive than Alternatives 1 and 4. There are seven SRMAs totaling over 750,000 acres (or 25.2 percent of lands within the planning area) and seven ERMAs totaling over 2.3 million acres (or 78.5 percent of lands within the planning area) that include land-use authorization exclusion and avoidance areas. Exclusion and avoidance areas may prohibit the highest and best use of a particular parcel of land for development and may reduce the amount of area available for development.

4.3.6.5.3.4.4. Alternative 3

Recreation management impacts under this alternative may be more restrictive to land-use authorizations than Alternatives 1, 2, and 4. There are seven SRMAs totaling over 870,000 acres (or 29.3 percent of lands within the planning area), and seven ERMAs totaling over 2.2 million acres (or 74.5 percent of lands within the planning area) that include land-use authorization exclusion and avoidance areas. Exclusion and avoidance areas may prohibit the highest and best use of a particular parcel of land for development and may reduce the amount of area available for development. For example, the Pahrump ERMA would have a significant impact to land-use

authorizations because this ERMA surrounds the Town of Pahrump, which includes two major thoroughfares (U.S. Highway 95 and State Highway 160). An avoidance designation in this area will create greater barriers to permitting land-use authorizations, which will increase project time and costs.

4.3.6.5.3.4.5. Alternative 4

Recreation management impacts on land-use authorizations may be less restrictive than Alternatives 2 and 3, but more restrictive than Alternative 1. Under this alternative, there are two SRMAs totaling over 32,000 acres (or 1.1 percent of the lands within the planning area), and four ERMAs totaling over 910,000 acres (or 30.4 percent of the lands within the planning area) that include land-use authorization exclusion and avoidance areas. Exclusion and avoidance areas may prohibit the highest and best use of a particular parcel of land for development and may reduce the amount of area available for development.

4.3.6.5.3.5. Travel and Transportation Impacts on Land-Use Authorizations (Right-of-Ways, Leases, Permits)

4.3.6.5.3.5.1. Impacts Common to All Alternatives

Travel and transportation management may have moderate impacts on land-use authorizations by providing manageable access to public lands while balancing resource protection and public safety. In areas allocated as closed to travel and transportation, the BLM may still issue permits or other land-use authorizations for public access. All travel modes and uses on the travel system must be consistent with the travel management plan and resource objectives while maintaining desired recreation experiences. Restoring and/or moving roads may take some considerable work by the applicant and the lands staff. If mitigation is required, it will generally be standard with known requirements and stipulations.

4.3.6.5.3.5.2. Alternatives 1 through 4

Travel and transportation management impacts to land-use authorizations would be determined on a case-by-case basis during project-level analysis.

4.3.6.5.3.6. Lands and Realty Impacts on Land-Use Authorizations (Right-of-Ways, Leases, Permits)

4.3.6.5.3.6.1. Land Tenure (Disposals and Acquisitions) Impacts on Land-Use Authorizations (Right-of-Ways, Leases, Permits)

4.3.6.5.3.6.1.1. Impacts Common to All Alternatives

Land tenure management may have moderate impacts on land-use authorizations. Timely management and close coordination with lands staff and resource specialists is essential when processing land disposals. Proper adjudication and evaluation of valid existing rights for conversion to perpetual easements is a process in itself that impacts the timeliness and cost for the conveyance of lands. Additional time and costs include proper adjudication of land status to ensure proper retention of utility corridors to be federally excepted and reserved from

conveyance. Such realty actions and review may take some considerable work on the part of the lands staff, including finding the legal basis to eliminate and/or consolidate and/or assign legal, valid, and existing rights and/or unauthorized uses. If mitigation is required, it will generally be standard with known requirements and stipulations. Opening land areas for development that were previously closed would create more space for applicants to apply for lands and realty development. Land-use authorization exclusion and avoidance areas may prohibit the highest and best use of a particular land area for development and may reduce the amount of area available for development.

4.3.6.5.3.6.1.2. Alternatives 1 through 4

Land tenure impacts to land-use authorizations would be determined on a case-by-case basis during project-level analysis.

4.3.6.5.3.6.2. Land-Use Authorizations (Right-of-Ways, Leases, Permits) Impacts on Land-Use Authorizations (Right-of-Ways, Leases, Permits)

4.3.6.5.3.6.2.1. Impacts Common to All Alternatives

The impacts from land-use authorizations, including renewable energy development, on land-use authorizations would be moderate. Renewable energy development could also impact other types of land-use authorizations. Renewable energy development on public lands is closely tied to land availability, power line access, and reasonable access to utility markets. Solar energy zones are designated within the planning area specifically for the development of solar energy projects. This could limit lands available for other types of land uses. Proposed land-use authorizations (non-solar), such as access, would need to be ancillary to solar development. As land-use authorizations are proliferated across the landscape, the impacts will increase as land become less available for use. Proponents would need to work cooperatively with other proponents. BLM would also evaluate proposals for the most efficient use of the landscape when considering land-use authorizations and consider multi-use of land-use authorizations.

4.3.6.5.3.6.2.2. Alternative 1

Under this alternative, there are over 14,000 acres designated as solar energy zones.

4.3.6.5.3.6.2.3. Alternative 2

Under this alternative, there are over 13,000 acres identified as solar energy zones. There are no additional impacts.

4.3.6.5.3.6.2.4. Alternative 3

Under this alternative, there are over 39,000 acres identified as solar energy zones.

4.3.6.5.3.6.2.5. Alternative 4

Under this alternative, there are over 168,000 acres identified as solar energy zones.

4.3.6.5.3.6.3. Utility Corridors Impacts on Land-Use Authorizations (Right-of-Ways, Leases, Permits)

4.3.6.5.3.6.3.1. Impacts Common to All Alternatives

Transportation and utility corridors impacts on land-use authorizations may be moderate. The designation of energy corridors can provide more efficient siting, permitting, and review processes for projects within such corridors, as well as improve the predictability and transparency of these processes. The confinement of all major linear rights-of-way within the utility corridors may present minor impacts, as it would assist the lands and realty program in managing these facilities while limiting resource degradation throughout the planning area. Conflicts between land-use authorization grant holders and other uses within these corridors would be possible.

Use of Section 368 corridors (West-Wide Energy Corridors, or WEC) may require additional review consistent with the 2012 court-approved settlement agreement that was issued for the Wilderness Society v. United States Department of Interior, No. 3:09-cv-03048-JW (D.N.D. Cal.) (hereinafter referred to as the "Settlement"). The Settlement specifies a process for the ongoing use of corridors. All corridors, including corridors of concern (COC), may be utilized for siting oil, gas, and hydrogen pipelines and electricity transmission and distribution projects. Project proponents will be encouraged to avoid or minimize siting projects within COCs. If it is determined that there are site-specific constraints within a corridor (e.g., required separation distances to meet electric reliability standards, engineering constraints), project proponents will be encouraged to site the relevant portion of the project as close as practical to a Section 368 corridor, or within or adjacent to other BLM-designated corridors, existing linear ROWs, or previously disturbed lands. If a project proponent proposes to site a project, in part or in whole, within a COC, it is likely that such projects may be challenged in court; involve significant environmental impacts and the preparation of an environmental impact statement; involve substantially increased or extensive mitigation measures such as regional or off-site mitigation to compensate for impacts to sensitive resources; include consideration of alternatives outside the corridor; and/or require a land-use plan amendment. Use of interagency operating procedures (IOPs) for projects sited within Section 368 corridors is intended to expedite the permitting process by reducing duplication, increasing coordination, and ensuring consistency among federal agencies. The IOPs provide uniform processing and performance criteria for energy transportation rights-of-way during project planning, construction, operation, and decommissioning. The following corridors within the planning area are identified as corridors of concern: 223-224, 39-113, 39-231, and 47-231.

4.3.6.5.3.6.3.2. Alternative 1

Transportation and utility corridor impacts to land-use authorizations may be moderate. Corridors range in width from 500 feet wide to 3,500 feet wide.

4.3.6.5.3.6.3.3. Alternative 2

Transportation and utility corridor impacts to land-use authorizations may be moderate. Corridors range in width from 2,000 feet wide to 3,500 feet wide.

4.3.6.5.3.6.3.4. Alternative 3

Transportation and utility corridor impacts to land-use authorizations may be moderate. Corridors range in width from 2,000 feet wide to 3,500 feet wide.

4.3.6.5.3.6.3.5. Alternative 4

Transportation and utility corridor impacts to land-use authorizations may be moderate. Corridors range in width from 2,000 feet wide to 5,280 feet wide.

4.3.6.5.4. Special Designations

4.3.6.5.4.1. Areas of Critical Environmental Concern Impacts on Land-Use Authorizations (Right-of-Ways, Leases, Permits)

4.3.6.5.4.1.1. Impacts Common to All Alternatives

ACEC management may have major impacts on land-use authorizations. There are concerns with sensitive species habitat fragmentation as the result of rights-of-way development. In terms of habitat fragmentation of special status species, it is preferable to locate new surface-disturbing facilities in areas that are already disturbed (e.g., with existing utilities, roadways, etc.), as opposed to pristine areas. ACECs are managed as avoidance and/or exlcusion areas to land-use authorizations. There are four desert tortoise ACECs (Coyote Springs, Gold Butte Part A, Mormon Mesa, and Piute/Eldorado) with disturbance caps. Tortoise ACECs are rights-of-way avoidance areas except within designated corridors and include disturbance caps. ACEC caps apply to disturbance from any authorized actions to include temporary use authorizations. Setting a cap on disturbance would have a major impact on land-use authorizations. Project proponents will need to be creative in design to not negatively impact special status species habitats and to avoid creating a non-functional ACEC. Requiring special design features may significantly increase project costs and time. Improving, maintaining, and/or preserving special status species populations and their habitats in areas proposed for land-use authorizations development may create significant project-level mitigation requirements. Proposed projects may be disallowed or require alternative locations and adherence to a resource specific management plan, which may impose additional mitigation requirements. For example, development may be impacted by big game species, particularly bighorn sheep, through seasonal (timing) restrictions as lands would be designated as controlled surface use. Proposed projects would require Section 7 consultation to reduce impacts to threatened and endangered species and their habitats. Such adherence and requirements would have a major impact on land-use authorizations' project scope, time, and cost. Refer to the ACEC section in Chapter 2 (p. 180) for specific management prescriptions

4.3.6.5.4.1.2. Alternative 1

ACEC management impacts to land-use authorizations may be major. There are 23 existing ACECs totaling over 1.01 million acres (or 33.8 percent of the lands within the planning area).

4.3.6.5.4.1.3. Alternative 2

ACEC management may have the most impacts on land-use authorizations under this alternative compared to Alternatives 1, 3, and 4. Under this alternative, there are 43 ACECs totaling over 1.4 million acres (or 48.1 percent of land within the planning area). Opening land areas for development that were previously closed would create more space for applicants to apply for land-use authorizations. Releasing over 1,400 acres (Arden Historic) and 435 acres (Crescent Townsite) previously designated as an ACEC, would provide additional lands for development. However, this alternative imposes a 160-acre cumulative disturbance cap for new site-type land-use authorizations (including disturbance within corridors) within the tortoise ACECs: Coyote Springs, Mormon Mesa, Piute/Eldorado, and Gold Butte Part A. There is also a 3 percent maximum disturbance cap imposed by the Bird Springs Valley ACEC for all new authorized and unauthorized (illegal) disturbance, excluding fire. Disturbed acres that count against the cap can be offset through reclamation and restoration of other disturbed areas within the ACEC (including disturbance existing prior to the date of this RMP) to create space in the disturbance cap. However, the acres of reclaimed and restored areas can be counted only after completion of the reclamation and/or restoration project. Setting a cap on disturbance would have a major impact on land-use authorizations.

4.3.6.5.4.1.4. Alternative 3

ACEC management under this alternative may have more impacts on land-use authorizations than Alternatives 1 and 4, but less than Alternative 2. Under this alternative, there are 41 ACECs totaling approximately 1.3 million acres (or 43.1 percent of the lands within the planning area). Releasing over 1,400 acres previously designated as the Arden Historic ACEC, would provide additional lands for development. However, this alternative imposes a 320-acre cumulative disturbance cap for new site-type land-use authorizations (including disturbance within corridors) within the tortoise ACECs: Coyote Springs, Mormon Mesa, Piute/Eldorado, and Gold Butte Part A. Setting a cap on disturbance would have a major impact on land-use authorizations.

4.3.6.5.4.1.5. Alternative 4

ACEC management would have less impacts on land-use authorizations under this alternative than Alternatives 2 and 3 but more than Alternative 1. Under this alternative, there are 25 ACECs totaling 1.02 million acres (or 34.0 percent of lands within the planning area). Releasing over 1,400 acres previously designated as the Arden Historic ACEC would provide additional lands for development. However, this alternative imposes a 640-acre cumulative disturbance cap for new site-type land-use authorizations (including disturbance within corridors) within the tortoise ACECs: Coyote Springs, Mormon Mesa, Piute/Eldorado, and Gold Butte Part A. Setting a cap on disturbance would have a major impact on land-use authorizations.

4.3.6.5.4.2. National Trails Impacts on Land-Use Authorizations (Right-of-Ways, Leases, Permits)

4.3.6.5.4.2.1. Impacts Common to All Alternatives

National trails may have a major impact to land-use authorizations. The Old Spanish National Historic Trail is the only designated national trail managed within the planning area. Lands and

realty actions are considered federal undertakings and must avoid inadvertent damage to federal and non-federal cultural/historic resource values such as national trails through compliance with Section 106 of the National Historic Preservation Act. Project redesign, rerouting, or mitigation through data recovery could be required to avoid adverse impacts, which could increase processing costs and processing time for both federal and non-federal parties.

4.3.6.5.4.2.2. Alternatives 1 through 4

There are no additional impacts to land-use authorizations.

4.3.6.5.4.3. Wild and Scenic Rivers Impacts on Land-Use Authorizations (Right-of-Ways, Leases, Permits)

4.3.6.5.4.3.1. Impacts Common to All Alternatives

Wild and scenic rivers management may have moderate impacts on land-use authorizations. Improving, maintaining, and/or preserving resource values in areas of proposed land-use authorizations to use the land may create mitigation requirements. New project applications may require alternate locations.

4.3.6.5.4.3.2. Alternatives 1 through 4

Wild and scenic rivers management impacts on land-use authorizations may be moderate, but would be determined on a case-by-case basis during project-level analysis.

4.3.6.5.4.4. Wilderness Impacts on Land-Use Authorizations (Right-of-Ways, Leases, Permits)

4.3.6.5.4.4.1. Impacts Common to All Alternatives

Wilderness areas management would have major impacts on land-use authorizations. Wilderness areas are congressionally withdrawn lands that are ultimately managed as exclusion areas. The Wilderness Act of 1964 defines wilderness characteristics, the uses of wilderness, and the activities prohibited within its boundaries. Wilderness areas are managed for use and enjoyment in a manner that will leave them unimpaired for future use and enjoyment as wilderness. Until Congress releases the wilderness designation, these lands are restricted from land-use authorizations.

4.3.6.5.4.4.2. Alternative 1

Wilderness areas management impacts to land-use authorizations would be major. See Impacts Common to all Alternatives.

4.3.6.5.4.4.3. Alternatives 2 and 3

Wilderness areas management impacts to land-use authorizations would be major. Improving, maintaining, and/or preserving resource values in areas of legal, valid and existing rights, or where land-use authorizations may be proposed to use the land may create significant mitigation requirements. For example, facilities adjacent to wilderness that would support management

within wilderness would be allowed. New project applications may require alternate locations. No net unmitigated losses may require significant mitigation, sometimes doubling project review time and cost: once for the proposed project and once for the off-site mitigation. Mitigation techniques may require unique, out-of-the-box solutions and specialized skills, including third parties.

4.3.6.5.4.4.4. Alternative 4

Wilderness areas management impacts to land-use authorizations may be major. Improving, maintaining, and/or preserving resource values in areas of legal, valid and existing rights to use the land may create significant mitigation requirements. New project applications may require alternate locations. Wilderness management may take some considerable work on the part of the lands staff, including finding the legal basis to eliminate and/or consolidate and/or assign legal, valid, and existing rights. If mitigation is required, it will generally be standard with known requirements and stipulations.

4.3.6.5.4.5. Wilderness Study Areas Impacts on Land-Use Authorizations (Right-of-Ways, Leases, Permits)

4.3.6.5.4.5.1. Impacts Common to All Alternatives

There are four WSAs within the planning area totaling over 37,000 acres (or 1.2 percent of the lands within the planning area). WSAs are public lands withdrawn by Congress to be reviewed for wilderness preservation. WSAs are managed to not impair the suitability of the WSA for preservation as wilderness. Land uses and facilities must meet this non-impairment standard — the use or facility is temporary and will not create new surface disturbance. Until Congress releases the wilderness designation, these lands are restricted from land-use authorizations. For example, in January 2014, Congress released the Sunrise Mountain Instant Study Area from its wilderness designation.

4.3.6.5.4.5.2. Alternative 1

WSA impacts on land-use authorizations would be major. By following a management plan specifically for a special designation, lands and realty development could be experience major impacts that would require mitigation. Opening land areas for development that were previously closed would create more space for applicants to apply for lands and realty development.

4.3.6.5.4.5.3. Alternatives 2 and 3

WSA impacts on land-use authorizations would be major. Improving, maintaining, and/or preserving wilderness study areas may create significant mitigation requirements on proposed land-use authorizations. New project applications may require alternate locations. No net unmitigated losses may require significant mitigation, sometimes doubling project review time and costs: once for the proposed project and a second time for the off-site mitigation. Mitigation techniques may require unique, out-of-the-box solutions and specialized skills, including third-party assistance.

4.3.6.5.4.5.4. Alternative 4

WSA impacts on land-use authorizations would be major. Improving, maintaining, and/or preserving resource values in areas of legal, valid, and existing rights to use the land may create significant mitigation requirements. New project applications may require alternate locations. Wilderness study area management may take some considerable work on the part of the lands staff, including finding the legal basis to eliminate and/or consolidate and/or assign legal, valid, and existing rights. If mitigation is required, it will generally be standard with known requirements and stipulations.

4.3.6.5.5. Cumulative Impacts

The cumulative impacts are presented at the end of the Lands and Realty section (p. 1217).

4.3.6.6. Transportation and Utility Corridors

4.3.6.6.1. Summary

Transportation and utility corridors on public lands provide for more efficient siting and permitting of major rights-of-way. As stated in the June 6, 2013, presidential memorandum "Transforming our Nation's Electric Grid Through Improved Siting, Permitting, and Review," corridors "provide an opportunity to co-locate projects and share environmental and cultural resource impact data to reduce overall impacts on environmental and cultural resources and reduce the need for land-use plan amendments in support of the authorization of transmission rights-of-way. The designation of energy corridors can help expedite the siting, permitting, and review processes for projects within such corridors, as well as improve the predictability and transparency of these processes."

BLM designates transportation and utility corridors (or ROW corridors) to minimize adverse impacts and the proliferation of separate use authorizations while providing an orderly system for transportation and utility purposes. Designation of corridors is also based on interest in having land uses such as major pipelines, highways, and utility routes to be confined to ROW corridors to protect other resources in adjacent areas. The designation of specific corridors does not approve projects within the corridors, nor would it require future energy transport projects to be located within these designated corridors, although the preference is to utilize designated corridors to avoid and/or minimize adverse impacts to other resources. Energy transport projects, on a case-by-case basis, may be proposed to cross federal lands in ROWs that are outside of any designated corridor. Projects crossing non-BLM administrative lands (e.g., other federal agencies, state/local governments, and private properties) would be subject to those respective lands regulations and authorities. Any requested use of BLM-administered lands must demonstrate compliance with all applicable federal, state, and local regulations in order to use federal land. Such compliance would be considered during the project-level approval process and required prior to use of the BLM-administered corridor.

The West-Wide Energy Corridor Programmatic EIS (WEC PEIS) evaluated utility corridors for inclusion in the nationwide designations authorized by Section 368 of the Energy Policy Act of 2005 (EPAct). Certain 1998 RMP utility corridors across the planning area were amended by the WEC PEIS pursuant to Section 368 of the EPAct. See Chapter 3 for a list of the existing corridors, as amended, within the planning area.

Section 368 corridors are sited to avoid, to the maximum extent possible, significant known resource and environmental conflicts. Corridors are sited to the maximum extent possible to promote renewable energy development in the West, which is currently constrained in part by a lack of transmission capacity. Interagency operating procedures (IOPs) developed and evaluated in the WEC PEIS are expected to foster long-term, systematic planning for energy transport development in the West, provide industry with a coordinated and consistent interagency permitting process, and provide practicable measures to avoid or minimize environmental harm from future development within the corridors. Such corridors are designed to be compatible with the management goals of the areas through which they pass. Expansion, as well as other actions, would not be approved if they did meet these requirements. Use of Section 368 corridors (or WEC) that are considered to be corridors of concern (COC) will require an extensive review and analysis consistent with the July 2012 settlement agreement during project-level implementation. Use of IOPs as defined in Appendix B of the 2009 Record of Decision for the WEC PEIS for projects sited/proposed within Section 368 corridors is required. The IOPs are intended to

expedite the permitting process by reducing duplication, increasing coordination, and ensuring consistency among federal agencies. The IOPs provide uniform processing and performance criteria for energy transportation rights-of-way during project planning, construction, operation, and decommissioning.

As part of the RMP revision process, the BLM worked with cooperating agencies to propose modifications to Section 368 corridors. This effort included thoughtfully siting corridors to provide maximum utility and minimum impact to the environment; to promote efficient use of the landscape for necessary energy development; and to provide connectivity to renewable energy generation to the maximum extent possible while also considering other sources of generation, in order to balance renewable resources and to ensure safety and reliability of electricity transmission. BLM will also consider public input and other interested parties for making potential revisions, deletions, or additions to Section 368 corridors.

Impacts to management of lands and realty transportation and utility corridors would be considered major (significant) if corridor designations would be inhibited in any way. See the land-use authorization analysis section for impacts to use of such corridors. Only those resource management areas that would inhibit the designation and/or use of a transportation and utility corridor are analyzed below.

4.3.6.6.2. Resources

4.3.6.6.2.1. Special Status Species Impacts on Transportation and Utility Corridors

4.3.6.6.2.1.1. Impacts Common to All Alternatives

Special status species management may have moderate impacts on transportation and utility corridors. Special status species include all plant and animal species that are federally listed as threatened or endangered under the Endangered Species Act of 1973 (ESA), as amended; and candidate species under the ESA to include state-listed species or other special status species as identified by the BLM Nevada state director. Consistent with Section 503 of FLPMA and land-use planning, corridors are designated in areas that would meet public demand and reduce impacts to sensitive resources while providing an orderly system of development for transportation and major utility transmission lines and related facilities. There are concerns with sensitive species habitat fragmentation as the result of rights-of-way development to include development within transportation and utility corridors. In terms of habitat fragmentation of special-status species, it is preferable to locate new utilities in areas that are already disturbed (e.g., existing utilities, roadways, etc.), as opposed to pristine areas. Project proponents will need to be creative in design to not negatively impact special status species habitats and to avoid creating non-functional utility corridors. Requiring special design features could significantly increase project costs and time.

4.3.6.6.2.1.2. Alternatives 1, 3, and 4

There are no additional impacts on transportation and utility corridors.

4.3.6.6.2.1.3. Alternative 2

Special status species management impacts on transportation and utility corridors may be moderate. Under this alternative, over 27,000 acres within the planning area in Nye County are proposed to be managed as areas of ecological importance (AEI):

- **North Amargosa Desert:** 6,841 acres.
- **Specter Range North:** 7,981 acres.
- **Specter Range South:** 6,404 acres.
- **Pahrump Valley East:** 5,812 acres.

Nye County requested that these areas be managed as conservation reserves as part of habitat conservation planning efforts. This effort may provide Nye County opportunities to obtain the necessary permits for development by mitigating for impacts on non-federal lands in Nye County. AEIs would be managed as avoidance areas except within designated corridors for linear rights-of-way. WEC 18-224 (a 3,500-foot-wide designated corridor) goes through the proposed Specter Range South AEI within the north half of T.16S., R.52E., sec. 14. WEC 224–225 (a 3,500-foot-wide designated corridor) goes through the proposed Pahrump Valley East AEI within T.19S., R.54E., secs. 5–8, 16, 17, 20, 21 and 28. These Section 368 corridors among others provide connectivity of existing power transmission and renewable energy resources, as well as potential future power and renewable energy projects. BLM will need to assess any proposed rights-of-way within and/or adjacent to corridors on a case-by-case basis, and review and approve individual project plans to ensure compatible development within and/or adjacent to corridors to maintain viable use of such corridors.

4.3.6.6.2.2. Wild Horse and Burro Impacts on Transportation and Utility Corridors

4.3.6.6.2.2.1. Impacts Common to All Alternatives

Wild horse and burro resource management may have moderate impacts on transportation and utility corridors. Improving, maintaining, and/or preserving habitat for wild horses and burros in areas designated for linear and site-type energy-generating facilities could require significant mitigation requirements during project-level implementation. BLM will need to assess land-use authorization applications proposed within and/or adjacent to corridors on a case-by-case basis, and review and approve individual project plans of development to ensure compatible development within and/or adjacent to corridors to maintain viable use of such corridors. Use of Section 368 (or WEC) corridors, including corridors of concern (COC), will require an extensive review and analysis consistent with the 2009 WEC PEIS and the settlement agreement during project-level implementation.

There are four established herd management areas (HMAs) within the planning area (Johnnie, Wheeler Pass, Red Rock, and Gold Butte) encompassing over 790,000 acres (or 26.5 percent of the lands within the planning area). No corridors go through the Gold Butte HMA. The affected corridors are described below under each alternative. Project proponents will need to be creative in design to avoid creating non-functional utility corridors while avoiding any adverse impacts to HMAs.

4.3.6.6.2.2.2. Alternative 1

Under this alternative, the respective HMA may impact the following transportation and utility corridors:

- **Johnnie HMA:**
  - US95-Crater Flat: 2,640 feet wide
  - WEC 18-224: 3,500 feet wide
  - WEC 224-225: 3,500 feet wide
  - COC 223-224: 3,500 feet wide
- **Wheeler Pass:**
  - US95-Crater Flat: 2,640 feet wide
  - US95–Crater Flat-Red Rock: 2,640 feet wide
  - WEC 224-225: 3,500 feet wide
  - COC 223-224: 3,500 feet wide
- **Red Rock:**
  - Amargosa-Roach: 2,640 feet wide
  - WEC 224-225: 3,500 feet wide

4.3.6.6.2.2.3. Alternative 2

Under this alternative, the respective HMA may impact the following transportation and utility corridors:

- **Johnnie HMA:**
  - US95-Crater Flat: 2,640 feet wide
  - WEC 18-224: 3,500 feet wide
  - WEC 224-225: 3,500 feet wide
- **Wheeler Pass:**
  - US95-Crater Flat: 2,640 feet wide
  - US95–Crater Flat-Red Rock: 2,640 feet wide
  - WEC 224-225: 3,500 feet wide
  - COC 223-224: 3,500 feet wide
- **Red Rock:**
  - Amargosa-Roach: 2,640 feet wide
  - WEC 224-225: 3,500 feet wide

4.3.6.6.2.2.4. Alternative 3

Under this alternative, the respective HMAs may impact the following transportation and utility corridors:.

- **Johnnie HMA:**
  - Kyle Canyon-Pahrump: 3,500 feet wide
  - WEC 18–224: 3,500 feet wide
  - WEC 224-225: 3,500 feet wide
- **Wheeler Pass:**
  - Kyle Canyon-Pahrump: 3,500 feet wide
  - WEC 224-225: 3,500 feet wide
  - COC 223-224: 3,500 feet wide

- **Red Rock:**
  - WEC 224-225: 3,500 feet wide
  - Goodsprings-Prim: 3,500 feet wide

4.3.6.6.2.2.5. Alternative 4

Under this alternative, the respective HMAs may impact the following transportation and utility corridors:

- **Johnnie HMA:**
  - Amargosa-Roach: 5,280 feet wide
  - Kyle Canyon-Pahrump: 5,280 feet wide
  - WEC 18-224: 5,280 feet wide
  - WEC 224-225: 5,280 feet wide
- **Wheeler Pass:**
  - Kyle Canyon-Pahrump: 5,280 feet wide
  - Goodsprings-Beatty: 5,280 feet wide
  - WEC 224–225: 5,280 feet wide
  - COC 223–225: 3,500 feet wide
- **Red Rock:**
  - Amargosa-Roach: 5,280 feet wide
  - Las Vegas-Goodsprings: 5,280 feet wide
  - WEC 224–225: 5,280 feet wide

4.3.6.6.2.3. Cave and Karst Management Impacts on Transportation and Utility Corridors

4.3.6.6.2.3.1. Impacts Common to All Alternatives

Cave and karst management may have moderate impacts on transportation and utility corridors. Managing cave and karst resource values within and/or adjacent to transportation and utility corridors may create significant mitigation requirements on ROW holders. It is the lands and realty program's goal to designate and manage ROW corridors to minimize adverse environmental impacts and the proliferation of separate use authorizations while providing an orderly system for transportation and utility purposes. Land-use authorization exclusion and avoidance areas may prohibit the highest and best use of a particular parcel for development and may reduce the amount of transportation and utility corridor space available for development. BLM will need to assess land-use authorization applications proposed within and/or adjacent to corridors on a case-by-case basis, and review and approve individual project plans of development to ensure compatible development within and/or adjacent to corridors to maintain viable use of such corridors. Use of Section 368 (or WEC) corridors, including corridors of concern, will require an extensive review and analysis consistent with the 2009 WEC PEIS and the settlement agreement during project-level implementation.

4.3.6.6.2.3.2. Alternatives 1 through 4

There are no additional impacts on land-use authorizations.

4.3.6.6.2.4. Cultural Resources Impacts on Transportation and Utility Corridors

4.3.6.6.2.4.1. Impacts Common to All Alternatives

Cultural resource management may have major impacts on transportation and utility corridors. Managing cultural resource values within and/or adjacent to transportation and utility corridors may create significant mitigation requirements on ROW holders. It is the lands and realty program's goal to designate and manage ROW corridors to minimize adverse environmental impacts and the proliferation of separate use authorizations while providing an orderly system for transportation and utility purposes. New project applications may require alternate locations defeating this goal. Land-use authorization exclusion and avoidance areas may prohibit the highest and best use of a particular parcel for development and may reduce the amount of transportation and utility corridor space available for development. BLM will need to assess land-use authorization applications proposed within and/or adjacent to corridors on a case-by-case basis, and review and approve individual project plans of development to ensure compatible development within and/or adjacent to corridors to maintain viable use of such corridors. Use of Section 368 (or WEC) corridors, including corridors of concern, will require an extensive review and analysis consistent with the 2009 WEC PEIS and the settlement agreement during project-level implementation.

4.3.6.6.2.4.2. Alternatives 1 through 4

There are no additional impacts on land-use authorizations.

4.3.6.6.2.5. Paleontological Resources Impacts on Transportation and Utility Corridors

4.3.6.6.2.5.1. Impacts Common to All Alternatives

Paleontological resource management may have major impacts on transportation and utility corridors. Managing paleontological resource values within and/or adjacent to transportation and utility corridors may create significant mitigation requirements on ROW holders. It is the lands and realty program's goal to designate and manage ROW corridors to minimize adverse environmental impacts and the proliferation of separate use authorizations while providing an orderly system for transportation and utility purposes. New project applications may require alternate locations defeating this goal. Land-use authorization exclusion and avoidance areas may prohibit the highest and best use of a particular parcel for development and may reduce the amount of transportation and utility corridor space available for development. BLM will need to assess land-use authorization applications proposed within and/or adjacent to corridors on a case-by-case basis, and review and approve individual project plans of development to ensure compatible development within and/or adjacent to corridors to maintain viable use of such corridors. Use of Section 368 (or WEC) corridors, including corridors of concern, will require an extensive review and analysis consistent with the 2009 WEC PEIS and the settlement agreement during project-level implementation.

4.3.6.6.2.5.2. Alternatives 1 through 4

There are no additional impacts on land-use authorizations.

4.3.6.6.2.6. Visual Resource Management Impacts on Transportation and Utility Corridors

4.3.6.6.2.6.1. Impacts Common to All Alternatives

Visual resource management (VRM) may have moderate impacts on transportation and utility corridors. VRM Class I is designed for preservation, and VRM Class II is designed for retention of landscape character. Generally, land-use authorizations fall under the requirement for compatibility with VRM Class III (partial retention of the landscape character), and VRM Class IV (modification of the landscape character). However, corridors fall under the requirement for compatibility with VRM Class III, which includes areas where changes in the basic elements caused by management activities may be evident in the characteristic landscape. The changes should remain subordinate to the existing landscape character. Requiring project proponents to mitigate for partial retention of the landscape character could increase design and development costs. Mitigation could include project relocation from designated rights-of-way corridors, burying, and/or color compatibility painting of the project with its surroundings to ensure scenic integrity. Project proponents would need to be creative in design to meet the objectives of the established VRM Class III for designated corridors while ensuring compatible proposed uses within/and adjacent to corridors. BLM will need to assess land-use authorization applications proposed within and/or adjacent to corridors on a case-by-case basis. Such review would include BLM approval of individual project plans of development to ensure compatible construction within and/or adjacent to corridors to maintain viable use of the corridors. Use of Section 368 (or WEC) corridors, including corridors of concern (COC), will require an extensive review and analysis consistent with the 2009 WEC PEIS and the settlement agreement during project-level implementation.

4.3.6.6.2.6.2. Alternatives 1 through 4

There are no additional impacts on land-use authorizations.

4.3.6.6.2.7. Lands with Wilderness Characteristics Impacts on Transportation and Utility Corridors

4.3.6.6.2.7.1. Impacts Common to All Alternatives

There are no impacts common to all alternatives.

4.3.6.6.2.7.2. Alternative 1

There are no lands with wilderness characteristics identified under this alternative.

4.3.6.6.2.7.3. Alternative 2

Lands with wilderness characteristics may have major impacts on transportation and utility corridors. Lands with wilderness characteristics are designated specifically to protect, preserve, and maintain their wilderness characteristics on the public landscape. Excluding new rights-of-way within areas identified as having wilderness characteristics significantly conflicts with the 2,640-foot-wide corridor (labeled as Amargosa-Roach). This corridor traverses the

proposed Resting Springs Addition (over 9,300 acres) located in southern Nye County. The Amargosa-Roach corridor traverses that portion of the addition within M.D.M., T.19S., R.51E., secs. 10,14,15, 23, 25, 26, 35, and 36; and S.B.M., T.25N., R.7E., sec. 25. The Resting Springs Addition would have a significant impact as it would make that segment of the subject corridor non-viable or usable.

4.3.6.6.2.7.4. Alternative 3

Lands with wilderness characteristics would have moderate impacts on transportation and utility corridors. Lands with wilderness characteristics are designated specifically to protect, preserve, and maintain their wilderness characteristics on the public landscape. This area is proposed to be managed as an avoidance area for new rights-of-way, which could conflict with the purpose of designating rights-of-way corridors for transportation and utility purposes. Under this alternative, there is a potential overlap with a 3,500-foot-wide corridor (labeled as Overton) and a 2,640-foot-wide corridor (labeled as SNWA) that traverses the proposed Arrow Canyon Addition in Clark County within M.D.M., T.13S., R.64E., sec. 33, and M.D.M., T.13.5S., R.64E., sec. 34. This may affect the designation and/or use of the corridor since the proposed management prescription is to avoid new rights-of-way and restrict construction of new structures and facilities that are unrelated to the preservation or enhancement of wilderness characteristics. There are no conflicts with corridors within the planning area in Nye County.

4.3.6.6.2.7.5. Alternative 4

Lands with wilderness characteristics would have moderate impacts on transportation and utility corridors. Lands with wilderness characteristics are designated specifically to protect, preserve, and maintain their wilderness characteristics on the public landscape. This area is proposed to be managed as an avoidance area for new rights-of-way, which could conflict with the purpose of designating rights-of-way corridors for transportation and utility purposes. Under this alternative, there is a potential overlap of a 5,280-foot-wide corridor (labeled as Overton) that traverses the Arrow Canyon Addition in Clark County within M.D.M., T.13S., R.64E., sec. 33; T.13.5S., R.64E., sec. 34; and T.14S., R.64E., sec. 1. Within the same vicinity, there is also a potential overlap of a 2,640-foot-wide corridor (labeled as SNWA) that traverses the proposed Arrow Canyon Addition within M.D.M., T.13S., R.64E., sec. 33. This could affect the designation and/or use of the corridor since the proposed management prescription is to avoid new rights-of-way and restrict construction of new structures and facilities that are unrelated to the preservation or enhancement of wilderness characteristics. There are no conflicts with corridors within the planning area in Nye County.

4.3.6.6.3. Resource Uses

4.3.6.6.3.1. Livestock Grazing Impacts on Transportation and Utility Corridors

4.3.6.6.3.1.1. Impacts Common to All Alternatives

Livestock grazing resource management may have minor/low impacts on transportation and utility corridors. Improving and/or maintaining areas opened for domestic livestock grazing (e.g., horses, cattle) where there are designated transportation and utility corridors could create mitigation requirements. Project proponents seeking land-use authorizations within designated corridors

that traverse open grazing allotments could require mitigation that involves excluding livestock grazing during the construction and rehabilitation phases of the project. Mitigation could also be required to facilitate livestock movement or provide for public safety (e.g. fencing and cattle guards) throughout the effective period of the authorization. Any impacts for use of corridors would be addressed during project-level analysis and implementation of standard stipulations.

4.3.6.6.3.1.2. Alternative 1

Under this alternative, there are four corridors that traverse open grazing allotments:

- **Lower Mormon Mesa and Muddy River grazing allotments:**
  - COC 39–113 (3,500 feet wide)
- **Hidden Valley grazing allotment:**
  - Interstate 15 South (2,640 feet wide)
- **Wheeler Wash grazing allotment:**
  - WEC 224–225 (3,500 feet wide)
  - Amargosa-Roach (2,640 feet wide)

4.3.6.6.3.1.3. Alternative 2

Under this alternative, all livestock grazing allotments would be closed.

4.3.6.6.3.1.4. Alternative 3

Under this alternative, there are three corridors that traverse an open grazing allotment:

- **Hidden Valley grazing allotment:**
  - Interstate 15 South (2,640 feet wide)
  - Jean Dry Lake (3,500 feet wide)
  - McCullough Pass-Primm (3,500 feet wide)

Use of the Interstate 15 South corridor must be consistent with the 2002 Clark County Act to provide high-quality development in Clark County.

4.3.6.6.3.1.5. Alternative 4

Under this alternative, there are five corridors that traverse an open grazing allotment:

- **Hidden Valley grazing allotment:**
  - Interstate 15 South (2,640 feet wide)
  - Jean Dry Lake (5,280 feet wide)
  - McCullough Pass-Primm (5,280 feet wide)
- **Wheeler Wash grazing allotment:**
  - WEC 224–225 (5,280 feet wide)
  - Amargosa-Roach (5,280 feet wide)

Use of Section 368 West-wide Energy corridors and corridors of concern will require an extensive review and analysis consistent with the 2009 WEC PEIS and the Settlement Agreement during project-level implementation. Use of the Interstate 15 South corridor must be consistent with the 2002 Clark County Act to provide high-quality development in Clark County.

4.3.6.6.3.2. Minerals Impacts on Utility Corridors

4.3.6.6.3.2.1. Saleable Minerals Impacts on Utility Corridors

4.3.6.6.3.2.1.1. Impacts Common to All Alternatives

Saleable minerals management may have moderate impacts on transportation and utility corridors. Saleable minerals (e.g., sand, stone, gravel) are predominantly used in the construction industries for urban uses. Saleable minerals can be large sand and gravel mining operations (i.e., Lone Mountain and Speedway community pits), which could impact the placement of energy-generating facilities such as pipelines, transmission lines, and substations by requiring project relocation. Relocation of proposed projects could inhibit the use of transportation and utility corridors and impact project scope, time, and cost. BLM will need to assess existing and proposed uses within and/or adjacent to corridors on a case-by-case basis to maintain viable uses of corridors, as well as ensure consistency with corridors established legislatively.

4.3.6.6.3.2.1.2. Alternative 1

There are no community pits within the planning area in Nye County that are adjacent to or overlap corridors. However, in Clark County, the following community pits (CP) are located adjacent to and/or overlap the described corridor: North Jean Lake CP overlaps the legislative 2,64- foot-wide Interstate 15 South corridor within T.24S., R60E., secs. 15, 16, 21 and 28; the South Jean Lake CP overlaps the 3,000-foot-wide McCullough Pass-Primm corridor within T.25S., R60E., secs. 26, 33-35; and T.26S., R.60E., secs. 3 and 4, overlaps the 3,500-foot-wide WEC 224-225 within T.25S., R.60E., secs. 7 and 21, and overlaps 3,500-foot-wide WEC 27-225 (formerly Boulder-Prim South corridor) within T.26S., R.60E., secs. 2 and 3.

4.3.6.6.3.2.1.3. Alternative 2

There are no community pits within the planning area in Nye County that are adjacent to or overlap corridors. However, in Clark County, the following community pits overlap the described corridors: North Jean Lake CP overlaps the legislative 2,640-foot-wide Interstate 15 South corridor within T.24S., R60E., secs. 15, 16, 21 and 28; and the South Jean Lake CP overlaps the 3,000-foot-wide McCullough Pass-Primm corridor within T.25S., R60E., secs. 26, 33-35; and T.26S., R.60E., secs. 3 and 4; and overlaps 3,500-foot-wide WEC 27-225 (formerly Boulder-Prim South corridor) within T.26S., R.60E., secs. 2 and 3.

4.3.6.6.3.2.1.4. Alternative 3

There are no community pits within the planning area in Nye County that are adjacent to or overlap corridors. However, in the Las Vegas Field Office, the following community pits overlap the described corridors: Speedway CP overlaps the 3,500-foot-wide Nellis Dunes corridor within T.19S., R.62E., sec. 13 and T.19S., R.63E., secs. 17-20; the North Jean Lake CP overlaps the 3,500-foot-wide Jean Dry Lake corridor within T.24S., R60E., secs. 21-23 and 26-28; and the South Jean Lake CP overlaps the 3,500-foot-wide McCullough Pass-Primm corridor within T.25S., R60E., secs. 26, 27, 33-35; and T.26S., R.60E., secs. 3 and 4; and overlaps 3,500-foot-wide WEC 27-225 (formerly Boulder-Prim South corridor) within T.26S., R.60E., secs. 2 and 3.

4.3.6.6.3.2.1.5. Alternative 4

The Pahrump Community Pit in Nye County overlaps a portion of the western boundary of a Section 368 WEC 224–225 corridor (5,280 feet wide) within T.20S., R.54E., secs. 16, 21, and 28. In Clark County, the following community pits (CP) overlap the described corridors: Speedway CP overlaps the 5,280-foot-wide Nellis Dunes corridor within T.19S., R.62E., sec. 13 and T.19S., R.63E., secs. 17-20; the North Jean Lake CP overlaps the 5,280-foot-wide Jean Dry Lake corridor within T.24S., R60E., secs. 21-23 and 26-28; and the South Jean Lake CP overlaps the 5,280-foot-wide McCullough Pass-Primm corridor within T.25S., R60E., secs. 26, 27, 33-35; and T.26S., R.60E., secs. 3 and 4; and overlaps the 5,280-foot-wide WEC 27-225 (formerly Boulder-Prim South corridor) within T.26S., R.60E., secs. 2 and 3.

4.3.6.6.3.3. Recreation Impacts on Utility Corridors

4.3.6.6.3.3.1. Impacts Common to All Alternatives

Recreation management may have moderate to major impacts on transportation and utility corridors. Improving and/or maintaining areas to ensure that a wide range of recreational opportunities are available where there are designated corridors could be problematic for corridors. Special recreation management areas (SRMA) and extensive recreation management areas (ERMA) are managed as land-use authorization avoidance or exclusion areas except within designated corridors. SRMAs require a recreation investment where more intensive recreation management is needed and where recreation is a principal management objective. These areas often have high levels of recreation activity, contain valuable natural resources, or require recreational settings that need special management. ERMAs are areas where recreation is non-specialized, dispersed, and does not require intensive management. Avoidance and exclusion areas except within designated corridors could inflict capacity issues and potential incompatible uses of corridors. BLM will need to carefully assess land-use authorization applications proposed within corridors on a case-by-case basis and review and approve individual project plans of development to ensure compatible development to maintain viable use of corridors. Use of Section 368 (or WEC) corridors, including corridors of concern, will require an extensive review and analysis consistent with the 2009 WEC PEIS and the settlement agreement during project-level implementation.

4.3.6.6.3.3.2. Alternative 1

Under this alternative, there are eight SRMAs that encompass approximately 19.8 percent of the public lands within the planning area, and one ERMA that encompasses approximately 83.9 percent of the planning area. These recreation management areas could have moderate to major impacts on transportation and utility corridors due to avoidance and exclusion area restrictions on land-use authorizations, except within designated corridors. This alternative would have fewer impacts on corridors than Alternatives 2 and 3, but more impacts than Alternative 4.

4.3.6.6.3.3.3. Alternatives 2

Under this alternative, there are seven SRMAs that encompass approximately 25.2 percent of the public lands within the planning area, and seven ERMAs that encompass approximately 78.5 percent of the planning area. These recreation management areas could have moderate to major impacts on transportation and utility corridors due to avoidance and exclusion area restrictions

on land-use authorizations, except within designated corridors. This alternative may have more impacts on corridors than Alternatives 1 and 4, but fewer impacts than Alternative 3.

4.3.6.6.3.3.4. Alternatives 3

Under this alternative, there are seven SRMAs that encompass approximately 29.3 percent of the public lands within the planning area, and seven ERMAs that encompass approximately 74.5 percent of the planning area. These recreation management areas may have moderate to major impacts on transportation and utility corridors due to avoidance and exclusion area restrictions on land-use authorizations, except within designated corridors. This alternative may have more impacts on corridors than Alternatives 1, 2, and 4.

4.3.6.6.3.3.5. Alternatives 4

Under this alternative, there are two SRMAs that encompass approximately 1.1 percent of the public lands within the planning area, and four ERMAs that encompass approximately 30.4 percent of the planning area. These recreation management areas may have moderate to major impacts on transportation and utility corridors due to avoidance and exclusion area restrictions on land-use authorizations, except within designated corridors. This alternative may have the least impacts on corridors.

4.3.6.6.3.4. Lands and Realty Impacts on Utility Corridors

4.3.6.6.3.4.1. Land Tenure (Disposals and Acquisitions) Impacts on Utility Corridors

4.3.6.6.3.4.1.1. Impacts Common to All Alternatives

Land tenure (e.g., disposals/conveyances) may have major impacts to transportation and utility corridors if corridors are not excepted and reserved to the United States upon conveyance of public land. Consistent with Section 208 of FLPMA, the BLM may insert in any such patent or other document of conveyance terms, covenants, conditions, and reservations as necessary to ensure proper land use and protection of the public interest, such as energy transmission corridors. The nation's power grid is the backbone of the economy, a key factor in future economic growth, and a critical component of energy security. To ensure the growth of America's clean energy economy and improve energy security, it is necessary to modernize and expand the power grid and to ensure continued compatible uses of corridors. Therefore, it is critical for BLM to evaluate disposal/conveyance actions on a case-by-case basis to ensure proper protection of designated transportation and utility corridors. Acquisition of private lands may benefit the lands program by enhancing and improving transportation and utility corridor connectivity.

4.3.6.6.3.4.1.2. Alternative 1

Under this alternative, corridors traverse the following disposal areas managed by the respective BLM field office:

- **LVFO:** Apex, Goodsprings, Ivanpah Airport Environs Overlay District, Laughlin, Moapa/Glendale, SNPLMA, and Searchlight.
- **PFO:** Amargosa Valley, Lathrop Wells, and Pahrump.

4.3.6.6.3.4.1.3. Alternative 2

Under this alternative, corridors traverse the following disposal areas managed by the respective BLM field office:

- **LVFO:** Apex, Goodsprings, Indian Springs, Indian Springs Prison, Ivanpah Airport Environs Overlay District, Moapa/Glendale, SNPLMA, and Searchlight.
- **PFO:** Lathrop Wells, and Pahrump.

4.3.6.6.3.4.1.4. Alternative 3

Under this alternative, corridors traverse the following disposal areas managed by the respective BLM field office:

- **LVFO:** Apex, City of Las Vegas, Goodsprings, Ivanpah Airport Environs Overlay District, Laughlin, Moapa/Glendale, North Las Vegas, SNPLMA, and Searchlight.
- **PFO:** Highway 95/160 Intersection, Lathrop Wells, and Pahrump.

4.3.6.6.3.4.1.5. Alternative 4

Under this alternative, the following disposal areas managed by the respective BLM field office may include corridors:

- **LVFO:** Apex, City of Las Vegas, Goodsprings, Ivanpah Airport Environs Overlay District, Laughlin, Moapa/Glendale, North Las Vegas, SNPLMA, and Searchlight.
- **PFO:** Lathrop Wells, Mercury, Nye County 1, Pahrump, Pahrump East, Pahrump Stateline, and Southern Pahrump Off The Grid.

4.3.6.6.3.4.2. Land-Use Authorizations (Right-of-Ways, Leases, Permits) Impacts on Utility Corridors

4.3.6.6.3.4.2.1. Impacts Common to All Alternatives

Land-use authorizations may have major impacts to transportation and utility corridors if non-compatible development, which could be communication sites, detention basins, and other site-type rights-of-way, were constructed within corridors. Consistent with the Energy Policy Act of 2005 (P.L. 109-58), and the 2009 Record of Decision for the WEC PEIS, designated corridors within the planning area are compatible for aboveground and underground purposes unless specified differently. WEC 37–232(S) is restricted to underground energy transport mode. BLM will need to assess land-use authorization applications proposed within and/or adjacent to corridors on a case-by-case basis. Such review would include BLM approval of individual project plans of development to ensure compatible construction within and/or adjacent to corridors to maintain viable use of the corridors. Use of Section 368 (or WEC) corridors, including corridors of concern, will require an extensive review and analysis consistent with the 2009 WEC PEIS and the Settlement Agreement during project-level implementation. Designation of additional corridors will enable more efficient planning of future land-use authorizations such as access roads, power transmission, communication lines, and transportation facilities. A lack of designated corridors sustains high planning costs to proponents such as utility companies and results in longer processing time frames for land-use authorization applications. Such additional costs translate into higher costs to the consumer.

4.3.6.6.3.4.2.2. Alternative 1

There are no additional impacts on transportation and utility corridors.

4.3.6.6.3.4.2.3. Alternatives 2 through 4

Land-use authorizations impacts on transportation and utility corridors may be major. Site-type ROWs and major linear rights-of-way may be placed within designated corridors when practicable and where compatible with the purpose of the corridor. Where a corridor is available, applicants will need to propose at least one of its project alternatives within an available corridor in any environmental analysis document to evaluate the potential effect of the project.

4.3.6.6.3.4.3. Renewable Energy Impacts on Utility Corridors

4.3.6.6.3.4.3.1. Impacts Common to All Alternatives

Renewable energy development may have major impacts to transportation and utility corridors if development, such as solar panels or wind turbines, were constructed within the corridors. Transportation and utility corridors are public land corridors where linear facilities (e.g., electric transmission lines, natural gas pipelines) could be sited. The designation of such corridors can help to facilitate energy development by identifying preferred locations for linear facilities. Renewable energy projects would tie into power substations to transmission lines for the transfer of energy. However, such uses within corridors must be compatible with the purpose of the corridor to avoid making the corridor non-viable. BLM has identified a need to respond in a more efficient and effective manner to the high interest in siting utility-scale solar and wind energy development on public lands and to ensure consistent application of measures to mitigate the potential adverse impacts of such development. While it is preferred for BLM to optimize existing transmission infrastructure and corridors, it is critical to ensure that corridors are not negatively impacted by renewable energy site-type rights-of-way. BLM will need to assess renewable energy linear project-related applications proposed within and/or adjacent to corridors on a case-by-case basis, and review and approve individual project plans of development to ensure compatible development within and/or adjacent to corridors to maintain viable use of such corridors.

4.3.6.6.3.4.3.2. Alternative 1

Renewable energy development may have major impacts to transportation and utility corridors. Under this alternative, there are approximately 14,000 acres designated for solar energy development; over 960,000 acres identified as avoidance/variance areas, which are areas potentially available for utility-scale solar energy; and over 2 million acres open for wind energy development. Solar energy zones and renewable energy avoidance/variance areas together encompass approximately 31.7 percent of the planning area while areas open for wind energy encompasses approximately 64.9 percent of the planning area. Solar energy zones, solar avoidance/variance areas, and areas open to wind energy development could have major impacts on corridors if, during project-level analysis, decisions are not carefully made to avoid incompatible uses within and/or adjacent to corridors.

There are two existing solar energy zones: the Dry Lake SEZ and the Amargosa Valley SEZ. These lands were withdrawn under Public Land Order 7818 for the protection and preservation of

solar energy zones for future development. BLM serialized this public land withdrawal under case file number N-87208. The withdrawal expires in July 2032.

The Dry Lake SEZ encompasses over 5,000 acres within the planning area in the Dry Lake Valley, northeast of Highway 93 and the Apex site in Clark County. This SEZ partially overlaps three locally designated corridors. The first corridor is a Section 368 corridor or West-wide Energy Corridor (WEC) labeled as WEC 37–232. This corridor is 2,640 feet wide, traversing a portion of the Dry Lake SEZ within T.17S., R.63E., secs. 34–36. The second corridor is 3,000 feet wide (referred as Dry Lake Valley) and traverses a portion of the Dry Lake SEZ within T.17S., R.64E., sec. 31; T.18S., R.63E., secs. 1, 12–14; and T.18S., R.64E., secs. 6 and 7. The third corridor is 2,640 feet wide (referred as Apex) and it traverses a portion of the Dry Lake SEZ within T.18S., R.63E., sec. 13. These existing corridors will be the preferred locations for any transmission development that is required to support solar development and future transmission grid improvements related to the build-out of the Dry Lake SEZ. Any use of the corridor lands for solar energy development must be compatible with valid existing rights and future use of the existing corridors.

The Amargosa Valley SEZ encompasses over 8,000 acres in the Amargosa Desert along the southern side of Highway 95 (south of Beatty) in the northeastern part of the planning area in southern Nye County. The Amargosa Valley SEZ is less than a mile west of the western boundary of WEC 18-224 within T.14S., R.47E., sec. 25 and 25. The northern part of this SEZ overlaps existing linear rights-of-way. Any use of the Amargosa Valley SEZ for solar development must be compatible with valid existing rights and use of the corridor

4.3.6.6.3.4.3.3. Alternative 2

Renewable energy development may have major impacts to transportation and utility corridors. This alternative would have fewer impacts to corridors than Alternatives 1, 3, and 4. There are approximately 14,000 acres designated for solar energy development; over 258,000 acres identified as avoidance/variance areas, which are areas potentially available for utility-scale solar energy; and over 172,000 acres identified as open and over 381,000 acres identified as avoidance areas for wind energy development. Solar energy zones and renewable energy avoidance/variance areas together encompass approximately 8.8 percent of the planning area; while open and avoidance areas for wind energy encompasses approximately 17.9 percent of the planning area. Solar energy zones, solar avoidance/variance areas, and areas open to wind energy development could have major impacts on corridors if, during project-level analysis, decisions are not carefully made to avoid incompatible uses within and/or adjacent to corridors.

This alternative also encompasses the same overlapping corridors and solar energy zones identified under Alternative 1. Corridors are the preferred locations for any transmission development that is required to support solar development and future transmission grid improvements related to the build-out of solar energy zones. Any use of the Dry Lake SEZ and the Amargosa Valley SEZ for solar development must be compatible with valid existing rights and use of the corridor.

4.3.6.6.3.4.3.4. Alternative 3

Renewable energy development may have major impacts to transportation and utility corridors. This alternative would have fewer impacts on corridors than Alternatives 1 and 4, and more impacts than Alternative 2. There are approximately 14,000 acres designated for solar energy development, as well as over 25,000 acres proposed for SEZs; over 417,000 acres identified as

avoidance/variance areas, which are areas potentially available for utility-scale solar energy; and over 183,000 acres open and over 429,000 acres identified as avoidance areas for wind energy development. Solar energy zones (designated and proposed) and renewable energy avoidance/variance areas together encompass approximately 14.7 percent of the planning area; while open and avoidance areas for wind energy encompasses approximately 19.8 percent of the planning area. Solar energy zones, solar avoidance/variance areas, and areas open to wind energy development could have major impacts on corridors if, during project-level analysis, decisions are not carefully made to avoid incompatible uses within and/or adjacent to corridors.

This alternative also encompasses the same overlapping corridors and solar energy zones identified under Alternative 1. However, the width of the corridor labeled as Dry Lake Valley under this alternative is proposed to increase from 3,000 feet wide to 3,500 feet wide. Under this alternative, the Dry Lake SEZ overlaps a portion of the Dry Lake Valley corridor within T.17S., R.64E., secs. 31 and 32; T.18S., R.63E., secs. 1, 11–14; and T.18S., R.64E., secs. 6 and 7. Corridors are the preferred locations for any transmission development that is required to support solar development and future transmission grid improvements related to the build-out of solar energy zones. Any use of the Dry Lake SEZ and the Amargosa Valley SEZ for solar development must be compatible with valid existing rights and use of the corridor.

4.3.6.6.3.4.3.5. Alternative 4

Renewable energy development may have major impacts to transportation and utility corridors. This alternative may have fewer impacts on corridors than Alternative 1, and potentially more impacts to corridors than Alternatives 2 and 3. There are approximately 14,000 acres designated for solar energy development, as well as over 154,000 acres proposed for SEZs; over 541,000 acres identified as avoidance/variance areas, which are areas potentially available for utility-scale solar energy; and over 485,000 acres open and over 865,000 acres identified as avoidance areas for wind energy development. Solar energy zones (designated and proposed) and renewable energy avoidance/variance areas together encompass approximately 22.9 percent of the planning area while open and avoidance areas for wind energy encompasses approximately 43.6 percent of the planning area. Solar energy zones, solar avoidance/variance areas, and areas open to wind energy development could have major impacts on corridors if, during project-level analysis, decisions are not carefully made to avoid incompatible uses within and/or adjacent to corridors.

This alternative also encompasses the same overlapping corridors and solar energy zones identified under Alternative 1. However, the width of the corridor labeled as Dry Lake Valley under this alternative is proposed to increase from 3,000 feet wide to 5,280 feet wide. Under this alternative, the Dry Lake SEZ overlaps a portion of the Dry Lake Valley corridor within T.17S., R.63E., sec. 36; T.17S., R.64E., secs. 31 and 32; T.18S., R.63E., secs. 1, 11–14; and T.18S., R.64E., secs. 5 – 7. Additionally, under this alternative, WEC 18–224 is proposed to increase from 3,500 to 5,280 feet wide. This increase in corridor width overlaps the eastern boundary of the Amargosa Valley SEZ within T.14S., R.47S., secs. 24 and 25. Corridors are the preferred locations for any transmission development that is required to support solar development and future transmission grid improvements related to the build-out of solar energy zones. Any use of the Dry Lake SEZ and the Amargosa Valley SEZ for solar development must be compatible with valid existing rights and use of the corridor.

4.3.6.6.3.4.4. Utility Corridors Impacts on Utility Corridors

4.3.6.6.3.4.4.1. Impacts Common to All Alternatives

BLM's objective is to locate corridors in favorable landscapes; to facilitate renewable energy where feasible; to avoid environmentally sensitive areas to the maximum extent practicable; to diminish the proliferation of dispersed rights-of-way crossing the landscape; and to improve long-term benefits of reliable and safe transmission. This process involves participation and input from BLM's interdisciplinary team of resource specialists, cooperating agencies, tribes, state and local governments, and other interested parties. Consistent with corridor siting principles, BLM will also evaluate land use authorization proposals for the most efficient use of designated corridors by considering rights-of-way with the least width feasible as well as considering multiple-use of existing rights-of-way. Furthermore, BLM's objective for renewable energy resource development is for proponents to construct, operate, maintain and eventually decommission a utility-scale project within the State of Nevada, where it can interconnect directly into the energy grid.

Consistent with FLPMA and NEPA, corridors are designated and/or amended through land use planning, or established by a congressional action. For example, a new corridor referred as the Interstate Route 15 South Corridor (or Ivanpah Valley Corridor) was established pursuant to the 2002 Clark County Act, to provide for high-quality development in Clark County. This corridor extends along Interstate 15 south of the Las Vegas Valley to Nevada and California state line. This corridor is legislatively restricted to a width of 2,640 feet between the Las Vegas valley and the proposed Ivanpah Airport for the placement, on a non-exclusive basis, of utilities and transportation. Subject to valid existing rights, the corridor is withdrawn from location and entry under the mining laws, and from operation under the mineral leasing and geothermal leasing laws until the Secretary terminates the withdrawal or the corridor or land, respectively, is patented.

The 2014 Consolidated Appropriations Act (2014 Act) H.R. 3547-309, Sec. 115 (a) released the Sunrise Mountain Instant Study Area (ISA) from further wilderness consideration and study, and the area is to be managed in accordance with the 1998 RMP, as amended by the WEC PEIS. The congressional release of the ISA from Wilderness consideration opened the entire ISA to new land use applications, subject to management direction in the applicable land use plan. The WEC PEIS amended this corridor (labeled as COC 39–231) by designating the corridor width to 500 feet-wide within the former ISA consistent with the 2002 Clark County Act, but expanded the width to 3,500 feet to the north and south of the corridor outside of the former ISA. Public land within the 500-foot wide corridor is subject to the management decisions contained in the 1998 RMP, as amended. Consistent with the 1998 RMP, public land outside of the 500-foot wide corridor, which is within the Rainbow Gardens ACEC, must be managed as a right—of—way "avoidance area." As an "avoidance area", even though the right—of—way corridor designation is currently 500 feet-wide, BLM may authorize projects outside of the designated right—of—way corridor, subject to site-specific resource concerns and analyses and land management planning requirements of Section 202 of FLPMA.

Corridors are designated to provide the maximum feasible and allowable width for transportation and utility purposes. Corridor locations and widths may vary depending on land status.

4.3.6.6.3.4.4.2. Alternative 1

Within the planning area, there are approximately 38 segments of designated transportation and utility corridors (includes Section 368 corridors) with varying widths from 500 feet to 3,500 feet. For a complete list of BLM's designated corridors, refer to Chapter 3 of the lands and realty section.

1. WEC 18-224 — this corridor is 3,500 feet wide for compatible multi-modal uses.
2. WEC 224-225 — this corridor is 3,500 feet wide for compatible multi-modal uses.
3. WEC 37-232 — this corridor is 2,640 feet wide for compatible multi-modal uses.
4. WEC 37-223(N) — this corridor is 3,500 feet wide for compatible multi-modal uses.
5. WEC 37-223(S) — this corridor is restricted to a width of 2,400 feet and to underground uses only.
6. WEC 37-39 — this corridor is 3,500 feet wide for compatible multi-modal uses.
7. WEC 225-231 — this corridor is 3,500 feet wide for compatible multi-modal uses.
8. WEC 27-225 — this corridor is 3,500 feet wide for compatible multi-modal uses.
9. COC 223-224 — this corridor has varying widths ranging from 2,050 feet to 3,500 feet due to proximity to the Red Rock Canyon National Conservation Area and military training requirements.
10. COC 39-113 — this corridor of concern is 3,500 feet wide for compatible multi-modal uses.
11. COC 39-231 — this corridor of concern ranges from 500 feet within the area that was formerly designated as the Sunrise Mountain Instant Study Area (ISA), to 3,500 feet—wide north and south of the former ISA.
12. COC 47-231 — this corridor of concern is 2,000 feet wide for compatible multi-modal uses. This reduced width is to minimize potential impacts to the Piute-Eldorado ACEC.

4.3.6.6.3.4.4.3. Alternative 2

Under this alternative, BLM proposes approximately 35 corridors (includes Section 368 corridors) with varying widths from 2,000 feet to 3,500 feet. The following Section 368 corridors are retained as designated/amended under the WEC PEIS, or revised as proposed below:

1. WEC 18-224 — retain corridor as designated under the WEC PEIS at 3,500 feet wide for compatible multi-modal uses.
2. WEC 224-225 — retain corridor as designated under the WEC PEIS at 3,500 feet wide for compatible multi-modal uses.
3. WEC 37-232 — retain corridor as designated under the WEC PEIS at 2,640 feet wide for compatible multi-modal uses.

4. WEC 37-223(N) — retain corridor as designated under the WEC PEIS at 3,500 feet wide for compatible multi-modal uses.

5. WEC 37-223(S) — retain this corridor to a width of 2,400 feet and to underground uses only.

6. WEC 37-39 — retain corridor as designated within the WEC PEIS at 3,500 feet wide for compatible multi-modal uses, except reduce corridor width to 2,640 feet within the Coyote Springs ACEC. Corridor width will vary within the Apex disposal area due to non-BLM lands.

7. WEC 225-231 — reduce corridor width to 2,640 feet for compatible multi-modal uses.

8. WEC 27-225 — retain corridor as designated under the WEC PEIS at 3,500 feet wide for compatible multi-modal uses.

9. COC 223-224 — re-align corridor with the existing 1998 RMP designated corridors (US-95–Crater Flat and the US095–Crater Flat–Red Rock) retaining the varying corridor widths ranging from 2,050 feet to 3,500 feet due to proximity to the Red Rock Canyon National Conservation Area and military training requirements. However, that segment of COC 223–224 that traverses through the Upper Las Vegas Wash ACEC within T.17S., R.58E., secs. 25 and 36; T.17S., R. 59E., secs. 31 and 32; and T.18S., R.59E., secs. 1–4, 11 and 12, will remain as designated in the WEC PEIS with a width of 3,500 feet.

10. COC 39-113 — this corridor of concern is deleted, and realigned to the west with the 1998 RMP corridors (Mormon Mesa, Moapa Indian Reservation, and Black Mountain-Crystal). This corridor now has varying widths from 2,000 to 3,000 feet, and provides the needed connectivity of energy transmission from the northeasterly to the southwesterly part of the planning area. The realignment removes the corridor from traversing through several specially-designated areas (e.g., Old Spanish Trail ACEC, Lower Mormon Mesa ACEC, Mesa Milkavetch ACEC, Muddy Mountains ACEC, and the California Wash ACEC).

11. COC 39-231 — this corridor of concern is re-aligned with the 1998 RMP designated corridors (Black Mountain—Crystal, and Rainbow Gardens-Eldorado). This modification reduces COC 39–231 from 3,500 feet to 2,000 feet, and increases the 500 feet wide corridor segment (within the former Sunrise ISA) to 2,000 feet wide.

12. COC 47-231 — retain 2,000 feet corridor width consistent with the 1998 RMP corridor (Aztec) for compatible multi-modal uses.

4.3.6.6.3.4.4.4. Alternative 3

Under this alternative, BLM proposes approximately 39 corridors (includes Section 368 corridors) with varying widths from 2,000 feet to 3,500 feet. The following Section 368 corridors are retained as designated/amended under the WEC PEIS, or revised as proposed below:

1. WEC 18-224 — retain corridor as designated under the WEC PEIS at 3,500 feet wide for compatible multi-modal uses.

2. WEC 224-225 — retain corridor width at 3,500 feet for compatible multi-modal uses. However, a segment of this corridor is realigned at an elbow turn within T.20S., R.54E., sec. 36 where the corridor is re-routed north of Hwy 160, traversing through T.21S., R.55E., secs. 5–9, 15–17, 22–26, and 36; T.21S., R.56E., secs. 30–32; T.22S., R.56E., secs. 3–5, 9–11, 13–15, 23–25; T.22S., R.57E., secs. 19, 29–32; T.23S., R.57E., secs. 4–6, 8, 9, 15, 16, 21–23,

26, 27, 35 and 36; T.24S., R.57E., secs. 1, 2, 12; T.24S., R. 58E., secs. 6–9, 14–18, 22–25; and terminating within T.24S., R.59E., secs. 19, 29, 30, 32 and 33.

3. WEC 37-232 — increase corridor width to 3,500 feet wide for compatible multi-modal uses.

4. WEC 37-223(N) — retain corridor as designated under the WEC PEIS at 3,500 feet wide for compatible multi-modal uses.

5. WEC 37-223(S) — increase corridor width to 3,500 feet for underground uses only.

6. WEC 37-39 — retain corridor width at 3,500 feet for compatible multi-modal uses. Corridor width will vary within the Apex disposal area due to non-BLM lands.

7. WEC 225-231 — retain corridor width of 3,500 feet for compatible multi-modal uses.

8. WEC 27-225 — retain corridor as designated under the WEC PEIS at 3,500 feet wide for compatible multi-modal uses.

9. COC 223-224 — re-align corridor with the existing 1998 RMP designated corridors (Kyle Canyon-Pahrump) retaining the varying corridor widths ranging from 2,050 feet to 3,500 feet due to proximity to the Red Rock Canyon National Conservation Area and military training requirements. However, that segment of COC 223–224 that traverses through the Upper Las Vegas Wash ACEC within T.17S., R.58E., secs. 25 and 36; T.17S., R. 59E., secs. 31 and 32; and T.18S., R.59E., secs. 1–4, 11 and 12, will remain as designated in the WEC PEIS with a width of 3,500 feet. Re-aligning this corridor to the Kyle Canyon-Pahrump corridor west towards WEC 224–225 causes a longer transmission connectivity with WEC 224–225 within T.17S., R.53E., sec. 30. This increased connectivity path may be a costly impact to project proponents.

10. COC 39-113 — this corridor of concern is deleted, and realigned to the west with the 1998 RMP corridors (Mormon Mesa, Moapa Indian Reservation, and Black Mountain-Crystal). BLM also added a new corridor labeled as the Moapa-Apex corridor that traverses outside the easterly and southerly boundary of the Moapa River Indian Reservation. This corridor has varying widths from 2,000 to 3,000 feet, and provides the additional connectivity of energy transmission from the northeasterly to the southwesterly part of the planning area. The realignment removes the corridor from traversing through several specially-designated areas (e.g., Old Spanish Trail ACEC, Lower Mormon Mesa ACEC, Mesa Milkavetch ACEC, Muddy Mountains ACEC, and the California Wash ACEC).

11. COC 39-231 — this corridor of concern is re-aligned with the 1998 RMP designated corridors (Black Mountain—Crystal, and Rainbow Gardens-Eldorado). This modification maintains the entire COC 39–231 alignment at 3,500 feet to include increasing the 500 feet wide corridor segment (within the former Sunrise ISA) to 3,500 feet wide.

12. COC 47-231 — increase corridor width to 3,500 feet for compatible multi-modal uses.

4.3.6.6.3.4.4.5. Alternative 4

Under this alternative, BLM proposes approximately 39 corridors (includes Section 368 corridors) with varying widths from 2,000 feet to 5,280 feet. The following Section 368 corridors are retained as designated/amended under the WEC PEIS, or revised as proposed below:

1. WEC 18-224 — increase corridor width to 5,280 feet for compatible multi-modal uses. This corridor is re-routed west to connect with the newly proposed Amargosa-Roach corridor within T.16S., R.52E., secs. 9, 16 and 17, to avoid a newly proposed disposal area labeled as Highway 95/160 Intersection.

2. WEC 224-225 — increase this corridor to 5,280 feet wide for compatible multi-modal uses. However, realign this corridor at the north segment where it connects to the newly proposed Amargosa-Roach corridor within T.17S., R.52E., secs. 16 and 21. WEC 224–225 continues southeasterly where it connects to the re-routed alignment as proposed under Alternative 3.

3. WEC 37-232 — increase corridor width to 5,280 feet wide for compatible multi-modal uses.

4. WEC 37-223(N) — increase corridor width to 5,280 feet wide for compatible multi-modal uses.

5. WEC 37-223(S) — increase corridor width to 5,280 feet for underground uses only.

6. WEC 37-39 — increase corridor width to 5,280 feet for compatible multi-modal uses. Corridor width will vary within the Apex disposal area due to non-BLM lands.

7. WEC 225-231 — increase corridor width to 5,280 feet wide for compatible multi-modal uses.

8. WEC 27-225 — increase corridor width to 5,280 feet wide for compatible multi-modal uses.

9. COC 223-224 — re-align corridor with the existing 1998 RMP designated corridors (Kyle Canyon-Pahrump) with varying corridor widths ranging from 2,050 feet to 5,280 feet due to proximity to the Red Rock Canyon National Conservation Area and military training requirements. However, that segment of COC 223–224 that traverses through the Upper Las Vegas Wash ACEC within T.17S., R.58E., secs. 25 and 36; T.17S., R. 59E., secs. 31 and 32; and T.18S., R.59E., secs. 1–4, 11 and 12, will increase to 5,280 feet wide. Re-aligning this corridor to the Kyle Canyon-Pahrump corridor west towards WEC 224–225 causes a longer transmission connectivity with WEC 224–225 within T.17S., R.53E., sec. 30. This increased connectivity path may be a costly impact to project proponents.

10. COC 39-113 — this corridor of concern is deleted, and realigned to the west with the 1998 RMP corridors (Mormon Mesa, Moapa Indian Reservation, and Black Mountain-Crystal). BLM also added a new corridor labeled as the Moapa-Apex corridor that traverses outside the easterly and southerly boundary of the Moapa River Indian Reservation. This corridor now has varying widths from 2,000 to 5,280 feet, and provides the needed connectivity of energy transmission from the northeasterly to the southwesterly part of the planning area. The realignment removes the corridor from traversing through several specially-designated areas (e.g., Old Spanish Trail ACEC, Lower Mormon Mesa ACEC, Mesa Milkavetch ACEC, Muddy Mountains ACEC, and the California Wash ACEC).

11. COC 39-231 — this corridor of concern is re-aligned with the 1998 RMP designated corridors (Black Mountain—Crystal, and Rainbow Gardens-Eldorado). This modification increases COC 39–231 to 5,280 feet wide to include the 500 feet wide corridor segment (within the former Sunrise ISA).

12. COC 47-231 — increase corridor width to 5,280 feet for compatible multi-modal uses.

4.3.6.6.4. Special Designations

4.3.6.6.4.1. Areas of Critical Environmental Concern Impacts on Utility Corridors

4.3.6.6.4.1.1. Impacts Common to All Alternatives

The designation and management of areas of critical environmental concern may have major impacts to transportation and utility corridors. ACECs are generally managed as avoidance and exclusion areas to land-use authorizations except within designated corridors. While it is preferred that the BLM optimize use of corridors, it is critical to ensure that corridors are not negatively impacted by incompatible linear and/or site-type rights-of-way. BLM will need to assess land-use authorization applications proposed within and/or adjacent to corridors on a case-by-case basis, and review and approve individual project plans of development to ensure compatible development within and/or adjacent to corridors to maintain viable use of such corridors. Refer to Chapter 2 of the ACEC section (p. 180) for specific management prescriptions regarding avoidance and exclusion areas for the respective ACEC.

4.3.6.6.4.1.2. Alternative 1

ACEC management may have major impacts to transportation and utility corridors. Under this alternative, corridors ranging from 2,000 to 3,500 feet wide traverse seven ACECs that are managed as either land-use authorization avoidance or exclusion areas except within designated corridors. This alternative would have fewer impacts on corridors than Alternatives 2, 3, and 4. The following ACECs are traversed by corridors: Ash Meadows, Big Dune, Ivanpah, Mormon Mesa, Piute/Eldorado, Rainbow Gardens, and River Mountains.

4.3.6.6.4.1.3. Alternative 2

ACEC management may have major impacts to transportation and utility corridors. This alternative would have more impacts on corridors than Alternatives 1, 3, and 4. Under this alternative, corridors ranging from 2,000 to 3,500 feet wide traverse 16 ACECs that would be managed as either avoidance or exclusion areas to land-use authorizations except within designated corridors. Additionally, this alternative imposes a 160-acre cumulative disturbance cap for new site-type land-use authorizations (including disturbance within corridors) within the tortoise ACECs: Coyote Springs, Mormon Mesa, Piute/Eldorado, and Gold Butte Part A. There is also a 3 percent maximum disturbance cap imposed by the Bird Springs Valley ACEC for all new authorized and unauthorized (illegal) disturbance, excluding fire. Disturbed acres that count against the cap can be offset through reclamation and restoration of other disturbed areas within the ACEC (including disturbance existing prior to the date of this RMP) to create space in the disturbance cap. However, the acres of reclaimed and restored areas can be counted only after completion of the reclamation and/or restoration project. Setting a cap on disturbance would have major impacts on the full use of transportation and utility corridors and connectivity of power transmission facilities to the nation's energy grid. Project proponents will need to be creative in design to not negatively impact special status species habitats while avoiding creating a non-functional corridor. The following ACECs are traversed by corridors: Ash Meadows, Big Dune, Bird Spring Valley, Coyote Springs, Ivanpah, Jean Lake, Moapa Mesquite, Mormon Mesa, Old Spanish Trail, Pahrump Valley, Piute/Eldorado, Rainbow Gardens, River Mountains, Specter Hills, Stewart Valley, and Upper Las Vegas Wash.

4.3.6.6.4.1.4. Alternative 3

ACEC management may have major impacts to transportation and utility corridors. This alternative would have fewer impacts on corridors than Alternative 2 but more impacts than Alternatives 1 and 4. Under this alternative, corridors ranging from 2,000 to 3,500 feet wide traverse 16 ACECs that would be managed as either avoidance or exclusion areas to land-use authorizations except within designated corridors. Additionally, this alternative imposes a 320-acre cumulative disturbance cap for new site-type land-use authorizations (including disturbance within corridors) within the tortoise ACECs: Coyote Springs, Mormon Mesa, Piute/Eldorado, and Gold Butte Part A. Setting a cap on disturbance would have major impacts on the full use of transportation and utility corridors and connectivity of power transmission facilities to the nation's energy grid. Project proponents will need to be creative in design to not negatively impact special status species habitats while avoiding creating a non-functional corridor. The following ACECs are traversed by corridors: Bird Spring Valley, Coyote Springs, Hiko Wash, Ivanpah, Jean Lake, Keyholde Canyon, Moapa Mesquite, Mormon Mesa, Mount Shrader, Muddy Mountains, Old Spanish Trail, Piute/Eldorado, Rainbow Gardens, River Mountains, Specter Hills, and Upper Las Vegas Wash.

4.3.6.6.4.1.5. Alternative 4

ACEC management may have major impacts to transportation and utility corridors. This alternative would have fewer impacts to corridors than Alternatives 2 and 3 but more impacts than Alternative 1. Under this alternative, corridors ranging from 2,000 to 5,280 feet wide traverse 16 ACECs that would be managed as either avoidance or exclusion areas to land-use authorizations except within designated corridors. Corridors range from 2,640 feet wide up to 5,280 feet wide. Additionally, this alternative imposes a 640-acre cumulative disturbance cap for new site-type land-use authorizations (including disturbance within corridors) within the tortoise ACECs: Coyote Springs, Mormon Mesa, Piute/Eldorado, and Gold Butte Part A. Setting a cap on disturbance would have major impacts on the full use of transportation and utility corridors and connectivity of power transmission facilities to the nation's energy grid. Project proponents will need to be creative in design to not negatively impact special status species habitats while avoiding creating a non-functional corridor. The following ACECs are traversed by corridors: Bird Spring Valley, Coyote Springs, Hiko Wash, Ivanpah, Jean Lake, Keyholde Canyon, Mormon Mesa, Mount Schrader, Muddy Mountains, Old Spanish Trail, Pahrump Valley, Piute/Eldorado, Rainbow Gardens, River Mountains, Spector Hills, and Upper Las Vegas Wash.

4.3.6.6.4.2. National Trails Impacts on Utility Corridors

4.3.6.6.4.2.1. Impacts Common to All Alternatives

National trails may have major impacts on transportation and utility corridors. The Old Spanish National Historic Trail is the only designated national trail managed within the planning area. Use of corridors could be restricted since lands and realty actions are considered federal undertakings and must avoid inadvertent damage to federal and non-federal cultural/historic resources values through compliance with Section 106 of the National Historic Preservation Act. Project redesign, rerouting, or mitigation through data recovery could be required to avoid adverse impacts, which could increase processing costs and processing time for both federal and non-federal parties.

4.3.6.6.4.2.2. Alternative 1

National trails (i.e., Old Spanish Trail) may have major impacts on the use of designated corridors. Under this alternative, the following corridors are traversed by this historic trail and/or its buffer area: Mormon Mesa, Black Mountain-Crystal, Apex Connector, Interstate 15 South, Amargosa-Roach, Boulder McCullough-Pass, Boulder Primm-South, Boulder City-Searchlight, Aztec, Rainbow Garden-Eldorado, Searchlight-Laughlin, WEC 224-225, COC 39-231, COC 39-113, and COC 47-231.

4.3.6.6.4.2.3. Alternative 2

National trails (i.e., Old Spanish Trail) may have major impacts on the use of designated corridors. Under this alternative, the following corridors are traversed by this historic trail and/or its buffer area: Mormon Mesa, Black Mountain-Crystal, Apex Connector, Interstate 15 South, Amargosa-Roach, Boulder McCullough-Pass, Boulder Primm-South, Boulder City-Searchlight, Aztec, Rainbow Gardens-Eldorado, Searchlight-Laughlin, WEC 224-225, and WEC 37-39.

4.3.6.6.4.2.4. Alternative 3

National trails (i.e., Old Spanish Trail) may have major impacts on the use of designated corridors. Under this alternative, the following corridors are traversed by this historic trail and/or its buffer area: Mormon Mesa, Moap-Apex, Black Mountain-Crystal, Apex Connector, Interstate 15 South, Boulder McCullough-Pass, Boulder Primm-South, Boulder City-Searchlight, Aztec, Rainbow Gardens-Eldorado, Searchlight-Laughlin, Jean Dry Lake, Nellis-Dunes, Goodsprings-Primm, WEC 224-225, and WEC 37-39.

4.3.6.6.4.2.4.1. Alternative 4

National trails (i.e., Old Spanish Trail) may have major impacts on the use of designated corridors. Under this alternative, the following corridors are traversed by this historic trail and/or its buffer area: Mormon Mesa, Moap-Apex, Black Mountain-Crystal, Apex Connector, Interstate 15 South, Boulder McCullough-Pass, Boulder Primm-South, Boulder City-Searchlight, Aztec, Amargosa-Roach, Rainbow Gardens-Eldorado, Ireteba, Searchlight-Laughlin, Jean Dry Lake, Nellis-Dunes, WEC 224-225, and WEC 37-39.

4.3.6.6.4.3. Wild and Scenic Rivers Impacts on Utility Corridors

4.3.6.6.4.3.1. Impacts Common to All Alternatives

There are no impacts common to all alternatives.

4.3.6.6.4.3.2. Alternative 1

Wild and scenic rivers (WSR) management may have moderate impacts on transportation and utility corridors. Improving, maintaining, and/or preserving resource values in areas designated for major energy transmission may restrict use of a corridor. New project applications may require alternate locations, including non-use of a segment of a corridor. There are seven eligible river segments determined suitable for inclusion in the National Wild and Scenic Rivers System.

Under this alternative, the following corridors are traversed by wild and scenic rivers: Mormon Mesa (2,640 feet wide), and COC 39-113 (3,500 feet wide).

4.3.6.6.4.3.3. Alternative 2

WSR management may have moderate impacts on transportation and utility corridors. Improving, maintaining, and/or preserving resource values in areas designated for major energy transmission may restrict use of a corridor. New project applications may require alternate locations, including non-use of a segment of a corridor. There are seven eligible river segments that would be determined suitable for WSR designation with the tentative classifications of wild, scenic, or recreational. Under this alternative, Mormon Mesa (2,640 feet wide) is the only corridor traversed by a wild and scenic river.

4.3.6.6.4.3.4. Alternative 3

WSR management may have moderate impacts on transportation and utility corridors. Improving, maintaining, and/or preserving resource values in areas designated for major energy transmission may restrict use of a corridor. New project applications may require alternate locations, including non-use of a segment of a corridor. There is one eligible river segment that would be determined suitable for WSR designation with the tentative classifications of recreational. Under this alternative, no corridors are traversed by a WSR.

4.3.6.6.4.3.5. Alternative 4

No river corridors would be determined suitable for inclusion in the National Wild and Scenic River System. Under this alternative, WSR impacts on corridors would be negligible.

4.3.6.6.4.4. Wilderness Impacts on Utility Corridors

4.3.6.6.4.4.1. Impacts Common to All Alternatives

Wilderness areas management may have major impacts on transportation and utility corridors. Wilderness areas are congressionally withdrawn lands that are ultimately managed as exclusion areas. Until Congress releases the wilderness designation, these lands are not available for designating corridors.

4.3.6.6.4.4.2. Alternative 1

Under this alternative, corridors range in width from 500 feet to 3,500 feet. There are no conflicts with corridors and wilderness areas under this alternative.

4.3.6.6.4.4.3. Alternatives 2 and 3

Under this alternative, corridors range in width from 2,000 feet to 3,500 feet. Wilderness areas may have major impacts to designating the maximum width of a corridor. Should a corridor overlap a wilderness area, that segment of the corridor would not be usable unless specified by Congress or until Congress releases the wilderness designation.

4.3.6.6.4.4.4. Alternative 4

Under this alternative, corridors range in width from 2,000 feet to 5,280 feet. Wilderness areas may have major impacts on designating the maximum width of a corridor. Should a corridor overlap a area, that segment of the corridor would not be usable unless specified by Congress or until Congress releases the wilderness designation.

4.3.6.6.4.5. Wilderness Study Areas Impacts on Utility Corridors

4.3.6.6.4.5.1. Impacts Common to All Alternatives

Wilderness study areas (WSA) management would have major impacts on transportation and utility corridors. WSAs are public lands withdrawn by Congress to be reviewed for wilderness preservation. Until Congress releases the wilderness designation, these lands are not available for designating corridors.

4.3.6.6.4.5.2. Alternative 1

Under this alternative, corridors range in width from 500 feet to 3,500 feet. There are no conflicts with corridors and wilderness study areas under this alternative.

4.3.6.6.4.5.3. Alternatives 2 and 3

Under this alternative, corridors range in width from 2,000 feet to 3,500 feet. WSAs will have major impacts to designating the maximum width of a corridor. Should a corridor overlap a WSA, that segment of the corridor would not be usable unless specified by Congress or until Congress releases the wilderness designation.

4.3.6.6.4.5.4. Alternative 4

Under this alternative, corridors range in width from 2,000 feet to 5,280 feet. WSAs will have major impacts to designating the maximum width of a corridor. Should a corridor overlap a WSA, that segment of the corridor would not be usable unless specified by Congress or until Congress releases the wilderness designation.

4.3.6.6.5. Cumulative Impacts

4.3.6.6.5.1. Cumulative Impacts on Lands and Realty

4.3.6.6.5.1.1. Impacts Common to All Alternatives

Cumulative impacts on lands and realty occur through changes in the designation and development of land resources and in changes to access of the land. Both private and BLM actions could have cumulative impacts to the lands and realty program. Increases in population generally lead to increased impacts on public land from both authorized uses (such as rights-of way) and unauthorized uses (such as illegal dumping). Both authorized and unauthorized uses increase the possibility of a release of hazardous materials. Additionally, urban encroachment near waste sites (including hazardous and non-hazardous) increases health risks to the public.

Release of BLM-administered land for disposal by sale, exchange, or lease and any resulting development will put further demands on existing public infrastructure. Such disposals will have a cumulative impact on rural ecosystems, water availability, and air quality in relation to housing, community, and industrial development opportunities. Land-use planning offices in Clark and Nye counties, including unincorporated cities and utility companies, will be tasked to provide appropriate infrastructure. Agricultural entry would not be authorized under Indian Allotments, Desert Land Entries, and Carey Act grants.

Contributions of renewable energy development to cumulative impacts on land use and realty would be in addition to those from other land-use authorizations for transmission lines, roads, and other facilities on public lands. It could also include other energy development on public and private lands that would further affect and limit other land uses within a given region. Cumulative impacts would be associated with changes in existing uses on public, state, and private lands that are converted to solar or wind energy or are near solar and wind energy facilities. Indirect impacts could include conversion of land in and around local communities from agricultural, open space, or other uses to solar or wind facilities, or to provide services and housing for employees and families who move to the region in support of solar or wind energy development on public and private lands. Renewable energy development, transmission lines and facilities, and urban development are the most likely new future uses of rural lands. Solar energy development, because of its intensive land use and outstanding resource potential in Nevada, would be a major contributor to those impacts, more so than wind energy developments due to its lesser quality resource potential.

Designation of additional transportation and utility corridors will enable more efficient planning of future energy, communication, and transportation facilities. A lack of designated corridors sustains high planning costs to utility companies and results in longer processing time for right-of-way applications. Such additional costs translate into higher costs to the consumer.

4.3.6.6.5.1.2. Past, Present, and Reasonably Foreseeable Actions

Past, present, and reasonably foreseeable actions affect the lands and realty program. Disposals and acquisitions will continue to consolidate public lands and facilitate land management and community expansion. Human activities will continue to require the issuance of land-use authorizations. Sales would continue until designated lands have been disposed as prescribed by the respective legislation for areas such as the SNPLMA, Santini-Burton Act, McCarran Airport Cooperative Management Area, Ivanpah Airport Environs Overlay District, and Apex. Communities within the planning area will begin to address increased growth in county development plans and other planning and zoning efforts, which should involve land management coordination with BLM. Recreation and Public Purpose leases would be authorized within disposal areas to enhance communities by providing lands at less than fair market value. Leases may be authorized for schools, libraries, community centers, parks, public golf courses, fire stations, churches, community buildings, law enforcement facilities, correctional institutions, and water and sewage treatment facilities.

There is potential for impact on land values in areas near solar energy facilities and associated land-use authorizations. Some reasons that land values may be reduced include aesthetic concerns, changes in the amount of vehicular traffic, or changes in current operations (e.g., the removal of a substantial or critical part of a grazing operation). Alternatively, land values may increase because of additional demand for developable private lands to support solar and wind development. The increase in land value would likely increase the local tax base. The presence of wind turbines,

permanent meteorological towers, and above-ground transmission lines associated with wind energy projects may add additional constraints to military testing and training operations that may occur at low altitudes (e.g., helicopter low-altitude tactical navigation areas, military operations areas, and military training routes). Depending on the situation, the operation of wind turbines may also impact aircraft radar during military missions. Pre-application consultations with the BLM and appropriate military representatives is encouraged. Consequently, the Federal Aviation Administration (FAA) requires a notice of proposed construction for a project so that it can determine whether it would adversely affect commercial, military, or personal air navigation safety (FAA 2000). Because wind energy development would have to meet appropriate FAA criteria, no adverse impacts to aviation would be expected.

With the exception of withdrawn or specially designated areas such as ACECs, public lands within the planning area may be available for airport leasing under the Airport Lease Act of May 24, 1928, as amended. These lands could be leased at less than fair market value to meet the need for public airport facilities for small but growing communities otherwise unable to afford such lands for these facilities. Several airports and numerous airstrips within the planning area are located on public lands under lease agreements authorized pursuant to the Airport Act of 1928. The Las Vegas area is serviced by several local airports (McCarran, North Las Vegas, and the Henderson Executive Airport [formerly Sky Harbor]). Pursuant to the Ivanpah Valley Airport Public Lands Transfer Act of January 24, 2000, P.L. 106-362, 114 Stat. 1404, BLM patented land in 2004 to Clark County for the development of an airport in the Ivanpah Valley about 30 miles southwest of McCarran International Airport for the Ivanpah airport. This location is between Jean and Primm. Consistent with the act, if the Federal Aviation Administration and the Clark County determine that an airport should not be constructed on the conveyed lands, the lands shall revert to the United States. Landing strips or smaller airports with limited facilities, authorized under the Airport Act of 1928, are found on public lands within the planning area, such as a public airport facility in Searchlight, Nevada. Airport leases would be authorized on an as-needed basis, providing communities with airport facilities which they could not otherwise afford to purchase. These lands would not be available for residential developments. However, commercial industries could potentially be developed within the lease areas. Foreseeable actions may include a replacement airport for the City of Mesquite and an airport for the Town of Pahrump.

The continued push to conserve public lands and move away from multiple-use is an issue. Designation of land-use authorization (e.g., rights-of-way, leases, permits) exclusion and avoidance areas would constitute a significant loss of public land available for linear rights-of-way, site-type rights-of-way, and material site rights-of-way (excluding existing established communication sites).

4.3.6.6.5.1.3. Alternative 1

Alternative 1 is defined as a continuation of the current management direction contained in the 1998 RMP, and amendments and changes since incorporation. Under this alternative, there is less land identified for disposal than Alternatives 3 and 4. Transportation and utility corridors range from 500 feet wide to 3,500 feet wide.

Exclusion Areas: This alternative has fewer lands managed as exclusion areas to land-use authorizations such as linear, small site-type (less than 5 acres), large site-type (more than 5 acres), and material site rights-of-way, than Alternatives 2, 3, and 4.

Avoidance Areas: This alternative has fewer lands managed as avoidance areas to linear rights-of-way than Alternatives 2 and 4. There are fewer avoidance areas to small site-type rights-of-way than Alternatives 2, 3, and 4. There are fewer avoidance areas to large site-type rights-of-way than Alternatives 3 and 4. There also are fewer lands managed as avoidance areas to material site rights-of-way than Alternatives 2 and 3.

It is reasonably foreseeable that this alternative would have the least cumulative impacts on community development and economic growth due to its emphasis on conservation by limiting disposal areas and limiting use authorizations due to exclusion and avoidance areas.

4.3.6.6.5.1.4. Alternative 2

Alternative 2 emphasizes the protection of the planning area's resource values. Management actions would emphasize resource values such as habitats for wildlife and plant species (including special status species), protection of riparian areas and water quality, preservation of ecologically important areas, maintenance of wilderness characteristics, and protection of scientifically important cultural and paleontological sites. Access to and development of resources within the planning area could occur with intensive management and mitigation of surface-disturbing and disruptive activities. Under this alternative, there is less land identified for disposal than Alternatives 1, 3, and 4, which significantly impacts community expansion and economic development. Transportation and utility corridors range from 2,000 feet wide to 3,500 feet wide.

Exclusion and Avoidance Areas: Of the four alternatives, this alternative has significantly more lands to be managed as exclusion and avoidance areas to land-use authorizations such as linear, small site-type (less than 5 acres), large site-type (more than 5 acres), and material site rights-of-way .

It is reasonably foreseeable that this alternative would have significantly more cumulative impacts on community development and economic growth due to its emphasis on conservation by limiting disposal areas and increasing exclusion and avoidance areas.

4.3.6.6.5.1.5. Alternative 3

Alternative 3 provides opportunities to use and develop resources within the planning area while ensuring resource protection. Alternative 3 would provide continued access to and development of resources with stipulations and mitigation to protect natural and cultural resources. Under this alternative, there is more lands identified for disposal than Alternative 2; but less land for disposal than Alternatives 1 and 4. Transportation and utility corridors range from 2,000 feet wide to 3,500 feet wide.

Exclusion Areas: This alternative has less lands to be managed as exclusion areas to linear, small site-type (less than 5 acres), large site-type (more than 5 acres), and material site rights-of-way than Alternative 2. However, Alternative 3 has more lands to be managed as exclusion areas to land-use authorizations than Alternatives 1 and 4.

Avoidance Areas: This alternative has less lands to be managed as avoidance areas to linear rights-of-way than Alternatives 1 and 4; but more avoidance areas to small and large site-types, and material site rights-of-way than Alternatives 1 and 4. Alternative 3 also as fewer avoidance areas to linear, small site-type, and material site rights-of-way than Alternative 2; but more avoidance areas for large site-type rights-of-way than Alternative 2.

It is reasonably foreseeable that Alternative 3 would have more cumulative impacts on community development and economic growth due to its emphasis on conservation by limiting disposal areas and increasing exclusion and avoidance areas than Alternative 1, and significantly less cumulative impacts than Alternative 2.

4.3.6.6.5.1.6. Alternative 4

Alternative 4 emphasizes opportunities to use and develop resources within the planning area. It would provide for motorized access and commodity production with minimal restrictions while providing protection of natural and cultural resources to the extent required by law, regulation, and policy. This alternative would largely rely on existing laws, regulations, and policies, rather than special management or special designations, to protect sensitive resources. Under this alternative, there is more acreage identified for disposal than Alternatives 1, 2, and 3. Transportation and utility corridors range from 2,000 feet wide to 5,280 feet wide.

Exclusion Areas: This alternative has fewer lands to be managed as exclusion areas to land-use authorizations such as linear, small site-type (less than 5 acres), large site-type (more than 5 acres), and material site rights-of-way than Alternatives 2 and 3; but it has more exclusion areas than Alternative 1.

Avoidance Areas: This alternative has more lands to be managed as avoidance areas to linear and small and large site-type rights-of-way than Alternative 1; but less avoidance areas to material site rights-of-way. Alternative 4 would have fewer avoidance areas to linear, small site-type and material site rights-of-way than Alternative 2; but more avoidance areas for large site-type rights-of-way. Alternative 4 would have less lands to be managed as avoidance areas to small and large site-type and material site rights-of-way than Alternative 3; but more avoidance areas to linear rights-of-way.

It is reasonably foreseeable that Alternative 4 would have the most cumulative impacts on community development and economic growth due to its emphasis on conservation by limiting disposal areas and increasing exclusion and avoidance areas, than Alternative 1; and significantly less cumulative impacts than Alternative 2.

4.4. Special Designations

4.4.1. Areas of Critical Environmental Concern

4.4.1.1. Summary

This analysis identifies effects of the management directions on the BLM's ability to protect against and prevent irreparable damage to the relevant and important (R&I) values associated with each potential ACEC across the alternatives. In concert with BLM guidelines, the impact analysis considers management actions that "defend or guard against damage or loss" to the R&I values. The management actions associated with the alternatives could either degrade or protect the R&I values.

The R&I values themselves are not expressly analyzed below. The parent resource (i.e., the resource program responsible for managing the relevant values) discusses impacts to these values when not managed as an ACEC. As such, a qualitative description of whether protection of R&I values is deemed to be adequate without ACEC designation is used.

4.4.1.2. Methods of Analysis

To the extent practical, spatial data were used to compare the proposed management of each alternative to existing conditions. In absence of quantitative data, potential impacts from each alternative are based on interdisciplinary team knowledge of the resources and the planning area and on information gathered from the public during the planning process. Impacts are sometimes described using ranges of potential impacts or in qualitative terms, if appropriate. Impacts were assessed according to the following assumptions:

- There would be an increase in BLM management to protect values in special designation ACECs.
- The proposed management prescribed for an area with a special designation would protect the qualities that are associated with the special designation for the area.
- Activities proposed that would not initially meet objectives for areas with special designations would be mitigated to the extent needed to meet the objectives.

4.4.1.3. Qualitative Intensity Scale

Impacts are described using ranges of potential impacts or in qualitative terms, if appropriate. When impacts are positive, it is so stated. The intensities of impacts are also described, where possible, using the following intensities:

- **Negligible:** No known impacts on R&I values. Any change would be undetectable and immeasurable.
- **Minor:** Direct effects on R&I values would be apparent, measurable, small, localized, and contained within the footprint of the action. Indirect effects would be undetectable.
- **Moderate:** Direct effects on R&I values would be readily apparent and measurable over a larger area, but still mainly within the footprint of the action. Indirect effects would be apparent and measurable but would not exceed much beyond the footprint of the action.
- **Major:** Direct effects on R&I values would be highly noticeable and extend well beyond the footprint of the action. Indirect affects would be readily apparent and measurable well beyond the footprint of the action.
- **Short-term effects:** Impacts would generally last less than a single year or growing season.

- **Long-term effects:** Impacts would result in a change in a resource, or its condition would last longer than a single year or growing season.

4.4.1.4. Resources

4.4.1.4.1. Air Quality Impacts on ACECs

4.4.1.4.1.1. Impacts Common to All Alternatives

Air quality protections would benefit ecosystems by reducing air pollution and helping to maintain ACEC values. The BLM would still comply with air quality regulations whether an area is designated as an ACEC in the various alternatives. The R&I values in areas not proposed as ACECs in an alternative would not receive negative impacts from air quality management compared to if they were designated as ACECs.

4.4.1.4.1.2. Alternatives 1 through 4

There are no additional impacts to ACECs.

4.4.1.4.2. Soil Resources Impacts on ACECs

4.4.1.4.2.1. Impacts Common to All Alternatives

Soil protection and restoration measures would benefit R&I values regardless of whether an area was designated an ACEC. These measures, though, would be more beneficial in conjunction with an ACEC designation than without because the ACEC designation itself would limit most sources of new ground disturbance.

4.4.1.4.2.2. Alternative 1

Alternative 1 would not provide management direction to evaluate and avoid areas with sensitive or fragile soils. Disturbance of sensitive and fragile soils can impact R&I values including rare plants, aquatic species, and cultural and paleontological resources. Not having these management directions could lead to impacts to R&I values, especially in areas not designated as ACECs.

4.4.1.4.2.3. Alternative 2

Alternative 2 would provide management directions to evaluate and avoid areas with sensitive or fragile soils. These management directions would provide an additional layer of protection for R&I values in the proposed ACECs. For areas identified as having R&I values but not proposed for ACEC designation under Alternative 2, these soil management directions may provide a small level of protection for the R&I values.

4.4.1.4.2.4. Alternative 3

Impacts under Alternative 3 would be similar to Alternative 2 except that two ACECs proposed under Alternative 2 would not be proposed under Alternative 3 and some of the ACECs would be smaller under Alternative 3. The R&I values in the two Alternative 2 ACECs not proposed

under Alternative 3 (Logandale and California Wash) are not dependent on sensitive soils, so the soil management directions would not provide any protection. For ACECs that are smaller in Alternative 3 compared to Alternative 2, the portions dropped from the ACEC boundaries would only be provided a minimal amount of protection from the soil management directions.

4.4.1.4.2.5. Alternative 4

ACECs proposed under Alternative 4 would receive the same benefits from soil management directions as in Alternatives 2 and 3. For those ACECs not proposed for designation, R&I values may receive some level of protection from the soil management directions but presumably not as much as from having a designated ACEC. The gypsum plants in Bitter Springs and Lovell Wash may benefit by management direction to avoid activities on the fragile gypsum soils. The old soils on the Lower Mormon Mesa, if considered a sensitive soil, could also be afforded some level of protection from soil management directions.

4.4.1.4.3. Water Resources Impacts on ACECs

4.4.1.4.3.1. Impacts Common to All Alternatives

Implementing best management practices to protect water quality and ensuring that adequate water is available to meet management goals could provide some protection to R&I values, such as riparian species that are dependent on water sources for their survival. Water-dependent R&I values, though, are threatened by impacts other than just water quality and quantity. The water management prescriptions alone, without an ACEC designation, would not fully protect these R&I values.

4.4.1.4.3.2. Alternative 1

Alternative 1 would not provide management direction to avoid projects that impact hydrologic function. Changes to hydrologic function can impact R&I values including rare plants, aquatic species, and cultural and paleontological resources. Not having this management direction could lead to impacts to R&I values, especially in areas not designated as ACECs.

4.4.1.4.3.3. Alternative 2

Alternative 2 would provide management direction to avoid projects that impact hydrologic function. This management direction would provide an additional layer of protection for R&I values in the proposed ACECs. For areas identified as having R&I values but not proposed for ACEC designation under Alternative 2, this management direction may provide a small level of protection for the R&I values.

4.4.1.4.3.4. Alternative 3

Impacts under Alternative 3 would be similar to Alternative 2 except that two ACECs proposed under Alternative 2 would not be proposed under Alternative 3, and some of the ACECs would be smaller under Alternative 3. The R&I values in the two Alternative 2 ACECs not proposed under Alternative 3 (Logandale and California Wash) are not dependent on hydrologic function, so the management direction would not provide any protection. For ACECs that are smaller in

Alternative 3 compared to Alternative 2, the portions dropped from the ACEC boundaries would only be provided a minimal amount of protection from water management directions.

4.4.1.4.3.5. Alternative 4

ACECs proposed under Alternative 4 would receive the same benefits from water management directions as Alternatives 2 and 3. For those ACECs not proposed for designation, R&I values may receive some minimal level of protection from the water management directions but not as much as from having a designated ACEC.

4.4.1.4.4. Integrated Vegetation Impacts on ACECs

4.4.1.4.4.1. Vegetation Impacts on ACECs

4.4.1.4.4.1.1. Impacts Common to All Alternatives

In general, integrated vegetation management actions designed to maintain or improve the condition of plant communities would help protect and improve the habitat for species-based R&I values.

4.4.1.4.4.1.2. Alternative 1

Alternative 1 would not contain a management direction requiring or recommending mitigation for loss of native plant communities. This could lead to a net overall loss of these resources over time and thus a net loss of R&I values. This is especially true in areas with identified R&I values that are not proposed for ACEC designation.

4.4.1.4.4.1.3. Alternative 2

Alternative 2 has management directions to require the no net unmitigated loss of native plant communities. Mitigation for actions done within ACECs and elsewhere in the planning area could be done in ACECs to improve the habitat or protection level (e.g. increased law enforcement) for R&I values. Because mitigation can be done off-site, it helps reduce the impact of an action at the landscape scale, but it does not necessarily stop the loss of local resource. Thus, these management directions would not necessarily provide protection of local R&I values that are not protected through an ACEC designation.

4.4.1.4.4.1.4. Alternative 3

Impacts under Alternative 3 would be similar to those under Alternative 2.

4.4.1.4.4.1.5. Alternative 4

Alternative 4 would not require the no net unmitigated loss of native plant communities but would instead only recommend the use of mitigation on a case-by-case basis. Mitigation could still be done that would benefit ACECs and mitigate for the loss of R&I values in areas not proposed as ACECs. Because mitigation would be required on fewer projects and the level of mitigation would likely be lower, the benefit to ACECs and R&I values would be less than in Alternatives 2 and 3.

4.4.1.4.4.2. Riparian Areas and Wetlands Impacts on ACECs

4.4.1.4.4.2.1. Impacts Common to All Alternatives

Several existing and proposed ACECs have riparian and mesquite acacia woodlands as R&I values. Maintaining these areas in federal ownership and managing them to protect their value as wildlife habitat would help protect these rare resources. Improving proper functioning condition (PFC) would improve functioning conditions of riparian and wetland areas and would improve riparian vegetation health. These management directions may provide some protection dor the riparian and mesquite-acacia R&I values in areas not proposed for ACEC designation under an alternative. The level of protection, though, is assumed to not be as high as would be provided by an ACEC designation.

4.4.1.4.4.2.2. Alternative 1

Alternative 1 would not contain a management direction requiring or recommending mitigation for loss of riparian woodlands or mesquite and acacia woodlands. This could lead to a net overall loss of these resources over time and thus a net loss of R&I values. This is especially true in areas with these R&I values that are not proposed for ACEC designation.

4.4.1.4.4.2.3. Alternative 2

Alternative 2 has management directions to require the no net unmitigated loss of riparian woodlands and mesquite and acacia woodlands. Mitigation for actions done within ACECs and elsewhere in the planning area could be done in ACECs to improve the habitat or protection level (e.g. increased law enforcement) for these R&I values. Because mitigation can be done off-site, it helps reduce the impact of an action at the landscape scale but it does not necessarily stop the loss of local resources. Thus, these management directions would not necessarily provide protection of local R&I values that are not protected through an ACEC designation.

4.4.1.4.4.2.4. Alternative 3

Impacts under Alternative 3 would be similar to those under Alternative 2.

4.4.1.4.4.2.5. Alternative 4

Alternative 4 would not require the no net unmitigated loss of riparian woodlands and mesquite and acacia woodlands but would instead only recommend the use of mitigation on a case-by-case basis. Mitigation could still be done that would benefit ACECs and mitigate for the loss of these R&I value areas not proposed as ACECs. Because mitigation would be required on fewer projects and the level of mitigation would likely be lower, the benefit to ACECs and R&I values would be less than in Alternatives 2 and 3.

4.4.1.4.4.3. Weeds Impacts on ACECs

4.4.1.4.4.3.1. Impacts Common to All Alternatives

Because non-native and invasive species can degrade habitats and increase the risk of wildland fire, management of weeds provides a general benefit to ACECs.

4.4.1.4.4.3.2. Alternative 1

Management direction for weeds would be focused on control of tamarisk. Several ACECs, especially the Virgin River ACEC, are infested with tamarisk, and its removal would help improve the R&I values of the ACECs. Other ACECs, though, are impacted by different non-native and invasive species. A weed management plan for projects would not be required by the RMP but could still be required on a case-by-case basis. Alternative 1 would also not have a management direction requiring a weed management plan for BLM-approved projects. While this could still be done on a case-by-case basis, there would be a higher probability for the spread or increase of weeds that impact R&I values compared to the other alternatives that would require the plans.

4.4.1.4.4.3.3. Alternative 2

Management direction for weeds would be broadened to cover prevention and control of all types of weeds. Alternative 2 would require weed management plans for BLM-approved projects of one acre or more. More projects would fall under this requirement under this alternative, so more protection would be afforded to R&I values compared to the other alternatives.

4.4.1.4.4.3.4. Alternative 3

Impacts under Alternative 3 would be similar to those under Alternative 2 except that Alternative 3 would only require weed management s for projects of five acres or more. This would provide slightly less protection to R&I values from the spread of weeds compared to Alternative 2.

4.4.1.4.4.3.5. Alternative 4

Weed management plans would only be required on projects of 10 acres or more, which would provide less protection to R&I values from the spread of weeds compared to Alternatives 2 and 3.

4.4.1.4.4.4. Forests and Woodlands Impacts on ACECs

4.4.1.4.4.4.1. Impacts Common to All Alternatives

Cactus and yucca salvaged from construction areas could be transplanted to ACECs. This could help restore previously disturbed areas and improve the scenic quality of the ACEC, as well as provide habitats for species to use for cover and nesting.

4.4.1.4.4.4.2. Alternatives 1 through 4

There are no additional impacts to ACECs.

4.4.1.4.5. Fish and Wildlife Impacts on ACECs

4.4.1.4.5.1. Impacts Common to All Alternatives

Fish and wildlife management directions are geared to protect and improve habitats, which would include protecting and improving habitats for fish and wildlife-based R&I values. The installation and maintenance of wildlife water developments would help improve the habitat for R&I species such as bighorn sheep. Implementation of best management practices, standard operating procedures, and other wildlife protective measures would reduce adverse impacts and would improve habitats for wildlife-based R&I values. The fish and wildlife management directions by themselves, though, would not provide much protection to R&I values in areas not proposed for ACEC designation.

4.4.1.4.5.2. Alternative 1

A one quarter mile buffer around artificial and natural water sources would provide some protection to R&I values, such as bighorn sheep, that rely on these resources.

4.4.1.4.5.3. Alternative 2

Alternative 2 would increase the avoidance buffer around natural and artificial waters to one half mile, which would increase the level of protection provided to R&I values compared to Alternative 1. Alternative 2 would also provide management direction to limit habitat fragmentation and protect landscape connectivity for wildlife. This connectivity would help maintain the genetic diversity of R&I values by allowing individuals with different genetic characteristics to move across the landscape. Connectivity would also allow species to move in response to climate change.

4.4.1.4.5.4. Alternative 3

Alternative 3 would maintain the one quarter mile avoidance buffer around natural waters and would only require impacts within one quarter mile of artificial water sources to be minimized on a case-by-case basis. This could lead to an increase in the number of impacts to R&I values that use the artificial water sources compared to Alternatives 1 and 2. Similar to Alternative 2, Alternative 3 provides management direction to limit habitat fragmentation and protect landscape connectivity for wildlife.

4.4.1.4.5.5. Alternative 4

Alternative 4 would only require avoidance within a quarter mile of natural water sources and would not provide any protection around artificial water sources. This could lead to an increase in the number of impacts to R&I values that use the artificial water sources compared to the other alternatives. Similar to Alternatives 2 and 3, Alternative 4 provides management direction to limit habitat fragmentation and protect landscape connectivity for wildlife.

4.4.1.4.6. Special Status Species Impacts on ACECs

4.4.1.4.6.1. Impacts Common to All Alternatives

Many of the R&I values identified in the planning area are also special status species including desert tortoise, bighorn sheep, dune beetles, and rare plants. Thus management directions to protect and improve habitats for special status species would also benefit most of the existing and proposed ACECs. These management directions by themselves, though, are not assumed to be enough to protect most R&I values in areas not proposed for ACEC designation.

Some areas meet R&I criteria for federally listed species, and some areas contain designated critical habitats for the species. Even if these areas are not designated as an ACEC, they would still have to be managed to protect the listed species and the critical habitat elements as required under the Endangered Species Act. Without the ACEC designation, though, other R&I values that occur in the area may not be protected simply by protecting the listed species and its critical habitat. For example, simply protecting the desert tortoise critical habitat within Gold Butte Part A ACEC would not necessarily protect the other R&I values such as relict leopard frog, scenic values, or cultural values.

4.4.1.4.6.2. Alternative 1

Alternative 1 does not contain management direction to protect important genetic corridors for special status species. This could lead to the genetic isolation of species within protected areas such as ACECs, and over time could lead to loss of genetic diversity in these areas. Loss of genetic diversity could lead to issues such as inbreeding depression and could lower the species' ability to respond to climate change. Even with an ACEC designation, loss of connectivity could lead to a decline in the population viability of these species and a decline in the R&I values of the ACEC.

Alternative 1 also does not contain management direction to require mitigation or minimize impacts to special status species habitats. This could lead to the gradual decline in the R&I values of an area that could have benefited from the mitigation or minimization measures.

4.4.1.4.6.3. Alternative 2

Alternative 2 would contain management directions to protect important genetic corridors and to require no unmitigated loss of habitat for special status species. Protecting important genetic corridors would help protect the genetic diversity and thus long-term population viability in ACECs. Mitigation for project impacts, including projects outside of ACECs, could be performed in ACECs, which would help improve habitats for and better protect R&I values in the ACECs. These management directions, though, would not necessarily provide protection of local R&I values that are not protected through an ACEC designation. The areas proposed to be managed as areas of ecological importance in Nye County were not identified as having R&I values, and thus the management prescriptions for these areas would not benefit any identified R&I values.

4.4.1.4.6.4. Alternative 3

Impacts under Alternative 3 would be similar to those under Alternative 2.

4.4.1.4.6.5. Alternative 4

Unlike Alternatives 2 and 3, Alternative 4 would not require no net unmitigated loss of special status species habitat. It would instead only require that impacts be minimized on a case-by-case basis. It is assumed that this would lead to less mitigation of impacts compared to Alternatives 2 and 3. Thus there would be fewer mitigation projects performed in ACECs and a higher net loss of R&I values over time compared to Alternatives 2 and 3.

4.4.1.4.7. Wild Horse and Burro Impacts on ACECs

4.4.1.4.7.1. Impacts Common to All Alternatives

Wild horses and burros may impact R&I values by disturbing habitats and introducing or spreading weeds. Population control measures to reach appropriate management levels (AMLs) in herd management areas (HMAs) would help reduce the impact of wild horses and burros on R&I values. This would help maintain ecosystem health and R&I values. Actions taken to protect wild horse and burro habitat components may also protect R&I values by limiting surface-disturbing activities. Several existing ACECs and other areas with R&I values overlap HMAs. Except for the Gold Butte Part A ACEC, AML values for the other areas would be set during the implementation phase for each HMA and are not set by the RMP.

4.4.1.4.7.2. Alternative 1

Gold Butte Part A ACEC would be managed for an AML of zero burros (horses do not occur within this HMA). This will help limit impacts to the R&I values, which include desert tortoise critical habitat.

4.4.1.4.7.3. Alternative 2

Similar to Alternative 1, Gold Butte Part A ACEC would be managed for an AML of zero burros.

4.4.1.4.7.4. Alternative 3

Impacts would be similar to those under Alternative 2.

4.4.1.4.7.5. Alternative 4

Alternative 4 would not contain management direction to manage Gold Butte Part A for an AML of zero burros but a management direction for the ACEC under the ACEC section would still be to pursue reverting the area from a herd management area to a herd area. Until such time as the area is reverted to a herd area, there could be impacts to R&I values if burros are allowed in the area.

4.4.1.4.8. Cave and Karst Management Impacts on ACECs

4.4.1.4.8.1. Impacts Common to All Alternatives

Only one existing or proposed ACEC in the planning area includes a cave resource as an R&I value. Rainbow Gardens ACEC includes the Pleistocene megafauna fossils found in Gypsum

Cave as an R&I value. Management directions to protect Gypsum Cave would thus help protect this R&I value. There is an existing designated utility corridor that crosses over Gypsum Cave, though, and the ROW avoidance management direction in the Cave and Karst section would not provide any extra protection to the cave. While other existing and proposed ACECs do not have cave resources identified as an R&I value, some do contain caves, and protecting these caves would provide a benefit to the ACEC as a whole.

4.4.1.4.8.2. Alternatives 1 through 4

There are no additional impacts to ACECs.

4.4.1.4.9. Wildland Fire Management Impacts on ACECs

4.4.1.4.9.1. Impacts Common to All Alternatives

Fire suppression activities may have localized negative impacts on R&I values in the short term but would provide a long-term benefit by reducing the amount of area impacted by the fire and reducing the risk of future catastrophic fires. ACECs would be prioritized for fire suppression response, reducing the risk of large wildfires that impact R&I values in these areas. Fuels management also would protect ACEC values over the long term through the construction of fuel breaks and the reduction of fuel loads through prescribed fires and other methods. Emergency stabilization and rehabilitation management would stabilize and rehabilitate areas burned within ACECs, allowing for long-term improvement in an ecosystem that has been damaged by wildland fire. Areas with R&I values not proposed for ACEC designation may have a slightly higher risk of being impacted by wildfires because they would not receive the same level of fire management focus compared to ACECs.

4.4.1.4.9.2. Alternatives 1 through 4

There are no additional impacts to ACECs.

4.4.1.4.10. Cultural Resources Impacts on ACECs

4.4.1.4.10.1. Impacts Common to All Alternatives

Management actions designed to protect cultural resources provide a general benefit to cultural and other R&I values. While impacts to cultural resources are analyzed during the site-specific NEPA process, cultural sites can still be impacted simply by increased use and visitation to an area. Thus cultural R&I values would be afforded more protection by an ACEC designation with management prescriptions that limit the types of activities in an area.

4.4.1.4.10.2. Alternative 1

Alternative 1 would not contain management direction to preserve the trace and viewshed of the Old Spanish Trail across Mormon Mesa. This area is also not an existing ACEC, so there would be no protection for this R&I value except for the normal protection provided under Section 106. There would be no exclusion buffer around cultural sites within ACECs, which could lead to unintended impacts to the cultural R&I values if projects are improved near these sites.

4.4.1.4.10.3. Alternative 2

Management direction to preserve the trace and viewshed of the Old Spanish Trail across the Mormon Mesa would provide some additional protection to the cultural R&I values of a portion of the proposed Old Spanish Trail ACEC. The cultural R&I values of the Old Spanish Trail ACEC portions in the California Wash and Stump Spring areas would not benefit from this management direction. A 500-foot exclusion buffer around cultural sites within ACECs would help limit the types of activities that could potentially impact these R&I values.

4.4.1.4.10.4. Alternative 3

Similar to Alternative 2, management direction to preserve the trace and viewshed of the Old Spanish Trail across the Mormon Mesa would provide some additional protection to the cultural R&I values of a portion of the proposed Old Spanish Trail ACEC. The cultural R&I values of the Old Spanish Trail ACEC portion in the California Wash would not benefit from this management direction. A 100-foot exclusion buffer around cultural sites within ACECs would help limit the types of activities that could potentially impact these R&I values. This buffer would only apply in ACECs and would not provide protection for cultural R&I values in areas not proposed for ACEC designation such as California Wash and Logandale.

4.4.1.4.10.5. Alternative 4

Under Alternative 4, the Old Spanish Trail would not be designated as an ACEC. Therefore, cultural management direction to preserve the trace and viewshed of the Old Spanish Trail across the Mormon Mesa would provide some protection to this R&I value in this area. The portions of the Old Spanish Trail in the California Wash and Stump Spring area would not protected by this management direction. A 100-foot exclusion buffer around cultural sites within ACECs would help limit the types of activities that could potentially impact these R&I values. This buffer would only apply in ACECs and would not provide protection for cultural R&I values in areas not proposed for ACEC designation.

4.4.1.4.11. Paleontological Resources Impacts on ACECs

4.4.1.4.11.1. Impacts Common to All Alternatives

Management actions designed to protect paleontological resources provide a general benefit to paleontological and other R&I values. These resources would not necessarily be protected on site, though, because projects would be allowed to mitigate impacts through collection and data recovery of the resources. This could lead to the gradual removal of these paleontological R&I values over time without an ACEC designation.

4.4.1.4.11.2. Alternatives 1 through 4

There are no additional impacts to ACECs.

4.4.1.4.12. Visual Resource Management Impacts on ACECs

4.4.1.4.12.1. Impacts Common to All Alternatives

In general, designation of an area as either a VRM Class I or II provides some protection to R&I values by limiting the amount of visual intrusion. While this mostly protects an area's scenic R&I values, it also can help protect other R&I values because it limits the types of ground-disturbing projects that would be allowed in an area. Designating an area as either VRM Class III or IV would allow for more visual intrusions and could lead to more impacts to an area's R&I values.

4.4.1.4.12.2. Alternative 1

Under Alternative 1, only wilderness and wilderness study areas are designated as VRM Class I. Portions of the existing Piute/Eldorado, Rainbow Gardens, Coyote Springs, Arrow Canyon, Mormon Mesa, Gold Butte Parts A-C, and Hidden Valley ACECs contain wilderness or wilderness study areas and benefit from this VRM designation. Portions of the existing Arrow Canyon, Mormon Mesa, Hidden Valley, Piute/Eldorado, Keyhole Canyon, Rainbow Gardens, and Virgin River ACECs, along with all the ACECs in Gold Butte, are currently designated as VRM Class II, which also provides some protection to R&I values. Other existing ACECs are currently designated as either VRM Class III or IV and thus are provided little protection from the VRM designation. This includes the River Mountains ACEC, which contains scenic R&I values.

The Gale Hills, Bitter Springs, Logandale, Hiko Wash, and Spirit Mountain areas are currently designated as VRM I or II. These areas are proposed as ACECs under Alternatives 2 and 3, and Gale Hills, Bitter Springs, Hiko Wash, and Logandale all have scenic as one of their R&I values. Thus the current VRM designation may provide some protection to these areas without ACEC protection. All of the areas, though, have other R&I values in addition to scenic, and the VRM designation alone is not assumed to provide the same level of protection to these R&I values as an ACEC designation. The other areas proposed for ACEC designation under the other alternatives are currently designated as either VRM Class III or IV, which provides little protection to the R&I values in these areas.

4.4.1.4.12.3. Alternative 2

Under Alternative 2, areas with a VRM Class I designation would include wilderness, wilderness study areas, lands with wilderness characteristics, and wild and scenic rivers. Thus more ACECs and more area within ACECs, both existing and proposed, would benefit from this most-restrictive VRM designation compared to Alternative 1. More ACECs and more area within existing and proposed ACECs, including the River Mountains ACEC, would also be designated as VRM Class II compared to Alternative 1. This includes a designation of at least a portion of all ACECs with scenic R&I values as VRM Class II.

4.4.1.4.12.4. Alternative 3

Impacts from VRM would be similar to those under Alternative 2 except that only wilderness and wilderness study areas would be designated as VRM Class I similar to Alternative 1. The other areas designated as VRM Class I under Alternative 2 would instead be designated as VRM Class II. Thus Alternative 3 would provide slightly less protection for R&I values from VRM designation compared to Alternative 2 but more than Alternative 1.

4.4.1.4.12.5. Alternative 4

Alternative 4 would be similar to Alternatives 1 and 3 in that only wilderness and wilderness study areas would be designated as VRM Class I. Alternative 4 would designate less area as VRM Class II compared to Alternatives 2 and 3 but more than in Alternative 1. Portions of the Bitter Springs, Gale Hills, Hiko Wash, and Logandale areas, which have scenic R&I values, would still be designated as VRM Class II, which may provide some protection to these values without an ACEC designation. It would not provide as much protection, though, to their other R&I values compared to Alternatives 2 and 3, where they would be designated as ACECs. The River Mountains ACEC would be designated as VRM Class II, which would better match its scenic R&I values compared to Alternative I.

4.4.1.4.13. Lands with Wilderness Characteristics Impacts on ACECs

4.4.1.4.13.1. Impacts Common to All Alternatives

There are no impacts common to all alternatives.

4.4.1.4.13.2. Alternative 1

No areas would be managed as lands with wilderness characteristics under Alternative 1, so there would be no benefit to ACECs.

4.4.1.4.13.3. Alternative 2

Protection of the wilderness character within proposed lands with wilderness characteristics would include closing the areas to motorized vehicles, new ROWs, mining, and other ground-disturbing activities. Where lands with wilderness characteristics overlap ACECs, these protective measures would also benefit the R&I values by further limiting ground-disturbing activities above what the ACEC management prescriptions limit. Several of the proposed lands with wilderness characteristics cross between ACECs. These relatively undisturbed areas could act as important connectivity corridors between the ACECs.

4.4.1.4.13.4. Alternative 3

Alternative 3 would manage fewer areas as lands with wilderness characteristics and have less restrictive management prescriptions compared to Alternative 2. Thus the amount of acres protected and the level of protection provided to R&I values would be less than in Alternative 2, but there would still be an added benefit to the R&I values from the lands with wilderness characteristics designation.

4.4.1.4.13.5. Alternative 4

Alternative 4 would manage fewer areas as lands with wilderness characteristics compared to Alternatives 2 and 3 and would have less restrictive management prescriptions compared to Alternative 2.

4.4.1.5. Resource Uses

4.4.1.5.1. Forestry and Woodland Products Impacts on ACECs

4.4.1.5.1.1. Impacts Common to All Alternatives

Maintaining woodlands and conifer forests for all aged stands would benefit R&I values such as mesquite-acacia woodlands, riparian woodlands, and relict forest stands. All aged stands in woodlands signify that the woodlands are healthy and actively reproducing. Healthy woodlands in ACECs also benefit other R&I values such as migratory birds that rely on these woodlands for nesting. Limiting firewood cutting and gathering to designated areas also helps protect woodlands from overcutting.

4.4.1.5.1.2. Alternative 1

Alternative 1 would still allow the collection of dead or down wood, including mesquite. This could lead to impacts to mesquite and acacia woodlands, which are identified as having R&I values in many places, if people mistake dormant branches for dead branches. Dead and down wood can also still provide habitat for R&I species such as migratory birds.

4.4.1.5.1.3. Alternative 2

Alternative 2 would prohibit the collection of mesquite and acacia wood, including dead and down wood. This would provide some protection to the mesquite and acacia R&I values, as well as the migratory birds that use this habitat. Collection of plant products for personal use would be allowed only outside of ACECs. Even collection for personal use can impact sensitive resources. Not allowing this activity in ACECs provides a protective benefit to the R&I values.

4.4.1.5.1.4. Alternative 3

Alternative 3 would prohibit the commercial collection of mesquite and acacia but would still allow collection for personal use for on-site recreational campfires. This could lead to impacts to mesquite and acacia R&I values in areas where camping is allowed near the woodlands. Similar to Alternative 2, Alternative 3 would provide a protective benefit to R&I values by allowing collection of plant materials only outside of ACECs.

4.4.1.5.1.5. Alternative 4

Impacts under Alternative 4 would be similar to those under Alternative 3.

4.4.1.5.2. Livestock Grazing Impacts on ACECs

4.4.1.5.2.1. Impacts Common to All Alternatives

Grazing can have minor to major impacts on R&I values as has already been analyzed under the specific resource sections. Managing allotments to maintain rangeland health standards can help reduce the impacts on R&I values, but impacts would still be expected to occur. Requiring salt and

mineral supplements to be placed at least one mile from water would help protect riparian-based R&I values from decreased water quality if the salt or mineral supplements get into the water.

4.4.1.5.2.2. Alternative 1

Alternative 1 would leave the most allotments open for grazing compared to the other alternatives. Many of these allotments are currently inactive. From 1998 to 2006, the Clark County Multiple Species Habitat Conservation Plan, in partnership with the Nature Conservancy, purchased the base property and water rights associated with more than 16 allotments from willing sellers as mitigation for desert tortoise and other species covered under the plan. Following the purchases, the new owners (Clark County) relinquished the grazing permits and preferences associated with the allotments. Not permanently closing these allotments could lead to a reintroduction of grazing into areas with R&I values sensitive to grazing impacts.

4.4.1.5.2.3. Alternative 2

Alternative 2 would close all grazing allotments within the planning area, including three currently active allotments. Thus grazing as a potential impact to R&I values would be eliminated throughout the planning area.

4.4.1.5.2.4. Alternative 3

Alternative 3 would leave only three allotments open to grazing. All three allotments are currently active. No R&I values have been identified within the Flat Top Mesa allotment. The Lower Mormon Mesa allotment overlaps the majority of the proposed Lower Mormon Mesa ACEC and portions of the Old Spanish Trail and Mesa Milkvetch ACECs. The Hidden Valley Allotment overlaps over half of the Jean Lake ACEC and a small portion of the expansion of the Piute/Eldorado ACEC. These areas have had active grazing for many years, so no additional impacts to R&I values are expected above what is currently occurring except for in the portion of the Lower Mormon Mesa not proposed for ACEC designation. Grazing combined with other activities that would not have been permitted under an ACEC designation may combine to have increased negative impacts on the R&I values in the area.

4.4.1.5.2.5. Alternative 4

In addition to the Flat Top Mesa, Hidden Valley, and Lower Mormon Mesa allotments, Alternative 4 would also leave open the Muddy River and Wheeler Wash allotments. The Wheeler Wash allotment overlaps a small portion of the area within the Pahrump Valley with identified R&I values. The Muddy River allotment overlaps a portion of the Muddy Mountains, Logandale, Mesa Milkvetch, Lower Mormon Mesa, and Moapa Mesquite areas with identified R&I values. These two allotments are currently inactive, and leaving them open may lead to the reintroduction of grazing impacts into these areas. In addition, the only allotment that would overlap a proposed ACEC would be the Hidden Valley allotment, which would overlap the Jean Lake ACEC. For the other areas with R&I values where no ACEC is proposed, grazing combined with other activities that would not have been permitted with an ACEC designation could lead to increased negative impacts on the R&I values in the areas.

4.4.1.5.3. Minerals Impacts on ACECs

4.4.1.5.3.1. Overall Minerals Impacts on ACECs

4.4.1.5.3.1.1. Impacts Common to All Alternatives

Impacts on R&I values could result from fluid leasable, and locatable mineral development and mineral material sales or disposal. Impacts associated with these actions include increased human presence, machinery, noise, loss or injury to plants and soils due to excavation or trampling, disturbance from mineral extraction, and increased exposure to dust and other contaminants associated with construction necessary for mineral development and use of access roads. Most ACECs have management prescriptions to either close the area or put limits on fluid and solid minerals leasing activities. These closures or limits provide some protection to the R&I values. Because these closures or limits would be in place due to the ACEC designation, areas with R&I values not proposed for ACEC designation would be more at risk to these types of impacts.

Under all alternatives, designated ACECs would either be closed to fluid mineral leasing or leasing would be subject to major constraints such as controlled surface use (CSU) or no surface occupancy (NSO). Closing an ACEC or an NSO designation would eliminate the surface-disturbing activities associated with the activity. An NSO designation may still lead to impacts to riparian R&I values if there are impacts to the water table. A CSU designation would provide some protection to R&I values by limiting activities seasonally and to designated routes. With a CSU designation, there could still be impacts to R&I values due to the loss of habitat or changes to an area's scenic quality.

With a few exceptions between alternatives, ACECs would be closed to solid leasable and saleable mineral activities. Closing the areas would eliminate the potential for development of these minerals to impact R&I values. In open areas, projects would still have to go through the NEPA process, and impacts to R&I values could be identified and avoided or mitigated. Many of the ACECs are either already withdrawn or withdrawal would be pursued for locatable minerals. These withdrawals eliminate the possibility of new locatable minerals claims and future mining activities, providing protection to R&I values from this type of activity. An ACEC designation would also require that validity exams be performed before approving mining plans on pre-existing claims.

4.4.1.5.3.1.2. Alternative 1

The majority of ACECs are designated as NSO for fluid mineral leasing and thus the R&I values are protected from this type of ground-disturbing activity. The Amargosa Mesquite, Gold Butte Part B, and Gold Butte Part C ACECs are designated as CSU for fluid minerals and thus leave open the potential for impacts to the R&I values. Ash Meadows, besides being designated NSO, is specifically closed to geothermal leasing, which would help reduce the potential for impacts to the local water table on which the R&I values in the area rely. All existing ACECs are designated as closed to solid mineral leasing and saleable minerals, as well as withdrawn for locatable minerals. Thus the R&I values in these areas are protected from these types of activities.

4.4.1.5.3.1.3. Alternative 2

Alternative 2 designates the most ACECs and has the most restrictive prescriptions and provides the most protection for R&I values compared to the other alternatives. All but one of the ACECs would be closed to fluid mineral leasing. This would provide protection to the R&I values from both surface disturbance and impacts to the water table. The Rainbow Gardens ACEC would be designated as NSO around its edges. The R&I values in this area are not assumed to be reliant on the water table, so this designation is not assumed to have the potential to cause impacts. All existing and proposed ACECs would be designated as closed to solid mineral leasing and saleable minerals, as well as withdrawn or pursued for withdrawal for locatable minerals, and thus the R&I values in these areas are protected from these types of activities.

4.4.1.5.3.1.4. Alternative 3

Alternative 3 designates a few less ACECs than Alternative 2 but would protect more R&I values from minerals activities compared to Alternatives 1 or 4. More of the ACECs would be designated as either NSO or CSU for fluid minerals compared to Alternative 2. For the ACECs designated as NSO, except for Amargosa Mesquite ACEC, the R&I values are assumed to not be reliant on the water table that may be impacted by fluid minerals activities. If fluid mineral activities at Amargosa Mesquite ACEC impact the water table, the mesquite groves may begin to dry out and die off and no longer provide high-quality bird habitat. For those ACECs designated as CSU, potential impacts to R&I values could be limited by seasonal restrictions and limiting travel to designated routes. It is expected that there could still be some loss of habitat for R&I values over time even with the CSU designation.

Under Alternative 3, five of the ACECs would remain open to solid leasable mineral development, 12 would remain open for locatable minerals, and four would remain open to saleable minerals. Projects would still have to go through the NEPA process prior to approval, and impacts to R&I values could be minimized or mitigated. The potential for impacts to R&I values, though, would be greater than in Alternative 2.

4.4.1.5.3.1.5. Alternative 4

Alternative 4 would designate four additional ACECs compared to Alternative 1 and would provide slightly more protection for R&I values from minerals activities compared to Alternative 1 but less than Alternatives 2 and 3. Except for the Amargosa Mesquite and River Mountains ACECs, designations for fluid minerals would be similar to those in Alternative 3. For Amargosa Mesquite and River Mountains ACECs, designations would be similar to those in Alternative 1. All existing and proposed ACECs, except for the Jean Lake ACEC, would be designated as closed to solid mineral leasing and saleable minerals, as well as withdrawn or pursued for withdrawal for locatable minerals. Thus the R&I values in these areas are protected from these types of activities. Jean Lake ACEC would remain open to locatable minerals but would be closed for solid leasable and saleable minerals.

4.4.1.5.3.2. Fluid Leasable Minerals Impacts on ACECs

4.4.1.5.3.2.1. Impacts Common to All Alternatives

See above discussion on impacts from minerals actions in general.

4.4.1.5.3.3. Solid Leasable Minerals Impacts on ACECs

4.4.1.5.3.3.1. Impacts Common to All Alternatives

See above discussion on impacts from minerals actions in general.

4.4.1.5.3.4. Locatable Minerals Impacts on ACECs

4.4.1.5.3.4.1. Impacts Common to All Alternatives

See above discussion on impacts from minerals actions in general.

4.4.1.5.3.5. Saleable Minerals Impacts on ACECs

4.4.1.5.3.5.1. Impacts Common to All Alternatives

See above discussion on impacts from minerals actions in general.

4.4.1.5.4. Recreation Impacts on ACECs

4.4.1.5.4.1. Impacts Common to All Alternatives

Refer to the specific resource sections for a discussion of how recreation activities may impact R&I values in general. Under all alternatives, areas could be designated as special recreation management areas (SRMAs) or extensive recreation management areas (ERMAs). Designating an area as a SRMA could lead to increased recreational development and visitor use. This could lead to increased impacts to R&I values from increased recreational use. A SRMA designation, though, could involve increased management oversight and planning efforts. This increased oversight and planning could help reduce impacts to R&I values by siting recreational developments in a way that would cause the least impacts. Visitors could also be guided away from sensitive resources and provided education and interpretation on protecting the R&I values. Designating areas as ERMAs may lead to lower visitation levels, but visitation may be less managed and could result in more impacts to R&I values.

Most organized recreational events, including speed- and non-speed based events, would have to get a special recreation permit (SRP) before they could take place. Each proposed ACEC has management prescriptions as to whether these types of events would be allowed. In some ACECs where they are allowed, limits may be placed on how many, where, and at what time of year the events can occur to help protect R&I values. Potential impacts to R&I values would also be evaluated during the permitting process, and minimization or mitigation measures could be required. Speed- and non-speed based events are more likely to be permitted if an area is not designated as an ACEC, which may lead to more impacts to R&I values.

4.4.1.5.4.2. Alternative 1

Speed-based recreational events would not be allowed in any ACEC except the Ivanpah Valley ACEC, so the R&I values in these areas would be protected. Alternative 1 has the fewest designated ACECs and protects the fewest R&I values from these types of events. Non-speed

based events would be allowed, but there would be amount and seasonal restrictions in the desert tortoise critical habitat ACECs. Non-speed based events are not likely to have impacts on R&I values assuming they stay on designated routes.

4.4.1.5.4.3. Alternative 2

Limiting vehicle parking and camping to only designated areas or previously disturbed areas would help limit potential sources of new uncontrolled habitat disturbance. Parking and camping sites could be designated to help limit potential impacts to R&I values. Big Dune and Lava Dune ACECs would be closed to camping to protect the endemic beetles from this type of habitat-disturbing activity. Keyhole Canyon would also be closed to camping, which would help protect cultural resources in the area.

Most of the existing of the proposed ACECs would still be closed to speed-based events. The River Mountains ACEC would allow speed-based mountain bike races. The increased human presence due to these events may cause impacts to bighorn sheep, especially if the events are held during lambing season. The Lower Mormon Mesa and Mesa Milkvetch ACECs would allow speed-based events using motorcycle or OHVs only, not larger vehicles. These smaller vehicles do not cause the same level of impacts as truck and buggy races, but impacts to R&I values could still occur. The Ivanpah Valley and Specter Hills ACECs would allow any type of speed-based event, including truck and buggy races. These are locations of historic race events and have already received impacts from this type of activity. The R&I values are not likely to be impacted if participants stay on designated courses and don't increase the amount of habitat disturbance. Excluding speed-based events in the other ACECs, while protecting the R&I values, may lead to an increase in the number of events occurring in the few remaining areas that would allow these events and thus increase the potential for impacts to R&I values.

Non-speed based events would still be allowed in most ACECs. Speed-based events would be excluded within the Lava Dune and Mt. Schrader ACECs and within the beetle habitat of the Big Dune ACEC. This would provide extra protection to the endemic beetles at Lava Dune and Big Dune, as well as the cultural resources at Mt. Schrader.

4.4.1.5.4.4. Alternative 3

Camping would be allowed at the Big Dune and Keyhole Canyon ACECs, which may lead to additional impacts to the R&I values compared to Alternative 2. Alternative 3 would allow speed-based events in more proposed ACECs. Depending on when and where an event is held, this could lead to impacts to R&I values. Allowing speed-based events in more areas, though, could reduce some of the impacts to R&I values in areas that would receive most of the events under Alternative 2.

4.4.1.5.4.5. Alternative 4

Alternative 4 would have similar recreation management prescriptions for ACECs as in Alternative 3 except that fewer ACECs would be designated in Alternative 4. Those areas with R&I values not proposed for ACEC designation would not benefit from restrictions on organized events, which may lead to more impacts to R&I values compared to Alternatives 2 and 3.

4.4.1.5.5. Travel and Transportation Impacts on ACECs

4.4.1.5.5.1. Impacts Common to All Alternatives

Vehicle travel could cause impacts to R&I values through increased human presence, habitat loss or degradation, and direct mortality. A travel designation of closed eliminates this type of impact from an area and provides the highest level of protection for R&I values. A travel designation of limited would provide some protection for R&I values by limiting travel to designated routes only. These routes are already disturbed and would not lead to new habitat disturbance. Direct mortality of individuals could still occur with this designation, as well as impacts due to human presence in a sensitive area. A designation of open could lead to the most impacts to R&I values. Open areas, though, tend to be areas devoid of vegetation. Portions of the Big Dune ACEC, mostly the unvegetated dunes portion, would be open for OHV travel under all alternatives. Beetles may be impacted if vehicles stray from the dunes into beetle habitat either intentionally or unintentionally. The other open areas in the alternatives would be Nellis Dunes and some dry lake beds. These areas do not have identified R&I values, so no impacts are expected from this designation.

4.4.1.5.5.2. Alternative 1

Wilderness areas, Hidden Valley ACEC, and approximately 200 acres of beetle habitat within the Big Dune ACEC would be closed to vehicles. The portion of Big Dune ACEC on the unvegetated dunes and outside the beetle habitat would be open for OHV travel. Some of the wilderness areas contain R&I values, so their closure would protect those values. Closure of the Hidden Valley ACEC would help protect bighorn sheep and cultural resource R&I values. Closure of the beetle habitat would protect this R&I value, but there could still be impacts due to vehicles using the neighboring open areas. The desert tortoise critical habitat ACECs, as well as Rainbow Gardens ACEC and a portion of Ash Meadows ACEC, would be limited to designated routes. Other ACECs would be limited to existing roads, trails, and washes. While limiting travel to existing roads, trails, and washes would help limit unrestricted OHV travel, impacts to R&I values could still occur, especially from travel in washes.

4.4.1.5.5.3. Alternative 2

Alternative 2 would close the most areas to vehicle travel and thus provide the most protection for R&I values. Hidden Valley, Lava Dune, and Mt. Schrader ACECs, as well as 233 acres of beetle habitat within Big Dune ACEC, would all be closed to vehicle travel, which would help protect their R&I values. In addition, closure of wilderness areas, Carson Slough, Hiko Spring, and lands with wilderness characteristics would help protect R&I values that occur in those areas. Except for a portion of the Big Dune ACEC which would be designated as open, all other areas with identified R&I values would be designated as limited to designated routes. This may still lead to impacts to R&I values, but potential impacts could be identified during the route designation process. The portion of the Big Dune ACEC that would be designated as open is mostly the unvegetated dunes and would be a smaller area compared to the other alternatives. This would provide the most protection to the beetle R&I values at the Big Dune ACEC compared to the other alternatives but there could still be impacts to the beetles in areas where they occur outside of the closed area.

4.4.1.5.5.4. Alternative 3

Impacts under Alternative 3 would be similar to those under Alternative 2 except that Carson Slough, Hiko Spring, and lands with wilderness characteristics would not be closed to vehicles but would instead be limited to designated. Impacts to the R&I values could still be limited during the route designation process. In addition, the closed area at the Big Dune ACEC would be reduced to 119 acres and the open area would be larger than in Alternative 2. This could lead to greater impacts to the beetle R&I values in the areas not closed to vehicles compared to Alternative 2.

4.4.1.5.5.5. Alternative 4

Only Hidden Valley ACEC, an 86 acre portion of Big Dune ACEC, and wilderness areas would be closed to vehicle travel. Other areas would be limited to designated routes only. In addition, a larger area at the Big Dune ACEC would be designated as open. Thus Alternative 4 provides less protection for R&I values compared to Alternatives 2 and 3.

4.4.1.5.6. Lands and Realty Impacts on ACECs

Lands actions such as disposals, land-use authorizations (LUAs), and renewable energy developments can all result in surface disturbance or increased water withdrawals that may lead to loss, degradation, or fragmentation of R&I values. Impacts to R&I values from such things as dispersed recreational use and invasive species can also increase due to nearby lands actions even if the action does not impact R&I values itself. Lands actions near areas with R&I values may also impact the R&I values through changes in landscape processes such as hydrologic function. Actions that lead to impacts to the regional water table and water quality may also impact off-site R&I values.

The existing and proposed ACECs normally have management prescriptions to exclude or avoid different types of lands actions that would help limit the impacts on R&I values. Most of these actions would be allowed without an ACEC designation, so not designating an ACEC in an alternative may lead to increased impacts to R&I values compared to alternatives where the ACEC is proposed.

4.4.1.5.6.1. Land Tenure (Disposals and Acquisitions) Impacts on ACECs

4.4.1.5.6.1.1. Impacts Common to All Alternatives

None of the alternatives has disposal parcels that would overlap an ACEC. Disposal of lands with R&I values that are not proposed as an ACEC would likely result in major impacts to the R&I values. Land acquisitions can benefit R&I values by acquiring private lands next to ACECs that have similar values. These acquisitions could be incorporated into the neighboring ACEC, increasing the amount of area protected. Refer to the specific resource sections for a discussion of how these actions may impact R&I values in general.

4.4.1.5.6.1.2. Alternative 1

The existing disposal areas within the Pahrump Valley and Laughlin overlap areas proposed for ACEC designation in other alternatives. Disposal of these parcels could lead to minor to major impacts to the R&I values in the Pahrump Valley and Hiko Wash ACECs. Disposals in

the Amargosa Valley, Pahrump, and Muddy River areas could impact nearby existing ACECs and ACECs proposed under other alternatives through impacts to the water table due to water withdrawals or through changes in hydrology due to blocking or diverting surface water runoff during storm events. These changes to hydrology could lead to major impacts to R&I values that are dependent on the water for survival.

4.4.1.5.6.1.3. Alternative 2

Of all the alternatives, Alternative 2 would designate the most ACECs and least amount of acres for disposal. There may still be some impact to ACEC R&I values if nearby disposals result in changes to the hydrology of an ACEC. Alternative 2, though, designates the fewest acres for disposal in the Amargosa Valley, Pahrump Valley, and Muddy River areas.

4.4.1.5.6.1.4. Alternative 3

Alternative 3 would designate fewer and smaller ACECs and more acres for disposal compared to Alternative 2. Disposals in the Pahrump Valley may impact the R&I values not encompassed by the smaller proposed Pahrump Valley ACEC. In addition, Pahrump Valley buckwheat would not be included as and R&I value in the Pahrump Valley ACEC under Alternative 3. This could lead to additional impacts to the R&I value in the ACEC if projects are approved that otherwise would not have been if the species was included as an R&I value. The Sandy Valley disposal area would be the same as in Alternative 1 and would completely overlap the area identified as having R&I values; the Sandy Valley ACEC would not be proposed for designation. This could lead to the complete loss of the identified R&I values in the Sandy Valley area.

The Mesquite-Bunkerville disposal area would overlap a portion of the area on Lower Mormon Mesa with identified R&I values, and the proposed Lower Mormon Mesa ACEC would be reduced compared to Alternative 2 to accommodate this disposal area. The Lower Mormon Mesa ACEC would also be reduced to accommodate the Moapa Glendale disposal. The Moapa Glendale disposal also would overlap a large portion of the Mesa Milkvetch area with identified R&I values, and the Mesa Milkvetch ACEC would be reduced in size. Due to the large area removed from the ACEC to accommodate the disposal area, protection of the R&I values may not be possible. Similar to Alternative 1, disposals in the Amargosa Valley, Pahrump Valley, and Muddy River areas could impact nearby ACECs due to changes in hydrology. The City of Las Vegas disposal area could lead to development right up to the edge of the Upper Las Vegas Wash ACEC. This, combined with other neighboring private parcels, could lead to casual users utilizing the ACEC, which could lead to impacts to the R&I values due to disturbance and illegal collection of fossils.

4.4.1.5.6.1.5. Alternative 4

Similar to Alternatives 1 and 3, disposal areas that overlap several of the areas with R&I values proposed for ACEC designation under Alternatives 2 and 3 would be designated. These include lands in the Sandy Valley, Pahrump Valley, Laughlin, Mesquite-Bunkerville, Bird Spring Valley, and the Nye County 1 disposals. More lands would be designated for disposal in the Pahrump Valley than in any of the other alternatives, which could lead to major impacts to the R&I values. The portions of the Mesquite-Bunkerville and Moapa Glendale disposal parcels that overlap R&I values on Lower Mormon Mesa would be the same as those under Alternative 3. The Nye County 1 disposal parcel would overlap a portion of the Lava Dune area and may impact its R&I values if

it contains dune beetle habitat. Similar to Alternatives 1 and 3, disposals in the Amargosa Valley, Pahrump Valley, and Muddy River areas could impact nearby ACECs due to changes in hydrology.

4.4.1.5.6.2. Land-Use Authorizations (Right-of-Ways, Leases, Permits) Impacts on ACECs

4.4.1.5.6.2.1. Impacts Common to All Alternatives

The existing and proposed ACECs normally have management prescriptions to exclude or avoid different types of LUAs, which would help limit the impacts on R&I values. Most of these actions would be allowed without an ACEC designation, and not designating an ACEC in an alternative may lead to increased impacts to R&I values compared to alternatives where the ACEC is proposed.

4.4.1.5.6.2.2. Alternative 1

All existing ACECs are either excluded for large site-type LUAs or these large LUAs are only allowed within one half mile of a federal-aid highway. Large site-type LUAs can lead to major impacts to R&I values through loss of large areas of habitat and loss of connectivity between remaining habitat patches. Thus excluding these types of LUAs provides some protection for R&I values. Allowing large site-type LUAs near federal-aid highways can lead to some impacts to R&I values but less than if these large projects were to be allowed anywhere within the ACEC. Federal-aid highways already limit habitat connectivity for many species, so placing large projects next to the highways should not decrease connectivity further unless these projects also block movement of species along the highway in addition to across the highway. The large projects could still lead to loss of large areas of habitat within the ACEC.

Similar to large site-type LUAs, all existing ACECs are either closed to material site ROWs or they are only allowed within one half mile of federal-aid highways. These material site ROWs can have similar impacts to R&I values as large site-type LUAs.

Except for the Big Dune and Hidden Valley ACECs, which are exclusion areas, all existing ACECs are avoidance areas for linear ROWs. Thus some linear ROWs may be approved in the ACECs, which may lead to some impacts to R&I values, especially scenic values. Some ACECs have designated corridors running through them, and new linear ROWs would be allowed within these corridors. This includes Ash Meadows, Coyote Springs, Mormon Mesa, Piute/Eldorado, Rainbow Gardens, and River Mountains ACECs. Except for Ash Meadows, these corridors have existing linear ROWs that may have impacted R&I values in the past. Assuming they are required to use the existing main access roads, new linear ROWs in these corridors are only expected to have minor additional negative impacts on the R&I values. If ROWs are developed in the corridor through Ash Meadows ACEC, there could be major impacts to R&I values due to loss of habitat.

Similar to linear ROWs, the majority of existing ACECs are avoidance areas for small site-type LUAs less than 5 acres. Small site-type LUAs do not cause the same level of impacts as large projects but can still impact R&I values through loss of habitat and habitat fragmentation. These small projects still often require the construction of an access road that, besides loss of habitat, can also lead to increased OHV use in the area. Big Dune and Hidden Valley ACECs are exclusion areas for small site-type LUAs. Gold Butte Part A, Mormon Mesa, and Piute/Eldorado ACECs are also exclusion areas for small site-type LUAs except that these LUAs would be

allowed within one half mile of federal-aid highways. Mormon Mesa ACEC also allows small site-type LUAs in designated corridors. For the ACECs that are avoidance areas, Ash Meadows, Coyote Springs, Rainbow Gardens, and River Mountains ACECs allow small site-type LUAs within designated corridors.

4.4.1.5.6.2.3. Alternative 2

Alternative 2 would designate the most ACECs and thus protect the most R&I values from lands actions. All existing and proposed ACECs would be also excluded for large site-type LUAs, even within one half mile of federal-aid highways. This would provide even more protection for R&I values than Alternative 1. Material site ROWs would also be closed or only allowed within one-quarter mile of federal-aid highways in all of the existing or proposed ACECs. The smaller allowed distance from highways would help limit potential impacts to a smaller area within the ACEC and reduces the potential for the project to impact connectivity.

The existing Devil's Throat, Gold Butte Townsite, Red Rock Springs, and Stump Spring ACECs would be changed from avoidance to exclusion for linear ROWs, providing more protection for their R&I values compared to Alternative 1. In addition, the proposed Lava Dune, Mt. Schrader, and Stuart Ranch ACECs would also be excluded for linear ROWs. The other existing and proposed ACECs would be avoidance for linear ROWs.

For small site-type LUAs, the existing Devil's Throat ACEC would be changed from avoidance to exclusion. Small site-type LUAs would be allowed within designated corridors in the Piute/Eldorado ACEC where they are currently excluded. In Rainbow Gardens ACEC, small site-type LUAs would be allowed not only in designated corridors, but also within one quarter mile of federal-aid highways, and communication sites would be allowed. This may lead to some additional impacts to the R&I values in these ACECs compared to Alternative 1.

The other existing ACECs would retain their current prescription for small site-type LUAs except that for those ACECs that allow LUAs near federal-aid highways, the distance would be reduced to one quarter mile, which would help reduce potential impacts to R&I values compared to Alternative 1. The proposed Lava Dune and Logandale ACECs would be excluded from small site-type LUAs. Bird Spring Valley, Jean Lake, Bitter Springs, California Wash, and Muddy Mountains ACECs would also exclude small site-type LUAs except within designated corridors or within one-quarter mile of federal-aid highways. The rest of the proposed ACECs would be avoidance areas for small site-type LUAs. Lower Mormon Mesa, Mesa Milkvetch, and Moapa Mesquite ACECs would allow small site-type LUAs within one-quarter mile of federal-aid highways. Moapa Mesquite, Old Spanish Trail, and Specter Hills ACECs would allow small site-type LUAs within designated corridors.

4.4.1.5.6.2.4. Alternative 3

Alternative 3 would designate fewer ACECs compared to Alternative 2 but more than Alternatives 1 and 4. Thus it would protect more R&I values from potential impacts from lands actions compared to Alternatives 1 and 4 but less than Alternative 2. Similar to Alternative 2, all ACECs would be excluded from large site-type LUAs. Most ACECs would still be closed to material site ROWs, but for those where these ROWs would allowed near highways, they would be allowed within one half mile, and there could be additional impacts to R&I values compared to Alternative 2. Some ACECs would be open to material site ROWs including Lower Mormon Mesa, Muddy Mountains, Pahrump Valley, and Stewart Valley ACECs. Even though these

projects would still have to go through the NEPA process where impacts to R&I values would be analyzed, leaving the ACECs open to this type of project could lead to additional impacts to R&I values compared to Alternative 2.

Bird Spring Valley, Jean Lake, Bitter Springs, and Muddy Mountains ACECs would be avoidance areas for small site-type LUAs. In addition to ACECs described in Alternative 2, linear and small site-type ROWs would be allowed within designated corridors within Mt. Schrader, Pahrump Valley, and Stewart Valley ACECs. In addition, for those ACECs that allow ROWs near federal-aid highways, the distance would be one half mile, which could lead to additional impacts to R&I values compared to Alternative 2.

4.4.1.5.6.2.5. Alternative 4

Alternative 4 would designate four additional ACECs and would provide protection to more R&I values from lands actions compared to Alternative 1, but it would provide less protection compared to Alternatives 2 and 3. Unlike Alternative 1, all ACECs except for Piute/Eldorado ACEC would be excluded from large site-type LUAs. Piute/Eldorado ACEC would be an avoidance area for large site-type LUAs, which may lead to large projects being approved in the area. This opens up the ACEC to more potential types of projects than Alternative 1 and could lead to major impacts to the R&I values in the area, which include desert tortoise critical habitat. Alternative 4 would have similar designations for material site ROWs as Alternative 1 for the existing ACECs. The four new ACECs would all be closed to material site ROWs.

Designations for linear and small site-type LUAs in ACECs would be similar to those in Alternative 3 except that Devil's Throat and Stuart Ranch ACECs would be avoidance area and not excluded. This may lead to additional impacts to its R&I values compared to Alternatives 2 and 3. For those ACECs that allow ROWs near federal-aid highways, the distance would be one half mile, which could lead to additional impacts to R&I values compared to Alternative 2.

4.4.1.5.6.3. Renewable Energy Impacts on ACECs

4.4.1.5.6.3.1. Impacts Common to All Alternatives

Renewable energy developments result in surface disturbance and potentially increased water withdrawals, which may lead to loss, degradation, or fragmentation of R&I values. Due to the normal size of renewable energy projects, they could cause major impacts to R&I values. Most ACEC designations result in the exclusion of solar and wind projects, which help protect the R&I values. Large projects next to ACECs could still lead to impacts in the ACEC due to introduction of invasive species, concentration of recreational users in the ACEC, and loss of landscape connectivity.

4.4.1.5.6.3.2. Alternative 1

Wind and solar energy projects are currently excluded from the existing ACECs. ACECs that are proposed for designation in the other alternatives would remain open for wind development. At least portions of most of these areas would also be open to solar except in areas where their terrain is too rugged. Development of these large-scale projects could lead to minor to major impacts to the R&I values in these areas.

4.4.1.5.6.3.3. Alternative 2

Alternative 2 would designate the most ACECs, and all existing and proposed ACECs would be closed to wind and solar projects. Thus Alternative 2 would protect the most R&I values from these types of projects.

4.4.1.5.6.3.4. Alternative 3

Alternative 3 would designate fewer ACECs compared to Alternative 2 but more than Alternatives 1 and 4. Proposed and existing ACECs would be closed to solar and wind energy development. Portions of the Bird Spring Valley, Pahrump Valley, and Stewart Valley areas would be open to wind that would be closed in Alternative 2 due to differences in proposed boundaries of the ACECs. Similarly, portions of Pahrump Valley and Stewart Valley would be open to solar that would be closed in Alternative 2. In addition, a portion of the California Wash area would be open for solar because that ACEC would not be proposed in Alternative 3. Opening these areas to wind and solar projects could cause major impacts to the R&I values due to the scale of these types of projects.

4.4.1.5.6.3.5. Alternative 4

Alternative 4 would designate four additional ACECs and provide protection to more R&I values compared to Alternative 1, but it would provide less protection compared to Alternatives 2 and 3. Proposed and existing ACECs, except for Piute/Eldorado ACEC, would be closed to solar and wind energy development. Piute/Eldorado ACEC would be an avoidance area for these large site-type LUAs as discussed above. Approving these large types of projects in the ACEC may lead to major impacts to the R&I values of the ACEC which include desert tortoise critical habitat. Many of the areas with R&I values that are not proposed as ACECs under Alternative 4 would instead be open to solar and/or wind projects, which could lead to major impacts to their R&I values.

4.4.1.5.6.4. Utility Corridors Impacts on ACECs

4.4.1.5.6.4.1. Impacts Common to All Alternatives

Some ACECs would have designated utility corridors running through them. Development of ROWs in these corridors could lead to impacts to R&I values but concentrates these impacts into the corridor as opposed to potentially having linear ROWs and their impacts spread throughout the ACEC.

4.4.1.5.6.4.2. Alternative 1

Some ACECs have designated corridors running through them, and new linear ROWs would be allowed within these corridors. This includes Ash Meadows, Coyote Springs, Mormon Mesa, Piute/Eldorado, Rainbow Gardens, and River Mountains ACECs. Except for Ash Meadows, these corridors have existing linear ROWs that may have impacted R&I values in the past. Assuming they are required to use the existing main access roads, new linear ROWs in these corridors are only expected to have minor additional negative impacts on the R&I values. If ROWs are developed in the corridor through Ash Meadows ACEC, there could be major impacts to R&I values due to loss of habitat.

4.4.1.5.6.4.3. Alternative 2

Corridors would be designated through the Ash Meadows, Bird Spring Valley, Coyote Springs, Jean Lake, Moapa Mesquite, Mormon Mesa, Old Spanish Trail, Pahrump Valley, Piute/Eldorado, Rainbow Gardens, River Mountains, Stewart Valley, and Specter Hills ACECs.

4.4.1.5.6.4.4. Alternative 3

In addition to those ACECs described in Alternative 2, corridors would be designated through the Mt. Schrader and Muddy Mountains ACECs. The Alternative 1 and 2 corridor that runs through Ash Meadows, Stewart Valley, and Pahrump Valley ACECs would be dropped in Alternative 3, which would provide more protection for R&I values compared to Alternatives 1 and 2. Some designated corridors would also be wider in Alternative 3 compared to Alternative 2, which could lead to additional impacts to R&I values compared to Alternative 2 because a wider corridor would increase the number of linear ROWs that could be sited within the corridor.

4.4.1.5.6.4.5. Alternative 4

In addition to the corridors through ACECs in Alternative 3, a corridor would be designated that passes through the Pahrump Valley area with identified R&I values. The Bird Spring Valley, Moapa Mesquite, Old Spanish Trail, Pahrump Valley, and Specter Hills ACECs would not be designated under Alternative 4. Some designated corridors would be wider compared to the other alternatives, which could lead to additional impacts to R&I values. A wider corridor would increase the number of ROWs that could be sited within the corridor.

4.4.1.6. Special Designations

4.4.1.6.1. Areas of Critical Environmental Concern Impacts on ACECs

4.4.1.6.1.1. Impacts Common to All Alternatives

An ACEC designation and the associated management prescriptions are designed to protect the R&I values in an area by excluding or limiting activities that may impact the R&I values. The alternatives vary in the number and size of ACECs proposed, as well as the type of management prescriptions. The more restrictive a management prescription, the more protection is provided to R&I values. Areas with identified R&I values for which no ACEC is proposed in an alternative may not be protected from potential impacts unless the values are protected through management prescriptions under other resource or resource use sections.

4.4.1.6.1.2. Alternative 1

Alternative 1 would have the fewest number of ACECs compared to the other alternatives. Thus, many areas with identified R&I values would not benefit from the ACEC designations.

4.4.1.6.1.3. Alternative 2

Alternative 2 would designate the most ACECs and increase the size of several existing ACECs. All areas with identified R&I values that are outside of congressionally designated disposal

areas would receive the benefit of an ACEC designation. Alternative 2 would also have the most restrictive management prescriptions of all the alternatives which would provide the most protection to R&I values.

4.4.1.6.1.4. Alternative 3

Alternative 3 would designate three fewer ACECs compared to Alternative 2 and some of the ACECs would not be as large compared to Alternative 2. The R&I values in the California Wash, Logandale, and Sandy Valley areas would not benefit from an ACEC designation and thus may be impacted if projects are approved in these areas due to the lack of an ACEC designation. In addition, Pahrump Valley buckwheat would not be included as an R&I value for the Pahrump Valley ACEC under Alternative 3 and thus would not directly benefit from the ACEC designation. It may still indirectly benefit by actions taken to protect the other R&I values. Alternative 3 also has slightly less restrictive management prescriptions compared to Alternative 2. Thus more types of projects that could potentially impact the R&I values would be permitted under Alternative 3 compared to Alternative 2.

4.4.1.6.1.5. Alternative 4

Alternative 4 would only designate four new ACECs and drop two existing ACECs compared to Alternative 1. Alternative 4 would also decrease the size of some ACECs compared to Alternatives 2 and 3. Thus, similar to Alternative 1, many of the areas with identified R&I values would not benefit from an ACEC designation.

4.4.1.6.2. National Trails Impacts on ACECs

4.4.1.6.2.1. Impacts Common to All Alternatives

See Cultural Resources for impacts on ACECs.

4.4.1.6.3. Wild and Scenic Rivers Impacts on ACECs

4.4.1.6.3.1. Impacts Common to All Alternatives

Because Alternative 4 does not contain any river segments determined to be suitable for wild and scenic river (WSR) designation, there would be no impacts common to all alternatives.

4.4.1.6.3.2. Alternative 1

Continuing to manage the Virgin River, Muddy River, Meadow Valley Wash, Hiko Springs, and Carson Slough as eligible for WSR designation would provide some protection to R&I values that rely on these rivers for habitat. The Virgin River passes through the Virgin River ACEC, and the Carson Slough is within the Ash Meadows ACEC.

For areas with R&I values with no designated ACEC under Alternative 1, maintaining WSR eligibility status may help protect those values that rely on the rivers for habitat. This includes the riparian habitat and riparian and aquatic species that occur along the Meadow Valley Wash as it passes through the Stuart Ranch and Moapa-Mesquite areas and the portions of the Virgin River

not within the current Virgin River ACEC boundary. It also includes the riparian habitats along Hiko Spring and the Muddy River in the Hiko Wash and Perkins Ranch areas respectively. These areas, though, have other R&I values such as cultural resources that would not be protected by maintaining WSR eligibility.

4.4.1.6.3.3. Alternative 2

Under Alternative 2, all currently eligible river segments would be determined suitable for WSR designation, and all areas with R&I values that depend on these rivers would be proposed as ACECs. The WSR suitability determination would add another layer of protection to the R&I values that depend on the rivers.

4.4.1.6.3.4. Alternative 3

Under Alternative 3, only the Meadow Valley Wash would be determined to be suitable for WSR designation. Meadow Valley Wash passes through the proposed Stuart Ranch and Moapa-Mesquite ACECs which have riparian habitats and species for R&I values. The other river segments would not be determined as suitable for WSR designation and thus not managed to protect their wild and scenic character. The added benefit to R&I values that depend on these river segments would not be provided compared to Alternative 2. These areas would still be proposed as ACECs under Alternative 3 and would still receive some level of protection.

4.4.1.6.3.5. Alternative 4

Under Alternative 4, no river segments would be determined to be suitable for WSR designation. Thus no areas with riparian dependent R&I values would receive the added benefit of a WSR suitability determination. Stuart Ranch and Perkins Ranch would still be designated as ACECs, so R&I values in these areas would still be protected even without the WSR determination. The Hiko Wash, Moapa-Mesquite, and additions to the Virgin River ACECs would not be designated under Alternative 4 and also would not benefit from a WSR suitability determination.

4.4.1.6.4. Wilderness Impacts on ACECs

4.4.1.6.4.1. Impacts Common to All Alternatives

Portions of the Piute/Eldorado, Gold Butte Part A, Gold Butte Part B, Coyote Springs, Arrow Canyon, Hidden Valley, and Mormon Mesa ACECs overlap wilderness areas. Management in these areas to protect wilderness characteristics would also provide protection to R&I values.

4.4.1.6.4.2. Alternative 1

There would be no impacts unique to Alternative 1.

4.4.1.6.4.3. Alternative 2

In addition to the ACECs that overlap wilderness areas in all alternatives, portions of the Ivanpah ACEC and the additional acres for the Piute/Eldorado ACEC would overlap the South McCullough Wilderness.

4.4.1.6.4.4. Alternative 3

Impacts under Alternative 3 would be similar to Alternative 2.

4.4.1.6.4.5. Alternative 4

There would be no impacts unique to Alternative 4.

4.4.1.6.5. Wilderness Study Areas Impacts on ACECs

4.4.1.6.5.1. Impacts Common to All Alternatives

Portions of Gold Butte Part A, Gold Butte Part B, Gold Butte Part C, and Rainbow Gardens ACECs overlap wilderness study area (WSAs). Managing the WSAs under the BLM's Interim Management Policy would protect and prevent irreparable damage to the R&I values from surface-disturbing activities, including mineral development.

4.4.1.6.5.2. Alternative 1

No unique impacts were identified for Alternative 1.

4.4.1.6.5.3. Alternative 2

In addition to the existing ACECs that overlap WSAs, a portion of the proposed additional acres for the Ash Meadows ACEC would overlap the Resting Springs WSA. This area of overlap, though, is unlikely to contain any of the R&I values (special status species) for the ACEC and thus the WSA is not assumed to provide any extra protection. Attaining no net unmitigated loss of wilderness characteristics in the areas of overlap between WSAs and ACECs may also result in mitigation for loss of R&I values in these areas, which would be a benefit to the R&I values.

4.4.1.6.5.4. Alternative 3

Impacts under Alternative 3 would be similar to those under Alternative 4.

4.4.1.6.5.5. Alternative 4

Alternative 4 would not require no net unmitigated loss of wilderness characteristics in WSAs but would instead mitigate on a case-by-case basis. This lower mitigation requirement is not assumed to lead to any additional impacts to the R&I values in these areas.

4.4.1.7. Cumulative Impacts on ACECs

4.4.1.7.1. Past and Present Actions/Impacts

Past and present impacts to the specific R&I values would be similar to those discussed under the specific program that manages those resources. The 1998 RMP designated 22 ACECs for a total of 974,531 acres. The R&I values in these areas have benefitted from ACEC designation because it limited the types of ground-disturbing activities. In addition, beneficial actions such as

habitat restoration have occurred to improve habitat for R&I values. Clark County, as part of its requirement under the multi-species habitat conservation plan, has also performed mitigation actions, such as restoration and funding law enforcement, that have benefitted the R&I values in the ACECs.

4.4.1.7.2. Reasonable Foreseeable Actions

In the future, ACECs would be primarily affected by urban expansion and population growth, OHV use and nonmotorized recreation, mineral development, and rights-of-way for roads and energy. It is assumed that ACECs will continue to receive management focus to protect and improve their R&I values. It is assumed that mitigation actions from other agencies, as well as mitigation for BLM actions occurring elsewhere, would be focused on ACECs as the amount of other lands available for mitigation actions diminish. In areas not designated as an ACEC, R&I values are expected to receive higher impacts than if the area was designated as an ACEC.

4.4.1.7.3. Cumulative Impact

4.4.1.7.3.1. Impacts Common to All Alternatives

Designated ACECs would be managed to prevent irreparable damage to R&I values. Actions such as recreation, linear and small site-type ROWs, and development of existing mineral rights could still lead to impacts to R&I values and lead to their decline in the long term. Climate change may also result in the habitats within the ACECs no longer being suitable for some species identified as having R&I values. Thus the ACEC designation does not guarantee the survival of species in the long term.

4.4.1.7.3.2. Alternative 1

Alternative 1 would continue with the existing ACECs, but no new ACECs would be designated. Therefore it would protect the fewest areas with R&I values of all the alternatives and could result in the most cumulative impacts to R&I values outside of ACECs. The existing ACECs would continue to be managed as they are now, which provides some protection to R&I values in those areas.

4.4.1.7.3.3. Alternative 2

Alternative 2 would designate the most ACECs and increase the size of several existing ACECs. Alternative 2 would also have the most restrictive management prescriptions of all the alternatives. Thus it would result in the least amount of cumulative impacts to R&I values of all the alternatives. Requirements for no net unmitigated loss of vegetation, riparian, and special status species could lead to mitigation projects being done in ACECs that help improve and protect their R&I values above the current level.

4.4.1.7.3.4. Alternative 3

Alternative 3 would designate three fewer ACECs compared to Alternative 2. Other ACECs would be smaller than in Alternative 2 and have less restrictive management prescriptions. Therefore, cumulative impacts to R&I values would be more than in Alternative 2 but less than

in Alternatives 1 and 4. Requirements for no net unmitigated loss of vegetation, riparian, and special status species could lead to mitigation projects being done in ACECs that help improve and protect their R&I values above the current level.

4.4.1.7.3.5. Alternative 4

Alternative 4 would designate four additional ACECs compared to Alternative 1. Several ACECs would be smaller and have less restrictive management prescriptions compared to Alternatives 2 and 3. Alternative 4 would also not require no net unmitigated loss of vegetation, riparian, and special status species. Mitigation actions could still be performed in ACECs but probably to a lesser extent than in Alternatives 2 and 3.

4.4.2. Back Country Byways

Analysis is the same as the 1998 RMP.

4.4.3. National Trails

The Old Spanish National Historic Trail is the only designated national trail managed within the planning area. Impacts are addressed in the Cultural Resources section (p. 873).

4.4.4. Wild & Scenic Rivers

4.4.4.1. Summary

In all action alternatives, the BLM would manage eligible and suitable river segments to protect or enhance the outstandingly remarkable values (ORV), tentative classification, water quality, and the free-flowing nature of these rivers with specific protection allocation within the river corridor (a quarter mile of the high water mark on each side of the river). BLM management is limited to public lands and is subject to valid existing rights. Management outlined in the RMP is for those eligible and suitable segments. Management, if designated, would follow the guidance in BLM Manual 6400.

The free-flowing condition of eligible and suitable river segments would be protected to the extent that modifications such as stream impoundments (except for those necessary to protect ORVs, such fish barriers), channelization, and/or riprapping would not be permitted along BLM shorelines. However, depending upon the alternative, values may be at risk from potential mineral development, cross-country OHV activity, or other surface-disturbing activities. In addition, unless BLM land is involved in a proposed action, BLM has no control of potential modifications of the shoreline or other development, including development related to the perfection of water rights on non-public lands. BLM's management authority only extends to public lands within the river corridor, and there are no water rights associated with suitability determinations. A suitability determination also has no effect on existing water compacts.

4.4.4.2. Methods of Analysis

Impact analysis and conclusions are based on interdisciplinary team knowledge of the planning area and review of literature. Effects are quantified where possible, and in the absence of quantitative data, qualitative effects are presented based on professional judgment.

4.4.4.3. Qualitative Intensity Scale

Indicators

For wild and scenic rivers (WSRs), the prime indicators are the intactness of the free-flowing nature, the outstandingly remarkable values (ORVs) described in the Wild and Scenic Rivers Review Eligibility Determination (see Appendix J (p. 1915)), and the intactness of the tentative classifications of each river segment.

Assumptions

- Uses and activities occurring outside the quarter mile corridor may influence the WSR values. These influences would generally be indirect.
- All guidelines for the maintenance of the WSR's values, as identified in this document, would be followed to the extent allowed by existing budget and available personnel.
- Surface-disturbing activities impact WSR values.

4.4.4.4. Resources

4.4.4.4.1. Air Quality Impacts to Wild and Scenic Rivers

4.4.4.4.1.1. Impacts Common to All Alternatives

There are no impacts common to all alternatives.

4.4.4.4.1.2. Alternatives 1 through 4

There are no additional impacts to wild and scenic rivers.

4.4.4.4.2. Soil Resources Impacts to Wild and Scenic Rivers

4.4.4.4.2.1. Impacts Common to All Alternatives

Soil resource management actions to restore degraded sites to slow or stop accelerated soil erosion and sedimentation will protect the five eligible/suitable rivers' WSR status. Free-flow and water quality would be enhanced and retained. Water quality directly affects the outstandingly remarkable values of fish by enhancing their habitat. Limiting soil erosion protects plants and enhances wildlife habitats. The ecological health of the riparian areas associated with wild and scenic rivers affects outstandingly remarkable values.

Benefits to limiting erosion include:

- **Virgin River, Muddy River, Meadow Valley Wash, Hiko Spring, and Carson Slough:**
- Fish and wildlife ORVs: Cleaner water for fish and wildlife habitats; more plant life takes hold for better habitats for wildlife.
- Cultural ORVs: Prevents erodity of cultural sites, retains intactness of sites.
- **Hiko Spring:**
- Scenery ORVs: Retain, preserve, and enhance quality of scenery and naturalness of area.
- Recreation ORVs: Experience enhanced encounters with wildlife and scenery; scenery and naturalness are preserved.

Tentative classifications for Hiko Springs, Carson Slough, and Meadow Valley Wash could be affected if soil actions fail to retain water quality and riparian habitat health.

4.4.4.4.2.2. Alternatives 1 through 3

There are no additional impacts to wild and scenic rivers.

4.4.4.4.2.3. Alternative 4

Even though no river segments were found suitable in this alternative, the non-suitable river sections will be protected by soil management as stated in the Impacts Common to All Alternatives.

4.4.4.4.3. Water Resources Impacts to Wild and Scenic Rivers

4.4.4.4.3.1. Impacts Common to All Alternatives

Water resource management actions to protect water quality and limit or mitigate for negative effects on surface waters may also limit development in riparian corridors. This can protect water quality, protecting fish habitat and in-stream flows and retaining tentative classifications.

Water quality and flow and ORVs for fish and wildlife will be enhanced by water resource decisions to protect the Virgin River, Muddy River, Meadow Valley Wash, Hiko Spring, and Carson Slough.

Failure to protect water quality and flow could affect the tentative classification of Meadow Valley Wash, Hiko Spring, and Carson Slough.

4.4.4.4.3.2. Alternatives 1 through 3

There are no additional impacts to wild and scenic rivers.

4.4.4.4.3.3. Alternative 4

Even though no river segments were found suitable in this alternative, the non-suitable river sections will be protected by water resource management as stated in the Impacts Common to All Alternatives.

4.4.4.4.4. Integrated Vegetation Impacts to Wild and Scenic Rivers

4.4.4.4.4.1. Vegetation Impacts to Wild and Scenic Rivers

4.4.4.4.4.1.1. Impacts Common to All Alternatives

There are no impacts common to all alternatives.

4.4.4.4.4.1.2. Alternative 1

Restricting vehicle events within one quarter mile of riparian areas would benefit and protect the ORVs of eligible WSR corridors. Managing the mesquite and acacia woodlands for their value as wildlife habitat would protect the wildlife ORVs of eligible river segments.

4.4.4.4.4.1.3. Alternatives 2 and 3

Managing the mesquite and acacia woodlands for their value as wildlife habitat would protect the wildlife ORVs of suitable river segments.

4.4.4.4.4.1.4. Alternative 4

Even though no river segments were found suitable in this alternative, managing the mesquite and acacia woodlands for their value as wildlife habitat would protect the wildlife ORVs of river segments.

4.4.4.4.4.2. Riparian Areas and Wetlands Impacts to Wild and Scenic Rivers

4.4.4.4.4.2.1. Impacts Common to All Alternatives

There are no impacts common to all alternatives

4.4.4.4.4.2.2. Alternatives 1 through 3

Maintaining the proper functioning condition of all riparian areas will protect water quality and ORVs of eligible river segments.

4.4.4.4.4.2.3. Alternative 4

Even though no river segments were found suitable in this alternative, maintaining the proper functioning condition of all riparian areas will protect water quality and ORVs of river segments.

4.4.4.4.4.3. Weeds Impacts to Wild and Scenic Rivers

4.4.4.4.4.3.1. Impacts Common to All Alternatives

Weed management actions to limit the spread of invasive or noxious weeds and use of integrated pest management techniques to limit or control the spread of invasive animal species protects wild and scenic river ORVs, including wildlife and fish, and allows native species to out-compete non-native species.

The allowed techniques used for invasive species control will be determined by the tentative classification of the river. Use of pesticides may affect water quality, which would affect ORVs for fish and may affect designation status.

4.4.4.4.4.3.2. Alternatives 1 through 3

There are no additional impacts to wild and scenic rivers.

4.4.4.4.4.3.3. Alternative 4

Even though no river segments were found suitable in this alternative, the non-suitable river sections will be protected by weed management actions as stated in the Impacts Common to All Alternatives.

4.4.4.4.4.4. Forests and Woodlands Impacts to Wild and Scenic Rivers

4.4.4.4.4.4.1. Impacts Common to All Alternatives

There are no impacts common to all alternatives.

4.4.4.4.4.4.2. Alternatives 1 through 4

There are no additional impacts to wild and scenic rivers.

4.4.4.4.5. Fish and Wildlife Impacts to Wild and Scenic Rivers

4.4.4.4.5.1. Impacts Common to All Alternatives

Wildlife habitats along the Virgin River, Muddy River, Meadow Valley Wash, Hiko Springs, and Carson Slough would be protected by limiting authorized activities near natural waters. This would allow BLM to limit activities that may cause erosion, vegetation trampling, or displace wildlife access. This may protect and enhance the wildlife and outstandingly remarkable values along the rivers listed above.

4.4.4.4.5.2. Alternative 1

Restricting vehicle events within one quarter mile of riparian areas would benefit and protect WSR corridors. Protecting wildlife habitats, watersheds, and retaining contiguous river and stream segments would benefit the ORVs of the eligible WSRs.

4.4.4.4.5.3. Alternative 2

Restricting vehicle events within one half mile of riparian areas would benefit and protect WSR corridors. Protecting wildlife habitats, watersheds, and retaining contiguous river and stream segments would benefit the ORVs of the suitable WSRs.

4.4.4.4.5.4. Alternative 3

Restricting vehicle events within one quarter mile of riparian areas would benefit and protect WSR corridors. Protecting wildlife habitats, watersheds, and retaining contiguous river and stream segments would benefit the ORVs of the suitable WSRs.

4.4.4.4.5.5. Alternative 4

Even though no river segments were found suitable in this alternative, restricting vehicle events within one quarter mile of riparian areas would benefit and protect the ORVs. Protecting wildlife habitats, watersheds, and retaining contiguous river and stream segments would benefit the ORVs.

4.4.4.4.6. Special Status Species Impacts to Wild and Scenic Rivers

4.4.4.4.6.1. Impacts Common to All Alternatives

There are no impacts common to all alternatives.

4.4.4.4.6.2. Alternative 1

Improving aquatic and riparian habitats on the Muddy River, the Virgin River, and Meadow Valley Wash would protect their WSR eligibility status. Building fish barriers, depending upon the design, may impair the riparian nature but would protect the fish ORV. The WSR eligibility status of Carson Slough would be protected by the improvement of the spring and wet meadow habitats in the Ash Meadows ACEC.

4.4.4.4.6.3. Alternative 2

Improving aquatic and riparian habitats on the Muddy River, the Virgin River, and Meadow Valley Wash would protect their WSR suitability status.

The WSR suitability status of Carson Slough would be protected by the improvement of the spring and wet meadow habitats in the Ash Meadows ACEC.

4.4.4.4.6.4. Alternative 3

Improving aquatic and riparian habitats in Meadow Valley Wash would protect WSR values.

4.4.4.4.6.5. Alternative 4

Even though no river segments were found suitable in this alternative, improving aquatic and riparian habitats on the Muddy River, the Virgin River, and Meadow Valley Wash would protect the ORVs. The ORVs of Carson Slough would be protected by the improvement of the spring and wet meadow habitats in the Ash Meadows ACEC.

4.4.4.4.7. Wild Horse and Burro Impacts to Wild and Scenic Rivers

4.4.4.4.7.1. Impacts Common to All Alternatives

There are no impacts common to all alternatives.

4.4.4.4.7.2. Alternatives 1 through 4

There are no additional impacts to wild and scenic rivers.

4.4.4.4.8. Cave and Karst Management Impacts to Wild and Scenic Rivers

4.4.4.4.8.1. Impacts Common to All Alternatives

There are no impacts common to all alternatives.

4.4.4.4.8.2. Alternatives 1 through 4

There are no additional impacts to wild and scenic rivers.

4.4.4.4.9. Wildland Fire Management Impacts on Wild and Scenic Rivers

4.4.4.4.9.1. Impacts Common to All Alternatives

There are no impacts common to all alternatives.

4.4.4.4.9.2. Alternatives 1 through 3

Fire prevention and suppression activities utilizing approved techniques would benefit WSR values.

4.4.4.4.9.3. Alternative 4

There are no additional impacts on wild and scenic rivers.

4.4.4.4.10. Cultural Resources Impacts to Wild and Scenic Rivers

4.4.4.4.10.1. Impacts Common to All Alternatives

There are no impacts common to all alternatives.

4.4.4.4.10.2. Alternatives 1 through 3

Protecting cultural resources on public lands would protect cultural ORVs on WSRs.

4.4.4.4.10.3. Alternative 4

Even though no river segments were found suitable in this alternative, protecting cultural resources on public lands would protect cultural ORVs.

4.4.4.4.11. Paleontological Resources

4.4.4.4.11.1. Impacts Common to All Alternatives

There are no impacts common to all alternatives.

4.4.4.4.11.2. Alternatives 1 and 2

Protecting paleontological resources on public lands would protect cultural ORVs on eligible and suitable WSRs.

4.4.4.4.11.3. Alternatives 3 and 4

There are no additional impacts to wild and scenic rivers.

4.4.4.4.12. Visual Resource Management Impacts on Wild and Scenic Rivers

4.4.4.4.12.1. Impacts Common to All Alternatives

There are no impacts common to all alternatives

4.4.4.4.12.2. Alternative 1

There are no additional impacts to wild and scenic rivers.

4.4.4.4.12.3. Alternative 2

A VRM designation of Class I will protect ORVs for suitable WSRs tentatively classified as wild.

4.4.4.4.12.4. Alternative 3

There are no additional impacts to wild and scenic rivers.

4.4.4.4.12.5. Alternative 4

No rivers would be suitable, therefore the ORVs would not be protected in areas with VRM Class III and IV.

4.4.4.4.13. Lands with Wilderness Characteristics Impacts on Wild and Scenic Rivers

4.4.4.4.13.1. Impacts Common to All Alternatives

There are no impacts common to all alternatives.

4.4.4.4.13.2. Alternatives 1 through 4

There are no additional impacts to wild and scenic rivers.

4.4.4.5. Resource Uses

4.4.4.5.1. Forestry and Woodland Products Impacts on Wild and Scenic Rivers

4.4.4.5.1.1. Impacts Common to All Alternatives

There are no impacts common to all alternatives.

4.4.4.5.1.2. Alternatives 1 through 4

There are no additional impacts to wild and scenic rivers.

4.4.4.5.2. Livestock Grazing Impacts on Wild and Scenic Rivers

4.4.4.5.2.1. Impacts Common to All Alternatives

There are no impacts common to all alternatives.

4.4.4.5.2.2. Alternatives 1 and 2

Grazing activity along the Muddy River may affect the ORVs.

4.4.4.5.2.3. Alternative 3

There are no additional impacts to wild and scenic rivers.

4.4.4.5.2.4. Alternative 4

No river segments were found suitable in this alternative. Grazing activity along the Muddy River may affect the ORVs.

4.4.4.5.3. Minerals Impacts on Wild and Scenic Rivers

4.4.4.5.3.1. Fluid Leasable Minerals Impacts on Wild and Scenic Rivers

4.4.4.5.3.1.1. Impacts Common to All Alternatives

There are no impacts common to all alternatives.

4.4.4.5.3.1.2. Alternatives 1 and 2

Closing Ash Meadows ACEC to geothermal prospecting and leasing would also protect Carson Slough's eligibility and suitability for WSR status.

4.4.4.5.3.1.3. Alternative 3

Carson Slough, the Virgin River, and Hiko Wash would be protected from minerals-caused surface-disturbing activities by having ACEC status.

Portions of the Muddy River and Meadow Valley Wash would not be protected from surface-disturbing activities caused from mining.

4.4.4.5.3.1.4. Alternative 4

No river segments were found suitable in this alternative and none is protected under the Wild and Scenic Rivers Act. Closing Ash Meadows ACEC to geothermal prospecting and leasing would protect Carson Slough's ORVs.

Mineral activities may cause surface-disturbing activities that impact the ORVs and free flow of river segments.

4.4.4.5.3.2. Solid Leasable Minerals Impacts on Wild and Scenic Rivers

4.4.4.5.3.2.1. Impacts Common to All Alternatives

There are no impacts common to all alternatives.

4.4.4.5.3.2.2. Alternative 1

Mineral activities may cause surface-disturbing activities that impact the ORVs and free flow of river segments.

4.4.4.5.3.2.3. Alternative 2

There are no additional impacts to wild and scenic rivers.

4.4.4.5.3.2.4. Alternative 3

Portions of the Muddy River and Meadow Valley Wash would not be protected from surface-disturbing activities caused from mining.

4.4.4.5.3.2.5. Alternative 4

Mineral activities may cause surface-disturbing activities that impact the ORVs and free flow of river segments.

4.4.4.5.3.3. Locatable Minerals Impacts on Wild and Scenic Rivers

4.4.4.5.3.3.1. Impacts Common to All Alternatives

There are no impacts common to all alternatives.

4.4.4.5.3.3.2. Alternative 1

Mineral activities may cause surface-disturbing activities that impact the ORVs and free flow of river segments.

4.4.4.5.3.3.3. Alternative 2

There are no additional impacts to wild and scenic rivers.

4.4.4.5.3.3.4. Alternative 3

Portions of the Muddy River and Meadow Valley Wash would not be protected from surface-disturbing activities caused from mining.

4.4.4.5.3.3.5. Alternative 4

Mineral activities may cause surface-disturbing activities that impact the ORVs and free flow of river segments.

4.4.4.5.3.4. Saleable Minerals Impacts on Wild and Scenic Rivers

4.4.4.5.3.4.1. Impacts Common to All Alternatives

There are no impacts common to all alternatives.

4.4.4.5.3.4.2. Alternative 1

Mineral activities may cause surface-disturbing activities that impact the ORVs and free flow of river segments.

4.4.4.5.3.4.3. Alternative 2

There are no additional impacts to wild and scenic rivers.

4.4.4.5.3.4.4. Alternative 3

Portions of the Muddy River and Meadow Valley Wash would not be protected from surface-disturbing activities caused from mining.

4.4.4.5.3.4.5. Alternative 4

Mineral activities may cause surface-disturbing activities that impact the ORVs and free flow of river segments.

4.4.4.5.4. Recreation Impacts on Wild and Scenic Rivers

4.4.4.5.4.1. Impacts Common to All Alternatives

There are no impacts common to all alternatives.

4.4.4.5.4.2. Alternatives 1 through 4

There are no additional impacts to wild and scenic rivers.

4.4.4.5.5. Travel and Transportation Impacts on Wild and Scenic Rivers

4.4.4.5.5.1. Impacts Common to All Alternatives

There are no impacts common to all alternatives.

4.4.4.5.5.2. Alternative 1

Eligible WSRs would be impacted by roads, trails, and dry washes within the one quarter mile corridor.

4.4.4.5.5.3. Alternatives 2 and 3

Suitable WSRs would be protected by the designation of roads, primitive roads, and trails within the one quarter mile corridor.

4.4.4.5.5.4. Alternative 4

There are no additional impacts to wild and scenic rivers.

4.4.4.5.6. Lands and Realty Impacts on Wild and Scenic Rivers

4.4.4.5.6.1. Land Tenure (Disposals and Acquisitions) Impacts on Wild and Scenic Rivers

4.4.4.5.6.1.1. Impacts Common to All Alternatives

Retaining contiguous river and stream segments would benefit the ORVs of the eligible and suitable WSR segments.

4.4.4.5.6.1.2. Alternative 1

Disposal of land within the one quarter mile corridor of any eligible WSR would be in violation of the Wild and Scenic Rivers Act. Possible rivers affected include the Muddy River, Meadow Valley Wash, and the Virgin River.

Acquisition of lands adjacent to eligible WSRs may enhance the manageability and ORVs.

Flood control developments may impair the ORVs of river segments that are eligible for WSRs status unless designed to retain the riparian condition of the stream.

4.4.4.5.6.1.3. Alternative 2

Disposal of land within the one quarter mile corridor of any suitable WSR would be in violation of the Wild and Scenic Rivers Act. Possible rivers affected include the Muddy River, Meadow Valley Wash, and the Virgin River.

Acquisition of lands adjacent to suitable WSRs may enhance the manageability and ORVs.

Flood control developments may impair the ORVs of suitable WSRs unless designed to retain the riparian nature of the stream.

4.4.4.5.6.1.4. Alternative 3

Disposal of land within the one quarter mile corridor of any suitable WSR would be in violation of the Wild and Scenic Rivers Act. Possible rivers affected include Meadow Valley Wash.

Acquisition of lands adjacent to suitable WSRs may enhance the manageability and ORVs.

Flood control developments may impair the ORVs of suitable WSRs unless designed to retain the riparian nature of the stream.

4.4.4.5.6.1.5. Alternative 4

Under this alternative, no WSRs would be found suitable under the Wild and Scenic Rivers Act. Therefore, the ORVs would not be protected from land disposals, flood control developments, utility corridors, or renewable energy developments.

4.4.4.5.6.2. Land-Use Authorizations (Right-of-Ways, Leases, Permits) Impacts on Wild and Scenic Rivers

4.4.4.5.6.2.1. Impacts Common to All Alternatives

There are no impacts common to all alternatives.

4.4.4.5.6.2.2. Alternative 1

Flood control developments may impair the ORVs of eligible WSRs unless designed to retain the riparian nature of the stream.

The existing water diversion on the Virgin River near the town of Bunkerville has a negligible effect on the free flow of the river. Proposed improvements to the diversion may have more impacts on the free flow, depending on the design.

4.4.4.5.6.2.3. Alternative 2

Proposed utility corridors cross the following suitable rivers: Meadow Valley Wash and the Muddy River. Power lines affect the ORVs and riparian nature of WSRs.

Flood control developments may impair the ORVs of suitable WSRs unless designed to retain the riparian nature of the stream.

The existing water diversion on the Virgin River near the town of Bunkerville has a negligible effect on the free flow of the river. Proposed improvements to the diversion may have more impacts on the free flow, depending on the design.

4.4.4.5.6.2.4. Alternative 3

Flood control developments may impair the ORVs of eligible WSRs unless designed to retain the riparian nature of the stream.

The existing water diversion on the Virgin River near the town of Bunkerville has a negligible effect on the free flow of the river. Proposed improvements to the diversion may have more impacts on the free flow, depending on the design. Under this alternative, the Virgin River would not be found suitable, therefore the free-flowing nature of the river would not be protected.

4.4.4.5.6.2.5. Alternative 4

Under this alternative, no river or stream segments would be found suitable under the Wild and Scenic Rivers Act. Therefore, the ORVs would not be protected from land disposals, flood control developments, utility corridors, or renewable energy developments.

The existing water diversion on the Virgin River near the town of Bunkerville has a negligible effect on the free flow of the river. Proposed improvements to the diversion may have more impacts on the free flow, depending on the design. Under this alternative, the Virgin River would not be found suitable, therefore the free-flowing nature of the river would not be protected.

4.4.4.5.6.3. Renewable Energy Impacts on Wild and Scenic Rivers

4.4.4.5.6.3.1. Impacts Common to All Alternatives

There are no impacts common to all alternatives.

4.4.4.5.6.3.2. Alternative 1

Eligible rivers are not protected from solar and wind developments under this alternative.

4.4.4.5.6.3.3. Alternative 2

Proposed wind developments may impact the visual corridor near the Virgin River.

4.4.4.5.6.3.4. Alternative 3

Under this alternative, only Meadow Valley Wash near Stuart Ranch is suitable; all other stream segments would be released from further study. Therefore, the ORV values of Meadow Valley Wash at Stuart Ranch would be protected, and no other streams would be protected from land disposals, flood control developments, utility corridors, and renewable energy developments.

4.4.4.5.6.3.5. Alternative 4

Under this alternative, no WSRs would be found suitable under the Wild and Scenic Rivers Act. Therefore, the ORVs would not be protected from land disposals, flood control developments, utility corridors, and renewable energy developments.

4.4.4.5.6.4. Utility Corridors Impacts on Wild and Scenic Rivers

4.4.4.5.6.4.1. Impacts Common to All Alternatives

There are no impacts common to all alternatives.

4.4.4.5.6.4.2. Alternatives 1 and 2

Proposed utility corridors cross the following eligible rivers: Meadow Valley Wash and the Muddy River. Power lines affect the ORVs and riparian nature of WSRs.

4.4.4.5.6.4.3. Alternative 3

Proposed utility corridors cross the Meadow Valley Wash. Power lines affect the ORVs, but, under this alternative, this river segment is not afforded the protection of WSR status.

4.4.4.5.6.4.4. Alternative 4

Under this alternative, no WSRs would be found suitable under the Wild and Scenic Rivers Act. Therefore, the ORVs would not be protected from land disposals, flood control developments, utility corridors, or renewable energy developments.

4.4.4.6. Special Designations

4.4.4.6.1. Areas of Critical Environmental Concern Impacts on Wild and Scenic Rivers

4.4.4.6.1.1. Impacts Common to All Alternatives

There are no impacts common to all alternatives.

4.4.4.6.1.2. Alternative 1

Restricting plant collection would benefit eligible rivers by protecting habitats needed for the ORVs. The ACEC designation would protect the eligible Virgin River by protecting the cultural and threatened and endangered species habitats included as the ORVs.

4.4.4.6.1.3. Alternative 2

Restricting plant collection would benefit suitable rivers by protecting habitats needed for the ORVs.

The ACEC designation would protect the suitable Virgin River and Meadow Valley Wash by protecting the cultural and threatened and endangered species habitats included as the ORVs.

4.4.4.6.1.4. Alternative 3

Restricting plant collection would benefit suitable rivers by protecting habitats needed for the ORVs.

The ACEC designation would protect the Virgin River and Meadow Valley Wash by protecting the cultural and threatened and endangered species habitats included as the ORVs.

4.4.4.6.1.5. Alternative 4

Even though no river segments were found suitable in this alternative, restricting plant collection would protect ORVs along the river segments.

ACEC designation would protect ORVs on the Carson Slough, Virgin River, and upper Meadow Valley Wash by protecting the cultural and threatened and endangered species habitats.

The following river segments would no longer be protected by ACEC or WSR status: Lower Meadow Valley Wash, the Muddy River, and Hiko Wash.

4.4.4.6.2. National Trails Impacts on Wild and Scenic Rivers

4.4.4.6.2.1. Impacts Common to All Alternatives

See Cultural Resources for impacts to wild and scenic rivers.

4.4.4.6.3. Wild and Scenic Rivers Impacts on Wild and Scenic Rivers

4.4.4.6.3.1. Impacts Common to All Alternatives

There are no impacts common to all alternatives.

4.4.4.6.3.2. Alternatives 1 and 2

Under this alternative, all seven eligible segments would be protected under the WSR Act.

4.4.4.6.3.3. Alternative 3

Under this alternative, one suitable segment would be protected under the WSR Act. All other stream segments would be released from further study.

4.4.4.6.3.4. Alternative 4

Under this alternative, no eligible river segments would be found suitable and would be released from further study. The ORVs would not be protected under the WSR Act.

4.4.4.6.4. Wilderness Impacts on Wild and Scenic Rivers

4.4.4.6.4.1. Impacts Common to All Alternatives

There are no impacts common to all alternatives.

4.4.4.6.4.2. Alternatives 1 and 4

There are no additional impacts to wild and scenic rivers.

4.4.4.6.5. Wilderness Study Areas Impacts on Wild and Scenic Rivers

4.4.4.6.5.1. Impacts Common to All Alternatives

There are no impacts common to all alternatives.

4.4.4.6.5.2. Alternatives 1 through 4

There are no additional impacts to wild and scenic rivers.

4.4.4.7. Social and Economic

4.4.4.7.1. Public Health and Safety

4.4.4.7.1.1. Impacts Common to All Alternatives

There are no impacts common to all alternatives.

4.4.4.7.1.2. Alternatives 1 and 2

The city of Mesquite has constructed earthen berms to protect the city from Virgin River flooding. The city has proposed permanent structures for future protection. These structures may affect the free-flowing condition of the river.

4.4.4.7.1.3. Alternatives 3 and 4

The city of Mesquite has constructed earthen berms to protect the city from Virgin River flooding. The city has proposed permanent structures for future protection. These structures may affect the free-flowing condition of the river. Under this alternative, the Virgin River would not be found suitable, therefore the free-flowing condition of the river would not be protected.

4.4.4.8. Cumulative Impacts on Wild and Scenic Rivers

4.4.4.8.1. Past and Present Actions/Impacts

Past and present actions impacting wild and scenic river values include actions such as rights-of-ways, land disposals, vegetation treatments to control invasive species, new minerals exploration, and increasing recreational visitation. Land disposals and power rights-of-ways within the eligible corridors would be in violation of the Wild and Scenic Rivers Act. The other actions listed would be minor with proper mitigation.

4.4.4.8.2. Reasonable Foreseeable Actions

Reasonably foreseeable future actions impacting wild and scenic river values include actions such as rights-of-ways, renewable energy projects, land disposals, vegetation treatments to control invasive species, new minerals exploration, and increasing recreational visitation. Land disposals

and power rights-of-ways within the suitable corridors would be in violation of the Wild and Scenic Rivers Act. The other actions listed would be minor with proper mitigation.

4.4.4.8.3. Cumulative Impact

4.4.4.8.3.1. Impacts Common to All Alternatives

There are no impacts common to all alternatives.

4.4.4.8.3.2. Alternative 1

Alternative 1 would afford the second-most protection of the outstandingly remarkable values and free-flowing condition because of the continued eligibility status of the river segments and the ACEC designations surrounding them. Conflicts exist with land disposal boundaries on the Virgin River, Muddy River, and Meadow Valley Wash. Solar and wind energy proposals along the Virgin River, Muddy River, Meadow Valley Wash, and Hiko Wash, outside of the one quarter mile river corridor, may affect the viewshed from within the corridor.

4.4.4.8.3.3. Alternative 2

Alternative 2 would afford the most protection of the outstandingly remarkable values and free-flowing condition because of the suitability standing of the river segments and the ACEC designations surrounding them. Conflicts exist with land disposal boundaries on the Virgin River, Muddy River, and Meadow Valley Wash. Solar energy proposals along the Virgin River, outside of the one quarter mile river corridor, may affect the viewshed from within the corridor.

4.4.4.8.3.4. Alternative 3

In Alternative 3, only the northern portion of Meadow Valley Wash would remain protected. All other stream segments would be released from further study. However, ACEC designations would protect most ORVs in the river corridors. Conflicts exist with land disposal boundaries and solar energy proposals on the Virgin River, Muddy River, and Meadow Valley Wash.

4.4.4.8.3.5. Alternative 4

Alternative 4 would provide the least protection of free flow and ORVs. No river segments would be protected under the Wild and Scenic Rivers Act, and there would be fewer ACECs to protect ORVs. Proposals for land disposal, diversion of water for the town of Bunkerville, flood control structures for the city of Mesquite, fish barriers to protect special status species, and potential actions on adjacent private lands may affect the free-flowing nature of the Virgin River. The Muddy River and Meadow Valley Wash have significant amounts of adjacent private land and proposals for land disposal and more fish barriers. Renewable energy developments may affect ORVs along the Virgin River, Muddy River, Meadow Valley Wash, and Hiko Wash.

4.4.5. Wilderness

4.4.5.1. Summary

This section presents the potential impacts of the alternatives on the 12 wilderness areas that have been designated by Congress as units of the National Wilderness Preservation System. There are 12 designated wilderness areas located in part or wholly within the planning area. This does not include wilderness study areas (WSAs), which are still pending before Congress, or lands with wilderness characteristics, which have been evaluated through the BLM's wilderness inventory process.

4.4.5.2. Methods of Analysis

Impact analysis and conclusions are based on interdisciplinary team knowledge of the planning area and review of literature. Effects are quantified where possible, and in the absence of quantitative data, qualitative effects are presented based on professional judgment.

Indicators

The focus of the analysis is on the values of wilderness characteristics for which the areas were established and which the BLM is mandated to preserve. Those wilderness values are: untrammeled, natural, undeveloped, outstanding opportunities for solitude or primitive and unconfined recreation, and supplemental values. Untrammeled refers to wilderness as essentially unhindered and free from modern human control or manipulation. This quality is impaired by human activities or actions that control or manipulate the components or process of ecological systems inside wilderness. Wilderness is protected and managed to preserve its natural conditions. In short, wilderness ecological systems should be as free as possible from the effects of modern civilization. Management must foster a natural distribution of native wildlife, fish, and plants by ensuring that ecosystems and ecological processes continue to function naturally. This quality may be affected by intended or unintended effects of human activities on the ecological systems inside the wilderness. An undeveloped wilderness has minimal evidence of modern human occupation or modification. This quality is impaired by the presence of structures or installations and by the use of motor vehicles, motorized equipment, or mechanical transport that increases people's ability to occupy or modify the environment. Wilderness provides opportunities for people to experience natural sights and sounds; remote, isolated, unfrequented, or secluded places (solitude); and freedom, risk, and the physical and emotional challenges of self-discovery and self-reliance (primitive and unconfined recreation). This quality is impaired by settings that reduce these opportunities, such as visitor encounters, signs of modern civilization, recreation facilities, and management restrictions on visitor behavior. Wilderness areas may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value. Although these values are not required of any wilderness, where they are present they are part of that area's wilderness character and must be protected as rigorously as any of the required qualities.

These character elements can be impacted by management decisions throughout the alternatives. Where management actions seek to maintain or enhance a natural state (e.g., augmenting native species and removing weeds), the associated character element is beneficially impacted, though the management action is itself a negative impact because it is a trammel. Generally, trammels are measured in the short term, while impacts to naturalness are measured in the long term by monitoring trends in terrestrial, aquatic, and atmospheric natural resources inside wilderness.

Where management actions are directed at addressing human behavior (e.g., managing overnight camping), undeveloped, solitude, primitive and unconfined recreation are largely affected. Lastly, actions involving surface disturbance and development can adversely impact all character elements. However, wilderness areas have legislative and regulatory protections so that any action that threatens the above wilderness values of an area would not be permitted.

Assumptions

Impacts were assessed according to the following assumptions:

- Development of a proactive management framework, including goals, objectives, and actions for resource values would generally benefit wilderness areas by maintaining or improving naturalness, though impacting untrammeled character. Otherwise, management of these resources would be compatible with the existing wilderness plans under all the alternatives.
- Uses and activities occurring outside wilderness areas could influence wilderness areas, though such influences would generally be indirect.
- All guidelines for the maintenance of the wilderness area's characteristics, as identified in this document, would be followed to the extent allowed by existing budget and available personnel.
- Newly proposed surface-disturbing activities would be subject to implementation-level NEPA analysis, including a minimum tool analysis as required for projects located within wilderness.

4.4.5.3. Qualitative Intensity Scale

A range of qualitative terms have been used to gauge the intensity of each impact from one program area on another. The analysis considers a management action's potential to cause changes to the landscape that could result in trammeling activities, maintain, reduce, or enhance other wilderness qualities of naturalness, undeveloped, outstanding opportunities for solitude, outstanding opportunities for primitive and unconfined recreation, and supplemental values. Both positive and negative impacts are considered, and, where necessary, the net impact of the two is discussed. The intensities of impacts are described using the following definitions:

- **Negligible:** There are no known impacts to wilderness character. Any change would be undetectable and immeasurable. There would be no appreciable change to the BLM's ability to protect and preserve wilderness character and implement wilderness program activities. Wilderness character would be preserved throughout the wilderness areas.
- **Minor:** Direct effects would be apparent, measurable, small, localized, and contained within the footprint of the action. Indirect effects would be undetectable. There would be a slight change to the BLM's ability to protect and preserve wilderness character and implement wilderness program activities. Wilderness character would be protected and preserved throughout the wilderness areas.
- **Moderate:** Direct effects would be readily apparent and measurable over a larger area, but still mainly within the footprint of the action. Indirect effects are apparent and measurable, but do not exceed much beyond the footprint of the action. There would be a limited change to the BLM's ability to preserve and protect wilderness character and implement wilderness program activities. Effects would occur on site and in the vicinity of the activity, but wilderness character would be maintained throughout wilderness areas.
- **Major:** Direct effects would be highly noticeable and substantial. Indirect effects would be readily apparent and measurable well beyond the footprint of the action. Complete or partial permanent alteration would occur on site, as well as affecting a larger portion of the wilderness areas. Changes in the BLM's ability to preserve and protect wilderness character and implement wilderness program activities would be severe.

- **Short-Term Effect:** The effect occurs only during or immediately after implementation of the alternative. For the purposes of this RMP, short-term effects would occur during the first five years.
- **Long-Term Effect:** The effect could occur for an extended period after implementing the alternative. The effect could last several years or more and could be beneficial or adverse. For the purposes of this RMP, long-term effects would occur beyond the first five years and perhaps over the life of the RMP.

4.4.5.4. Resources

4.4.5.4.1. Air Quality Impacts on Wilderness

4.4.5.4.1.1. Impacts Common to All Alternatives

Air quality protections would indirectly benefit ecosystems by reducing air pollution that could decrease plant vigor and make plants more susceptible to pest and disease outbreaks. This would foster a healthier ecosystem and would help to protect and preserve the natural character and scenic values of wilderness characteristics. No impacts to solitude or primitive and unconfined recreation would occur.

4.4.5.4.1.2. Alternatives 1 through 4

There are no additional impacts to wilderness.

4.4.5.4.2. Soil Resources Impacts on Wilderness

4.4.5.4.2.1. Impacts Common to All Alternatives

Management actions designed to improve or maintain soil quality, reduce wind and water erosion, conserve soils, and restore disturbed and degraded sites would improve naturalness but adversely affect untrammeled character.

4.4.5.4.2.2. Alternatives 1 through 4

There are no additional impacts to wilderness.

4.4.5.4.3. Water Resources Impacts on Wilderness

4.4.5.4.3.1. Impacts Common to All Alternatives

Management actions proposed to protect water quality would also protect natural character. Actions designed to increase BLM access to water sources for wildlife and habitat improvements impact untrammeled character and naturalness due to surface disturbances and disruption. Installations are prohibited in wilderness except as necessary to meet the minimum requirements for the administration of the area as wilderness.

4.4.5.4.3.2. Alternatives 1 through 4

There are no additional impacts to wilderness.

4.4.5.4.4. Integrated Vegetation Impacts on Wilderness

4.4.5.4.4.1. Impacts Common to All Alternatives

Integrated vegetation includes general vegetation, riparian areas, wetlands, weeds, forests, and woodlands and therefore analysis of impacts are described collectively. Management actions such as maintaining potential natural community, weed treatments, and restoration manipulate or control natural processes and impact untrammeled character. There could be a benefit to naturalness by improving wildlife habitats, vegetation, and long-term ecological health. Road restoration could decrease instances of vehicle incursions that diminish undeveloped character. Treatments for restoration could cause a temporary diminishment of solitude for recreationists. Improved habitats for riparian and wetland-dependent wildlife species may also improve opportunities for recreation such as hunting and biological and zoological sightseeing. Limiting the spread of weeds would reduce the size and intensity of wildfires that destroy native vegetation, representing additional protection for non-fire-adapted plant communities. Naturalness would be retained to the extent that native plant communities are protected from direct mortality or indirect harm due to weeds.

4.4.5.4.4.1.1. Alternative 1

Alternative 1 would not contain many of the management actions found in the other alternatives that could provide long-term benefit to naturalness. These actions could still be carried out on a case-by-case basis.

4.4.5.4.4.1.2. Alternative 2

Requiring no net unmitigated loss of vegetation communities, including riparian areas, would mitigate for loss of naturalness. Mitigation actions could improve naturalness in other locations. Requiring mitigation for all the ecosystem services, managing native plant communities for climate change, and protecting genetic integrity of vegetation may also help protect naturalness in the long term.

Fuel breaks would help reduce the changes of large-scale wildfires in ecosystems that are not fire-adapted, thereby benefitting naturalness in the long term. Construction of fuel breaks would diminish naturalness and solitude in the short term. The fuel break could also lead to OHV use of the cleared area, further impacting solitude and primitive and unconfined recreation. Prescribed fires would in the long-term improve the vegetative diversity and age class that contributes to naturalness. However, prescribed fires are usually conducted in the cooler months of the year, increasing the likelihood of temporarily impacting solitude.

Monitoring of vegetation change and cooperating in vegetation research could contribute to the scientific supplemental values of the areas through increased understanding of natural processes at the landscape level.

4.4.5.4.4.1.3. Alternative 3

Impacts from Alternative 3 would be similar to Alternative 2 except that weed management plans would be required for projects with a disturbance footprint of five acres or more. This will cover fewer projects than Alternative 2, and more projects could spread weeds into neighboring wilderness areas.

4.4.5.4.4.1.4. Alternative 4

Impacts from Alternative 4 would be similar to those under Alternative 2. Weed management plans would be required only for projects with a disturbance of 10 acres or more. This could lead to the increased spread of weeds onto adjacent wilderness. Also, Alternative 4 does not have language requiring no net unmitigated loss of vegetation communities, and therefore naturalness could decrease.

4.4.5.4.5. Fish and Wildlife Impacts on Wilderness

4.4.5.4.5.1. Impacts Common to All Alternatives

The wildlife objectives stress the importance of natural ecological processes and functions in relation to land uses and discretionary actions. Trammeling and impacts to naturalness would result from implementing management actions to restore or improve wildlife habitats. Actions would also cause temporary disruption to solitude or primitive and unconfined recreation during project construction, installation, and maintenance. Management of ROWs and ROW corridors for siting and construction of communication towers could indirectly protect opportunities for solitude inside adjacent wilderness by limiting the sights, sounds, and evidence of modern civilization.

4.4.5.4.5.2. Alternative 1

A quarter-mile avoidance buffer around artificial and natural waters would help protect naturalness and solitude by reducing surface-disturbing activities, sights, sounds, and evidence of others.

4.4.5.4.5.3. Alternative 2

Avoiding authorized actions within one half mile of natural waters and within one quarter mile of artificial waters would help protect naturalness and solitude by reducing surface-disturbing activities, sights, sounds, and evidence of others. Actions to limit and reduce fragmentation may directly or indirectly impact naturalness, specifically population viability. Inventorying and monitoring wildlife populations and their habitats could contribute to the scientific supplemental values of the areas.

4.4.5.4.5.4. Alternative 3

Impacts under Alternative 3 would be similar to Alternative 2 except that there would be a smaller avoidance buffer around natural water sources in Alternative 3. In addition, language for artificial water sources would only be to minimize impacts and not full avoidance. The reduced buffer for

natural waters and softer language for artificial waters could lead to some additional impacts to naturalness and solitude due to surface-disturbing activities, sights, sounds, and evidence of others.

4.4.5.4.5.5. Alternative 4

Impacts under Alternative 4 would be similar to Alternative 2 except that the avoidance buffer around natural water sources would be one quarter mile and there would be no buffer around artificial waters. The reduced buffer around natural waters could lead to additional impacts to naturalness and solitude due to surface-disturbing activities, sights, sounds, and evidence of others.

4.4.5.4.6. Special Status Species Impacts on Wilderness

4.4.5.4.6.1. Impacts Common to All Alternatives

Maintaining or improving habitats for special status species would also impact wilderness characteristics. Managing for diverse native vegetation, wildlife, and a variety of habitats would impact naturalness, primitive and unconfined recreation (e.g. opportunities for hunting, trapping, and wildlife viewing), and any identified supplemental values (e.g. biological). However, there could be negative impacts on solitude and primitive and unconfined recreation resulting from project implementation, installations, and maintenance actions.

4.4.5.4.6.2. Alternative 1

Alternative 1 would not contain some of the actions proposed under the other alternatives that could also positively or negatively impact wilderness characteristics. These actions could still be carried out on a case-by-case basis.

4.4.5.4.6.3. Alternative 2

Managing and protecting important genetic and demographic corridors for listed and sensitive species would impact naturalness, primitive recreation, and supplemental values (e.g. ecological). Mitigation performed as part of no net unmitigated loss of sensitive species habitats would likely benefit those same wilderness values.

4.4.5.4.6.4. Alternatives 3 and 4

Impacts under Alternatives 3 and 4 would be similar to Alternative 2.

4.4.5.4.7. Wild Horse and Burro Impacts on Wilderness

4.4.5.4.7.1. Impacts Common to All Alternatives

Wild horse and burro management actions could affect wilderness characteristics to varying degrees. Large herbivores — horses in particular — consume relatively large amounts of vegetation and water and impact riparian areas, all of which contribute to decreases in naturalness. Installation of facilities and animal gathers would impact undeveloped character, solitude, and primitive and unconfined recreation. However, gathers would help prevent excess impacts from overpopulation of the species and ensure preservation of naturalness.

4.4.5.4.7.2. Alternative 1

Under Alternative 1, horses and burros would be managed for zero animals in specific areas. Overall, this would help preserve wilderness characteristics. Not recommending any new horse or burro ranges would limit impacts to wilderness character to only current ranges and not expand impacts to new areas.

4.4.5.4.7.3. Alternative 2

Similar to Alternative 1, there would be specific areas where horses and burros would be managed for zero animals. The use of fertility control to manage horse and burro populations may help reduce impacts from overpopulation and impacts from frequent gathers. The possibility of new horse or burro ranges could spread impacts to areas currently not receiving impacts from horses or burros. Excluding ROWs of five acres or greater and excluding surface-disturbing activities that adversely impact key horse and burro habitat components within herd management areas (HMAs) would indirectly benefit naturalness and solitude within adjacent wilderness.

4.4.5.4.7.4. Alternative 3

Impacts under Alternative 3 would be similar to Alternative 2 except that ROWs and other surface-disturbing activities would be avoided, not excluded.

4.4.5.4.7.5. Alternative 4

Impacts under Alternative 3 from language about the use of fertility control and potential new ranges would be the same as Alternative 2. Alternative 4 would not contain language to manage certain areas to zero AML. This could lead to impacts from horses or burros as they move in from surrounding areas and are not gathered. ROWs of five acres or more may be allowed, and this could further impact adjacent wilderness areas.

4.4.5.4.8. Cave and Karst Management Impacts on Wilderness

4.4.5.4.8.1. Impacts Common to All Alternatives

Cave and karst management actions would result in negligible impacts to wilderness characteristics depending on the extent of changes to the undeveloped character, opportunities for solitude, and primitive and unconfined recreation. Impacts would occur to varying degrees as a result of management decisions regarding recreation-related developments, use restrictions, and requiring permits.

4.4.5.4.8.2. Alternative 1

ROW avoidance areas for all significant cave resources and newly discovered caves would tend to indirectly benefit naturalness and solitude within adjacent wilderness areas.

4.4.5.4.8.3. Alternative 2

Impacts would be similar to Alternative 1 except that ROW avoidance areas within one half mile of significant caves may provide slightly less indirect protection of naturalness and solitude than Alternative 1.

4.4.5.4.8.4. Alternative 3

Impacts would be similar to Alternative 2 except that ROW avoidance areas within one quarter mile of significant caves may provide slightly less protection of naturalness and solitude than Alternative 2.

4.4.5.4.8.5. Alternative 4

Impacts would be similar to Alternative 2 except that allowing ROWs near caves sites would provide less protection for naturalness and solitude than Alternative 2.

4.4.5.4.9. Wildland Fire Management Impacts on Wilderness

4.4.5.4.9.1. Impacts Common to All Alternatives

Fire (wild and prescribed) and fire suppression affect wilderness characteristics in a variety of ways. Where the ecosystem is fire adapted, wildland fire would be allowed to function in its natural ecological role, mirroring historical fire return interval and severity. Management actions would result in long-term modification of the current condition to one that would be more representative of the native vegetation diversity. On the other hand, fire can also result in the invasion of non-native plant species and conversion of the landscape to a monoculture, thereby reducing naturalness. Where vegetation conditions and fuel loading within these lands are not in a historically natural condition, fire would still be considered a natural but managed (trammeled) component within these areas. While fire suppression is a trammel, action would prevent catastrophic destruction of vegetation and may preserve naturalness over the long term. Minimum impact suppression tactics would minimize unanticipated effects on wilderness characteristics during fire suppression activities.

Fire line construction is a surface-disturbing activity that impacts naturalness, and the use of motor vehicles and motorized equipment creates noise that detracts from solitude and undeveloped character. Primitive and unconfined recreation may be restricted (e.g., access) or impaired (e.g., visibility) during fire events. However, these impacts on the quality of visitor experience would be limited to the fire area and duration and likely would not affect overall use and wilderness characteristics outside of the fire area. Solitude is positively influenced by vegetation in that it can provide screening. Depending on the vegetation community in which the fires occur, vegetation screening could be reduced or eliminated. Use of retardant would impact naturalness, but this would fade over time.

Stabilization and rehabilitation of disturbances, implementing hazardous fuels, and noxious weed treatments are trammels that would impact natural vegetation communities over time; implementation could temporarily impact solitude and undeveloped character. Actions geared toward restoring natural ecosystems can benefit an array of supplemental values contained within lands with wilderness characteristics. Likewise, visitor experience and opportunities for

solitude and primitive unconfined recreation may be enhanced by restoration of the historical natural condition.

Prescribed fire could have similar effects; however, these could be avoided or minimized through site-specific project plans. In the long-term, prescribed fires may benefit naturalness by reducing catastrophic wildland fires.

4.4.5.4.9.2. Alternative 1

There would be no management actions to address emergency stabilization and rehabilitation (ESR) activities (trammeling) involving erosion control or reseeding. In the long-term, this may result in the persistence of surface disturbances, conversion of the landscape to a monoculture of grasses, and reduced vegetative screening. No hazardous fuels and weed management actions involving noxious or invasive species treatments would occur. Short-term impacts to trammeling and solitude from these management actions would not occur, but in the long-term, the landscape may be less representative of natural plant species' composition and distribution that is associated with the natural fire regime. Not allowing fuel breaks and prescribed fire could result in a long-term detriment to wilderness characteristics by increasing the impacts created by future catastrophic wildland fires.

4.4.5.4.9.3. Alternative 2

This alternative would allow trammeling activities such as ESR, erosion control, and reseeding. Naturalness could be benefitted by reducing surface disturbances and the likeliness of conversion of the landscape to a monoculture of grasses, both of which would contribute to improving vegetative screening; however, impacts to solitude and undeveloped character could occur during implementation. Manipulations involving hazardous fuels and weed management involving noxious or invasive species treatments could in the long term benefit naturalness by creating a landscape that is more representative of native plant species' distribution and composition. In the short term, allowing treatments (mechanical, chemical, or biological) could negatively impact solitude and undeveloped character.

4.4.5.4.9.4. Alternatives 3 and 4

Impacts from Alternatives 3 and 4 are similar to those in Alternative 2.

4.4.5.4.10. Cultural Resources Impacts on Wilderness

4.4.5.4.10.1. Impacts Common to All Alternatives

Impacts to solitude, undeveloped character, and primitive and unconfined recreation could occur from excavation of cultural sites localities and from cultural sites managed for public recreational use due to increased human presence. These management actions could increase human presence and environmental modifications, and result in recreation-related facilities or restrictions. Managing cultural resources for public values such as education and to protect traditional areas could impact supplemental values of wilderness.

4.4.5.4.10.2. Alternatives 1 through 4

There are no additional impacts to wilderness.

4.4.5.4.11. Paleontological Resources Impacts on Wilderness

4.4.5.4.11.1. Impacts Common to All Alternatives

Management actions designed to mitigate adverse effects to paleontological localities and study known sites could have varying degrees of localized impacts. It is anticipated that undeveloped character, solitude, primitive and unconfined recreation, and supplemental values would likely be affected.

4.4.5.4.11.2. Alternative 1

No unique impacts were identified for Alternative 1.

4.4.5.4.11.3. Alternative 2

Developing interpretation and public access could reduce characteristics of undeveloped character, solitude, primitive and unconfined recreation, and supplemental values.

4.4.5.4.11.4. Alternative 3

Impacts from Alternative 3 are similar to Alternative 2.

4.4.5.4.11.5. Alternative 4

No unique impacts were identified for Alternative 4.

4.4.5.4.12. Visual Resource Management Impacts on Wilderness

4.4.5.4.12.1. Impacts Common to All Alternatives

There are no visual resource class designations for wilderness in Alternative 1, and thus no impacts are common to all alternatives.

4.4.5.4.12.2. Alternative 1

Current VRM designations of Class II, III, and IV would be retained, but this is inconsistent with national BLM policy because VRM Class I is assigned to areas where a decision has been made previously to maintain a natural landscape. Wilderness areas would continue to be managed to preserve wilderness character, particularly the quality of naturalness that is most affected by projects that alter visual values. Therefore any action that diminishes the appearance of a natural landscape would not be permitted.

4.4.5.4.12.3. Alternative 2

Wilderness areas would receive a VRM Class I designation consistent with national BLM policy. Management emphasizes natural ecological changes, allowing limited management activities. As VRM Class I is the most restrictive designation, few resource management activities may be allowed within wilderness, (e.g., designated hiking trails and wildlife water developments). Class I would support preservation of natural landscapes and scenic values by retaining native vegetation communities and limiting surface-disturbing activities. Any impacts would not be new.

4.4.5.4.12.4. Alternatives 3 and 4

Impacts from Alternatives 3 and 4 are identical to Alternative 2.

4.4.5.4.13. Lands with Wilderness Characteristics Impacts on Wilderness

4.4.5.4.13.1. Impacts Common to All Alternatives

There are no impacts common to all alternatives because no areas would be managed to protect and preserve wilderness characteristics outside designated wilderness and wilderness study areas (WSAs) in Alternative 1.

4.4.5.4.13.2. Alternative 1

Alternative 1 would not allocate protection of wilderness characteristics through lands with wilderness characteristics designations. Where lands with wilderness characteristics are contiguous with congressionally designated wilderness, indirect impacts to untrammeled, natural, solitude, primitive and unconfined recreation, and supplemental values may occur. Impacts to wilderness would be primarily indirect; the extent and intensity of impacts would depend on the management prescriptions for other resource values and uses. Manipulations of ecological processes occurring outside wilderness boundaries could alter natural distribution of native wildlife, fish, and plants within wilderness. Evidence of human occupation and modification such as developments, structures, installations, and the use of modern transportation and equipment would continue to occur on adjacent lands, resulting in a wilderness surrounded by a sea of development. Moreover, activities that are incompatible with wilderness preservation, such as motorized use and mechanical transport, could spill over into wilderness areas, thereby impacting solitude.

4.4.5.4.13.3. Alternative 2

Alternative 2 would designate the greatest number of lands with wilderness characteristics contiguous with designated wilderness and contains the most restrictive management prescriptions. Baseline wilderness characteristics would be protected and preserved by excluding or limiting activities that could impact characteristics. This alternative provides the most indirect protection to designated wilderness by limiting surface disturbing and disruptive activities. Lands with wilderness characteristics prescriptions include limiting motorized and mechanized travel to existing designated routes, excluding ROWs, and NSO for oil and gas. No new and/or additional designated routes would be permitted under this alternative. Any permitted activities would be limited to those that preserve the natural and undeveloped character. Structures and facilities

would impact relatively small, localized areas however it would continue to appear affected primarily by the forces of nature.

4.4.5.4.13.4. Alternative 3

Impacts from Alternative 3 would be similar to Alternative 2 except that fewer areas with wilderness characteristics would be designated as lands with wilderness characteristics. Wilderness areas contiguous with lands with wilderness characteristics would receive some indirect protection of wilderness character, except lands with wilderness characteristics protections would be slightly less restrictive than in Alternative 2. Motorized and mechanized travel could be allowed, although use would be limited to designated trails. Where no lands with wilderness characteristics are designated, impacts would be similar to those described in Alternative 1.

4.4.5.4.13.5. Alternative 4

Impacts from Alternative 4 would be similar to Alternative 3 except that fewer areas with wilderness characteristics would be designated as lands with wilderness characteristics.

4.4.5.5. Resource Uses

4.4.5.5.1. Forestry and Woodland Products Impacts on Wilderness

4.4.5.5.1.1. Impacts Common to All Alternatives

Maintaining woodlands and conifer forests for all aged stands would benefit wilderness values such as naturalness (i.e., integrity of native plant communities), solitude (i.e., vegetative screening), and primitive recreation (e.g., nature study of these plant communities).

4.4.5.5.1.2. Alternatives 1 through 4

There are no additional impacts to wilderness.

4.4.5.5.2. Livestock Grazing Impacts on Wilderness

4.4.5.5.2.1. Impacts Common to All Alternatives

There are no impacts common to all alternatives because allotments which overlap designated wilderness would be left open for grazing under Alternative 1 and Alternative 4.

4.4.5.5.2.2. Alternative 1

Alternative 1 would leave the most allotments open for grazing compared to the other alternatives. Many of these allotments are currently inactive and had their previous grazing privileges bought out as part of mitigation for the desert tortoise. Not permanently closing these allotments could lead to a reintroduction of grazing into wilderness areas. Managing allotments could impact many of the qualities of wilderness characteristics. Livestock grazing is a trammel that impacts naturalness through removal of native vegetation, soil compaction, and spreading weeds; range improvement construction and maintenance can impact qualities of solitude and undeveloped.

Conversely, closures of allotments could result in a long-term improvement to wilderness character.

4.4.5.5.2.3. Alternative 2

Under Alternative 2, all allotments, including the three currently active allotments, would be closed to grazing, resulting in a benefit to wilderness character.

4.4.5.5.2.4. Alternative 3

Alternative 3 would leave three administered allotments open in the planning area, none of which overlap with wilderness areas, thus resulting in a benefit to wilderness character.

4.4.5.5.2.5. Alternative 4

Alternative 4 would leave five administered allotments open in the planning area, one of which overlaps the Mt. Charleston Wilderness. Impacts from Alternative 4 would be identical to those described in Alternative 1.

4.4.5.5.3. Minerals Impacts on Wilderness

4.4.5.5.3.1. Impacts Common to All Alternatives

The minerals program includes fluid leasable, solid leasable, locatable, and saleable minerals, so analysis of impacts are described collectively. Minerals actions are managed within designated wilderness to honor valid existing rights while preserving wilderness character to the greatest extent possible. All BLM wilderness areas, if not already withdrawn, are withdrawn from mineral entry on the date of wilderness designation subject to valid existing rights. No new mineral or geothermal leases, licenses, or permits under the mineral or geothermal leasing laws or sales contracts or free-use permits under the Materials Act are permitted in designated wilderness.

Regarding locatable minerals, exploration and development of mining claims, mill sites, or tunnel sites within wilderness are permitted only if the claim or site was valid as of the date of an area's designations or at the time of withdrawal if the area was withdrawn prior to designation and remains valid at the time of any subsequent validity exam. Mining claims and sites cannot be located or established within a wilderness area subsequent to the date of the area's designation.

Mining operations within wilderness must include reasonable stipulations to protect wilderness character; however, uses that are generally prohibited in wilderness may be authorized in the plan of operations for a valid claim. Impacts associated with mining actions include increased human presence, motor vehicles and equipment, mechanized transport, noise, and surface disturbance from extraction and access roads. Developing and mining valid existing rights would entail disturbing the land surface and building roads for access and extraction activities. The related sights and sounds of mining activity would degrade or eliminate opportunities for solitude and primitive recreation on affected parcels. Mitigation strategies could be identified and reclamation could recover wilderness values of an area, but changes could still be minor to moderate for many years after mining has ceased.

Indirect impacts to naturalness and solitude could occur within wilderness where mining activities are in close proximity to wilderness boundaries. Impacts from each alternative would vary based on the number of acres opened, closed, or withdrawn and based on special or standard stipulations or mitigation measures. Types of restrictions such as those on siting and operations vary by the type of mineral activity and whether it is saleable, leasable, or locatable. Generally, greater restrictions on disturbances result in fewer indirect impacts to wilderness character. For example, controlled surface use (CSU) and no surface occupancy (NSO) for fluid minerals could limit impacts to naturalness and solitude due to surface-disturbing activities, respectively.

4.4.5.5.3.2. Alternatives 1 through 4

There are no additional impacts to wilderness.

4.4.5.5.4. Recreation Impacts on Wilderness

4.4.5.5.4.1. Impacts Common to All Alternatives

Under all alternatives, areas would be designated as special recreation management areas (SRMAs), recreation management areas (RMZs), or extensive recreation management areas (ERMAs). Designating an area as either a SRMA or RMZ could lead to increased recreational development, recreation restrictions, and visitor use, thereby decreasing naturalness, solitude, and primitive and unconfined recreation. A SRMA and RMZ designation, though, could involve increased management oversight and planning efforts, thereby helping reduce impacts to wilderness values by careful siting of recreational developments and managing access points and recreation use. Areas allocated as ERMAs and all other public lands would be managed to provide unstructured recreational opportunities with few restrictions and minimal management oversight and therefore a diminishment of wilderness character is more likely to occur.

Special recreation permits would continue to be authorized and may include commercial services in wilderness. Short-term degradation of wilderness characteristics could result, mainly to solitude. Most current forms of recreation pursuits, with the exception of target shooting, travel management, and its associated OHV uses, would have negligible impacts on wilderness characteristics. Hunting, hiking, sightseeing, backpacking, horseback riding, trapping, and target shooting would have negligible impacts on wilderness characteristics. Direct and indirect impacts to solitude can occur from high concentrations of recreation users (e.g., large group sizes and/or frequent group encounters) within wilderness and motorized and mechanized use occurring adjacent to wilderness. Closing or limiting motor vehicle or mechanized transport to designated routes throughout the planning area would benefit wilderness characteristics by limiting the likelihood for incursions and disruptions to solitude and primitive recreation.

Providing signs for visitor information, regulations, or interpretation could occur nearby and are generally not allowed within wilderness. Signs could indirectly benefit undeveloped characteristics, solitude, and primitive and unconfined recreation by directing incompatible uses to other appropriate locations. Additionally, information and interpretation can be an effective tool to indirectly manage visitor behavior rather than more direct and invasive methods (e.g., regulations, limits) that negatively affect primitive and unconfined recreation.

4.4.5.5.4.2. Alternative 1

Recreation will be managed to concentrate the majority of its recreation program effort within SRMAs while the remaining lands would be managed as an ERMA to emphasize dispersed and diverse recreation opportunities. Areas outside SRMAs would continue to be managed as an ERMA and would not have facilities or visitation standards established to conserve wilderness. Recreation use would continue to be generally unmanaged, except in a few SRMAs. Commercial and casual motorized and mechanized use would continue to increase, likely creating a greater amount of indirect negative impacts to wilderness character. Overall, long-term loss, impairment, or diminishment of wilderness characteristics due to recreation management would occur in localized areas. This alternative would contribute minimally to the indirect protection of wilderness character.

4.4.5.5.4.3. Alternative 2

Recreation would be managed within SRMAs and ERMAs according to the designations, acreages, and prescriptions described in the Recreation section of Chapter 2 (p. 104). Generally, there would be more acres designated as SRMAs as compared to Alternative 1. This alternative would include the most areas of developed and intensively managed recreation and provide more indirect protection of wilderness character. Managing general recreation use would have various impacts on wilderness characteristics depending on the type of use, recreation-related developments, access points, management restrictions, and potential for surface disturbance.

4.4.5.5.4.4. Alternative 3

Recreation would be managed within SRMAs and ERMAs according to the designations, acreages, and prescriptions described in the Recreation section of Chapter 2 (p. 104). Impacts are similar to Alternative 2 except that Alternative 3 would designate slightly fewer acres as ERMAs.

4.4.5.5.4.5. Alternative 4

Recreation would be managed within SRMAs and ERMAs according to the designations, acreages, and prescriptions described in the Recreation section of Chapter 2 (p. 104). Generally, Alternative 4 provides the least amount of acres designated as SRMAs and ERMAs compared to the other alternatives. The majority of the planning area would be managed as public lands not designated recreation management areas. This alternative has the least number of developed recreation management actions. Some areas would still include developed and intensively managed recreation, but most of the planning area would be managed for more a more unstructured type of recreational experience.

4.4.5.5.5. Travel and Transportation Impacts on Wilderness

4.4.5.5.5.1. Impacts Common to All Alternatives

Wilderness legislation has closed all areas to motorized and mechanized travel, but, in general, management of roads and trails contributes to preservation of visitors' experiences in wilderness. Vehicle travel could cause impacts to wilderness values through increased human presence, surface disturbance, and noise, particularly where wilderness is adjacent to areas of heavy

motorized use and where vehicle routes are prolific. Selective closure of vehicle routes and/or re-routing would protect wilderness values. Designating areas adjacent to wilderness as closed can indirectly benefit wilderness character by eliminating impacts. A travel designation of limited would provide some protection for wilderness character by limiting the number of access points to wilderness and travel routes near the boundary. Opportunities for solitude and primitive recreation can be retained and enhanced while decreasing surface disturbances from incursions. Route evaluation and designation considers conflicts to resources in the network and design and is structured to minimize those impacts. Limiting travel and transportation to designated routes would help reduce negative impacts to wilderness character, and those impacts would vary depending on the type of route and reduction in the number and miles of routes.

4.4.5.5.5.2. Alternative 1

Management classifications of open, closed, and limited to designated roads and trails would occur with acreages and prescriptions described in the Travel and Transportation section in Chapter 2 (p. 149). Lack of OHV management use along with management allocation limiting travel to existing roads, trails, and washes has led to resource damage. This use has resulted in a proliferation of routes and off-road use that removes vegetation, increases the spread of weeds, disturbs soils, and increases intrusions. Continuing this management scheme could expand the size and magnitude of the damaged area, leading to moderate or major effects.

4.4.5.5.5.3. Alternative 2

Management classifications of open, closed, and limited to designated roads and trails would occur with acreages and prescriptions described in the Travel and Transportation section in Chapter 2 (p. 149). Generally, there would be less than half as many acres designated as open than in Alternative 1.

4.4.5.5.5.4. Alternative 3

Management classifications of open, closed, and limited to designated roads and trails would occur with acreages and prescriptions described in the Travel and Transportation section in Chapter 2 (p. 149). Generally, there would be more acreage designated as open than Alternative 2 but less than Alternative 1. More acreage would be designated as open than Alternative 2 but less than Alternative 1. With respect to effects on wilderness character, Alternative 3 would be similar to Alternative 2.

4.4.5.5.5.5. Alternative 4

Impacts under Alternative 4 would be similar to Alternative 3.

4.4.5.5.6. Lands and Realty Impacts on Wilderness

4.4.5.5.6.1. Impacts Common to All Alternatives

The lands and realty program includes land tenure (disposals, acquisitions, exchanges, withdrawals, and segregations), land-use authorizations (rights-of-way, permits, leases, and easements), renewable energy, and utility corridors. Overall, lands actions tend to lead to development that creates surface disturbance that may lead to indirect loss or degradation of

wilderness character. The impacts would affect undeveloped character, naturalness, solitude, and primitive, unconfined recreation. Impacts to wilderness character would depend on the size, location of the action in relation to the wilderness, disposition or type and level of landscape modification resulting from the lands action, and conduciveness of the terrain for development.

Naturalness and scenic value are indirectly affected by surface disturbances, human uses, and developments that manipulate natural processes. Additionally, development can cause an increase in potential for non-native invasive species to become established in wilderness. Opportunities for solitude would be impacted from the sights and sounds of other people and human activities on adjacent lands and increased visitation within wilderness. Development commonly includes the need for access roads, which increases the likelihood of unauthorized OHV use, route proliferation, and vehicle incursions that negatively impact primitive recreation. Projects next to designated wilderness could result in minor to major impacts on wilderness character.

4.4.5.5.6.2. Alternative 1

Impacts from Alternative 1 could result from developments such as utility corridors adjacent to Arrow Canyon Wilderness, Muddy Mountains Wilderness, Ireteba Peaks Wilderness, and South McCullough Wilderness. Parcels identified for disposal near the northern portion of Arrow Canyon Wilderness could result in impacts to wilderness character. Areas identified as avoidance/variance for solar energy could impact adjacent wilderness, specifically Arrow Canyon Wilderness, Muddy Mountains Wilderness, Eldorado Wilderness, Ireteba Peaks Wilderness, Mt. Charleston Wilderness, South McCullough Wilderness, and Wee Thump Joshua Tree Wilderness. Open areas for wind energy development are adjacent to and have the potential to impact Arrow Canyon Wilderness, Eldorado Wilderness, Ireteba Peaks Wilderness, Meadow Valley Range Wilderness, Mt. Charleston Wilderness, Muddy Mountains Wilderness, South McCullough Wilderness, Spirit Mountain Wilderness, and Wee Thump Joshua Tree Wilderness.

4.4.5.5.6.3. Alternative 2

Generally, fewer acres would be subject to lands and realty actions in Alternative 2 than in Alternative 1, and thus this alternative would have fewer impacts to wilderness character. Impacts from utility corridors would be similar to Alternative 1 except that Alternative 2 proposes one less corridor near the Muddy Mountains Wilderness. Areas identified as variance/avoidance for solar energy could impact Arrow Canyon Wilderness, Muddy Mountains Wilderness, and Wee Thump Joshua Tree Wilderness. Areas identified as open to wind would impact Eldorado Wilderness, Ireteba Peaks Wilderness, South McCullough Wilderness, and Wee Thump Joshua Tree Wilderness. Areas identified as variance for wind could impact adjacent areas including Eldorado Wilderness, Ireteba Peaks Wilderness, and Mt. Charleston Wilderness.

4.4.5.5.6.4. Alternative 3

Impacts to wilderness character from lands and realty actions identified in Alternative 3 are similar to those in Alternative 2. Impacts from utility corridors and wind energy development would be similar to Alternative 1. Impacts from solar energy development would be similar to Alternative 2 except that no impacts to the Muddy Mountains Wilderness would occur.

4.4.5.5.6.5. Alternative 4

Lands and realty actions identified in Alternative 4 would result in greater impacts to wilderness character than in Alternative 3. Impacts from designated utility corridors are similar to those in Alternative 3. Proposed solar energy areas adjacent to Arrow Canyon Wilderness and Muddy Mountains Wilderness would impact wilderness character. Areas identified as avoidance/variance for solar could impact Eldorado Wilderness, Ireteba Peaks Wilderness, Mt. Charleston Wilderness, Muddy Mountains Wilderness, and Wee Thump Joshua Tree Wilderness. Areas identified as open to wind could impact Arrow Canyon Wilderness, Eldorado Wilderness, Ireteba Peaks Wilderness, Muddy Mountains Wilderness, South McCullough Wilderness, and Wee Thump Joshua Tree Wilderness. Moreover, wind avoidance areas could result in impacts to Eldorado Wilderness, Ireteba Peaks Wilderness, and Mt. Charleston Wilderness.

4.4.5.6. Special Designations

4.4.5.6.1. Areas of Critical Environmental Concern Impacts on Wilderness

4.4.5.6.1.1. Impacts Common to All Alternatives

Generally, special management areas such as ACECs result in protection of ecological processes, undeveloped character, solitude, and primitive recreation. In particular, ACEC management decisions adjacent to wilderness can contribute to preservation of wilderness character by limiting or excluding surface disturbances and motorized and mechanized use on those lands. Furthermore, ACECs protect relevance and importance (R&I) values that correspond to the supplemental values of wilderness, specifically ecological, geological, historical, and scenic. All these restrictions would help protect wilderness character to various degrees. The main difference between the alternatives is the number and size of ACECs proposed for designation and thus the number of acres of wilderness values potentially protected.

4.4.5.6.1.2. Alternative 1

Alternative 1 contains ACECs that overlay wilderness areas to varying degrees. ACECs designated to protect R&I values include would impact Arrow Canyon Wilderness, Ireteba Peaks Wilderness, Jumbo Springs Wilderness, Lime Canyon Wilderness Meadow Valley Range Wilderness, Mormon Mountains Wilderness, Muddy Mountains Wilderness, South McCullough Wilderness, and Wee Thump Joshua Tree Wilderness.

4.4.5.6.1.3. Alternative 2

Alternative 2 would designate the most ACECs and have the most restrictive ACEC management prescriptions and thus provides the greatest contribution toward preservation of wilderness character. Additional ACEC designations would further benefit Muddy Mountains Wilderness and Spirit Mountain Wilderness.

4.4.5.6.1.4. Alternative 3

Impacts from Alternative 3 are similar to those in Alternative 2.

4.4.5.6.1.5. Alternative 4

Alternative 4 is similar to Alternative 1 regarding the number and approximate acreage designated to protect R&I values through ACEC designations, but prescriptions would be more restrictive in Alternative 4. Fewer acres would be designated as an ACEC around Mormon Mountains Wilderness, therefore the wilderness would be afforded slightly less protection.

4.4.5.6.2. National Trails Impacts on Wilderness

4.4.5.6.2.1. Impacts Common to All Alternatives

See Cultural Resources for impacts to wilderness.

4.4.5.6.3. Wild and Scenic Rivers Impacts on Wilderness

4.4.5.6.3.1. Impacts Common to All Alternatives

Because Alternative 4 does not contain any river segments determined to be suitable for wild and scenic river (WSR) designation, there would be no impacts common to all alternatives.

4.4.5.6.3.2. Alternative 1

Continuing to manage the Meadow Valley Wash as eligible for WSR designation would provide some protection to wilderness characteristics of the adjacent Meadow Valley Range Wilderness and Mormon Mountains Wilderness.

4.4.5.6.3.3. Alternative 2

Under Alternative 2, Meadow Valley Wash would be determined suitable for WSR designation. This would provide additional protection to wilderness characteristics of the adjacent Meadow Valley Range Wilderness and Mormon Mountains Wilderness.

4.4.5.6.3.4. Alternative 3

Impacts from Alternative 3 are identical to Alternative 2.

4.4.5.6.3.5. Alternative 4

Under Alternative 4, no river segments would be determined to be suitable for WSR designation. Thus Meadow Valley Range Wilderness and Mormon Mountains Wilderness would not receive the added benefit of a WSR suitability determination.

4.4.5.6.4. Wilderness Impacts on Wilderness

4.4.5.6.4.1. Impacts Common to All Alternatives

Wilderness areas would be managed to preserve wilderness character by excluding or limiting activities that may impact those values.

4.4.5.6.4.2. Alternative 1

Alternative 1 would not contain any of the management prescriptions related to facilities, access points, and adaptive management that could indirectly benefit wilderness character. These actions could still occur on a case-by-case basis. Wilderness areas would not benefit from the management prescription to mitigate for the benchmark quality of wilderness character.

4.4.5.6.4.3. Alternative 2

Alternative 2 affords the greatest protection for wilderness areas through management of facilities, access points, and no net unmitigated loss of wilderness values.

4.4.5.6.4.4. Alternative 3

Impacts from Alternative 3 are identical to those in Alternative 2.

4.4.5.6.4.5. Alternative 4

This alternative is similar to Alternative 3 except that mitigation would occur on a case-by-case basis in Alternative 4.

4.4.5.6.5. Wilderness Study Areas Impacts on Wilderness

4.4.5.6.5.1. Impacts Common to All Alternatives

Management actions for wilderness study areas do not impact designated wilderness, so no further analysis is required.

4.4.5.6.5.2. Alternatives 1 through 4

There are no additional impacts to wilderness.

4.4.5.7. Cumulative Impacts on Wilderness

4.4.5.7.1. Past and Present Actions/Impacts

The cumulative impacts analysis area includes wilderness and certain lands surrounding such areas as deemed necessary to satisfactorily assess impacts on the resource. Past, present, and reasonably foreseeable actions have the potential to cause cumulative impacts on wilderness characteristics.

Past and present impacts to wilderness would be similar to those discussed under the specific program that manages those resources. Wilderness values have benefitted from management direction under the 1998 RMP, which limits ground-disturbing activities and protects opportunities for solitude or primitive recreation. Beneficial actions such as habitat restoration, route designations for motor vehicles and mechanical transport, vehicle barriers, and removal of range developments have occurred and improved wilderness values.

4.4.5.7.2. Reasonable Foreseeable Actions

In the future, wilderness would be primarily affected by urban expansion and population growth, which could increase recreational visitation, OHV use and non-motorized recreation, and lands actions. Wilderness will continue to be managed to preserve and improve wilderness character.

4.4.5.7.3. Cumulative Impact

4.4.5.7.3.1. Impacts Common to All Alternatives

Development actions within the planning area could produce long-term cumulative impacts on wilderness. Potential impacts of the alternatives on wilderness character are based on the potential management decisions that result in development, particularly in close proximity to wilderness areas. Impacts would continue to result from resource uses that tend to create surface disturbances such as minerals, lands and realty, renewable energy, and recreation. These resource uses could potentially have long-term adverse impacts to wilderness character within the planning area.

4.4.5.7.3.2. Alternatives 1 through 4

There are no additional impacts to wilderness.

4.4.6. Wilderness Study Areas

4.4.6.1. Summary

This analysis identified effects of the management directions on the BLM's ability to protect the area's identified wilderness characteristics. Wilderness study areas (WSAs) are managed so as not to impair the suitability of such areas for preservation as wilderness until Congress acts on a WSA by either designating the area as wilderness or releasing it for other purposes. WSAs are those areas identified by the wilderness review required by Section 603 of FLPMA and currently under review by Congress (this includes instant study areas). This analysis does not apply to areas designated by Congress as wilderness or to other lands that may have wilderness characteristics.

4.4.6.2. Methods of Analysis

Assumptions

The analysis focuses on protecting WSAs from actions that would diminish wilderness character while the areas are under congressional review. Within the planning area, direct and indirect impacts will be assessed on areas that include the WSAs and lands immediately adjacent. At any time, Congress may either designate or release WSAs for other purposes. In those instances, and depending on how Congress acts, lands would be managed according to different laws, regulations, and management policies. Since it is not possible to predict the ultimate disposition of WSAs, this analysis does not assess impacts to wilderness character from change in study status.

To the extent practical, spatial data were used to compare the proposed management of each alternative to existing conditions. In absence of quantitative data, potential impacts from each alternative are based on Interdisciplinary Team knowledge of the resources and the planning area and on information gathered from the public during the planning process. Impacts are sometimes described using ranges of potential impacts or in qualitative terms, if appropriate. Impacts were assessed according to the following assumptions:

- Uses and activities occurring outside WSAs could influence the BLM's ability to preserve wilderness character and maintain the nonimpairment standard, though such influences would generally be indirect.
- Due to legislative protections, impacts to WSAs do not vary greatly by alternative, and the existing conditions would likely be maintained or marginally improved through renewed management emphasis and improved planning (e.g., travel and transportation management).
- There would be an increase in the use of BLM-administered land.
- Any proposed action within a WSA would be processed in accordance with the policies stated in BLM Manual 6330 – Management of Wilderness Study Areas.
- Management of WSAs is subject to valid existing rights, the impact of which is not included in the analysis.

Indicators

The original wilderness inventory criteria of naturalness, outstanding opportunities for solitude, or a primitive and unconfined type of recreation are used as the indicators for impacts. Naturalness refers to an area as generally appearing to have been affected primarily by the forces of nature with the imprint of man's work substantially unnoticeable. It should be an area where the earth and its community of life are not impeded or hindered by man and his activities. Solitude is the

experience of being away from the sights, sounds, and evidence of other people in the area. Primitive and unconfined recreation are activities that provide dispersed, undeveloped recreation that do not require facilities, motorized equipment, or mechanized transport; and opportunities may exist through either the diversity types of recreational activities possible or the outstanding quality of one opportunity. Lastly, these areas may contain ecological, geological, or other features of scientific, educational, scenic, or historical use that do not overlap with the other wilderness elements. While these supplemental values are not required, when present, they should be protected as rigorously as the other required qualities.

These elements are beneficially impacted when they are either protected or enhanced. In contrast, the elements are adversely impacted when they lose protection or become diminished.

4.4.6.3. Qualitative Intensity Scale

A range of qualitative terms have been used to gauge the intensity of each impact from one program area on another. Both positive and negative impacts are considered and, where necessary, the net impact of the two is discussed. The intensities of impacts are described using the following definitions:

- **Negligible:** No known impacts to WSAs. Any change is undetectable and immeasurable. The suitability of such areas for wilderness designation is preserved.
- **Minor:** Direct effects are apparent, measurable, small, localized, and contained within the footprint of the action. Indirect effects are undetectable. The suitability of such areas for wilderness designation is preserved.
- **Moderate:** Direct effects are readily apparent and measurable over a larger area but are still mainly within the footprint of the action. Indirect effects are apparent and measurable but do not exceed much beyond the footprint of the action. Effects would occur on site and in the vicinity of the activity. The BLM's ability to manage WSAs so as not to impair the suitability for preservation as designated wilderness would be maintained.
- **Major:** Direct effects would be highly noticeable and substantial. Indirect effects would be readily apparent and measurable well beyond the footprint of the action. Complete or partial permanent alteration would occur on site, as well as affecting a larger portion of the WSAs. The BLM's ability to manage WSAs so as not to impair the suitability for preservation as designated wilderness would be diminished.

4.4.6.4. Resources

4.4.6.4.1. Air Quality Impacts on Wilderness Study Areas

4.4.6.4.1.1. Impacts Common to All Alternatives

Air quality protections would indirectly benefit naturalness by reducing air pollution that could decrease plant vigor and make plants more susceptible to pest and disease outbreaks. This would foster a healthier ecosystem and would help to protect and preserve the aesthetic and scenic values of WSAs. No impacts to solitude, primitive and unconfined recreation, and supplemental values would occur.

4.4.6.4.1.2. Alternatives 1 through 4

There are no additional impacts to wilderness study areas.

4.4.6.4.2. Soil Resources Impacts on Wilderness Study Areas

4.4.6.4.2.1. Impacts Common to All Alternatives

There would be a positive benefit to WSAs resulting from soil management actions. Management actions are designed to improve or maintain soil quality, reduce wind and water erosion, and conserve soils. These and restoration of disturbed and degraded sites would improve naturalness. No impacts to solitude, primitive and unconfined recreation, and supplemental values would occur.

4.4.6.4.2.2. Alternatives 1 through 4

There are no additional impacts to wilderness study areas.

4.4.6.4.3. Water Resources Impacts on Wilderness Study Areas

4.4.6.4.3.1. Impacts Common to All Alternatives

Management actions propose to protect water quality and to ensure that adequate water is available to meet management goals. Protecting water quality will also help protect aquatic species that live in the water, as well as species that drink from the water sources.

4.4.6.4.3.2. Alternatives 1 through 4

There are no additional impacts to wilderness study areas.

4.4.6.4.4. Integrated Vegetation Impacts on Wilderness Study Areas

4.4.6.4.4.1. Impacts Common to All Alternatives

Integrated vegetation includes general vegetation, riparian areas, wetlands, weeds, forests, and woodlands, therefore analysis of impacts are described collectively. Management actions such as maintaining potential natural community, weed treatments, and restoration manipulate or control natural processes and thus impact untrammeled character. There could be a benefit to naturalness by improving wildlife habitats, vegetation, and long-term ecological health. Road restoration could decrease instances of vehicle incursions that diminish natural character. Treatments for restoration could cause a temporary diminishment of solitude for recreationists. Improved habitats for riparian and wetland-dependent wildlife species may also improve opportunities for recreation such as hunting and biological and zoological sightseeing. Limiting the spread of weeds would reduce the size and intensity of wildfires that destroy native vegetation, representing additional protection for the non-fire adapted plant communities. Naturalness would be retained to the extent that native plant communities are protected from direct mortality or indirect harm due to weeds.

4.4.6.4.4.2. Alternatives 1 through 4

There are no additional impacts to wilderness study areas.

4.4.6.4.5. Fish and Wildlife Impacts on Wilderness Study Areas

4.4.6.4.5.1. Impacts Common to All Alternatives

The wildlife objectives stress the importance of natural ecological processes and functions in relation to land uses and discretionary actions. Implementing management actions to restore or improve wildlife habitat would support apparent naturalness by ensuring species health and diversity. Management of ROWs and ROW corridors for siting and construction of communication towers could indirectly protect opportunities for solitude inside adjacent WSAs by limiting the sights, sounds, and evidence of modern civilization.

4.4.6.4.5.2. Alternatives 1 through 4

There are no additional impacts to wilderness study areas.

4.4.6.4.6. Special Status Species Impacts on Wilderness Study Areas

4.4.6.4.6.1. Impacts Common to All Alternatives

Maintaining or improving habitat for special status species would also provide long-term benefits to wilderness characteristics. Managing for diverse native vegetation, wildlife, and a variety of habitats would have a positive effect on apparent naturalness, primitive and unconfined recreation (e.g. increased opportunities for hunting, trapping, and wildlife viewing), and any identified supplemental values (e.g. biological). However, there could be negative impacts on solitude and primitive and unconfined recreation resulting from project implementation, installations, and maintenance actions.

4.4.6.4.6.2. Alternatives 1 through 4

There are no additional impacts to wilderness study areas.

4.4.6.4.7. Wild Horse and Burro Impacts on Wilderness Study Areas

4.4.6.4.7.1. Impacts Common to All Alternatives

Wild horse and burro management actions could affect wilderness characteristics to varying degrees. As large herbivores, horses in particular consume relatively large amounts of vegetation and water, impact riparian areas, all of which contribute to decreases of naturalness. Gathers would help prevent excess impacts from overpopulation of the species and ensure preservation of naturalness.

4.4.6.4.7.2. Alternatives 1 through 4

There are no additional impacts to wilderness study areas.

4.4.6.4.8. Cave and Karst Management Impacts on Wilderness Study Areas

4.4.6.4.8.1. Impacts Common to All Alternatives

Cave and karst management actions would result in negligible impacts to WSAs depending on the extent of changes to naturalness, opportunities for solitude, and primitive and unconfined recreation. Impacts would occur to varying degrees as a result of management decisions regarding recreation-related developments, use restrictions, and requiring permits.

4.4.6.4.8.2. Alternatives 1 through 4

There are no additional impacts to wilderness study areas.

4.4.6.4.9. Wildland Fire Management Impacts on Wilderness Study Areas

4.4.6.4.9.1. Impacts Common to All Alternatives

Fire line construction during suppression activities negatively impacts wilderness character in several ways. Construction is a surface-disturbing activity while suppression manipulates natural processes, both of which impact naturalness. Primitive and unconfined recreation may be restricted (e.g., access) or impaired (e.g., visibility) during all naturally ignited and planned fire events. However, these impacts on the quality of visitor experience would be limited to the fire area and duration, and likely would not affect overall use and wilderness characteristics outside of the fire area. Solitude is positively influenced by vegetation in that it can provide screening. Depending on the vegetation community in which the fires occur, vegetation screening could be reduced or eliminated. Use of retardant would impact naturalness but this would fade over time. Stabilization and rehabilitation of disturbances, implementing hazardous fuels and noxious weed treatments would enhance or restore natural vegetation communities over time though activities could temporarily impact solitude. Actions geared toward restoring natural ecosystems can benefit an array of supplemental values. Likewise, visitor experience and opportunities for solitude and primitive unconfined recreation may be enhanced by restoration of the historical natural condition.

4.4.6.4.9.2. Alternatives 1 through 4

There are no additional impacts to wilderness study areas.

4.4.6.4.10. Cultural Resources Impacts on Wilderness Study Areas

4.4.6.4.10.1. Impacts Common to All Alternatives

Cultural resources and the information they convey are supplemental values and an important part of the wilderness characteristics of WSAs. Guidance prohibiting surface disturbance near some archaeological sites and protecting traditional areas would directly benefit WSAs. Activities such as excavation may be permitted if they meet the non-impairment standard.

4.4.6.4.10.2. Alternatives 1 through 4

There are no additional impacts to wilderness study areas.

4.4.6.4.11. Paleontological Resources Impacts on Wilderness Study Areas

4.4.6.4.11.1. Impacts Common to All Alternatives

Paleontological resources and the information they convey are supplemental values and an important part of the wilderness characteristics of WSAs where they are found. Management actions designed to mitigate adverse effects to paleontological localities and study known sites could have varying degrees of localized impacts to wilderness values. Impacts could include surface disturbances, reduced solitude, and loss of supplemental values due to collection and data recovery.

4.4.6.4.11.2. Alternatives 1 through 4

There are no additional impacts to wilderness study areas.

4.4.6.4.12. Visual Resource Management Impacts on Wilderness Study Areas

4.4.6.4.12.1. Impacts Common to All Alternatives

The BLM would manage all WSAs as VRM Class I, which means changes to the characteristic landscape would be very low and must not attract attention. Lands adjacent to Million Hills WSA and Virgin Mountain ISA would be designated VRM Class II. Such VRM class allocations would retain the existing character of the landscape and activities would not be visible from adjacent WSAs, resulting in negligible impacts to naturalness and solitude.

4.4.6.4.12.2. Alternative 1

Lands adjacent to Mount Stirling WSA and Resting Springs WSA would continue to be managed as VRM Class III and IV, respectively. Such VRM class allocations would allow for moderate to high changes to the characteristic landscape that would be visible from adjacent WSAs, thus resulting in minor to major impacts to naturalness and solitude.

4.4.6.4.12.3. Alternative 2

This alternative would provide the most indirect protection to naturalness and solitude of WSAs. Lands adjacent to the Mount Stirling WSA would be managed as VRM Class III and IV, while Resting Springs WSA would be contiguous with VRM Class I lands.

4.4.6.4.12.4. Alternative 3

Impacts from Alternative 3 are similar to Alternative 2 except that Resting Springs WSA would be contiguous with VRM Class II and thus would receive slightly less indirect protection of naturalness and solitude.

4.4.6.4.12.5. Alternative 4

Lands adjacent to Mount Stirling would be designated VRM Class III and IV, while Resting Springs WSA would be contiguous with VRM Class II and III. Beneficial indirect impacts to naturalness and solitude would be less than Alternative 2 but greater than Alternative 3.

4.4.6.4.13. Lands with Wilderness Characteristics Impacts on Wilderness Study Areas

4.4.6.4.13.1. Impacts Common to All Alternatives

There would be no impacts common to all alternatives for lands with wilderness characteristics because no areas would be managed to protect and preserve wilderness characteristics outside designated wilderness and WSAs in Alternative 1.

4.4.6.4.13.2. Alternative 1

Lands found to have wilderness characteristics adjacent to Resting Springs WSA would not be designated as lands with wilderness characteristics to protect wilderness characteristics. Indirect impacts to WSAs could occur depending on adjacent resource and resource use allocations.

4.4.6.4.13.3. Alternative 2

Alternative 2 would designate the Resting Springs Addition as a land with wilderness characteristics contiguous with Resting Springs WSA. The lands with wilderness characteristics designation and the associated management prescriptions are designed to protect and preserve the wilderness characteristics of naturalness, outstanding opportunities for solitude or primitive, unconfined recreation, and supplemental values by excluding or limiting activities that may impact those characteristics. Management actions include limiting surface-disturbing and disruptive activities such as limiting motorized and mechanized travel to existing designated routes, excluding ROWs, and no surface occupancy for oil and gas. No new and/or additional designated routes would be permitted under this alternative. This alternative provides the most indirect protection of wilderness character for Resting Springs WSA.

4.4.6.4.13.4. Alternatives 3 and 4

Impacts from Alternatives 3 and 4 would be similar to Alternative 1.

4.4.6.5. Resource Uses

4.4.6.5.1. Forestry and Woodland Products Impacts on Wilderness Study Areas

4.4.6.5.1.1. Impacts Common to All Alternatives

Maintaining woodlands and conifer forests for all aged stands would benefit wilderness values such as naturalness (i.e., integrity of native plant communities), solitude (i.e., vegetative screening), and primitive recreation (e.g., nature study of these plant communities).

4.4.6.5.1.2. Alternatives 1 through 4

There are no additional impacts to wilderness study areas.

4.4.6.5.2. Livestock Grazing Impacts on Wilderness Study Areas

4.4.6.5.2.1. Impacts Common to All Alternatives

There are no impacts common to all alternatives because allotments which overlap WSAs would be left open for grazing under Alternative 1 and Alternative 4.

4.4.6.5.2.2. Alternative 1

Alternative 1 would leave the most allotments open for grazing compared to the other alternatives. Many of these allotments are currently inactive and had their previous grazing privileges bought out as part of mitigation for the desert tortoise. Not permanently closing these allotments could lead to a reintroduction of grazing into WSAs. Managing allotments could impact many of the qualities of wilderness characteristics. Livestock grazing is a trammel that impacts naturalness through removal of native vegetation, soil compaction, and spreading weeds. Range improvement construction and maintenance can impact qualities of naturalness and solitude. Conversely, closures of allotments could result in a long-term improvement to wilderness character.

4.4.6.5.2.3. Alternative 2

Under Alternative 2, all allotments, including the three currently active allotments, would be closed to grazing, resulting in a benefit to wilderness character.

4.4.6.5.2.4. Alternative 3

Alternative 3 would leave three administered allotments open in the planning area, none of which overlap WSAs, thus resulting in a benefit to wilderness character.

4.4.6.5.2.5. Alternative 4

Alternative 4 would leave five administered allotments open in the planning area, one of which overlaps the Mount Stirling WSA. Impacts from Alternative 4 would be similar to those described in Alternative 1.

4.4.6.5.3. Minerals Impacts on Wilderness Study Areas

4.4.6.5.3.1. Impacts Common to All Alternatives

The minerals program includes fluid leasable, solid leasable, locatable, and saleable minerals, so the analysis of impacts is described collectively. The BLM would continue to maintain WSAs as closed to fluid leasable, solid leasable, and saleable mineral activities. WSAs have been withdrawn from locatable mineral activities. This would continue to protect the wilderness values and maintain the nonimpairment standard by which WSAs are administered. There would be no new impacts. The related sights and sounds of mining activity would indirectly diminish opportunities for solitude and primitive recreation to adjacent WSAs.

Indirect impacts from each alternative would vary based on the number of acres opened, closed, or withdrawn and based on special or standard stipulations or mitigation measures. Types of restrictions, such as those on siting and operation, vary by the type of mineral activity. For example, controlled surface use (CSU) and no surface occupancy (NSO) for fluid minerals could limit indirect impacts.

4.4.6.5.3.2. Alternative 1

Fluid mineral leasing would be allowed outside identified disposal, administrative areas, and ACECs totaling 1,909,351 acres while 866,000 acres of ACEC activities could occur subject to NSO. Solid mineral leasing would be allowed on 1,862,673 acres outside of identified areas and additional areas on released WSAs. Locatable minerals would remain open on approximately 2,135,146 acres while the remainder of the planning area would be withdrawn.

4.4.6.5.3.3. Alternative 2

Fluid minerals would be managed as open, CSU, NSO, and closed according to the acreages described in the Minerals section of Chapter 2 (p. 87). Solid mineral leasing would be managed as open or closed according to the acreages described in Chapter 2. Generally, fewer acres would be designated as open and therefore unavailable for solid mineral leasing than in Alternative 1. Additionally, locatable minerals would be managed as open or withdrawn according to acreages described in Chapter 2. Generally, fewer acres would remain open than in Alternative 1.

4.4.6.5.3.4. Alternative 3

Impacts would be similar to Alternative 2 except that in general, Alternative 3 allows for more fluid mineral leasing to occur within areas designated as open, CSU, and NSO; however fewer acres are designated as closed. Generally, more acres would be designated as open and thus available for solid mineral leasing than in Alternative 2. Additionally, more acres would be designated as open and thus available for locatable mineral development than Alternative 2.

4.4.6.5.3.5. Alternative 4

Impacts would be similar to Alternative 3 except that in general, Alternative 4 allows for more fluid mineral leasing to occur within areas designated as open, CSU, and NSO; however there would be more acres designated as closed. Generally, this alternative would designate the greatest

number of acres as open and thus available for solid mineral leasing. Impacts from locatable minerals management actions would be identical to Alternative 3.

4.4.6.5.4. Recreation Impacts on Wilderness Study Areas

4.4.6.5.4.1. Impacts Common to All Alternatives

Under all alternatives, areas would be designated as SRMAs or ERMAs. Designating an area as a SRMA could lead to increased recreational development, recreation restrictions, and visitor use, thereby decreasing naturalness, solitude, and primitive, unconfined recreation. A SRMA designation, though, could involve increased management oversight and planning efforts, thereby helping reduce impacts to wilderness values nonimpairment by careful siting of recreational developments and managing access points and recreation use. Areas allocated as ERMAs would be managed to provide unstructured recreational opportunities with few restrictions and minimal management oversight, therefore a diminishment of wilderness character is more likely to occur.

High concentrations of recreation users (e.g., large group sizes and/or frequent group encounters) in WSAs could decrease outstanding opportunities for solitude. Opportunities for solitude would more likely be negatively affected in areas where there are conflicting user groups such as OHV use and hikers in a wilderness setting. Primitive recreation is negatively affected by the presence of motor vehicles and mechanized transport. Closing or limiting motor vehicle or mechanized transport to designated routes throughout the planning area would benefit wilderness characteristics by reducing surface disturbances, disruptions caused by vehicle noise, and uses that conflict with primitive recreation. However, most of the areas with wilderness characteristics would not receive consistent concentrated recreation use.

Providing signs for visitor information, regulations, or interpretation could occur adjacent to WSAs and are generally not allowed within wilderness. Signs could indirectly benefit naturalness, solitude, and primitive unconfined recreation by directing incompatible uses to other appropriate locations. Additionally, information and interpretation can be an effective tool to indirectly manage visitor behavior rather than more direct and invasive methods (e.g., regulations, limits) that negatively affect primitive and unconfined recreation.

Seasonal closures of certain habitats that can be less resistant to surface disturbances would result in a long-term benefit to naturalness, though short-term impacts to primitive and unconfined recreation would result from the temporary loss of access.

Although recreational activities themselves are temporary in nature, the impacts of these activities can be long-lasing, particularly if they involve uses such as recreational target shooting and unauthorized OHV use.

4.4.6.5.4.2. Alternative 1

Recreation will be managed to concentrate the majority of its recreation program effort within SRMAs while the remaining lands would be managed as an ERMA to emphasize dispersed and diverse recreation opportunities. Areas outside SRMAs would continue to be managed as an ERMA and would not have facilities or visitation standards established to conserve wilderness. Recreation use would continue to be generally unmanaged, except in a few SRMAs. Commercial and casual motorized and mechanized use would continue to increase, and there would likely be a greater amount of indirect negative impacts to wilderness character. Overall, long-term loss,

impairment, or diminishment of wilderness characteristics due to recreation management would occur in localized areas. This alternative would contribute minimally to the indirect protection of wilderness character.

4.4.6.5.4.3. Alternative 2

Recreation would be managed within SRMAs and ERMAs according to the designations, acreages, and prescriptions described in the Recreation section of Chapter 2 (p. 104). Generally, there would be more acres designated as SRMAs as compared to Alternative 1. This alternative would include the most areas of developed and intensively managed recreation and provide more indirect protection of wilderness character. Managing general recreation use would have various impacts on wilderness characteristics depending on the type of use, recreation-related developments, access points, management restrictions, and potential for surface disturbance.

4.4.6.5.4.4. Alternative 3

Recreation would be managed within SRMAs and ERMAs according to the designations, acreages, and prescriptions described in the Recreation section of Chapter 2 (p. 104). Impacts are similar to Alternative 2 except that Alternative 3 would designate slightly more acres as ERMAs.

4.4.6.5.4.5. Alternative 4

Recreation would be managed within SRMAs and ERMAs according to the designations, acreages, and prescriptions described in the Recreation section of Chapter 2 (p. 104). Generally, Alternative 4 provides the least amount of acres designated as SRMAs and ERMAs. This alternative has the least number of developed recreation management actions. Some areas would still include developed and intensively managed recreation, but most of the planning area would be managed for more a unstructured type of recreational experience.

4.4.6.5.5. Travel and Transportation Impacts on Wilderness Study Areas

4.4.6.5.5.1. Impacts Common to All Alternatives

The BLM would continue to manage motorized and mechanized travel within WSAs as limited to no more than those ways (“primitive routes”) existing at the time of the wilderness inventory. In general, roads and trails negatively impact wilderness characteristics of naturalness, solitude, and primitive recreation. Roads and trails are surface disturbances that modify the natural landscape, remove vegetation, and introduce weeds. Depending on the nature and extent of the modification, these features may be considered substantially unnoticeable. Limiting roads and trails would minimize disturbance thereby protecting the natural character. The number and extent of roads and trails decreases opportunities for visitors to experience isolation and find seclusion. Impacts to solitude result from motorized vehicle noise which diminishes the ability for recreationists to escape the sounds of others. Roads and trails constitute developed recreation facilities, and when combined with the motorized vehicles and mechanical transport, contributes to diminishment of primitive recreation.

A travel designation of limited would provide some protection for wilderness character and maintaining nonimpairment by limiting the number of access points to WSAs and travel routes near the boundary. Thus opportunities for solitude and primitive recreation can be retained

and enhanced while decreasing surface disturbances from incursions. Limiting travel and transportation to designated routes would help reduce negative impacts to wilderness character, and those impacts would vary depending on the type of route and reduction in the number and miles of routes.

Most of the planning area would be managed as limited to designated routes in each alternative. A decrease in the number and extent of roads would improve the wilderness recreationists' ability to find seclusion and experience isolation and natural soundscapes. This is because poorly located roads and trails are visually intrusive, so selective closures followed by decommissioning are beneficial. Limiting routes also improves opportunities to experience the physical and emotional challenge of self-discovery and self-reliance. Decommissioning roads and trails would result in benefits to wilderness character. Apparent naturalness would be improved through naturalizing surface disturbances and restoring vegetation.

Vehicle travel could cause impacts to wilderness values through increased human presence, surface disturbance, and noise, particularly where wilderness is adjacent to areas of heavy motorized use and where vehicle routes are prolific. Selective closure of vehicle routes and/or re-routing would protect wilderness values. Designating areas adjacent to wilderness as closed can indirectly benefit wilderness character by eliminating impacts.

4.4.6.5.5.2. Alternative 1

Management classifications of open, closed, and limited to designated roads and trails would occur with acreages and prescriptions described in the Travel and Transportation section in Chapter 2 (p. 149). Million Hills WSA, Mount Stirling WSA, and adjacent lands would continue to be managed as limited to designated routes. Resting Springs WSA, Virgin Mountain ISA, and adjacent lands would continue to be managed as limited to existing roads, trails, and dry washes. Lack of OHV management use along with management allocation limiting to existing roads, trails, and washes has led to resource damage. This use has resulted in a proliferation of routes and use off-road that removes vegetation, increases the spread of weeds, disturbs soils, and increases intrusions. Continuing this could expand the size and magnitude of the damaged area.

4.4.6.5.5.3. Alternative 2

Management classifications of open, closed, and limited to designated roads and trails would occur with acreages and prescriptions described in the Travel and Transportation section in Chapter 2 (p. 149). Million Hills WSA, Mount Stirling WSA, Virgin Mountain ISA, and adjacent lands would all be managed as limited to designated. Resting Springs WSA would continue to be managed as limited to designated while adjacent lands would be closed to motorized and mechanized transportation. Alternative 2 would provide more protection of wilderness character and ability to manage to the nonimpairment standard than Alternative 1.

4.4.6.5.5.4. Alternatives 3 and 4

Management classifications of open, closed, and limited to designated roads and trails would occur with acreages and prescriptions described in the Travel and Transportation section in Chapter 2 (p. 149). Generally, there would be more acreage designated as open than Alternative 2 but less than Alternative 1. More acreage would be designated as open than Alternative 2 but less than Alternative 1. All WSAs and lands adjacent would be designated as limited to designated routes.

4.4.6.5.6. Lands and Realty Impacts on Wilderness Study Areas

4.4.6.5.6.1. Impacts Common to All Alternatives

The lands and realty program includes land tenure (disposals, acquisitions, exchanges, withdrawals, and segregations), land-use authorizations (rights-of-way, permits, leases, and easements), renewable energy, and utility corridors. Overall, lands actions tend to lead to development that creates surface disturbance, which may lead to indirect loss or degradation of wilderness character. The impacts would affect naturalness, solitude, and primitive, unconfined recreation. Impacts to wilderness character would depend on the size, location of the action in relation to the wilderness, disposition or type and level of landscape modification resulting from the lands action, and conduciveness of the terrain for development. Changes in land tenure are not anticipated to impact WSAs in any of the alternatives.

Naturalness and scenic value are indirectly affected by surface disturbances, human uses, and developments that manipulate natural processes. Additionally, development can cause an increase in potential for non-native invasive species to become established in WSAs. Opportunities for solitude would be impacted from the sights and sounds of other people and human activities on adjacent lands and increased visitation within wilderness. Development commonly includes the need for access roads, which increases the likelihood of unauthorized OHV use, route proliferation, and vehicle incursions that negatively impact primitive recreation. Projects next to WSAs could result in minor to major impacts on wilderness character and difficulty managing areas to the nonimpairment standard.

4.4.6.5.6.2. Alternative 1

Impacts from Alternative 1 could result from developments such as development within the designated utility corridor and West Wide Energy Corridor adjacent to Resting Springs WSA and Mount Stirling WSA, respectively. Areas identified as avoidance/variance for solar energy and open areas for wind energy development are adjacent to and have the potential to impact Resting Springs WSA and Mount Stirling WSA.

4.4.6.5.6.3. Alternative 2

In general, Alternative 2 provides the greatest indirect protection of wilderness character within WSAs than the other alternatives. Impacts resulting from utility corridor development would be identical to Alternative 1. Exclusion of solar energy development adjacent to Mount Stirling WSA and Resting Springs WSA could offer greater indirect protection of wilderness character. Managing wind energy development as exclusion and avoidance adjacent to Resting Springs WSA and Mount Stirling WSA, respectively, could offer greater protection of these areas.

4.4.6.5.6.4. Alternative 3

Impacts to wilderness character from lands and realty actions identified in Alternative 3 are similar to those in Alternative 2. However, in Alternative 3, only the West Wide Energy Corridor would be designated.

4.4.6.5.6.5. Alternative 4

Lands and realty actions identified in Alternative 4 would result in greater impacts to wilderness character than Alternative 3. Only the West Wide Energy Corridor would be designated, potentially impacting Mount Stirling WSA. Lands adjacent to Mount Stirling WSA and Resting Springs WSA would be designated in part as exclusion and variance/avoidance for solar development. Managing wind energy development as exclusion and avoidance adjacent to Resting Springs WSA and Mount Stirling WSA, respectively, could offer greater protection of these areas.

4.4.6.6. Special Designations

4.4.6.6.1. Areas of Critical Environmental Concern Impacts on Wilderness Study Areas

4.4.6.6.1.1. Impacts Common to All Alternatives

Generally, special management areas such as ACECs result in protection of the native biological communities, solitude, and primitive recreation by limiting or excluding surface disturbances and motorized and mechanized use, respectively. Use restrictions in ACECs could include exclusion, avoidance, closure, or limits to resource uses. Furthermore, ACECs protect relevance and importance (R&I) values that correspond to the supplemental values of WSAs, specifically ecological, geological, historical, and scenic. All these restrictions would help protect wilderness character and management to the nonimpairment standard to various degrees. ACECs designated to protect R&I values overlay Million Hills WSA and Virgin Mountain ISA.

4.4.6.6.1.2. Alternatives 1 through 4

There are no additional impacts to wilderness study areas.

4.4.6.6.2. National Trails Impacts on Wilderness Study Areas

4.4.6.6.2.1. Impacts Common to All Alternatives

See Cultural Resources for impacts to wilderness study areas.

4.4.6.6.3. Wild and Scenic Rivers Impacts on Wilderness Study Areas

4.4.6.6.3.1. Impacts Common to All Alternatives

The river segments found to be eligible for inclusion in the National Wild and Scenic Rivers System are not located within or adjacent to WSAs. No direct or indirect impacts are anticipated, and no further analysis is required.

4.4.6.6.3.2. Alternatives 1 through 4

There are no additional impacts to wilderness study areas.

4.4.6.6.4. Wilderness Impacts on Wilderness Study Areas

4.4.6.6.4.1. Impacts Common to All Alternatives

Management decisions for wilderness would not result in direct or indirect impacts to WSAs, and no further analysis is required.

4.4.6.6.4.2. Alternatives 1 through 4

There are no additional impacts to wilderness study areas.

4.4.6.6.5. Wilderness Study Areas Impacts on Wilderness Study Areas

4.4.6.6.5.1. Impacts Common to All Alternatives

The BLM would continue to manage WSAs under policy until Congress either designates these areas or releases them for other purposes. If Congress releases a WSA from consideration as wilderness, the area would be managed for multiple uses using a variety of resource management objectives. There would be no new impacts.

4.4.6.6.5.2. Alternative 1

In Alternative 1, WSAs would not benefit from the management prescription to mitigate for the benchmark quality of wilderness character.

4.4.6.6.5.3. Alternative 2

Alternative 2 affords the greatest protection for WSAs through no net unmitigated loss of wilderness values.

4.4.6.6.5.4. Alternative 3

Impacts from Alternative 3 are identical to those in Alternative 2.

4.4.6.6.5.5. Alternative 4

This alternative is similar to Alternative 3 except that mitigation would occur on a case-by-case basis in Alternative 4.

4.4.6.7. Cumulative Impacts on Wilderness Study Areas

4.4.6.7.1. Past and Present Actions/Impacts

The cumulative impacts analysis area includes WSAs and certain lands surrounding such areas that are deemed necessary to satisfactorily assess impacts on the resource. Past, present, and reasonably foreseeable actions have the potential to cause cumulative impacts on wilderness characteristics and the BLM's ability to manage to the nonimpairment standard.

Past and present impacts to WSAs would be similar to those discussed under the specific program that manages those resources. Wilderness values have benefitted from management direction within the 1998 RMP that limits ground-disturbing activities and protects opportunities for solitude or primitive recreation. Beneficial actions such as habitat restoration, route designations for motor vehicles and mechanical transport, vehicle barriers, weed treatments, and removal of range developments have occurred and improved wilderness values. Past actions that have impacted WSAs include wildland fire and suppression activities, unauthorized grazing, illegal vehicle use, and trespasses.

4.4.6.7.2. Reasonable Foreseeable Actions

In the future, WSAs would be primarily affected by urban expansion and population growth, which could increase recreational visitation, OHV use and non-motorized recreation, and lands actions. WSAs will continue to be managed to the nonimpairment standards to preserve and improve wilderness character.

4.4.6.7.3. Cumulative Impact

4.4.6.7.3.1. Impacts Common to All Alternatives

Development actions within the planning area could produce long-term cumulative impacts on WSAs. Potential impacts of the alternatives on wilderness character are based on the potential management decisions that result in development, particularly in close proximity to WSAs. Impacts would continue to result from resources uses that tend to create surface disturbances such as minerals, lands and realty, renewable energy, and recreation. These resource uses could potentially have long-term adverse impacts to WSAs within the planning area.

4.4.6.7.3.2. Alternatives 1 through 4

There are no additional impacts to wilderness study areas.

4.5. Social and Economic Conditions

4.5.1. Tribal Interests

There are two main types of impacts on Native American tribal interests: (1) damage to or loss of religiously/spiritually significant sites, and (2) actions that affect tribal treaty rights or the ability to access areas/resources for traditional/ceremonial purposes. The BLM coordinates and officially consults regularly with various Native American tribes/groups to identify and consider their concerns in BLM land-use planning and decision-making. Further consultation (as part of this planning effort and during implementation of the RMP) will continue to identify specific sites or areas.

Each alternative has measures to protect cultural resource sites, including those related to traditional uses and practices. Impacts from management decisions to cultural resource sites are discussed and analyzed in the Cultural Resources section. Physical impacts on religiously/spiritually significant sites would not be different than those noted in the cultural resources impact analysis and therefore will not be repeated here. However, religiously/spiritually significant sites differ from more typical archaeological and historical sites because of their sacredness to Native Americans and because the loss of information and damage on the site cannot be mitigated by recovery of scientific information. Federal mandates direct the BLM to protect these places and to make accommodations to allow their traditional and/or religious use by Native American people to the extent possible within the bounds of other appropriate regulations.

Therefore, in addition to the impacts on the physical sites noted in the Cultural Resources section, impacts from surface-disturbing activities could include a disruption from visual or auditory effects of such actions (e.g., drilling, earth-moving equipment, and automobile traffic). The duration of these impacts are directly related to the duration of the disruptive activity. For example, disruptions from an exploratory oil and gas well would be eliminated upon reclamation (3 to 5 years), while disruptions associated with a surface mine would extend over the life of the mine. The spiritual/religious significance and the experience of people on sites at or adjacent to these disturbances would be reduced or lost due to the intrusions. Mitigation identified in the tribal and Section 106 consultation processes would identify measures to reduce impacts to the extent possible. Through the process of mineral development, most of these impacts would be avoidable. However, development of any large surface mine in the planning area could result in the elimination of sites that could be religiously/spiritually significant.

Under all alternatives, impacts on tribal interests (not including those addressed above) are not anticipated as a result of implementing management actions for the following resources, resource uses, and designations: air quality, soil resources, special status species, fish and wildlife, paleontological resources, livestock grazing, recreation, transportation, minerals and energy, ACECs, wild and scenic rivers, wilderness, wilderness study areas, and other designations.

4.5.1.1. Impacts Common to All Alternatives

There are no impacts common to all alternatives.

4.5.1.2. Identification and Protection of Religiously/Spiritually Significant Sites

Based on the American Indian Religious Freedom Act Amendments of 1994, the BLM will "protect and preserve for American Indians their inherent right of freedom to believe, express, and

exercise the traditional religions … including but not limited to access to sites … and the freedom to worship through ceremonials and traditional rites." In addition, Executive Order 13007 directs federal land management agencies to accommodate access to and ceremonial use of Indian sacred sites by Indian religious practitioners and avoid adversely affecting the physical integrity of such sacred sites, to the extent practicable, permitted by law, and not clearly inconsistent with essential agency functions. Sacred sites would be identified on a case-by-case basis through consultation efforts with Native American tribes. As these sacred sites are identified, the BLM would protect them and provide access to them through site-specific means identified on a case-by-case basis.

For many of the resources evaluated across RMP alternatives, there is no difference from one action alternative to another. General management actions for native plant communities, protection of riparian zones, protection and conservation of wildlife, and so on, are either very similar or identical across the action alternatives under consideration. Where there are differences that could affect economic conditions, they have been noted in the alternative-specific sections.

4.5.1.2.1. Alternative 1

Management would continue with no change from the 1998 RMP. For the most part, tribal activities would continue as at the present time. The primary impact of Alternative 1 on tribal interests would be uncertainty regarding resources and issues for which management decisions over conflicting uses and interests would not be resolved.

4.5.1.2.2. Alternative 2

Alternative 2 offers the most protection for most natural resources in comparison with the other alternatives. Under this alternative, plant communities, open spaces, and other resources that may be of interest to tribal groups would be given greater consideration than under Alternatives 3 and 4.

4.5.1.2.3. Alternative 3

Under Alternative 3, a new utility corridor would be designated along the eastern boundary of the Moapa River Indian Reservation. Tribal representatives have previously expressed a desire that this corridor not be designated by BLM. Alternative 3 is considered to be the "balanced approach" alternative, and accordingly there would be more development activities allowed under this alternative in comparison with Alternative 2, but less than under Alternative 4, which is considered to be the "development" alternative.

4.5.1.2.4. Alternative 4

Alternative 4 includes the same eastern-boundary utility corridor near the Moapa River Indian Reservation as is included in Alternative 3. Overall, under Alternative 4, more acres of land would be open to development of various types than under Alternative 2 or 3, possibly leading to less availability of native plant materials and other resources for tribal use.

4.5.2. Public Health and Safety

Impacts Common to All Alternatives

The potential for impacts from hazardous material and waste would be low because hazardous waste sites do not currently exist within the planning area. Impacts would be further limited through federal regulation of hazardous materials, substances, and waste; national contingency plans; BLM policy on hazardous waste disposal; and continued coordination with federal and state partners regarding hazardous materials and waste issues (e.g., abandoned mine lands). BLM-administered public land sites contaminated with hazardous wastes would be reported, secured, and remediated according to applicable federal and state regulations and contingency plans. Such efforts would be costly and likely involve several regulatory agencies and other entities or individuals. If remediation of a large hazardous waste site was necessary, considerable funding would be required for the public health and safety program, which could result in significant impacts.

The BLM would work with the appropriate agencies and land owners to identify and close/render these sites safe and to help ensure program funds are made available. On sites where the BLM shares ownership with other entities, cooperative efforts with the state of Nevada to address remediation needs would be required. Evaluating all abandoned mine lands to determine effective methods for remediation would require substantial effort and funding over the planning period. Conducting actual remediation efforts would greatly increase costs associated with managing the public health and safety program.

4.5.2.1. Alternative 1

Under Alternative 1, current conditions would continue.

4.5.2.2. Alternative 2

Selection and implementation of Alternative 2, with the most total acres in areas designated for special management or protection, may result in a decrease in concerns related to public health and safety because motorized recreational use, industrial use, and other high-hazard uses of BLM land could be minimized in comparison with the other alternatives.

4.5.2.3. Alternative 3

Under Alternative 3, a reduction in acres managed for resource conservation might correspond with an increase in activities that lead to public health and safety concerns such as increased OHV use, increased mineral extraction activities, and other high-hazard uses of BLM lands.

4.5.2.4. Alternative 4

Alternative 4 offers the least restrictions on development-oriented and motorized uses of the three action alternatives. In addition, under Alternative 4, fewer areas are classified under special protection designations. Consequently, public health and safety concerns might be the greatest under Alternative 4. Potentially higher uses such as mining, OHV use, areas available for commercial activities, and development of various sorts could result in more accidents, more conflicts between user groups, and greater risks to visitors.

4.5.3. Social and Economic Conditions

This section describes potential social and economic impacts from management actions. Such impacts may result from specific individual management actions, but also often reflect the collective effect of a number of actions under a particular alternative. Thus, this section presents impacts from the specific management actions of various resource programs and alternatives on the local economy, population, community services, public finance, and social customs and culture. Environmental justice, a BLM critical element, is also addressed.

Potential economic impacts include changes in employment, income, business costs, and tax revenue to local, state, and federal entities. Changes in employment and income can then cause indirect socioeconomic impacts, such as changes in population, which can lead to community impacts on housing, infrastructure, and other government services. These economic impacts may then produce social impacts, such as changes in community structure as new people move in to take new jobs. Changes in management of resources under all alternatives also can have direct social impacts on residents and visitors, affecting livelihoods, lifestyles, attitudes, opinions, quality of life, and social structures.

The socioeconomic impact analysis and conclusions are based on BLM knowledge of resource uses in the project area; review of existing literature; and information provided by BLM specialists, local and state cooperating entities, and industry contacts. Impacts are quantified where possible and described in qualitative terms in the absence of reliable quantitative data. The analysis of socioeconomic impacts is intended to capture the most notable, overall socioeconomic impacts under each alternative and cannot address all potential impacts.

4.5.3.1. Economic Impact Analysis Approach and Quantitative Results

Economic impacts can be described qualitatively, and in certain cases where adequate data exists, they can be quantified. Qualitative impact analysis involves identifying the most likely direction of change in economic conditions resulting from a particular management action or a set of management actions expected to have similar effects. For example, based on the type of action, a likely increase or decrease in production values or costs for certain producers may be identified, or an increase or decrease in tourist expenditures in the planning area may be deemed likely. These determinations are based on experience in the local area or other, similar areas, and professional judgment. The results of all qualitative impact analyses are presented below for each alternative.

Quantitative economic impact analysis requires that sufficient information exists to quantify current conditions or a change in the value of production or in costs or expenditures resulting from a specific management action or set of actions. Where sufficient data exists, these changes in value or costs can then be analyzed with an economic model to estimate likely changes in employment and income. In other cases, employment and income effects cannot be quantified, but the basic data on costs and values can be presented. Because of the nature of the economic impacts of the alternatives under consideration, very few differences in quantitative values can be identified in specific dollar terms across the alternatives. Where this is the case, impacts will be described in qualitative terms only.

For each resource use, future economic activity is dependent on a variety of factors beyond the control of the BLM. For instance, the extent, pace, and timing of energy development activities depend on national and international energy demand and prices, production factors within each industry, and business strategies of operators.

4.5.3.1.1. Social Impact Analysis Approach

Along with fish, wildlife, vegetation, and the physical environment, people are an integral part of ecosystems. Livelihoods, lifestyles, attitudes, beliefs, values, social structure, culture, and population characteristics affect and are affected by management actions such as those made by the BLM. In addition, BLM lands and BLM management of these lands have emotional meanings to many people. There are a number of broad but distinct types of use of and interests in BLM land. These categories reflect the different linkages people have to the land. They are characterized by distinct sets of values, opinions, and perceptions about BLM lands and the effects of various land management policies and actions. The interest categories are:

- Local traditional use
- Motorized recreation
- Non-motorized recreation
- Outfitter-based recreation
- Livestock grazing
- Natural resource development
- Preservation

The social impact analysis in this Draft RMP/EIS uses these categories of interest to differentiate impacts of management actions under each alternative. The analysis is written in terms of impacts on individuals or groups who have interests in each specific category. This is not meant to imply that all individuals and social groups fit neatly into a single category; many specific individuals or organizations may have multiple interests and would see themselves reflected in more than one category. Nonetheless, these categories provide a useful way of organizing the discussion of social impacts. The social impact analysis is qualitative and based on knowledge of resource uses and social patterns and conditions in the socioeconomic study area.

4.5.3.2. Economic Impacts

4.5.3.2.1. Impacts Common to All Alternatives

Certain activities within the planning area are now occurring, or expected to commence, and are expected to continue in the future. There are minor differences in the alternatives with respect to the economic impacts of management decisions, which are discussed under the alternatives. The economic impacts that are expected to be common to all alternatives are as follows:

- Direct economic benefits to the socioeconomic study area would accrue from BLM-influenced activities, such as oil and gas development, livestock grazing, and recreation and tourism, although the dollar values of the benefits would vary from one alternative to another.
- Various industries in the regional economy would continue to be indirectly affected by activities within the planning area, including retail establishments and services that benefit from expenditures of labor income generated by resource uses on BLM public lands.
- Tax and other revenues derived from activities on BLM-administered lands would continue to have fiscal implications for the federal government, the state of Nevada, and communities near the planning area.
- BLM budgets will provide inputs to the local economy. Payroll for field office employees and material purchases and contracts for restoration and rehabilitation of public lands (e.g., vegetation treatments to achieve vegetation and range management goals and desired wildland fire conditions) represent inflows of money to the socioeconomic study area. The resulting

economic benefits cannot be quantified, or differences in benefits between the alternatives characterized, due to insufficient information on likely levels of specific types of expenditures.

- Economic benefits from development of locatable minerals are expected to be low. With a few exceptions, there is low potential for locatable minerals in the planning area, and management actions in all alternatives are not expected to affect development.
- Economic benefits from sand and gravel and stone development are expected to increase over the planning period. Exclusions from mineral material disposal under the alternatives will have little impact on these economic contributions because ample sites for development are available under all alternatives. Economic benefits will include jobs and income from production and sale of mineral materials, and cost savings to local governments and other entities resulting from avoidance of transport or purchase of mineral materials from more distant locations.
- Commercial timber harvesting has not occurred in recent years in the planning area and is not expected to occur under any of the alternatives.
- Population growth would continue regardless of BLM management actions, and this growth, not activities on BLM lands, would drive most of the economic changes expected to occur in the socioeconomic study area over the planning period.
- Designations of ACECs, wilderness areas, wild and scenic rivers, and other designations would produce "designation effects" that draw non-local visitors to the socioeconomic study area, resulting in monetary inflows to the area through expenditures in local establishments. The economic impacts due to these effects are encompassed within the discussions below related to specific resource uses.

Draft RMP/EIS decisions would not result in notable population or employment changes within the region. New oil and gas development and production expected under all alternatives would be expected to produce a modest number of jobs. Some differences between the alternatives in management actions with respect to recreation, transportation (OHV use), and grazing could result in variations in employment. These variations cannot be quantified given available information. However, these variations would be small in relation to the overall employment supported by these resource uses under all alternatives because substantial recreation, OHV, and grazing activity would occur under all alternatives. The variations would be negligible in relation to total employment in the socioeconomic study area. It is possible that variations in land disposals between the alternatives could produce locally significant differences in use of some current BLM lands for economic development. However, this possibility cannot be confirmed or denied given information available at the RMP decision level, and in any case it is likely that these variations would only affect where already-expected socioeconomic study area economic and population growth is absorbed, rather than leading to new population growth.

4.5.3.2.2. Impacts on Community Services

Draft RMP/EIS decisions could cause impacts on local government services in various ways. For example, changes in demand for local government services could vary with changes in population tied to management actions. As discussed above, notable population changes are not expected under any alternative.

Activities supported by Draft RMP/EIS management decisions have implications for community services. For example, increased recreational use of planning area lands (including OHV use), which is likely to occur under all alternatives due to regional and national trends, would increase the demand for local government services associated with safety, emergency services, and police protection. While local search and rescue operations use volunteers, there would be a growing

need for training, equipment, and resources. In addition, these operations must be supported by the sheriff's office in each county. Road maintenance and traffic control requirements might also increase with the increased recreational demand expected under all alternatives. However, it is unlikely that recreational use would vary between the alternatives in ways that would result in substantial variations in public safety, road maintenance, traffic control, or other community infrastructure and service needs. The types of community service impacts noted here could be mitigated through cooperation between the BLM, other local federal and state agencies, and local governments to establish efficient means for providing necessary services.

Increased government services also may be needed to support potential oil and gas development and production. This could include emergency and safety services and road maintenance. However, oil and gas development in all alternatives is very limited compared to major oil and gas producing areas in other parts of the western United States. Any community service impacts would be limited and could be mitigated through cooperation between the BLM and local governments to efficiently provide necessary services.

4.5.3.2.3. Impacts on Public Finance

Management decisions under the Draft RMP/EIS alternatives could affect various revenues collected by the federal, state, and various local governments. The Socioeconomic Baseline Report (BLM 2010) details a variety of revenue sources that are tied to or related to natural resource management on BLM lands. Any oil and gas production that might occur under all alternatives would produce some new federal and state mineral revenues, and the state would in turn provide some oil and gas revenues to the counties of origin. The state also would obtain new revenues from its oil and gas severance taxes, oil and gas conservation fees, and income taxes. Local governments would obtain new revenues from associated natural resource property taxes. Because the amount of oil production is unknown, these impacts cannot be quantified, but they are not expected to vary between the alternatives because the RFD scenario does not vary between the alternatives.

Under all alternatives, the BLM would collect revenues through right–of–way rents, recreation fees, grazing fees, mineral material fees, and other permit fees. Some of these fees would be forwarded to the federal treasury; others would be returned to state and local governments and local grazing boards or retained and used by the BLM at the local level.

All alternatives are expected to continue to generate local sales and lodging tax revenues through expenditures of visitors in local establishments. These revenues would increase through the planning period as visitation increases due to regional and national trends and management actions that increase the attractiveness of the planning area to non-local visitors.

Land tenure adjustments under the BLM lands and realty program could potentially impact local government finances. Disposal of BLM lands to private ownership may reduce payments in lieu of taxes (PILT) by the federal government to local government, but also would result in payments of property taxes to local government by the new private property owners. Land exchanges to other governments may also impact PILT payments. Acquisition of private land by the BLM would reduce property taxes paid to local government but would increase PILT payments. Differences between the alternatives and the net impact on local government finances cannot be determined without detailed information on the specific properties in question and the tax rates and other financial figures for the particular local governments.

4.5.3.2.4. Social Impacts

A number of social impacts would be common to all alternatives:

- Activities and resources available in and around the planning area would continue to be important to the quality of life of current and future residents and visitors.
- Management of BLM lands within the planning area has and will continue to have important social implications for many individuals and groups. This includes local residents that depend on development activities on BLM lands as a source of employment, income, or subsistence. Others are tied to the public lands for natural beauty, open space, recreational activities, and general ecosystem health.
- Livestock grazing tied to the planning area would continue to have social and cultural importance in the planning area, in spite of its minimal economic importance. Challenges to continuation of these traditions would continue regardless of BLM management decisions, due to broader trends in the economics of grazing, intergenerational transfer of grazing operations, and other considerations.
- Conflicts between resource users would continue under all alternatives.
- None of the alternatives would have major impacts on local residents' "Sunday drive" enjoyment of BLM lands or other casual, dispersed uses not involving OHVs or harvesting of products off BLM land (these aspects are discussed for each alternative).

4.5.3.2.5. Environmental Justice

A few non-tribal environmental justice populations exist in the socioeconomic study area, based on federal criteria and the analysis in the Socioeconomic Baseline Report (BLM 2010). The management actions under consideration, however, are not expected to have disproportionate impacts on any of the non-tribal environmental justice populations identified in the study area. On the other hand, two of the alternatives include utility corridor routes that could possibly result in lower fees paid to the Moapa River Indians and, therefore, could possibly be construed as having environmental justice implications because their selection would disproportionately affect the tribe as compared to the general population within the planning area.

4.5.3.3. Resources

4.5.3.3.1. Special Status Species Impacts on Economics

4.5.3.3.1.1. Alternative 1

Management for special status species under Alternative 1 would be designed to conserve, maintain, and/or improve habitat for a variety of aquatic and terrestrial species. Existing and currently proposed agreements and projects would be continued in efforts to improve conditions for specific plant and animal populations within the planning area. Economic impacts would be limited to those caused by actions that are already planned or under way.

4.5.3.3.1.2. Alternatives 2 and 3

Under Alternatives 2 and 3, one objective is to attain no net unmitigated loss of special status species habitat due to BLM-authorized activities. In comparison with Alternatives 1 and 4, this

management objective could potentially result in some reduction in economic activity related to development due to increased costs of permitted projects on BLM lands.

4.5.3.3.1.3. Alternative 4

Under Alternative 4, one objective is to minimize impacts to special status species habitat due to BLM-authorized activities. In comparison with Alternatives 1, 2, and 3, this management objective could potentially result in increases in economic activity related to development due to increased costs of permitted projects on BLM lands.

4.5.3.3.2. Wild Horse and Burro Impacts on Economics

4.5.3.3.2.1. Alternative 1

Under Alternative 1, current plans for wild horse and burro management would continue to be implemented, with no new wild horse and burro management areas being evaluated for designation.

4.5.3.3.2.2. Alternative 2

Of the three action alternatives currently under consideration, Alternative 2 includes the most restrictions on development activities within herd management areas (HMAs). In particular, exclusion of new surface-disturbing or disruptive activities, as well as site-type ROWs of more than 5 acres, would preclude many types of economically beneficial actions and activities within HMAs. All other wild horse and burro management actions are the same across the three action alternatives.

4.5.3.3.2.3. Alternative 3

Of the three action alternatives currently under consideration, Alternative 3 includes some restrictions on development activities within HMAs. Under this alternative, avoidance of new surface-disturbing or disruptive activities, as well as site-type ROWs of more than 5 acres, might preclude some types of economically beneficial actions and activities within HMAs. All other wild horse and burro management actions are the same across the three action alternatives.

4.5.3.3.2.4. Alternative 4

Of the three action alternatives currently under consideration, Alternative 4 includes some restrictions on development activities within HMAs. Under this alternative, avoidance of new surface-disturbing or disruptive activities during foaling season, as well as case-by-case determination on restrictions of site-type ROWs of more than 5 acres, could potentially preclude some types of economically beneficial actions and activities within HMAs. All other wild horse and burro management actions are the same across the three action alternatives.

4.5.3.3.3. Visual Resource Management Impacts on Economics

4.5.3.3.3.1. Alternative 1

Existing VRM class designations would be retained, meaning there would be no change in restrictions on development activities that might impact VRM characteristics. There are 47,562 acres of Class I, 917,200 acres of Class II, 1,622,226 acres of Class III, and 523,297 acres of Class IV under this alternative.

4.5.3.3.3.2. Alternative 2

VRM classifications would be expected to shift away from Class III, with 363,186 acres of Class I, 1,039,263 acres of Class II, 837,323 acres of Class III, and 872,967 acres of Class IV in comparison with Alternative 1. These increases could possibly result in additional restrictions on economically beneficial activities within the planning area, although the increase in Class IV acres could open up more acres to economic activities that might generate visual disturbances.

4.5.3.3.3.3. Alternative 3

VRM classifications would be expected to shift away from Class III, with 230,372 acres of Class I, 1,149,827 acres of Class II, 852,001 acres of Class III, and 879,525 acres of Class IV in comparison with Alternative 1. These changes could possibly result in additional restrictions on economically beneficial activities within the planning area, although the increase in Class IV acres could open up more acres to economic activities that might generate visual disturbances.

4.5.3.3.3.4. Alternative 4

VRM classifications would be expected to shift away from Class III, with 230,372 acres of Class I, 897,796 acres of Class II, 836,153 acres of Class III, and 1,148,444 acres of Class IV in comparison with Alternative 1. These changes could possibly result in additional restrictions on economically beneficial activities within the planning area, although the increase in Class IV acres could open up more acres to economic activities that might generate visual disturbances.

4.5.3.3.4. Lands With Wilderness Characteristics Impacts on Economics

4.5.3.3.4.1. Alternative 1

There are no additional impacts to economics.

4.5.3.3.4.2. Alternative 2

In addition, Alternative 2 includes 147,697 acres of land classified as lands with wilderness characteristics. This too could result in increased restrictions on activities that could generate economic benefits.

4.5.3.3.4.3. Alternative 3

In addition, Alternative 3 includes 36,033 acres of land classified as lands with wilderness characteristics. This too could result in somewhat increased restrictions on activities that could generate economic benefits.

4.5.3.3.4.4. Alternative 4

Alternative 4 includes 29,840 acres of land classified as lands with wilderness characteristics. This too could result in somewhat increased restrictions on activities that could generate economic benefits.

4.5.3.4. Resource Uses

4.5.3.4.1. Forest and Woodland Products Impacts on Economics

4.5.3.4.1.1. Alternative 1

Limited domestic harvesting of woodland products (e.g., cedar posts and fuelwood) is expected to continue under Alternative 1 at the same level as is currently allowed.

Alternative 1 is expected to result in social impacts as described for the following interests: Under Alternative 1, residents who value harvesting of woodland products such as fuelwood would be able to continue these harvests on a limited basis much as they do now, in most cases including where, when, and how they do so. For instance, utilization of OHVs for cross-country travel to facilitate these harvests, and for recreational purposes, could continue.

4.5.3.4.1.2. Alternative 2

Given that Alternative 2 is considered to be the “conservation” alternative, under this alternative there would be more land managed in a manner compatible with protection of and increased availability of plant materials. As with the other alternatives, since the total available forest acres is a very small portion of the total planning area, the economic significance of forest-related products is minimal. Their importance to specific people, however, should not be discounted, especially to the degree that access to wood for campfires and other incidental uses enhances the overall outdoor recreational experience for visitors from the local area, as well as for visitors from other regions of the U.S. and the world.

4.5.3.4.1.3. Alternative 3

Given that Alternative 3 is considered to be the “balanced” alternative, under this alternative there would be more land managed in a manner compatible with protection of and increased availability of plant materials in comparison with Alternatives 1 and 4, but less in comparison with Alternative 2. As with the other alternatives, since the total available forest acres is a very small portion of the total planning area, the economic significance of forest-related products is minimal. Their importance to specific people, however, should not be discounted, especially to the degree that access to wood for campfires and other incidental uses enhances the overall

outdoor recreational experience for visitors from the local area, as well as for visitors from other regions of the U.S. and the world.

4.5.3.4.1.4. Alternative 4

Given that Alternative 4 is considered to be the "development" alternative, under this alternative there would be more land managed in a manner that is not necessarily compatible with protection of and increased availability of plant materials in comparison with the other action alternatives under consideration. As with the other alternatives, since the total available forest acres is a very small portion of the total planning area, the economic significance of forest-related products is minimal. Their importance to specific people, however, should not be discounted, especially to the degree that access to wood for campfires and other incidental uses enhances the overall outdoor recreational experience for visitors from the local area, as well as for visitors from other regions of the U.S. and the world.

4.5.3.4.2. Livestock Grazing Impacts on Economics

4.5.3.4.2.1. Alternatives 1, 3, and 4

Under Alternatives 1, 3, and 4, grazing would continue to be authorized on Hidden Valley, Lower Mormon Mesa, and Flat Top Mesa allotments. Across alternatives, there would be no change in management for grazing.

4.5.3.4.2.2. Alternative 2

Under Alternative 2, grazing would be discontinued in the Hidden Valley, Lower Mormon Mesa, and Flat Top Mesa allotments. The closures would result in a loss of revenue for the permittees. Because the number of animals permitted is small (approximately 70 animals), the economic impacts to the local community would be limited.

4.5.3.4.3. Minerals Impacts on Economics

4.5.3.4.3.1. Alternative 1

Persons, companies, and social groups interested in mineral and energy development would enjoy much the same access to BLM lands for these activities as at present. Under Alternative 1, a total of 8,764,732 acres would be open to fluid and solid minerals development of various types, some with stipulations and restrictions attached. This includes acres open to development for fluid minerals but with no surface occupancy allowed.

4.5.3.4.3.2. Alternative 2

Under Alternative 2, a total of 5,650,207 acres would be open to liquid or solid minerals development, a decrease of 3,114,525 acres in comparison with Alternative 1. This decrease in acres open to development could potentially result in a decrease in economic activity related to the minerals industry. The impacts would, however, be somewhat limited if current knowledge of development potential is accurate. Should local, regional, national, or global market conditions in any of the relevant minerals markets change to a sufficient degree, currently non-viable

deposits could potentially become economically viable and, therefore, become more attractive for development.

4.5.3.4.3.3. Alternative 3

Under Alternative 3, a total of 7,318,070 acres would be open to liquid or solid minerals development, a decrease of 1,446,662 acres in comparison with Alternative 1. This decrease in acres open to minerals development could potentially result in a decrease in economic activity related to the minerals industry. The impacts would, however, be somewhat limited if current knowledge of development potential is accurate. Should local, regional, national, or global market conditions in any of the relevant minerals markets change to a sufficient degree, currently non-viable deposits could potentially become economically viable and, therefore, become more attractive for development.

4.5.3.4.3.4. Alternative 4

Under Alternative 4, a total of 7,544,294 acres would be open to liquid or solid minerals development, a decrease of 1,220,438 acres in comparison with Alternative 1. This moderate decrease in acres open to minerals development could potentially result in a comparably moderate decrease in overall economic activity related to the minerals industry, depending on the specific areas closed to development. The impacts would, however, be somewhat limited if current knowledge of development potential is accurate. Should local, regional, national, or global market conditions in any of the relevant minerals markets change to a sufficient degree, currently non-viable deposits could potentially become economically viable and, therefore, become more attractive for development.

4.5.3.4.4. Recreation Impacts on Economics

4.5.3.4.4.1. Alternative 1

Recreational activities are expected to continue to have economic value for local residents and to affect regional economic activity by drawing visitors to the area for its unique recreational opportunities. Recreators are drawn to BLM lands both as destinations in themselves and for access to additional public lands in the region. BLM estimates of recreational use indicate that there currently might be more than 200,000 recreational visitor-days spent in the planning area each year. The proportion of non-local use is not known, but it is surely substantial. As visitors come to this area to recreate, they spend money on goods and services such as lodging, meals, gasoline, guides, and other items that support their activities. These expenditures provide monetary inflows to the socioeconomic study area, creating an important economic stimulus.

Accurate quantification of this economic stimulus is not possible at this time because of the lack of verifiable data on recreational use specifically attributable to BLM lands. Nonetheless, recreation is one of the key uses of planning area lands, and it is clear that the level of use of BLM lands indicates that recreation is an important contributor to the local economy. Recreation expenditures support the services sector, which is the second largest sector of the local economy for wages and salaries in both Clark and Nye counties. This is also a sector that has been showing strong growth.

Indirect data presented in the Socioeconomic Baseline Report (BLM 2010) shows that some segments of recreation as an industry in the two-county study area have declined somewhat in

recent years. Other segments of the recreation and tourism industry, however, have increased and are expected to continue to increase over the long term. Outside factors such as increasing populations in the Las Vegas Valley are highly likely to result in increased visitation to BLM lands within the planning area. Within the BLM planning area specifically, indications are that recreation activity is on the upswing.

Visitation as estimated for the Recreation Management Information System shows that total use of BLM lands at specific, measurable locations, has fluctuated for specific activities over time, but overall visitation has steadily increased since fiscal year 2006.

Under Alternative 1, demand for recreational activities on planning area lands is expected to continue growing during the study period. An increase in demand for recreational activities would have positive economic impacts on the local economy, generating jobs and income as visitors spend money while visiting the area.

People who enjoy current types of OHV access, particularly cross-country travel through most of the planning area, would continue to have access much as at present. Conflicts between individuals and groups who enjoy OHV use and others who object to certain OHV uses, while not necessarily becoming widespread (the conflict is perhaps more philosophical than actual specific impacts), would increase as the demands of both groups increase. Some individuals and groups with an interest in non-motorized recreation would experience declining recreational quality due to conflicts with cross-country OHV use. Outfitter-based recreation could continue much as it currently does. Under Alternative 1, however, the lack of clear guidelines and rules for SRPs required for this type of recreation might fail to adequately allocate and optimize this type of recreational experience.

4.5.3.4.4.2. Alternative 2

Under Alternative 2, there would be seven SRMAs (754,676 acres) and seven ERMAs (2,354,032 acres). Depending on changes in usage patterns, these changes in recreation areas could potentially result in different recreation-related economic patterns as compared with Alternative 1. It is possible that increases in the desirability and aesthetic experiences available for low-impact recreation within the planning area could result in an increase in overall recreation use and related economic activity as a result of selecting and implementing Alternative 2.

4.5.3.4.4.3. Alternative 3

Under Alternative 3, there would be seven SRMAs (879,321 acres) and seven ERMAs (2,235,485 acres). Depending on changes in usage patterns, these reductions in recreation areas could potentially result in decreased recreation-related economic activity as compared with Alternative 1. On the other hand, it is also possible that due to increases in the desirability and aesthetic experiences available for low-impact recreation within the planning area, overall recreation use and related economic activity could increase as a result of selecting and implementing Alternative 3, depending on visitor responses to the changes.

4.5.3.4.4.4. Alternative 4

Under Alternative 4, there would be two SRMAs (32,037 acres) and four ERMAs (912,197 acres). Depending on changes in relative usage patterns, these net reductions in recreation areas

could potentially result in either a decrease or an increase in recreation-related economic activity as compared with Alternative 1.

4.5.3.4.5. Travel and Transportation Impacts on Economics

4.5.3.4.5.1. Alternative 1

OHV use is expected to increase in the planning area through the life of the RMP. The rapid recent increase in OHV registrations in the socioeconomic study area and in the state (see Section 3.3.4) is indicative of the trend in OHV use. As with recreation, OHV use provides economic value to local residents and bolsters the local economy by drawing visitors from outside the area. Trails within and across the planning area are an important part of this drawing power. The expenditures of these visitors in local establishments and for local services provide an economic stimulus to the local area. It is not possible to quantify the local jobs and income that result from these expenditures due to the lack of reliable data on OHV use specific to the planning area. However, it is clear that use of BLM lands for OHV-based recreation provides important benefits to the local economy. Under Alternative 1, the economic stimulus provided by OHV-focused visitation would be an important economic benefit and one that would increase over time.

Under this alternative, 26,563 acres are classified as open; 1,628,460 acres are classified as limited to existing; 1,136,598 acres are classified as limited to designated; and 319,408 acres are classified as Closed. There are no designated travel management areas.

4.5.3.4.5.2. Alternative 2

Under this alternative, 15,881 acres are classified as open; 0 acres are classified as limited to existing; 2,764,741 acres are classified as limited to designated; and 329,681 acres are classified as closed. Under Alternative 2, specific travel management areas are expected to be designated. An increase in restrictions on OHV travel in comparison with the no action alternative could potentially mean a reduction in use and/or an increase in conflicts between user groups as usage becomes more concentrated within smaller areas. A slight increase in acres closed to OHV use, compared with Alternative 1, could potentially result in decreased economic activity associated with OHV users and their recreation-related purchases.

4.5.3.4.5.3. Alternative 3

Under this alternative, 15,880 acres are classified as open (essentially the same as Alternative 2); 0 acres are classified as limited to existing; 2,912,805 acres are classified as limited to designated; and 181,617 acres are classified as closed. Under Alternative 3, specific travel management areas are expected to be designated. An increase in restrictions on OHV travel in comparison with the no action alternative could potentially mean a reduction in use and/or an increase in conflicts between user groups as usage becomes more concentrated within smaller areas. A fairly large decrease in the number of acres closed to OHV use, compared with Alternative 1, could potentially result in increased recreation-related economic activity associated with OHV users and their expenditures within the planning area.

4.5.3.4.5.4. Alternative 4

Under this alternative, 15,586 acres are classified as open; 0 acres are classified as limited to existing; 2,913,100 acres are classified as limited to designated; and 181,616 acres are classified as closed. Under Alternative 4, specific travel management areas are expected to be designated. An increase in restrictions on OHV travel in comparison with the no action alternative could potentially mean a reduction in use and/or an increase in conflicts between user groups as usage becomes more concentrated within smaller areas. A decrease in the number of acres closed to OHV use, compared with Alternative 1, could potentially result in increased recreation-related economic activity associated with OHV users and their expenditures within the planning area.

4.5.3.4.6. Lands and Realty Impacts on Economics

4.5.3.4.6.1. Alternative 1

Under Alternative 1, requests for ROWs, permits, leases, withdrawals, and land tenure adjustments from other RMP programs or outside entities are expected to increase as neighboring communities grow and the demand for use of public lands increases. The amount of land expected to be available for FLPMA Section 203 sales (disposal) is not indicated for Alternative 1. Disposal of BLM lands to local governments or private parties may further economic development within the socioeconomic study area or serve other important social purposes such as provision of special recreational areas. Neither the increased economic activity nor other social benefits or costs can be quantified within the framework of the Draft RMP/EIS process because these impacts depend on the location and timing of the specific land tenure adjustments. Analysis of these impacts would properly occur at the implementation level.

Similarly, ROWs, leases, and permits play important roles in the economy within, and in some cases, beyond the socioeconomic study area. Policies established in the Draft RMP/EIS may support or deny certain ROWs, leases, and permits, but actual impacts would depend on the specific location and proposal. The socioeconomic impacts cannot be quantified at the RMP level.

Under this alternative, 163,918 acres have been identified for potential disposal.

4.5.3.4.6.2. Alternative 2

Under Alternative 2, rights-of-way and corridor designations would be similar to Alternative 1. The number of acres identified for potential disposal under this alternative is 78,499; 85,419 acres less than Alternative 1. This lower amount of acres for disposal could potentially result in reduced economic opportunities for communities in the planning area in comparison with the 1998 RMP.

4.5.3.4.6.3. Alternative 3

Under Alternative 3, rights-of-way and corridor designations would be similar to Alternatives 1 and 2. A key difference between Alternative 3 in comparison with Alternatives 1 and 2 is the designation of a new utility corridor along the east edge of the Moapa River Indian Reservation. Also, under this alternative the number of acres identified for potential disposal is 155,279; 8,639 acres less than Alternative 1. This relatively small lower amount of acres for disposal could potentially result in slightly reduced economic opportunities for communities in the planning area in comparison with the 1998 RMP.

4.5.3.4.6.4. Alternative 4

Under Alternative 4, rights-of-way and corridor designations would be similar to Alternatives 1 and 2. As is the case with Alternative 3, a key difference between Alternative 4 in comparison with Alternatives 1 and 2 is the designation of a new utility corridor along the east edge of the Moapa River Indian Reservation. Also, under this alternative the number of acres identified for potential disposal is 194,738; 30,820 acres more than under Alternative 1. This larger amount of acres for disposal could potentially result in increased economic opportunities for communities in the planning area in comparison with the 1998 RMP.

4.5.3.4.7. Renewable Energy Impacts on Economics

4.5.3.4.7.1. Alternative 1

Interest in renewable energy projects is increasing, and multiple projects in solar, wind, and geothermal energy production have already been evaluated for possible implementation within the planning area. Several solar energy projects are already under way, and these sorts of developments would be expected to continue under Alternative 1. No specific areas would be designated for renewable energy, but ACECs would be excluded from renewable energy project development. A total of 2,027,225 acres would be open for renewable energy development while 2,129,838 acres would be excluded for solar development, 968,148 acres would be classified as solar avoidance acres, and 1,098,385 acres would be excluded for wind power development.

4.5.3.4.7.2. Alternative 2

Under this alternative, areas specifically designated for possible renewable energy projects include 13,921 acres open for solar and 172,537 acres open for wind energy development. Under Alternative 2, 1,840,767 fewer acres would be open for renewable energy development as compared with Alternative 1. This decrease in available acres could potentially result in detrimental economic impacts if renewable energy becomes an increasingly important part of the overall U.S. energy portfolio over time.

4.5.3.4.7.3. Alternative 3

Under this alternative, areas specifically designated for possible renewable energy projects include 39,113 acres open for solar and 183,861 acres open for wind energy development. Under Alternative 3, 1,804,251 fewer acres would be open for renewable energy development as compared with Alternative 1. This decrease in available acres could potentially result in detrimental economic impacts if renewable energy becomes an increasingly important part of the overall U.S. energy portfolio over time.

4.5.3.4.7.4. Alternative 4

Under this alternative, areas specifically designated for possible renewable energy projects include 168,255 acres open for solar and 485,067 acres open for wind energy development. Under Alternative 4, 1,373,903 fewer acres would be open for renewable energy development as compared with Alternative 1. This decrease in available acres could potentially result in

detrimental economic impacts if renewable energy becomes an increasingly important part of the overall U.S. energy portfolio over time.

4.5.3.5. Special Designations

4.5.3.5.1. Areas of Critical Environmental Concern Impacts on Economics

4.5.3.5.1.1. Alternative 1

There are no additional impacts to economics. Under this alternative, 23 existing ACECs would be maintained (1,014,301 acres).

4.5.3.5.1.2. Alternative 2

Under Alternative 2, at total of 44 ACECs would be maintained (1,444,548 acres) in comparison with Alternative 1. This increase in designated ACECs could possibly lead to decreased economic activity in the planning area should the new ACEC designations result in restrictions on activities that would generate economic benefits.

4.5.3.5.1.3. Alternative 3

Under Alternative 3, at total of 41 ACECs would be maintained (1,292,216 acres) in comparison with Alternative 1. This increase in designated ACECs could possibly lead to decreased economic activity in the planning area should the new ACEC designations result in restrictions on activities that would generate economic benefits.

4.5.3.5.1.4. Alternative 4

Under Alternative 4, at total of 25 ACECs would be maintained (1,021,365 acres) in comparison with Alternative 1. This slight increase in designated ACECs could possibly lead to a minimal decreased economic activity in the planning area, in comparison with Alternatives 2 and 3, should the new ACEC designations result in restrictions on activities that would generate economic benefits.

4.5.3.5.2. Wild and Scenic River Impacts on Economics

4.5.3.5.2.1. Alternative 1

Under Alternative 1, no river segments would be managed as eligible for WSR status. Individuals and groups with this interest, however, likely would experience a decline in preservation values over time, for a variety of reasons. These would include continued allowance of cross-country OHV use across most of the planning area, mineral and energy development policies that are less protective than under other alternatives, grazing management policies that do not emphasize wildlife and watershed values as much as this group might desire, ad hoc decisions on granting of ROWs, and the lack of use of designation of ACECs as a tool for protection of habitats, ecosystems, and related values.

4.5.3.5.2.2. Alternative 2

Under Alternative 2, 55 miles of river corridor are found to be suitable for Wild and Scenic River designation, in comparison with 0 miles under Alternative 1. This increase in possible WSR designation could result in positive economic impacts on tourism and recreational activities due to increased interest in and visitation to the local area. On the other hand, should WSR designation result in restrictions on development activities, there could also be some off-setting negative economic impacts.

4.5.3.5.2.3. Alternative 3

Under Alternative 3, 3 miles of river corridor are found to be suitable for wild and scenic river designation, in comparison with 0 miles under Alternative 1. This modest increase in possible WSR designation could result in limited positive economic impacts on tourism and recreational activities due to increased interest in and visitation to the local area, although such impacts are expected to be negligible. On the other hand, should WSR designation result in restrictions on development activities, there could also be some off-setting negative economic impacts. This impact would likely be minimal given the low number of miles included in this designation under Alternative 3.

4.5.3.5.2.4. Alternative 4

Under Alternative 4, no segments of river corridor are recommended for Wild and Scenic River designation, the same as under Alternative 1. This lack of possible WSR designation could result in a loss of positive economic impacts on tourism and recreational activities that could have occurred due to increased interest in and visitation to the local area. On the other hand, should WSR designation have resulted in restrictions on development activities, there could also be some off-setting positive economic impacts.

4.5.3.6. Social and Economic

4.5.3.6.1. Social Impacts on Economics

4.5.3.6.1.1. Alternative 1

Under Alternative 1, all social impacts would remain as they are at present or as they are projected to be given the trajectory of resource uses and expected future conditions under the 1998 RMP.

4.5.3.6.1.2. Alternative 2

Alternative 2 would be expected to generate a wide range of positive social impacts, as well as some negative impacts.

Some examples of positive impacts include greater protection for the aesthetic values enjoyed by many visitors to the area, a decrease in accidents and other public safety hazards associated with motorized recreation and industrial developments on public lands, and the provision of greater conservation values for society which could, over the time of the planning horizon, prove to be more valuable from a social and economic standpoint than the conventional economic values as

assessed at the present time. As development pressures and decreasing open space make existing open space relatively more valuable to society, conserved landscapes are expected to become more and more valuable to society. The enjoyment of wildland values would be enhanced under Alternative 2 in comparison with all three of the other alternatives.

Possible negative social impacts would include the detrimental effects felt by those whose recreational activities would be more restricted than they would be under the other alternatives under consideration.

4.5.3.6.1.3. Alternative 3

Alternative 3 would be expected to generate positive social impacts and negative impacts.

In comparison with Alternative 1, some examples of positive impacts include somewhat increased protection for the aesthetic values enjoyed by many visitors to the area, a possible decrease in accidents and other public safety hazards associated with motorized recreation and industrial developments on public lands, and the provision of greater conservation values for society which could, over the time of the planning horizon, prove to be more valuable from a social and economic standpoint than the conventional economic values as assessed at the present time. As development pressures and decreasing open space make existing open space relatively more valuable to society, conserved landscapes are expected to become more and more valuable to society. The enjoyment of wildland values would be enhanced under Alternative 3 in comparison with Alternatives 1 and 4.

Possible negative social impacts would include the detrimental effects felt by those whose recreational activities would be somewhat more restricted than they would be under the other alternatives under consideration.

4.5.3.6.1.4. Alternative 4

Alternative 4 would be expected to generate both positive social impacts and negative impacts.

In comparison with Alternative 1, some examples of positive impacts include the benefits that could come from increased economic activity as access to resources for development purposes was enhanced. Compared with the other alternatives being considered, under Alternative 4 there would be somewhat decreased protection for the aesthetic values enjoyed by many visitors to the area, a possible increase in accidents and other public safety hazards associated with motorized recreation and industrial developments on public lands, and the provision of lesser conservation values for society which could, over time prove to be a greater loss to society than it might currently be considered. The enjoyment of development- and motorized recreation-related values would be enhanced under Alternative 4 in comparison with Alternatives 1, 2, and 3.

Possible positive social impacts would include the effects enjoyed by those whose recreational activities would be somewhat less restricted than they would be under the other alternatives under consideration.

Chapter 5. Consultation and Coordination

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5.1. Specific Consultation and Coordination Activities

The Las Vegas/Pahrump RMP/EIS was prepared by an interdisciplinary team of specialists from the Las Vegas and Pahrump field offices and the Southern Nevada District Office. Technical review and support were provided by the Nevada State Office. Table 5.3, "List of Preparers" (p. 1336) lists the names of individuals involved in preparing this document. Members of the planning team have consulted formally or informally with numerous agencies, groups, and individuals during the planning process. Consultation, coordination, and public involvement occurred as a result of scoping meetings, meetings and briefings with the state of Nevada, tribal and local government representatives, meetings with interest groups, and individual contacts.

The Draft RMP/EIS is consistent with plans and policies of other relevant jurisdictions to the maximum extent possible consistent with federal law and other provisions.

5.1.1. Federal Agency and Intergovernmental

Cooperating agency status provides a formal framework for governmental agencies to engage in active collaboration with a federal agency to implement the requirements of the National Environmental Policy Act (42 U.S.C. 4321, et seq.) and state agencies. Local and tribal governments may qualify as cooperating agencies because of "jurisdiction by law or special expertise" (40 CFR 1501.6 and 1508.5).

The Las Vegas/Pahrump RMP/EIS included participation from various federal government and intergovernmental agencies with an interest in the planning area. The following table lists the agencies that participated as a cooperating agency:

Table 5.1. Cooperating Agency List

City of Boulder City
City of Henderson
City of Las Vegas
City of Mesquite
City of North Las Vegas
Clark County
Moapa Band of Paiutes
National Park Service, Death Valley
National Park Service, Lake Mead National Recreation Area
National Park Service, Mojave National Preserve
Naval Air Warfare Center Weapons Division
Nellis Air Force Base
Nevada Department of Wildlife
Nevada Department of Energy
Nevada Division of State Lands
Nye County
U.S. Bureau of Reclamation, Lower Colorado Regional Office
U.S. Fish and Wildlife Service, Desert National Wildlife Refuge Complex
U.S. Forest Service, Humbolt-Toiyabe National Forest

5.1.2. Tribes

In recognition of the government-to-government relationship between tribes and the federal government, 13 federally recognized tribes in or near the Las Vegas/Pahrump planning area were contacted to inform them of the planning process and to offer cooperating agency status.

Table 5.2. Tribal Organization Contacted

Cedar Band, Paiute Indian Tribe of Utah
Chemehuevi Indian Tribe
Colorado River Indian Tribes
Fort Mojave Indian Tribe
Hualapai Tribal Council
Indian Peaks Band, Piute Indian Tribes of Utah
Inter-Tribal Council of Nevada
Kaibab Paiute Tribe
Kanosh Band, Paiute Indian Tribes of Utah
Las Vegas Paiute Tribe
Moapa Band of Paiutes
Pahrump Paiute Tribe (non-federally recognized)
Timbisha Shoshone Tribe

5.1.3. Special Status Species Consultation

Coordination with USFWS is ongoing with regard to special status species. Section 7 consultation will include the preparation of a biological assessment by the BLM and a subsequent biological opinion prepared by the USFWS.

5.1.4. List of Preparers

Table 5.3. List of Preparers

Name	Title	Area of Responsibility
Evan Allen	Geologist	Minerals
Mark Boatwright	Archaeologist	Archaeology, Cultural Resources, Paleontology, Native American Interests, National Trails
Lauren Brown	Weeds Specialist	Noxious Weeds, Visual Resources
Lew Brownfield	GIS Specialist	Maps and related Databases
Kirsten Cannon	Public Affairs Officer	Public Affairs
Nancy Christ	Planning & Environmental Coordinator	RECO
Lisa Christianson	Natural Resource Specialist	Air Quality, Greenhouse Gas, Climate Change
Melanie Cota	Biologist	Wildlife, Integrated Vegetation
Shonna Dooman	Assistant Field Manager	Reviewer, Supervision
Lorri Dee Dukes	Geologist	Minerals
Fred Edwards	Botanist	Integrated Vegetation, Grazing, Forestry
David Fanning	Geologist	Minerals
Susan Farkas	Planning & Environmental Coordinator	NEPA, Project Coordination

Name	Title	Area of Responsibility
Mathew Hamilton	Wildlife Biologist	Wildlife, T&E Species
Gregory Helseth	Project Manager	RECO
Mike Heydon	Fire Management Specialist	Wildland Fire Management, Noxious Weeds
Vanessa Hice	Assistant Field Manager	Reviewer, Supervision
Krystal Johnson	Wild Horse and Burro Specialist	Wild Horses and Burros
Manuela Johnson	Realty Specialist	Lands
Lee Kirk	Planning & Environmental Coordinator	Project Lead, NEPA
Katherine Kleinick	Biologist	Wildlife, Integrated Vegetation
Erick Kurkowski	Assistant District Manager	Project Supervision
Randy Kyes	Wilderness Specialist	Lands with Wilderness Characteristics, Wilderness, Wilderness Study Areas
Michelle Leiber	Realty Specialist	Lands
Chris Linehan	Outdoor Recreation Planner	Recreation, Wild & Scenic Rivers, Travel and Transportation, Visual Resource Management
Kerri Linehan	Writer/Editor	Document Preparation
Deborah MacNeill	Field Manager	Oversight, Supervision
Gayle Marrs-Smith	Field Manager	Oversight, Supervision
Sean McEldery	Fire Management Specialist	Wildland Fire Management, Noxious Weeds
Erica Pionke	Realty Specialist	Lands
Stan Plum	Archaeologist	Archaeology, Cultural Resources, Paleontology, Native American Interests, National Trails
Boris Poff	Hydrologist	Hydrology, Soils, Riparian, Water Rights, Water Quality
Phil Rhinehart	Realty Specialist	Lands
Marc Sanchez	Outdoor Recreation Planner	Recreation, Travel and Transportation
Mark Slaughter	Supervisory Natural Resource Specialist	T&E Species, Reviewer, Supervision
Tim Smith	District Manager	Project Supervision
Mark Tanaka-Sanders	Assistant Field Manager	Reviewer, Supervision
Kerri-Anne Thorpe	Realty Specialist	Lands, Communication Sites
Catrina William	Supervisory Realty Specialist	Lands, Supervision
Victoria Worfolk	Law Enforcement Ranger	Law Enforcement
Jayson Barangan	Wildlife Biologist (2009–2012)	Wildlife, T&E Species
Nora Caplette	Weeds Specialist (2009–2012)	Noxious Weeds
Mark Chandler	Realty Specialist (2010-2013)	Renewable Energy
Jill Craig	Weeds Specialist (2012–2013)	Noxious Weeds
Robert Dieli	Supervisory Outdoor Recreation Planner (2009–2012)	Recreation, Travel and Transportation
John Evans	Planning & Environmental Coordinator (2010–2013)	NEPA
Sendi Kalcic	Wilderness Specialist (2010–2014)	Wilderness, Lands with Wilderness Characteristics, Wilderness Study Areas, Visual Resources
Katherine Kleinick	Biologist (2009–2014)	Wildlife, Integrated Vegetation
Frederick Marcells	Realty Specialist (2009–2013)	Lands

Name	Title	Area of Responsibility
Greg Marfil	Fire Management Specialist (2009–2011)	Wildland Fire Management
Hillerie Patton	Public Affairs Officer (2009–2014)	Public Affairs
Marilyn Peterson	Outdoor Recreation Planner (2009–2014)	Recreation, Wild & Scenic Rivers, Travel and Transportation
Sarah Peterson	Hydrologist (2009–2010)	Hydrology, Soils, Riparian, Water Rights, Water Quality
Christina Price	Realty Specialist (2012–2013)	Lands, Utility Corridors
Patrick Putnam	Field Manager (2009–2010)	Project Supervision
Carolyn Ronning	Natural Resource Specialist (2009–2013)	ACECs
Robert Ross	Field Manager (2009–2013)	Project Supervision
Susanne Rowe	Archaeologist (2009–2013)	Archaeology, Cultural Resources, Paleontology, Native American Interests, National Trails
Mary Jo Rugwell	District Manager (2009–2012)	Project Supervision
Amelia Savage	Wildlife Biologist (2012–2013)	Wildlife, T&E Species
Mark Spencer	Field Manager (2009–2012)	Project Supervision
Kathleen Sprowl	Archaeologist (2009–2013)	Archaeology, Cultural Resources, Paleontology, Native American Interests, National Trails
Jessica Stegmeier	Wildlife Biologist (2009–2011)	Wildlife, T&E Species
Jeffrey Steinmetz	Planning & Environmental Coordinator (2009)	Project Lead, NEPA
George Varhalmi	Geologist (2009–2014)	Geology, Minerals
Brenda Wilhight	Realty Specialist (2010-2013)	Lands
Quincy Bahr, Booz Allen Hamilton	Project Manager (2009–2011)	Project Management
Russel Franklin, Booz Allen Hamilton	Biologist (2010–2013)	Wildlife, T&E Species
Jared Gunnerson, Booz Allen Hamilton	Assistant Manager /Project Manager (2009–2013)	Project Management
Michael Sumner, Booz Allen Hamilton	Assistant Project Manager (2011–2013)	Project Management, Recreation
Caitlin Willoughby, Booz Allen Hamilton	GIS Specialist (2009–2013)	Maps and related Databases

Appendix A. Fire Management Plan

Bureau of Land Management
Las Vegas Field Office

Fire Management Plan

Southern Nevada Fire Planning Unit

LAS VEGAS

FIELD OFFICE

FIRE MANAGEMENT PLAN

2004

Prepared By: _____ **Date:** 09/22/04
Las Vegas Field Office Fire Management Staff

Recommended By: Kevin E. Oliver **Date:** 09/24/04
Las Vegas Field Office Fire Management Officer

Recommended By: _____ **Date:** 09/27/04
Las Vegas Field Office Manager

Recommended By: _____ **Date:** 09/29/04
Nevada State Office Fire Management Officer

Accepted By: _____ **Date:** 9-30-04
Bureau of Land Management, Nevada, State Director

NEVADA STATE OFFICE
**CATEGORICAL EXCLUSION REVIEW
AND APPROVAL**

Team Leader Everell Hayes `Date September 29, 2004
Name of Proposed Action BLM Nevada Fire Management Plan Interagency Template Conversion

CX Number NV-913-04-001 Project or Serial Number N/A

CATEGORICAL EXCLUSION REFERENCE

Cite the Departmental Manual and reference the appropriate categorical exclusion.

516 DM 2 Appendix 1, 1.10

Cite the Categorical Exclusion (exactly as it appears in the Departmental Manual)

Policies, directives, regulations and guidelines of an administrative, financial, legal, technical or procedural nature; or the environmental effects of which are too broad, speculative or conjectural to lend themselves to meaningful analysis and will be subject later to the NEPA process, either collectively or case-by-case.

DESCRIPTION OF PROPOSED ACTION AND STANDARD OPERATING PROCEDURES

As directed by Congress, and articulated through Office of Fire and Aviation Instruction Memorandum 2003-038, the Proposed Action is to prepare a new Fire Management Plan (FMP) by converting existing agency fire management direction and operational plans into a Departmental-wide standard template which clearly links fire management strategies and operations to resource management objectives contained in relevant land use plans. The template conversion includes working with agency partners with wildland fire responsibilities in developing common multi-agency Fire Planning Units (FPUs) and Fire Management Units (FMUs) for the purposes of allocating cross-agency fire preparedness budgets in Fiscal Year 2007. The geographic scope is approximately all of the public lands administered by BLM-Nevada which have burnable vegetation. The administrative scope is BLM-Nevada, which participates in a total of six interagency FPUs.

Agency jurisdictions included in FPU and FMU development include, but are not limited to, U.S. Forest Service Humboldt-Toiyabe National Forest; State of Nevada Division of Forestry, Bureau of Indian Affairs, U.S. Fish and Wildlife Service and National Park Service. The template conversion will result in no changes to relevant land use plans goals, objectives, and decision terms or conditions for BLM-Nevada. Any subsequent actions taken on-the-ground as guided by the objectives and strategies outlined in the Statewide FMP will be required to demonstrate compliance with NEPA prior to implementation.

Standard Operating Procedures to be followed are contained in relevant field office resource management and activity-level plans.

The 17 Policy Statements outlined in the 2001 National Wildland Fire Policy will be adhered to. These are listed below:

2001 Federal Wildland Fire Policy Statements
(from Chapter 3, *Review and Update of the 1995 Federal Wildland Fire Management Policy*)

1. **Safety:** Firefighter and public safety is the first priority. All Fire Management Plans and activities must reflect this commitment.

2. **Fire Management and Ecosystem Sustainability:** The full range of fire management activities will be used to help achieve ecosystem sustainability, including its interrelated ecological, economic, and social components.

3. **Response to Wildland Fire:** Fire, as a critical natural process, will be integrated into land and resource management plans and activities on a landscape scale, and across agency boundaries. Response to wildland fire is based on ecological, social, and legal consequences of the fire. The circumstances under which a fire occurs, and the likely consequences on firefighter and public safety and welfare, natural and cultural resources, and values to be protected dictate the appropriate management response to the fire.

4. **Use of Wildland Fire:** Wildland fire will be used to protect, maintain, and enhance resources and, as nearly as possible, be allowed to function in its natural ecological role. Use of fire will be based on approved Fire Management Plans and will follow specific prescriptions contained in operational plans.

5. **Rehabilitation and Restoration:** Rehabilitation and restoration efforts will be undertaken to protect and sustain ecosystems, public health, and safety, and to help communities protect infrastructure.

6. **Protection Priorities:** The protection of human life is the single, overriding priority. Setting priorities among protecting human communities and community infrastructure, other property and improvements, and natural and cultural resources will be based on the values to be protected, human health and safety, and the costs of protection. Once people have been committed to an incident, these human resources become the highest value to be protected.

7. **Wildland Urban Interface:** The operational roles of federal agencies as partners in the Wildland Urban Interface are wildland firefighting, hazardous fuels reduction, cooperative prevention and education, and technical assistance. Structural fire suppression is the responsibility of tribal, State, or local governments. Federal agencies may assist with exterior structural protection activities under formal Fire Protection Agreements that specify the mutual responsibilities of the partners, including funding. (Some federal agencies have full structural protection authority for their facilities on lands they administer, and may also enter into formal agreements to assist State and local governments with full structural protection.)

8. **Planning:** Every area with burnable vegetation must have an approved Fire Management Plan. Fire Management Plans are strategic plans that define a program to manage wildland and prescribed fires based on the area's approved land management plan. Fire Management Plans must provide for firefighter and public safety; include fire management strategies, tactics, and alternatives; address values to be protected and public health issues; and be consistent with resource management objectives, activities of the area, and environmental laws and regulations.

9. **Science:** Fire Management Plans and programs will be based on a foundation of sound science. Research will support ongoing efforts to increase our scientific knowledge of biological, physical, and sociological factors. Information needed to support fire management will be developed through an integrated

interagency fire science program. Scientific results must be made available to managers in a timely manner and must be used in the development of land management plans, Fire Management Plans, and implementation plans.

10. **Preparedness:** Agencies will ensure their capability to provide safe, cost-effective fire management programs in support of land and resource management plans through appropriate planning, staffing, training, equipment, and management oversight.

11. **Suppression:** Fires are suppressed at minimum cost, considering firefighter and public safety, benefits, and values to be protected, consistent with resource objectives.

12. **Prevention:** Agencies will work together and with their partners and other affected groups and individuals to prevent unauthorized ignition of wildland fires.

13. **Standardization:** Agencies will use compatible planning processes, funding mechanisms, training and qualification requirements, operational procedures, values-to-be-protected methodologies, and public education programs for all fire management activities.

14. **Interagency Cooperation and Coordination:** Fire management planning, preparedness, prevention, suppression, fire use, restoration and rehabilitation, monitoring, research, and education will be conducted on an interagency basis with the involvement of cooperators and partners.

15. **Communication and Education:** Agencies will enhance knowledge and understanding of wildland fire management policies and practices through internal and external communication and education programs. These programs will be continuously improved through the timely and effective exchange of information among all affected agencies and organizations.

16. **Agency Administrator and Employee Roles:** Agency administrators will ensure that their employees are trained, certified, and made available to participate in the wildland fire program locally, regionally, and nationally as the situation demands. Employees with operational, administrative, or other skills will support the wildland fire program as necessary. Agency administrators are responsible and will be held accountable for making employees available.

17. **Evaluation:** Agencies will develop and implement a systematic method of evaluation to determine effectiveness of projects through implementation of the 2001 Federal Fire Policy. The evaluation will assure accountability, facilitate resolution of areas of conflict, and identify resource shortages and agency priorities.

NV-1791-03

SCREENING FOR EXCEPTIONS TO CATEGORICAL EXCLUSIONS

The following exceptions apply to actions being considered as categorically excluded. Environmental documents must be prepared if any of these exceptions apply. Place an "X" in appropriate box. Would the proposed action:	Yes	No
1. Have significant adverse effects on public health or safety?		X
2. Have adverse effects on such unique geographic characteristics as historic or cultural resources, park, recreation or refuge lands, wilderness areas, wild or scenic rivers, sole or principal drinking water aquifers, prime farmlands, wetlands, floodplains, or ecologically significant or critical areas, including those listed on the Department's National Register of Natural Landmarks?		X
3. Have highly controversial environmental effects?		X
4. Have highly uncertain and potentially significant environmental effects or involve unique or unknown environmental risks?		X
5. Establish a precedent for future action or represent a decision in principle about future actions with potentially significant environmental effects?		X
6. Be directly related to other actions with individually insignificant but cumulatively significant environmental effects?		X
7. Have adverse effects on properties listed or eligible for listing on the National Register of Historic Places?		X
8. Have adverse effects on species listed or proposed to be listed on the List of Endangered or Threatened Species, or have adverse effects on designated Critical Habitat for these species?		X
9. Require compliance with Executive Order 11988 (Floodplain Management), Executive Order 11990 (Protection of Wetlands), or the Fish and Wildlife Coordination Act?		X
10. Threaten to violate a Federal, State, local or tribal law or requirement imposed for the protection of the environment?		X

FINDINGS

Based on review of the proposal and the 10 exceptions listed above, this action qualifies as a categorical exclusion and environmental analysis is not required. The proposed action is in conformance with current BLM Land Use Plans.

Approving Official Robert V. Abbey 9-30-04 Date:
Robert V. Abbey, State Director, Nevada

A.1. Introduction

A.1.1. Purpose

The purpose of the Las Vegas Fire Management Plan (FMP) is to identify and integrate all wildland fire management guidance, direction and activities required to implement national fire policy. This includes all other applicable amendments and activity plans of the Bureau of Land Management, Las Vegas Resource Management Plan (RMP).

Existing management direction from the RMP and applicable amendments and activity plans allow for fire to be restored as an integral part of ecosystems to meet resource management objectives. This plan directs activities for fire and resource personnel to improve protection of human life, property and resource values, through aggressive fire protection, reduction of hazardous fuels and restoration of fire damaged ecosystems. This management direction may be updated as a result of any approved amendments of the Las Vegas RMP or other related planning documents.

Federal policy requires that Fire Management Plans be developed for all acres of burnable vegetation on federal land, and that they be linked closely with approved RMPs. This FMP was developed in compliance with the Interagency Fire Management Plan Template, to ensure that FMP's prepared by the USDI and USDA have consistent content and format.

The following policies are incorporated by reference in this FMP:

- *Federal Wildland Fire Management Policy and Program Review, 1995*
- *Review and Update of the 1995 Federal Wildland Fire Management Policy, 2001*
- *The Interagency Fire Management Plan Template*
- *A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment: 10-Year Strategy Implementation Plan.*

This FMP also provides quantified information for the Fire Program Analysis (FPA) planning process. FPA is the interagency fire planning model that will be used to project the budget and personnel needs for the LVFO and all other fire management organizations administered by the U.S. Departments of the Interior (USDI) and Agriculture (USDA). The FPA process is being implemented in two phases. The FMP will provide information for both Phase I and Phase II of FPA. These FPA Phases will develop program budgets and organizations for all fire management functions, which includes wildland fire preparedness, initial attack, wildland fire use, large fire suppression, fuels management, community education/assistance and fire prevention activities.

The fire management information presented in this FMP will be updated to ensure that the most current information is available for use in the FPA resource and budget allocation process. The fire management objectives and strategies identified in this FMP will also be updated as appropriate, to reflect current issues and conditions.

A.1.2. Relationship to Environmental Compliance

This FMP has been developed in a collaborative manner with Fire Planning Unit (FPU) agency partners to implement decisions made in the BLM Field Office Land Use Plan[1], inclusive of subsequent plan amendments and implementation-level activity plans (herein referred to as the "land use plan").

Impacts of fire suppression, hazardous fuels reduction, and burned area rehabilitation activities on public lands administered by the BLM have been previously analyzed in the Las Vegas RMP Fire Management Section, and at a programmatic level in the environmental impact statement (EIS) that accompanies the land use plan and in the tiered NEPA compliance (EA or EIS) documents for subsequent land use plan amendments and relevant activity plans.

Inclusion of decisions from the Las Vegas Resource Management Plan (RMP) in the Fire Management Plan (FMP) also assures consistency with other federal, State, local and tribal laws, regulations, policies and plan to the maximum extent possible. Additionally, inclusion of decisions made in the land use plan into this FMP meets all National Environmental Policy Act (NEPA) requirements. Prior development of these decisions through the BLM Resource Management Planning process also assures that requirements for compliance with other federal and State laws and regulations or consistency with State and local government plans have been achieved. The decisions and analysis contained in the land use plan did not address lands administered by other federal or state agencies which may be present in this Fire Planning Unit.

The Las Vegas FMP is a strategic document that does not make resource management decisions or project-specific implementation decisions and is categorically excluded from further NEPA analysis under 516 DM 2, Appendix 1, Chapter 2, 1.10: "Policies directives, regulations and guidelines of an administrative, financial, legal, technical or procedural nature; or the environmental effects of which are too broad, speculative or conjectural to lend themselves to meaningful analysis and will be subject later to the NEPA process, either collectively or case-by-case".

The FMP is a working reference to provide continuity of operations for wildland fire management, hazardous fuels treatments, and burned area rehabilitation activities that occur within the Field Office's administrative jurisdiction within the FPU. The FMP provides the necessary baseline information to generate out-year budgets through the Fire Program Analysis (FPA) for preparedness, suppression, extended attack, large fire support, prevention/education, hazardous fuels reduction, emergency stabilization, burned area rehabilitation, and fire use within the FPU. The FMP will be reviewed annually and revised as needed to ensure that the strategic guidance provided in the plan is assisting the Field Office(s) in meeting its resource management and fire/fuels management goals, and objectives and actions outlined in the land use plan.

A.1.2.1. Land Use Plan Conformance

All objectives and fire management strategies outlined in the FMP are in conformance with the goals, objectives, management actions, and terms and conditions of the supporting land use plan. Revisions, additions, and adjustments to the FMP that are in conformance with the

[1]BLM manages public lands under Management Framework Plans (MFPs) and Resource Management Plans (RMPs). In some cases, a BLM Field Office may have one or all plan types within their jurisdiction. In order to reduce confusion, these plans are collectively referred to as Land Use Plans (LUPs).

LUP(s) may be made at any time as a result of annual reviews of the FMP. As required, additional NEPA analysis will be conducted on any revision, addition, or adjustment that is not adequately analyzed in other planning/NEPA documents incorporated into the FMP or that establish new land use plan objectives.

A.1.2.2. FMP Implementation

Prior to implementing fire management projects on-the-ground, including projects that may be planned in cooperation with other agencies, additional environmental analysis for compliance with NEPA, ESA and other federal and state laws and regulatory requirements, such as the National Historic Preservation Act, the Clean Water Act and the Clean Air Act may be required. Projects will be developed in a collaborative manner consistent with direction found in the 10 Year Strategy Implementation Plan (2002).

A.1.3. Collaborative Process Identification

The Las Vegas Field Office Fire Management Plan was developed in consultation with and review by representatives from: federal agencies, state agencies, state government, local governments, non-governmental organizations, and individuals. Willing participants in this process were engaged by the BLM as planning partners. The process included planning partner meetings during development of the FMP.

A.1.4. Authorities

The Federal Land Policy and Management Act of 1976 (FLPMA; Public Law 94-579; 43 U.S.C. 1701) establishes the primary authority and provides guidance for how the public lands are to be managed by the BLM. In managing public lands on the basis of multiple use and sustained yield, FLPMA requires that the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource and archeological values be protected.

Additional authorities for the FMP include:

- Protection Act of September 20, 1922 (42 Stat. 857; U.S.C. 594).
- Taylor Grazing Act of June 28, 1934 (48 Stat. 1269; U.S.C. 315).
- Reciprocal Fire Protection Act of May 27, 1955(69 Stat. 66; 42 U.S.C. 1856, 1856a).
- Economy Act of June 30, 1932 (47 Stat. 417; 31 U.S.C. 686).
- Wild Free-Roaming Horse and Burro Act of 1971, as amended (PL 92-195)
- Public Rangeland Improvement Act of 1978 (PL 95-514)
- Disaster Relief Act, Section 417 (Public Law 93-288).
- Annual Appropriations Acts for the Department of the Interior.
- United States Department of the Interior Manual (910 DM 1.3).
- 1995 Federal Wildland Fire Management Policy.

- 2001 Updated Federal Wildland Fire Management Policy (1995 Federal Wildland Fire Management Policy Update).
- 1998 Departmental Manual 620 Chapter 1, Wildland Fire Management General Policy and Procedures.
- The Multiple-Use Sustained-Yield Act of June 12, 1960
- The Forest and Rangeland Renewable Resources Planning Act of August 17, 1974
- CFR Title 43 (1610) (BLM's planning guidance and regulations); BLM Manual 1601
- National Environmental Policy Act of 1969 and Title 40 CFR Part 1500
- Endangered Species Act of 1973, as amended
- Wilderness Act of 1964
- Clean Water Act and Clean Air Act 1-8
- National Historic Preservation Act 1966
- Native American Consultation per Executive Orders 12866, 13084 et al.,
- Protocol Agreement (1998) with State Historic Preservation Office, Nevada
- The President's National Energy Policy (Executive Order 13212)
- Healthy Forests Restoration Act, December 2003 (PL 108-148)
- And other applicable laws, regulations, and policies as appropriate.

A.2. Relationship to Land Management Planning/Fire Policy

A.2.1. Bureau of Land Management/Las Vegas Field Office Policy and Program Guidance

The Las Vegas Field Office Fire Management Plan addresses fire suppression, prescribed fire, non-fire fuel treatments, and community assistance and education on every acre of burnable vegetation under BLM administrative jurisdiction within the Field Office. The Las Vegas FMP emphasizes that firefighter and public safety is the first priority. It also prescribes objectives and strategies to improve wildfire prevention and suppression, reduce hazardous fuels, restore fire adapted ecosystems, and promote community assistance. The emphasis placed on these issues, in the FMP, are consistent with national policy statements regarding fire management described in this document.

Federal policy requires that Fire Management Plans be developed for all acres of federal land with burnable vegetation. The Las Vegas Field Office Fire Management Plan derives overall program guidance from the following policy statements:

A.2.1.1. BLM National Fire Policy

43 CFR 9212.0-6 Policy - It is the policy of the BLM to take all necessary actions to protect human life, the public lands and the resources and improvements thereon through the prevention of wildfires.

BLM Manual Section 9212, Fire Prevention (1992) - Consistent with Departmental policy (910 DM 1.4), it is the BLM's policy that:

1. Prevention of catastrophic wildfires is a high priority. Commitment to an effective wildfire prevention program is expected at all levels within the Bureau.

2. The wildfire prevention program shall be designed to minimize losses from fire consistent with resource objectives identified in Resource Management Plans.

3. Wildfire prevention shall stress the analysis of risks, hazards and values and the development of specific educational, engineering, enforcement and administrative prevention actions.

4. Wildfire prevention activities shall be coordinated with all federal, state, county, and municipal agencies.

5. Each state and district office shall provide coordination, guidance, and assistance to achieve an aggressive wildfire prevention program and shall maintain and update as required a Wildfire Prevention Plan integrated with the Fire Management planning process.

6. Wildfire Prevention Program funding shall be consistent with the identified needs as determined through a prevention analysis that is approved as an operational plan of the FMAP (BLM 9212-1).

7. The BLM shall emphasize the use of hazardous fuel reduction techniques as part of the wildfire prevention program.

BLM Manual Section 1742, Emergency Fire Rehabilitation and BLM Handbook 1742 - Provide guidance for emergency fire rehabilitation including measures to prevent accelerated soil erosion, establishment of noxious and/or invasive plant species, and post fire management of restoration areas. Fire line rehabilitation would include restoration of surface contours and closure to vehicles.

BLM Manual Section 9214, Prescribed Fire Management (1988), and BLM Handbook 9214 (2000) - describes the authority and policy for prescribed fire use on public lands administered by the Bureau of Land management. It is BLM Policy that:

1. The role of fire and its potential use will be considered in establishing the management strategy for all ecosystems.

2. Prescribed fires may be initiated by planned or unplanned (unscheduled) ignition. See definitions under BLM Manual Section 9210.

3. All prescribed fire (including hazard reduction) projects will support one or more approved land management objective(s) derived from the Bureau's land management planning process.

4. The planning and execution of the prescribed fire will be funded by the benefiting program(s).

5. Each prescribed fire project will have an approved Prescribed Fire Plan completed before ignition and will be reported upon completion. Other agency projects supported by the Bureau will have approved participation.

6. Each prescribed fire will be managed and executed in conformance with the approved plan by qualified personnel. The term qualified will include experience, training, and physical fitness for key positions.

7. Prescribed fire projects will comply with federal, state and local regulations and standards, including air quality and smoke management programs.

8. Pre-burn, burn, and post-burn fuel and weather measurement(s) will be taken on all prescribed fire projects for planning purposes, prescription, compliance, and project evaluation. It may not be necessary to take post-burn weather measurements on fuel reduction projects.

9. Pre-burn and post-burn monitoring will be conducted to determine whether resource and fire objectives are achieved, unless where previous documented experience is adequate to predict post-burn results.

Interagency Standards for Fire and Fire Aviation Operations - as amended annually, describes policy and operations for all fire related activities in the DOI and USDA.

BLM Manual Section 1740 and BLM Manual Handbook H-1740-1 – provide guidance and procedures for management and treatment of renewable resources, including utilization of management prescribed fire and emergency fire rehabilitation.

A.2.1.2. National Fire Plan

The 2001 Review and Update of the 1995 Federal Wildland Fire Management Policy states:

1. **Safety** - Firefighter and Public Safety is the first priority. All Fire Management Plans and activities must reflect this commitment.

2. **Fire Management and Ecosystem Sustainability**-The full range of fire management activities will be used to help achieve ecosystem sustainability, including its interrelated ecological and social components.

3. **Response to Wildland Fire** - Fire, as a critical natural process, will be integrated into land and resource management plans and activities on a landscape scale, and across agency boundaries. Response to wildland fire is based on ecological, social, and legal consequences of the fire. The circumstances under which a fire occurs, and the likely consequences on firefighter and public safety and welfare, natural and cultural resources, and values to be protected dictate the appropriate management response to the fire.

4. **Use of Wildland Fire** - Wildland fire will be used to protect, maintain, and enhance resources and, as nearly as possible, be allowed to function in its natural ecological role. Use of fire

will be based on approved Fire Management Plans and will follow specific prescriptions contained in operational plans.

5. **Rehabilitation and Restoration** - Rehabilitation and restoration efforts will be undertaken to protect and sustain ecosystems, public health, and safety, and to help communities protect infrastructure.

6. **Protection Priorities** - The protection of human life is the single, overriding priority. Setting priorities among protecting human communities and community infrastructure, other property and improvements, and natural and cultural resources will be based on the values to be protected, human health and safety, and the costs of protection. Once people have been committed to an incident, these human resources become the highest value to be protected.

7. **Wildland Urban Interface** - The operational roles of federal agencies as partners in the Wildland Urban Interface are wildland firefighting, hazardous fuels reduction, cooperative prevention and education, and technical assistance. Structural fire suppression is the responsibility of tribal, State, or local governments. Federal agencies may assist with exterior structural protection activities under formal Fire Protection Agreements that specify mutual responsibilities of the partners, including funding. (Some federal agencies have full structural protection authority for their facilities on lands they administer, and may also enter into formal agreements to assist State and local governments with full structural protection.)

8. **Planning** - Every area with burnable vegetation must have an approved Fire Management Plan. Fire Management Plans are strategic plans that define a program to manage wildland and prescribed fires based on the area's approved land management plan. Fire Management Plans must provide for firefighter and public safety; include fire management strategies, tactics, and alternatives; address values to be protected and public health issues; and be consistent with resource management objectives, activities of the area, and environmental laws and regulations.

9. **Science** - Fire Management Plans and programs will be based on a foundation of sound science. Research will support on-going efforts to increase our scientific knowledge of biological, physical, and sociologic factors. Information needed to support fire management will be developed through an integrated interagency fire science program. Scientific results must be made available to managers in a timely manner and must be used in the development of land management plans, Fire Management Plans, and implementation plans.

10. **Preparedness** - Agencies will ensure their capabilities to provide safe, cost-effective fire management programs in support of land and resource management plans through appropriate planning, staffing, training, equipment, and management oversight.

11. **Suppression** - Fires are suppressed at minimum cost, considering firefighter and public safety, benefits, and values to be protected, consistent with resource objectives.

12. **Prevention** - Agencies will work together and with their partners and other affected groups and individuals to prevent unauthorized ignition of wildland fires.

13. **Standardization** - Agencies will use compatible planning processes, funding mechanisms, training and qualification requirements, operational procedures, values to be protected methodologies, and public education programs for all fire management activities.

14. **Interagency Cooperation and Coordination** - Fire management planning, preparedness, prevention, suppression, fire use, restoration and rehabilitation, monitoring, research, and education will be conducted on an interagency basis with the involvement of cooperators and partners.

15. **Communication and Education** - Agencies will enhance knowledge and understanding of wildland fire management policies and practices through internal and external communication and education programs. These programs will be continuously improved through the timely and effective exchange of information among all affected agencies and organizations.

16. **Agency Administrator and Employee Roles** - Agency administrators will ensure that their employees are trained, certified, and made available to participate in the wildland fire program locally, regionally, and nationally as the situation demands. Employees with operational, administrative, or other skills will support the wildland fire program as necessary. Agency administrators are responsible and will be held accountable for making employees available.

17. **Evaluation** - Agencies will adopt and implement a systematic method of evaluation to determine effectiveness of projects through implementation of the 2001 Federal Fire Policy. The evaluation will assure accountability, facilitate resolution of conflicts, and identify resource shortages and agency priorities.

A Report to the President in Response to the Wildfires of 2000; (September 2000), "Managing the Impacts of Wildfires on Communities and the Environment." - contains the following key points and recommendations:

1. **Continue to Make All Necessary Firefighting Resources Available** – As a first priority the Department will continue to provide all necessary resources to ensure that fire suppression efforts are at maximum efficiency in order to protect life and property.

2. **Restore Damaged Landscapes and Rebuild Communities** – After ensuring that suppression resources are sufficient, invest in the restoration of communities and landscapes impacted by the year 2000 fires.

3. **Investment in Projects to Reduce Fire Risk** – The fires of 2000 have underscored the importance of pursuing an aggressive program to address the fuels problem with help of local communities, particularly those in the wildland-urban interface areas, where threats to lives and property are greater and the complexity and cost of treatments higher.

4. **Work directly With Local Communities** – Working with local communities is a critical element in restoring damaged landscapes and reducing fire hazards proximate to homes and communities.

5. **Be Accountable** – A Cabinet-level management structure should be established to ensure that the actions recommended by the Departments receive the highest priority.

A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment -10 Year Comprehensive Strategy, August 2001 **-** provides a foundation for wildland agencies to work closely with all levels of government, tribes, conservation, and commodity groups and community-based restoration groups to reduce wildland fire risk to communities and the environment, It also provides a suite of core principles and four goals. The core principles include the concepts of collaboration, priority setting, and accountability. The four goals are:

1. Improve Prevention and Suppression

2. Reduce Hazardous Fuels

3. Restore Fire Adapted Ecosystems

4. Promote Community Assistance

Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment, 10 Year Comprehensive Strategy – Implementation Plan, August 2001 - States:

1. This Implementation Plan establishes a collaborative, performance-based framework for achieving these goals and actions with performance measures and tasks to identify key benchmarks and track progress over time. It also provides tools to deliver national goals at the local level in an ecologically, socially, and economically appropriate manner. The Implementation Plan contains the following Implementation outcomes that respond to the four goals established in the 10 Year Comprehensive Strategy:

2. Losses of life are eliminated, and firefighter injuries and damage to communities and the environment from severe, unplanned and unwanted wildland fire are reduced.

3. Hazardous fuels are treated, using appropriate tools, to reduce the risk of unplanned and unwanted wildland fire to communities and the environment.

4. Fire-adapted ecosystems are restored, rehabilitated and maintained, using appropriate tools, in a manner that will provide sustainable environmental, social, and economic benefits.

5. Communities at risk have increased capacity to prevent losses from wildland fire and the potential to seek economic opportunities resulting from treatments and services.

Restoring Fire Adapted Ecosystems On Federal Lands A Cohesive Strategy For Protecting People and sustaining Natural Resources, February 2002 - The primary goal is to coordinate an aggressive, collaborative approach to reduce the threat of wildland fire to communities and to restore and maintain land health.

Healthy Forests An Initiative for Wildfire Prevention and Stronger Communities, August 2002 - The Healthy Forest Initiative will implement core components of the National Fire Plan's 10-year Comprehensive Strategy and Implementation Plan. This historic plan, which was adopted this spring by federal agencies and western governors, in collaboration with county commissioners, state foresters, and tribal officials, calls for protecting communities and the environment through local collaboration on thinning, planned burns and forest restoration projects.

The initiative will complement the National Fire Plan by reducing unnecessary regulatory obstacles and allowing more effective and timely actions.

Healthy Forest Restoration Act, December 2003 - Purposes of the Act include the following:

1. To reduce wildfire risk to communities, municipal water supplies, and other at-risk federal land through a collaborative process of planning, prioritizing, and implementing hazardous fuel reduction projects;

2. To authorize grant programs to improve the commercial value of forest biomass (that otherwise contributes to the risk of catastrophic fire or insect or disease infestation) for producing electric energy, useful heat, transportation fuel, and petroleum-based product substitutes, and for commercial purposes;

3. To enhance efforts to protect watersheds and address threats to forest and rangeland health, including catastrophic wildfire, across the landscape;

4. To promote systematic gathering of information to address the impact of insect and disease infestations and other damaging agents on forest and rangeland health;

5. To improve the capacity to detect insect and disease infestations at an early stage, particularly with respect to hard-wood forests; and

    a. To promote the recovery of threatened and endangered species;

    b. To improve biological diversity; and

    c. To enhance productivity and carbon sequestration.

A.2.1.3. Special Status Species Policy and Guidance

Endangered Species Act of 1973 (16U.S.C. 1531 *et seq.*), as amended.

Provisions of the ESA, as amended, apply to plants and animals that have been listed as endangered or threatened, those proposed for being listed, and designated and proposed critical habitat.

Sikes Act of 1974, Title II (16 U.S.C. 670g *et seq.*), as amended.

This Act directs the Secretaries of Interior and Agriculture to, in cooperation with the State agencies, develop plans to establish, maintain, and coordinate programs for the conservation and rehabilitation of wildlife, fish and game. Such conservation and rehabilitation programs shall include, but not limited to, specific habitat improvement projects, and related activities and adequate protection for species considered threatened or endangered.

BLM Special Status Species Policy

It is BLM National Special Status Species Policy to comply with the following stipulations:

1. Conserve federally listed and proposed threatened or endangered species and the habitats on which they depend.

2. Ensure that actions requiring authorization or approval by the BLM are consistent with the conservation needs of special status species (SSS) and do not contribute to the need to list any SSS, either under provisions of the ESA or other provisions of this policy.

Fire management planning and activities that involve site-specific projects within the BMFO should consider the following guidance where ESA species occur:

1. Ensure compliance with recovery or conservation plans and activities that promote species recovery in the BMFO.

2. Ensue compliance with terms and conditions of consultation with the USFWS and NDOW to promote species recovery in the BMFO.

3. Identify specific fire management strategies, activities and guidelines that serve to conserve SSS and ESA listed proposed and candidate species.

BLM Manual 6840.06 - BLM Sensitive Species Policy

BLM policy is to provide sensitive species with the same level of protection as is provided for candidate species in BLM Manual 6840.06 C, that is to "ensure that actions authorized, funded, or carried out do not contribute to the need for the species to become listed". The Sensitive Species designation is normally used for species that occur on Bureau administered lands for which BLM has the capability to significantly affect the conservation status of the species through management.

A.2.1.4. BLM Greater Sage grouse Species Policy and Guidance

BLM Manual 6840 Special Status Species Management - Sage grouse

Policy guidance for Sage grouse habitat conservation is summarized in this manual. It provides national-level policy direction, consistent with appropriate laws, for the conservation of special status species of animals and plants and the ecosystems on which they depend. *Conservation* in this Strategy, and consistent with 6840 policy, means the use of all methods and procedures necessary to improve the condition of special status species and their habitats to a point where their special status recognition is no longer warranted.

BLM National Sage grouse Habitat Conservation Strategy – June 2004

The objective of the national BLM Sage grouse Habitat Conservation Strategy is to manage public land in a manner that will maintain, enhance, and restore Sage grouse habitats while providing for multiple uses of BLM-administered public land.

The following five goals will guide BLM's implementation of the national Strategy:

1. Develop a consistent and effective management framework for addressing conservation needs of Sage grouse on public lands.

2. Increase our understanding of resource conditions and priorities for maintaining and restoring habitat.

3. Expand available research and information that supports effective management of Sage grouse habitat.

4. Develop partnerships to enhance effective management of Sage grouse habitats.

5. Ensure leadership and resources are adequate to implement national and state-level Sage grouse habitat conservation strategies.

Sections of the BLM National Sage grouse Habitat Conservation Strategy that reference fire management issues and strategies are summarized in Chapter 3, Section C. Fire Management Options

A.2.2. BLM Nevada/Regional Policy, Direction and Guidance

A.2.2.1. Nevada BLM Sensitive Species Policy

BLM Nevada Sensitive Species are taxa that are not already included as BLM Special Status Species under the following listings:

1. Federally listed, proposed, or candidate species; or

2. State of Nevada listed species.

BLM policy is to provide these species with the same level of protection as is provided for candidate species to "ensure that actions authorized, funded, or carried out do not contribute to the need for the species to become listed". The Sensitive Species designation is normally used for species that occur on Bureau administered lands for which BLM has the capability to significantly affect the conservation status of the species through management.

A.2.2.2. Desert Tortoise Recovery Plan, 1994

The Desert Recovery Plan of 1994 identifies unwanted wildfire as a significant factor in "habitat destruction, degradation, and fragmentation". Changes in vegetation accumulating over almost a century and a half in the Mojave region have been substantial. In general, these changes are characterized by decreases in perennial grasses and native annuals and an increase in exotic ephemerals such as red brome (Bromus rubens). Continuous stands of exotic ephemerals provide fuel which can carry fire over large areas. Historically, fires were small or infrequent over vast areas of the Mojave region, and because native desert plants have not evolved with fire and are not adapted to it, they generally are killed by high-intensity fire. The increasing incidence and severity of fires in the Mojave region are already converting desert shrublands into ephemeral grasslands.

These vegetation changes can be detrimental to desert tortoises for a number of reasons. First, these animals require perennial shrubs for cover from the intense solar radiation in the desert. Second, perennial grasses are important secondary food sources for the desert tortoise in many areas. Third, recurrent fires and competition from exotic ephemerals may reduce the abundance and diversity of native forbs which are the major food source of the desert tortoise. Finally, major fires fragment desert tortoise habitat; fires can also

kill desert tortoises. Several site-specific management plans have been developed to further define recovery strategies and actions.

A.2.2.3. Greater Sage grouse Conservation Plan for Nevada and Eastern California - June 2004

The 2004 First Edition of the Sage grouse Conservation Plan for Nevada and Eastern California quantitatively identifies "risks to Sage grouse populations as they are understood to date". In consideration of all of the exiting factors, it is clear that the risk factors relating to habitat quantity, habitat quality, *and wildfire* have affected Nevada Sage grouse populations the most. Habitat quantity has been reduced because of pinyon-juniper encroachment and changes in the plant community from sagebrush to annual grasses due to catastrophic wildfire, the invasion of exotic, fire prone annuals species, improper grazing management systems, and wild horse over-utilization.

A.2.2.4. Nevada Fire Safe Council Statewide Risk Assessment

The Bureau of Land Management Nevada State Office, through and with the cooperation of the Nevada Fire Safe Council (a non-profit, statewide stakeholder organization) has developed a statewide, county-by-county risk/hazard assessment and mitigation plan for wildland urban interface communities for all 17 Nevada Counties. This plan consists of several components, which include: County and community risk/hazard assessments, prioritization of significant community values that would be severely impacted by wildfire, community fire protection preparedness and community mitigation goals and objectives. The Nevada Statewide Risk Assessment will be used in the development of the LVFO Fire Management Plan as it relates to community assistance, community risk assessment and community protection.

A.2.3. Las Vegas Field Office Fire Program Planning Guidance

The Las Vegas Field Office Fire Management Plan derives overall program guidance from the following planning documents, standards and guidelines:

A.2.3.1. Resource Management Plans (RMP) and General Management Plans Guidance

Wildland fire management activities within the Las Vegas Field Office will assist in meeting the following management goals, standards, and guidelines from the plans listed above.

Primary planning guidance is derived from the Las Vegas RMP, subsequent amendments to the RMP and other applicable Las Vegas Field Office Special Management and/or Activity Plans (e.g.; Desert Tortoise Recovery Plan, 1994 and Multi-Species Management Plan, 2002).

Existing management direction from the Las Vegas RMP and various implementation plans allows for fire as an integral part of ecosystems to meet resource management objectives. This plan also directs activities to improve protection of human life, property and natural resource values through aggressive fire protection, reduction of hazardous fuels and restoration of fire-damaged ecosystems. The LVFO-FMP will provide clear management direction for fire and resource personnel. This management direction may be modified as a result of any amendments of the Las Vegas RMP, or other related planning documents.

The Las Vegas Field Office Fire Management Plan also derives program guidance from the following policy and planning documents:

- Desert Tortoise Recovery Plan, 1994
- Nevada Test and Training Range Resource Management Plan, July 1, 2004
- Red Rock Canyon National Conservation Area General Management Plan (approval pending)
- Sloan Canyon National Conservation Area General Management Plan (approval pending)
- Multiple Species Habitat Conservation Plan, 2002
- Public Law 107-282-Nov. 6, 2002; Clark County Conservation of Public Land and Natural Resources Act of 2002

- BLM Manual 8560 – Management of Designated Wilderness
- BLM Manual Handbook H-8550-1 Interim Management Policy for Lands Under Wilderness Review
- Clark County - State Implementation Plan - for PM 10 & CO
- Southern Nevada Mesquite Woodland Habitat Management Plan, April 1999, (pending approval)
- Final Recovery Plan Southwestern Willow Flycatcher, August, 2002
- Desert Bighorn Sheep Habitat Status and Cooperative Action Plan in the Las Vegas District, 1979
- Rangewide Plan for Managing Habitat of Desert Bighorn Sheep on Public Lands, 1989
- Recovery Plan for Endangered and Threatened Species of Ash Meadows Nevada; Sept. 1990
- Virgin River Fishes Recovery Plan, April 1995
- Recovery Plan for Aquatic Species of the Muddy River Ecosystem, May 1996
- Las Vegas District Normal Fire Rehabilitation Plan and Environmental Assessment – EA No. NV—054-9-24; February, 1992
- Las Vegas District Hazardous Materials Incident Contingency Plan, February 1992

Overall Fire management program guidance and direction, as stated by fire management objectives found within the Las Vegas RMP, is identified as follows:

- To provide fire suppression on approximately 3,332,000 acres of public lands based on suppression unit objectives and resource management needs. (Ref; FE-1)
- Allow prescribed fire for resource enhancement purposes on those areas identified in the fire management plan and RMP. (Ref; FE-2)
- Provide fuels reduction management for resource protection on those areas identified in the fire management plan and RMP. (Ref; FE-3)
- Provide fire suppression assistance to other state and federal entities where formal agreements are in place. (Ref; FE-4)

Additional Fire management program guidance and direction, as stated by fire management direction found within the Las Vegas RMP, is identified as follows:

- Provide fire suppression efforts commensurate with resource and adjacent property values at risk.
- Use approved fire suppression techniques in ACEC's, where there are concerns for habitat, cultural resources, T&E species, wilderness study areas, designated natural areas, and urban/rural/wildland fire interface zones.

- Prevent human-caused fires through an aggressive education, investigation, and public outreach effort.
- Determine specific prescribed burn priorities annually, including any noxious or invasive species infestations, and implement where possible.
- To minimize wildfire damage to life, property and resources.
- To use fire as a tool to improve wildlife habitat, range, watershed, and other values.
- Use integrated weed management techniques to control and eradicate tamarisk, such as burning.

A.3. Fire Management Unit Descriptions, Objectives, and Strategies

A.3.1. General Management Considerations

In compliance with direction provided in current LVFO planning documents, the following general Las Vegas Field Office wildland fire management guidance was developed:

- Use or manage fire to restore and/or sustain ecosystem health based on sound scientific principles and information, balanced with other resource management goals, societal goals, including public health and safety, and air quality.
- All wildland fire management activities will be managed as described in the FMU guidance outlined in Chapter III, Section D.
- Identify appropriate management response (AMR) goals, objectives, and constraints by individual Fire Management Units (FMUs) within LVFO.
- In those areas of LVFO that provide cooperator fire protection, coordinate with those agencies and/or other cooperators to develop AMR actions, as documented in the operating plan, for wildland fires on or threatening BLM lands. Ensure emphasis on minimizing the loss of life and damage to private property, minimizing environmental damage due to suppression efforts, primary consideration of firefighter and public safety, and consideration of resource values and high value habitat.
- Meet management goals and objectives through the use of prescribed fire, mechanical treatment, chemical treatment, and biological treatment. Any fire-funded chemical treatments will be required to comply with NEPA analysis and appropriate EIS/EA chemical treatment documents.
- Work collaboratively with the communities at risk from wildfire within the LVFO FMP boundary and established WUI zones
- Work collaboratively with federal, state, and local partners to develop cross boundary management strategies and prioritize interagency/cross-boundary fire management actions.
- Work collaboratively with international partners to develop cross-jurisdictional management strategies and prioritize interagency/international cross-border fire management actions.

A.3.2. Wildland Fire Management Goals

As stated in Chapter II, The Las Vegas Field Office Fire Management Plan will reflect the wildland fire management goals that are identified in the 1995/2001 Federal Wildland Fire Policy, the National Cohesive Strategy and the 10 Year Comprehensive Strategy.

The 10 year Comprehensive Strategy provides a suite of core principles and fire management goals that identifies an aggressive, collaborative approach to reduce the threat of wildland fire to communities and to restore and maintain land health. The four primary goals are:

1. Improve Prevention and Suppression

2. Reduce Hazardous Fuels

3. Restore Fire Adapted Ecosystems

4. Promote Community Assistance

Additionally, the following goal statements reflect the general direction, guidance and intent of the Las Vegas Fire Management Plan:

- Ensure that firefighter and public safety are the highest priority in every fire management activity.

- Assess risk to communities and rural developments in terms of direct wildland fire impact and economic values, and implement effective programs to mitigate that risk through collaborative planning, projects and education.

- Implement the full range of wildland fire and fuels management practices, including prescribed fire, mechanical, chemical, biological, and cultural treatments that will reflect land management decisions as identified in Las Vegas Field Office Resource Management Plans.

- Establish new and/or continue existing partnerships with all interagency cooperators to facilitate coordinated fire management activities.

- Encourage close coordination and collaboration among stakeholders with federal, interested organizations, private landowners, state, and local partners.

- Develop and use the best scientific information (including fire science, vegetation, ecology, watershed, public safety etc.) available to deliver technical and community assistance to support ecological, economic, and social sustainability.

- Design the use of prescribed fire to protect, maintain, and enhance resources, and as nearly as possible, allow fire to function in its ecological role when appropriate for the site and situation, as identified in the Las Vegas Field Office Plans.

- Encourage a multi-disciplinary, integrated approach to fire and resource management within the Las Vegas Field Office.

A.3.3. Wildland Fire Management Options

Wildland fire management options for the Las Vegas Field Office will typically include the following:

- Wildland Fire Suppression – Appropriate Management Response
- Prescribed fire and possible future applications of wildland fire use
- Non-Fire Fuels Treatment that include mechanical, biological, chemical and biomass removal
- Post Fire Rehabilitation and Restoration
- Community Protection, Community Assistance and Rural Fire Assistance

Implementation of the above identified fire management options are further discussed in the following statements:

- The Las Vegas Field Office will provide an appropriate management response (AMR) on all wildland fires that occur within the Field Office.
- Emphasis will be placed on fire fighter and public safety, minimizing environmental damage as a result of suppression activities, and protecting private property, economic benefits and resource values consistent with BLM Policy, resource objectives, standards and guidelines.
- Las Vegas Field Office and its cooperators will respond to each wildland fire in a timely manner with appropriate suppression resources, based upon established fire management direction, interagency agreements and Las Vegas Operating Plans.
- Appropriate management response actions taken by the Las Vegas Field Office will be specifically pre-defined in fire management plans and other operating plans. These plans allow the Las Vegas Field Office (field office manager) to develop preplanned wildland fire management strategies to meet objectives established in resource management plans and their associated implementation/operating plans.
- Operational emphasis will be placed on firefighter and public safety, minimizing the loss of life and damage to private property and minimizing environmental damage due to suppression efforts.

In addition, as identified in the Las Vegas RMP, the LVFO fire program guidance proposes to improve ecosystem management using the following fire management options within the Las Vegas Field Office by:

- Restoring fire as an integral part of ecosystems;
- Using mechanical treatments such as green strips, shaded fuel breaks and tree thinning to reduce wildfire fuel hazards;
- Improving diversity of vegetation.

A.3.3.1. Greater Sage grouse Conservation Plan for Nevada and Eastern California - June, 2004 - Fire Management Strategies, Options and Guidelines

A.3.3.1.1. Fire and Fuels Management Strategies

Strategies to improve habitat quantity include such treatments as mechanical pinyon/juniper removal in known Sage grouse seasonal habitats, protecting quality habitats from wildfire using green strips at the interface of previously burned areas and unburned areas, and re-seeding crested wheatgrass seedings with native grasses and forbs to improve early and late brood rearing habitat.

Habitat quality conservation actions also include vegetative management to establish sagebrush in perennial grasslands, managing riparian areas for proper functioning condition, and vegetation management to combat cheatgrass establishment and/or domination of the understory. Wildfire mitigation actions mainly include pre-suppression treatments to help reduce the intensity and size of wildfires. These projects will be coordinated and implemented in conjunction with local land use plans and/or fire management plans.

A.3.4. Description of Wildland Fire Management Strategies by Fire Management Unit

A.3.4.1. Summary

Table A.1. Summary of Fire Management Units for the Las Vegas Field Office:

FMU Number	FMU Name	FMU Type
NV 050-01	Tortoise - Moderate Density	High Value Habitat
NV 050-02	Tortoise ACEC North	Special Management Area
NV 050-03	Tortoise ACEC South	Special Management Area
NV 050-04	Tortoise - Low Density	High Value Habitat
NV 050-05	Sloan NCA	Special Management Area
NV 050-06	Red Rock NCA (LE)	Special Management Area
NV 050-07	Red Rock NCA (HE)	Special Management Area
NV 050-08	Las Vegas Valley - Apex	Wildland Urban Interface
NV 050-09	Moapa - Overton	Wildland Urban Interface
NV 050-10	Mesquite - Bunkerville	Wildland Urban Interface
NV 050-11	Virgin - Muddy - Meadow	Wildland Urban Interface
NV 050-12	High Juniper	High Value Habitat
NV 050-13	Ash Meadows	Special Management Area
NV 050-14	Mesquite - Acacia	High Value Habitat
NV 050-15	Pahrump	Wildland Urban Interface
NV 050-16	Amargosa - Indian Springs	Wildland Urban Interface
NV 050-17	Laughlin - Nelson	Wildland Urban Interface
NV 050-18	Goodsprings - Primm	Wildland Urban Interface
NV 050-19	Joshua Tree Forest	Special Management Area
NV 050-20	Nellis - Sagegrouse	High Value Habitat
NV 050-21	Nellis Bighorn	High Value Habitat
NV 050-22	Nellis - High Juniper	Vegetation
NV 050-23	Nellis - Low Elevation Shrub	Vegetation

For the purposes of this Fire Plan, a Fire Management Unit is a specific land management area that is defined by fire management objectives, management constraints, topographic features, access, values to be protected, political boundaries, fuel types, and major fire regime groups.

BLM FMP guidance suggests each FMU should be assigned a classification or type, in order to clearly define its primary resource management objective and fire protection values. This FMU type classification has been adopted in this plan as well as its subset of imbedded "resource values". This will be a key component in the FPA-PM process, and will subsequently define a range of "protection value" (pv) weights that occur in each FMU.

A general classification of Fire Management Unit category types are listed as follows:

- **Wildland Urban Interface (WUI)**
- **Special Management Areas (SMA**
- **High Value Habitat (HVH)**
- **Cultural/Historic/Paleontological (CHP)**
- **Vegetation (VEG)**
- **Wilderness (WLD) and Wilderness Study Areas (WSA)**

The Las Vegas Field Office Fire Management Units were developed by an interdisciplinary team, and serve to define fire management objectives, physical characteristics, resource values and treatment actions necessary to achieve resource management objectives, as identified in the LVFO Resource Management Plan. Each of the individual FMUs are somewhat unique, as evidenced by strategies, objectives and value attributes which set it apart from the management characteristics of an adjacent FMU.

The Las Vegas Field Office FMUs will also be used in the Fire Program Analysis (FPA) planning process to define and develop the LVFO fire management program requirements, budgets and program organization.

Wildland Fire Management Strategies and Guidelines Common to All Las Vegas Field Office FMUs

In order to comply with direction provided in current National Fire Plan guidance, the Las Vegas Field Office will work collaboratively with regional partners in fire and resource management, across agency boundaries, to achieve the following fire management priorities, strategies, guidelines and results.

General Fire Management Guidelines

Protection of human life is the first and most important consideration in all wildfire events and suppression actions. The safety of the public and fire fighters is of primary importance. All fire management actions whether they are related to fire suppression, fuels treatment, community education and assistance, or emergency stabilization and rehabilitation will be conducted in a manner consistent with the primary firefighter and public safety priority.

Protection of private property and facilities in at risk wildland urban interface areas will be a high priority. To this end, agencies within the Southern Nevada Fire Planning Unit (FPU) will work collaboratively with communities at risk within the WUI to develop plans for risk reduction.

Where appropriate, use wildland fire to restore and/or sustain ecosystem health, improve the ecological condition/productivity of range ecosystems and maintain natural plant community diversity. Allow fire to function in its ecological role when appropriate for the site and situation to protect, maintain, and enhance resource values.

Fire Suppression

- The Las Vegas Field Office will provide an AMR on all wildland fires that occur within the fire management jurisdiction of the Field Office. LVFO will also identify appropriate management response (AMR) goals, objectives, and constraints by specific Fire Management Units (FMU) within the FPU. All wildland fire management activities will be implemented as described in the individual FMU guidance described in Chapter III, Section D., FMU Descriptions.
- Wildland fires may be managed for resource benefit only if an approved Wildland Fire Implementation Plan (WFIP) is in place. The WFIP identifies specific resource and fire management objectives, a pre-defined geographic area, and prescriptive criteria that must be met.
- As is, the current policy, human caused fires will always be suppressed. Other general fire suppression guidelines are as follows:
- Minimum impact suppression tactics (MIST) will apply, whereby the environmental impacts of emergency fire management methods will be no greater than necessary to meet fire management objectives.
- In the case of a wildland fire that escapes initial attack, a Wildland Fire Situation Analysis (WFSA) must be completed to determine the complexity level and identify suppression alternatives. When analyzing alternatives, consideration should always be given to least cost suppression tactics as long as other resource objectives can be met.
- Assignment of one or more resource advisors will be a standard practice for all intermediate and large wildfires in high value habitat and special management area FMUs.

Fuels Treatments

Prescribed fire and non-fire fuels treatments (mechanical, chemical, and biological) will be developed and implemented in order to create fire safe communities, protect private property, achieve resource management objectives, and restore ecosystem health. Where practicable, projects will be developed in a collaborative manner consistent with the 10-Year Strategy Implementation Plan (2002).

Prescribed burns and non-fire fuel treatments will be reseeded, using native species to the extent practicable, wherever residual vegetation is not adequately abundant to revegetate the sites naturally, prevent domination by invasive weed species, and meet ecosystem restoration objectives.

Wildland Urban Interface areas are of great concern to the BLM and will be considered for fuels treatment projects. These areas are identified in the Communities at Risk section of each

FMU description. Additional collaborative project level planning will be completed prior to implementation of fuels management actions. Additional at risk areas and projects may be identified through a collaborative process on a case-by-case basis.

Community Education and Assistance

An active community education and assistance program will be established where needed to create fire safe communities and prevent catastrophic impacts on sensitive natural resources. Fire prevention strategies will be employed to reduce human ignition with special emphasis in the wildland-urban interface, campgrounds and transportation corridors.

Emergency Stabilization and Rehabilitation (ESR)

Emergency stabilization and rehabilitation efforts will be designed and implemented to achieve vegetation, habitat, soil stability, and watershed objectives. Aggressive actions will be taken in burned areas susceptible to conversion to cheatgrass, or other invasive species.

Rx Fire and Fuel Treatment Monitoring

Increased emphasis will be placed on natural resource objectives for each fire and fuels management treatment. A monitoring and evaluation program will be established to determine the effectiveness of the management implemented. This will include the purposeful collection and analysis of data to determine the results of implementing management actions. It will require monitoring for both pre and post-fire environmental conditions. This information will be used to adjust management determinations. Adjustment in fire and fuels management practices based on sound scientific monitoring and analysis will be consistent with this plan amendment.

Environmental Analysis (NEPA

Current standard operating procedures for environmental analysis will be followed. Each proposal for a prescribed burn or non-fire fuel treatments will be further analyzed in a project specific environmental analysis (CX, EA, DNA) as appropriate.

Las Vegas Field Office – Fire Management Information

The following maps and statistical data provide fire management information in a field-office wide scale, which will serve to define fire management issues and characteristics in a more landscape context.

MAPS:

- Las Vegas Field Office Vegetation/Fuel Type Map
- Las Vegas Field Office Fire Management Unit (FMU) Map
- Las Vegas Fire History, Occurrence and Perimeter Map
- Las Vegas Fire Regime, Condition Class

STATISTICAL SUMMARIES:

- Las Vegas Field Office Agency Ownership by FMU Type
- Las Vegas Field Office Wildfire Ignition History by Decade and 80-03 Total, by Individual FMU

- Las Vegas Field Office Wildfire Ignition History by Year; 1980-2003
- Las Vegas Field Office Wildfire Ignition History by FMU
- Las Vegas Field Office Wildfire Ignition History and Multiple Fire Day History by FMU

Table A.2. Las Vegas Field Office Agency Ownership, by Fire Management Unit Type

Acres and Percent Areas by FMU Type	Wildland Urban Interface		Special Management Area		High Value Habitat		Vegetation		Total Acreages
Ownership	Acres	Percent of Area	Acres	Percent of Area	Acres	Percent of Area	Acres	Percent of Area	
Bureau of Land Management	400,929	42.3	1,201,821	92.8	1,777,223	71.1	50,345	2.2	3,430,318
Bureau of Reclamation	17,402	1.8	9,781	0.8	12,842	0.5	0	0.0	40,026
Department of Defense	8,443	0.9	201	0.0	415,110	16.6	1,640,225	70.6	2,063,979
Department of Energy	0	0.0	0	0.0	230,857	9.2	630,464	27.2	861,321
Fish and Wildlife Service	5	0.0	547	0.0	28	0.0	0	0.0	580
National Park Service	0	0.0	4	0.0	1,030	0.0	0	0.0	1,035
Nevada State	2,246	0.2	561	0.0	33,612	1.3	0	0.0	36,419
Private	519,469	54.7	82,061	6.3	30,371	1.2	769	0.0	632,670
Water	380	0.0	0	0.0	0	0.0	0	0.0	380
Total Acres	948,874		1,294,977		2,501,073		2,321,803		7,066,727

Table A.3. Las Vegas Field Office Ignition History Table, Total and Decadal, by Individual Fire Management Unit

FMU Number	Decadal Number of Fires (94-03)	Largest Fire (94-03)	Decadal Total Acres (94-03)	Decadal Average Acres (94-03)	23 Year Number of Fires (80-03)	Largest Fire (80-03)	23 Year Total Acres (80-03)	23 Year Average Acres (80-03)
NV 050-01	86	1,020.0	27.5	27.5	340	6,011.0	13,402.4	39.4
NV 050-02	27	5,700.0	352.6	352.6	78	5,700.0	15,304.2	196.2
NV 050-03	8	40.0	8.7	8.7	19	250.0	356.3	18.8
NV 050-04	27	2.0	0.3	0.3	60	195.0	217.7	3.6
NV 050-05	0	0.0	0.0	0.0	1	0.0	0.0	0.0
NV 050-06	75	774.0	11.5	11.5	270	774.0	929.9	3.4
NV 050-07	43	75.0	2.0	2.0	142	1,250.0	1,664.0	11.7
NV 050-08	54	40.0	2.2	2.2	316	253.0	990.6	3.1
NV 050-09	12	40.0	5.4	5.4	28	140.0	226.0	8.1
NV 050-10	11	180.0	19.7	19.7	41	225.0	1,025	25.0
NV 050-11	1	0.1	0.1	0.1	4	3.0	6.2	1.6
NV 050-12	8	38.0	7.4	7.4	13	38.0	93.0	7.2
NV 050-13	4	1,100.0	340.1	340.1	7	1,100.0	1,444.3	206.3
NV 050-14	1	0.1	0.1	0.1	3	15.0	15.1	5.0
NV 050-15	35	15.0	1.5	1.5	53	15.0	65.6	1.2
NV 050-16	1	0.1	0.1	0.1	3	0.1	0.2	0.1
NV 050-17	2	0.1	0.1	0.1	7	300.0	350.2	50.0
NV 050-18	0	0.0	0.0	0.0	9	1.0	2.0	0.2
NV 050-19	2	20.0	10.1	20.1	3	20.0	25.1	8.4
NV 050-20	0	0.0	0.0	0.0	3	4.0	4.3	1.4
NV 050-21	1	3.0	3.0	3.0	6	12,050.0	13,007.5	2167.9
NV 050-22	1	5,000.0	5,000.0	5,000.0	1	5,000.0	5,000.0	5,000.0
NV 050-23	4	500.0	125.3	501.2	12	8,320.0	8,951.3	745.9

Table A.4. Las Vegas Field Office Ignition History Table, by Year

Fire Acres by Year for 1980-2003, Las Vegas Field Office				
Year	Number of Ignitions	Largest Fire (Acres)	Average Fire (Acres)	Total Acres
1980	90	1,400	68.5	6,164
1981	87	200	8.8	767
1982	108	40	0.7	73
1983	89	1,250	25.5	2,268
1984	79	200	4.7	369
1985	79	40	1.3	103
1986	77	125	2.5	192
1987	77	6,011	82.2	6,328
1988	65	12,050	323.3	21,016
1989	55	750	19.6	1,078
1990	42	5	0.5	21
1991	65	10	0.4	23
1992	28	8	0.4	13
1993	75	3,200	58.1	4,360
1994	55	5,700	150.3	8,266
1995	47	5,000	159.0	7,474
1996	49	774	33.9	1,663
1997	33	250	8.9	295
1998	51	400	12.0	613
1999	42	5	0.6	26
2000	39	1,100	43.0	1,676
2001	40	180	5.5	220
2002	24	10	1.1	27
2003	23	40	2.0	46

Table A.5. Las Vegas Field Office Ignition History Table, by Fire Management Unit Type

Fire Acres by Type for 1980-2003, Las Vegas Field Office				
FMU Type	Number of Fires	Largest Fire	Average Fire	Total Acres
WUI	461	300.0	5.8	2,666.2
SMA	520	5,700.0	37.9304	19,723.8
HVH	425	12,050	62.9	26,740
VEG	13	8,320	1,073.2	13,951

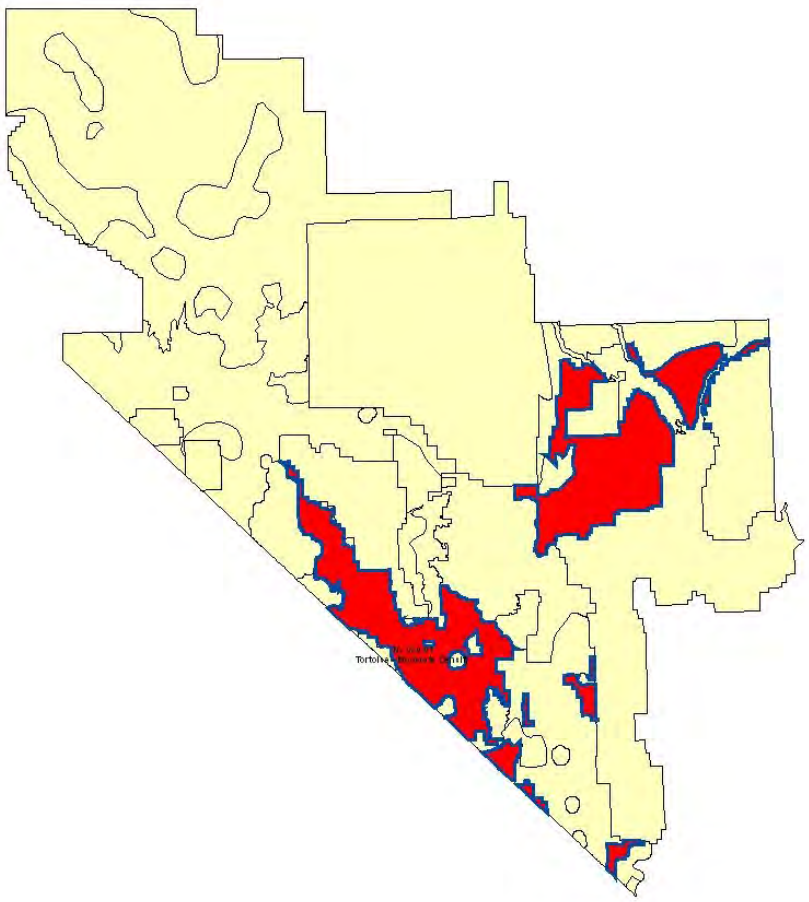
Table A.6. Las Vegas Field Office Ignition History and Multiple Fire Day History Table, by Fire Management Unit Type

Las Vegas Field Office Planning Period				
Las Vegas Field Office Planning Period	WUI	SMA	HVH	VEG
Average Annual Fire Occurrence	19.21	21.67	17.71	0.54
Average Annual Acres Burned	111	66,004	1,114	581
Average Annual Multiple Fire Data				
Average Annual ***Multiple Fires***	6.21	8.83	7.79	0.17

Las Vegas Field Office Planning Period				
Average Annual Acres Burned by ***Multiple Fires***	16.8	411.0	107.0	209.4
Average Annual ***Multiple Fire*** Days	4.33	5.58	4.79	0.17
Total Multiple Fire Data				
Total ***Multiple Fire*** Days and Number of Fires	104 Multiple Fire Days for 149 Fires	134 Multiple Fire Days for 212 Fires	115 Multiple Fire Days for 212 Fires	4 Multiple Fire Days for 4 Fires
Total **Acres Burned by** Multiple Fires	404	9,864	2,568	5,025

A.3.4.2. Tortoise – Moderate Density

NV050-01



FMU Name & Unit No.: Tortoise – Moderate Density; NV050-01

FMU Type/Category: High Value Habitat (HVH)

A.3.4.2.1. FMU Description:

A.3.4.2.1.1. FMU Location Information

Geographic boundaries: This discontinuous, "catch all" FMU takes in those geographic portions of the Las Vegas Field Office not otherwise included in specific FMUs extending to the Northeast and Southern thirds of the Field Office area. The FMU chiefly takes in Mormon Mesa, the Muddy Mountains, Ivanpah Valley and Pahrump Valley, but also includes small areas in the Gold Butte and Piute/Eldorado vicinity. The primary unifying attribute of this FMU is that it incorporates all of the moderate density and most of the low density Desert tortoise range in the Las Vegas Field Office (i.e., as distinct from FMUs NV050-02 and NV050-03, which specifically include only Desert tortoise critical habitat and/or ACEC's).

A.3.4.2.1.2. FMU Acre Total

Ownership by Acres and Percent		
NV-050-01	**Tortoise - Moderate Density**	
Ownership	**Acres**	**Percent**
Bureau of Land Management	1,052,370	92.8
Bureau of Reclamation	12,842	1.1
Department of Defense	14,167	1.2
Nevada State	33,612	3.0
Private	21,188	1.9
Total Acres	1,134,180	

A.3.4.2.1.3. Fire Occurrence and History

FMU Number	**Decadal (94-03)**	**24 Years (80-03)**	**Ignition Cause (80-03)**	
NV 050-01			Lightning	116
Number of Fires	86	340	Human/Other	224
Largest Fire (Acres)	1,020.0	6,011.0	**Multiple Fire Days (80-03)**	
Total Acres Burned	2,367.5	13,402.4	Total Multiple Fire Days (MFD)	102
Average Fire Size (Acres)	27.5	39.4	Number of MFD Fires	153
			Total Acres Burned by Multiple Fires	2,347.4

Narrative Description: Historically, in their undisturbed condition, the low elevation desert shrub communities of this FMU (creosote bursage, blackbrush, saltbush, Mojave scrub, etc) did not typically support the spread or intensity of wildfire. Due to human influences during the past century or more, wildfire now occurs in these desert plant communities with much greater frequency, size, and intensity. These fires are most typically wind driven and are also strongly correlated to ephemeral buildups of invasive annual grasses, primarily red brome.

General Fire Protection Characteristics:

- The low elevation, desert shrub habitat portions of this FMU constitute high suppression priority T&E species values (Desert tortoise).

- Widely scattered throughout this large FMU are pockets of riparian and/or mesquite/acacia habitat. A secondary priority in this FMU is to protect all such habitats from substantial disturbance, either from wildfire or from the impacts of firefighting activities.

- Response times by ground forces can typically exceed one or more hours. The use of aerial suppression resources and tactics will be at a premium.

- Higher elevation portions of this FMU contain mountain shrub communities and even pockets of pinyon-juniper woodland. The majority of this portion of the FMU is located within designated Wildernesses or the Mount Stirling WSA. The operative need here is to avoid unnecessary disturbance resulting from suppression activities. Individual small wildfires (up to 15-acres in size) would generally be considered to benefit bighorn sheep and Mule deer habitat quality (by creating mosaics of shrub cover within pinyon-juniper stands), while also allowing wildfire to re-assert its natural role in mountain systems. For each wilderness area, these and other resource objectives will be identified in Wilderness Plans. Until such time as these plans are completed, suppression actions in the Wilderness/WSA portions of this FMU will comply with the *Las Vegas Field Office Interim Wilderness Management Plan* (2003).

A.3.4.2.1.4. FMU Vegetation

FMU Vegetation/Fuel Types		
NV 050-01	**Tortoise - Moderate Density**	
Veg/Fuel Type	Acres	Percent
Grassland	1,194	0.1
Mojave	1,107,450	97.5
No Significant Vegetation	6,583	0.6
Pinyon/Juniper Woodlands	248	0.0
Sagebrush	4,075	0.4
Salt Desert Scrub/Shadscale	15,794	1.4
Grand Total	1,135,345	

Vegetation Narrative: Approximately 98% of this FMU consists of desert shrub communities, primarily creosote bursage, blackbrush and Mojave scrub. The other 2% of the FMU consists of scattered pockets of higher elevation land, vegetated by mountain chaparral types and pinyon-juniper woodlands.

A.3.4.2.1.5. FMU Fuel Models & Live Fuel Moisture Characteristics

Surface Fuel Model & Canopy Cover: With few exceptions, fine fuels drive the characteristics of wildland fires occurring in this FMU. These fine fuels are ephemeral and primarily consist of red brome and other non-native annual grasses.

Live Fuel Moisture Averages:

LFM Site	May	June	July	Aug	Sept	Oct
N5G	167%	121%	96%	98%	88%	75%

Live Fuel Moisture Characteristics:

- At live fuel moisture levels of 181% and above fires typically will exhibit Very Low Fire Behavior characteristics

- At live fuel moisture levels of 151% to 180% fires typically will exhibit Low Fire Behavior characteristics
- At live fuel moisture levels of 126% to 150% fires typically will exhibit Moderate Fire Behavior characteristics
- At live fuel moisture levels of 101% to 125% fires typically will exhibit High Fire Behavior characteristics
- At live fuel moisture levels of 75% to 100% fires typically will exhibit Extreme Fire Behavior characteristics
- At live fuel moisture levels of 75% and below fires typically will exhibit Advanced Fire Behavior characteristics

A.3.4.2.1.6. Fire Weather & Climate Related Impacts

(Detailed weather station data for this FMU will be added to the FMP Appendix upon completion of the national fire weather data validation/correction project.)

- Wet lightning is common in this area. Fires generally remain small when starts occur under these common conditions.
- Dry Lightning is possible in this area. Larger fires can occur with these erratic and gusty thunderstorm events.
- Larger fires occur when human ignitions occur under typical warm and windy summer weather.
- Fire behavior can be extreme under these conditions in heavily infested tamarisk riparian areas.

A.3.4.2.1.7. Fire Regime

- Fire Regime V; Condition Class II

FMU by Condition Class and Fire Regime			
NV 050-01		Tortoise - Moderate Density	
CC	FR	Acres	Percent
2	II	207,952	18.4
	IV	124	0.0
	V	879,713	78.0
3	I	3,656	0.3
	II	6,501	0.6
	III	611	0.1
	IV	29,293	2.6
	V	340	0.0
Total		1,128,189	

A.3.4.2.1.8. FMU Physical Characteristics

Topography:

- Elevation Range: 1,397 feet to 5,396 feet
- Slope: mostly less than 10%; some areas of 10-30%

- Aspect: Various
- Major topographical features:
  - Mormon Mesa
  - Muddy Mountains
  - California Wash
  - Eldorado Mountains
  - New York Mountains
  - Hiko Wash
  - Newberry Mountains
  - Ivanpah Valley
  - Pahrump Valley

Access Information: Primary access in this FMU is roughly divided between Interstate 15 North (Mormon Mesa); Interstate 15 South (Ivanpah Valley), and State Route 160 (Pahrump Valley). Other access within the FMU includes the Bitter Springs Back Country Byway (Muddy Mountains), State Route 161 (Goodsprings), State Route 164 (New York Mountains) and numerous unpaved roads. Much of this FMU is roadless. Response times by ground forces can typically exceed one or more hours. The use of aerial suppression resources and tactics will be at a premium.

A.3.4.2.1.9. FMU Resource Values & Attributes

Wildland-Urban Interface/Intermix:

- Those areas of the FMU that abut or surround these seven WUI FMUs: Mesquite-Bunkerville; Moapa-Overton; Virgin-Muddy-Meadow; Las Vegas Valley; Laughlin-Nelson; Goodsprings-Primm; Pahrump.
- Mines
- Utility line corridors and ROW's

Resource Use:

- Dispersed recreation; hunting; special use permit activities
- Open grazing allotments (5):
  - Lower Mormon Mesa Allotment
  - Muddy River Allotment
  - Hidden Valley Allotment
  - Jean Lake Allotment

  - Wheeler Wash Allotment
- Mines
- Utility line corridors and ROW's
- Commercial reptile collecting

Air Quality: This FMU contains portions of 3 non-attainment airsheds. Fire management activities in this FMU may include fire suppression, open burning, and light and heavy equipment mobilization. Fire Management Open burning (RX FIRE) is permitted in Clark County with a courtesy call to the Department of Health. Open burning is defined here "where fire is set either by OFFICERS of governmental agencies, in performance of their official duties or the purposes of training and instruction of firefighting and fire-rescue personnel". (*Section 42-Open Burning, Clark County Air Quality Regulations*).

Rx fire burn plans witnin NYE County will have an approved variance (Open Burn Permit) from the State of Nevada, Division of Environmental Protection; Smoke Management Program.

Soils: Soils have formed under conditions of physical weathering (rather than chemical dissolution) because of the arid climate. Soils on lower portions of alluvial fans and valley floors contain very little organic material, are moderately to highly alkaline, and can contain high concentrations of gypsum and dissolved salts. A gravelly surface crust (called desert pavement) occurs throughout these areas. Desert pavement is very stable and protects underlying fine-grained soils from erosion. A cemented hardpan layer commonly occurs at shallow depths beneath surface soils throughout these areas. Mountain slopes tend to be covered by an unstable layer of large rocks, boulders, stones, and cobbles. Runoff from periodic rainstorms transports large amounts of material to lower elevations, forming alluvial fans of coarse material and depositing thick sequences of gravelly loams, sands, and finer grained sediments on valley floors.

Soils are susceptible to water and wind erosion. Water erosion occurs during periodic high-intensity, short duration summertime thunderstorms and less frequent, sustained wintertime rainstorms. Water erosion occurs by a combination of sheet flow, rill formation, splashing, and channelized flow in ephemeral washes and stream channels. Wind erosion occurs in areas where the desert pavement layer has been disturbed by human activities or heavy use by wild horses and burros, where large areas of vegetation have been burned by fire, sand dune areas, and as part of physical weathering processes.

Cultural and Paleontological Values:

- Arrow Canyon ACEC
- Hidden Valley ACEC
- Crescent Townsite ACEC
- North Muddy Mountains (rock art sites)
- Logan Wash (rock art sites)
- Weiber Wash (rock art sites)
- Overton Wash (rock art sites)

- Buffington Pockets (rock art sites)
- Battleship Wash (rock art sites)
- Double Canyon (rock art sites)
- Old Spanish Trail/Mormon Road
- Nelson (historic mining district)
- Goodsprings (historic mining district)

T&E and Sensitive Species:

- Desert tortoise
- Moderate and low density Desert tortoise habitat (T&E Species)
- Wilderness areas; Wilderness Study Area
- Sensitive species habitat (plants, bats, birds, reptiles); including riparian areas and mesquite/acacia stands (especially Hiko Wash)

Habitat Values:

- Moderate and low density Desert tortoise habitat
- Sensitive species, including 16 plants that are strongly associated with gypsum soils, deep-sand swales, or coarse gravelly washes. Populations are concentrated in Mormon Mesa; California Wash; Weiser Wash; Bitter Springs Valley; White Basin; Gypsum Spring; Frenchman Mountain/Rainbow Gardens; Hidden Valley; Jean Dry Lake Valley; Ivanpah Valley; southern Pahrump Valley.
- Other sensitive species habitats/populations (bats, birds, plants).
- Riparian and mesquite/acacia habitats.
- Bighorn sheep crucial habitat; Bighorn sheep winter range.
- Mule deer crucial summer habitat; Mule deer winter range.
- Wild horse and burro range

Hydrology and Water Quality: The Tortoise-Moderate Density FMU lies within the Colorado River Basin hydrographic region which is part of a regional flow system that drains portions of seven southwestern states. The Colorado River and its mainstem reservoirs (Lake Mead and Lake Mohave) are an important source of water for the Las Vegas Valley and millions of downstream users. Ephemeral wash channels drain most areas and only convey flow after periodic high-intensity summer thunderstorms or sustained winter rainstorms. The only perennial streams occur in the eastern and south-central portions of Clark County, within the Colorado River hydrographic region.

Wilderness or WSA:

- Arrow Canyon Wilderness

- Muddy Mountains Wilderness
- Eldorado Wilderness
- Ireteba Peaks Wilderness
- South McCullough Wilderness
- Mt. Charleston Wilderness
- Mountain Mount Stirling Wilderness Study

A.3.4.2.1.10. FMU Public Safety, Economic & Community Values at Risk

- Life safety (public and firefighters)
- Moderate and low density Desert tortoise range (T&E Species)
- Sensitive species, including 16 plants that are strongly associated with gypsum soils, deep-sand swales, or coarse gravelly washes. Populations are concentrated in Mormon Mesa; California Wash; Weiser Wash; Bitter Springs Valley; White Basin; Gypsum Spring; Frenchman Mountain/Rainbow Gardens; Hidden Valley; Jean Dry Lake Valley; Ivanpah Valley; southern Pahrump Valley.
- Other sensitive species habitats/populations (bats, birds, plants).
- Riparian and mesquite/acacia habitats.
- Bighorn sheep crucial habitat; Bighorn sheep winter range.
- Mule deer crucial summer habitat; Mule deer winter range.
- Wild horse and burro range (4 Herd Management Areas)
- Arrow Canyon Wilderness
- Muddy Mountains Wilderness
- Eldorado Wilderness
- Ireteba Peaks Wilderness
- South McCullough Wilderness
- Mt. Charleston Wilderness
- Mount Stirling Wilderness Study Area
- Rainbow Gardens ACEC (sensitive plant species habitat)
- Arrow Canyon ACEC
- Hidden Valley ACEC
- Crescent Townsite ACEC

- Mines
- Utility line corridors and ROW's
- Grazing (5 Allotments)

A.3.4.2.1.11. FMU Fire Protection Responsibility

Wildland fire protection on all BLM public lands within this FMU is provided by the Las Vegas Field Office. Structural fire protection on private lands within this FMU is provided by the Clark County Fire Department and/or the City of Mesquite Fire Department.

A.3.4.2.2. FMU Objectives & Strategies

A.3.4.2.2.1. FMU Fire Management Objectives Priority Statement

- Protect human life, safety of wildland firefighters, and protection of human safety and health *(National Fire Plan 2001)*.
- Use approved fire suppression techniques in areas of critical environmental concern where there are concerns for habitat, threatened and endangered species, and urban/rural/wildland interface zones (LVFO RMP, 1998. Fire Management Direction FE-1-d).
- Provide fire suppression efforts commensurate with resource and adjacent property values at risk (LVFO RMP, 1998. Fire Mgt Direction FE-1-a).
- Manage habitat to further sustain the populations of federally listed species so they would no longer need protection of the Endangered Species Act. Manage habitats for non-listed special status species to support viable populations so that future listing would not be necessary *(LVFO RMP 1998. Special Status Species Mgt Objective SS-2)*.
- Manage special status species habitat at the potential natural community or desired plant community, according to the need of the species (LVFO RMP 1998. Special Status Species Mgt Objective SS-1).
- Determine specific hazard reduction priorities, including any noxious or invasive species infestations, and implement according to the existing budget (LVFO RMP, 1998. Fire Mgt Direction FE-2-a).
- On watersheds that exhibit good potential for recovery, implement protective measures, including but not limited to fencing and removal of tamarisk (LVFO RMP, 1998. Soil Resource Mgt Objective SL-1).
- Maintain or improve the condition of vegetation on public lands to a Desired Plant Community or to a Potential Natural Community (LVFO RMP 1998. Vegetation Mgt Objective VG-1).
- Restore plant productivity on disturbed areas of the public lands. Rehabilitate, reclaim, or revegetate areas subjected to surface-disturbing activities, where feasible. When rehabilitating, manage for optimum species diversity by seeding native species, except where non-native species are appropriate (LVFO RMP 1998. Vegetation Mgt Objective VG-2).

- Manage Mesquite and Acacia woodlands for their value as wildlife habitat in the following areas: Amargosa Valley, Pahrump Valley, Stewart Valley, Hiko Wash, Piute Wash, Crystal and Stump Springs, or any other areas identified as being of significant wildlife value *(LVFO RMP, 1998. Fish, Wildlife and Special Status Species Management, Management Direction FW-3-a)*.

- Protect important resting/nesting habitats, such as riparian areas and mesquite/acacia woodlands *(LVFO RMP, 1998. Fish & Wildlife Mgt Direction FW-3-g)*.

- Wilderness areas are to be managed to provide for the protection, the preservation of their natural conditions, and the preservation of their wilderness character [Wilderness Act, Section 4(b), BLM Manual 6340]. Specific objectives and management direction for the Muddy Mountains, Arrow Canyon, Ireteba Peaks, Eldorado, South McCullough, and Mt. Charleston Wilderness Areas will be identified in Wilderness Management Plans for the areas (LVFO RMP 1998. Wilderness Mgt Objective WS-2) and (BLM Manual 6340).

- Ensure that characteristics on certain lands that caused them to be inventoried and designated as Wilderness Study Areas are maintained and not diminished or lessened in any way that might constrain or limit Congress' final wilderness designation decisions (LVFO RMP 1998. Wilderness Mgt Objective WS-1).

- Manage Wilderness Study Areas in accordance with the Interim Management Policy for Lands Under Wilderness Review (LVFO RMP 1998. Wilderness Mgt Direction WS-1-a).

- Use integrated weed management techniques to control and eradicate tamarisk, such as burning, chemical, biological or mechanical treatments, where potential for treatment is good. Rehabilitate with native species to help reduce the potential for tamarisk re-establishment and improve ecosystem health (LVFO RMP, 1998. Riparian Mgt Objective RP-1-f).

A.3.4.2.2.2. FMU Wildland Fire Suppression Objectives & Strategies

Fire Suppression Objectives:

- Minimize impacts to tortoise habitat during fire suppression by minimizing the use of mechanized equipment and, where possible, staying on existing roads and trails.

- Give priority to keeping each wildfire less than 15 acres in size.

- Utilize MIST and comply with identified operational constraints in scattered FMU locations of special management value, including: riparian habitats, mesquite/acacia woodland stands, wilderness areas, and Wilderness Study Areas.

- Require reclamation of disturbed lands so that predisturbed condition can be reached within a reasonable time frame.

Fire Suppression Strategies:

- Prioritize suppression of wildfires occurring in any portion of this FMU that abuts or surrounds WUI FMUs.

- Wildland fires will be fought aggressively in upland habitat areas in order to minimize burned acreage in moderate density Desert tortoise range, using Appropriate Management Response options.

- MIST will be employed on all wildfires occurring in wilderness areas, the WSA, and all riparian habitats or mesquite/acacia habitats (particularly Hiko Wash).
- Unless human life or property is threatened, all firefighting activities in this FMU will conform to the specific operational constraints identified here for: Desert tortoise; Wilderness; WSA/ISA; riparian and mesquite/acacia; and noxious/invasive weed transport control.

Suppression/Protection Priorities:

- Moderate density Desert tortoise habitat: Mormon Mesa; Moapa Valley/ California Wash; Pahrump Valley; Ivanpah Valley north of Interstate 15.
- Moderate and low density Desert tortoise range (T&E Species)
- All riparian and mesquite/acacia habitats, especially Hiko Wash.
- All wildfires occurring within the air quality non-attainment airshed basins in this FMU: north and south of Apex, along US Highway 93; between Las Vegas Valley and Jean, NV, primarily north of Interstate 15.
- Wilderness Areas (6): Arrow Canyon; Muddy Mountains; Eldorado; Ireteba Peaks; South McCullough; Mt. Charleston.
- Mount Stirling Wilderness Study Area
- Rainbow Gardens ACEC (sensitive plant species habitat)
- Cultural resource ACEC's (3): Arrow Canyon; Hidden Valley; Crescent Townsite.
- Sensitive species habitats and populations mainly concentrated in areas of either gypsum soils; deep sand swales; gravelly washes; riparian areas; or mesquite/acacia stands.
- Wild horse & burro Herd Management Areas (4): Muddy Mountains HMA; Eldorado HMA; Red Rock HMA; Johnnie HMA.

FMU Target Individual Wildland Fire Size: 15 acres @ 90%

FMU Target Acres Burned Per Decade: 500 acres

A.3.4.2.2.3. FMU Wildland Fire Operational Constraints, Objectives & Strategies

Special Fire Management Consideration/Areas:

- Moderate density Desert tortoise habitat
- Arrow Canyon Wilderness
- Muddy Mountains Wilderness
- Ireteba Peaks Wilderness
- Eldorado Wilderness
- South McCullough Wilderness

- Mt. Charleston Wilderness
- Mount Stirling Wilderness Study Area
- Riparian and/or mesquite/acacia habitats; especially Hiko Wash

A.3.4.2.2.3.1. Wildland Fire Operational Constraints Objectives & Strategies:

A.3.4.2.2.3.1.1. Desert Tortoise:

- Initiate full suppression activities with minimum surface disturbances to reduce loss of tortoise cover and to minimize the spread of exotic annual grasses.
- Require consultation with a qualified Resource Advisor for all wildfires within desert tortoise habitat.
- Restrict OHV travel and the use of tracked vehicles to the minimum necessary to suppress wildfires within desert tortoise habitat. Obliterate all tracks to reduce possibility of future use.
- Use of aerial retardant is authorized; foam or fugitive retardant is preferable to iron oxide retardant.
- Do not authorize burning out of unburned fingers or islands of vegetation. The exception to this case would be the removal of fuels for safety concerns.
- Establish fire camps, staging areas, and helispots in previously disturbed areas outside of ACEC's and designated critical habitat units, where possible, in consultation with a qualified Resource Advisor.
- Provide all firefighters and support personnel with a briefing on desert tortoises and their habitat to minimize take, particularly those associated with vehicle use.

A.3.4.2.2.3.1.2. Wilderness:

- A Resource Advisor will be dispatched to all fires occurring in or threatening a wilderness area.
- Use of Heavy equipment (bulldozers, etc.) will only be used in Wilderness if the fire is threatening human life or property. The Field Manager must approve the use of heavy equipment in all cases.
- Motorized vehicles used in fire suppression efforts will remain on "cherrystem" roads or predetermined existing ways inside Wilderness.
- Air resources including helicopters and SEAT's will be included in the WILDCAD system for all wilderness fire suppression activities.
- Helibases, staging areas, and fire camps will be located outside of wilderness areas, unless authorized by the Field Manager.
- Use of retardant must be approved by the Field Manager.
- If retardant is not approved, water may be dropped from aircraft.

- Landing of helicopters will be kept to a minimum and will only occur in existing openings.
- All fire suppression activities will use Minimum Impact Suppression Techniques (MIST) at all times. See attached MIST Guidelines.
- Hand crews may use conventional hand tools and, with approval from the Resource Advisor, may conservatively use chainsaws for fire line construction. Chainsaw use and line width should be kept to a minimum. Utilization of existing natural barriers, minimum "scratch line", and cold trailing is encouraged where feasible. Handline construction will be rehabilitated back to the natural contour.
- A "Leave No Trace" policy will be used in the wilderness area. All evidence of human activity must be removed, to the maximum extent possible.
- Noxious weeds will be controlled in conformance with the attached "Las Vegas Field Office Noxious Weed Control, Fire Management Weed Transport Control" guidelines.

A.3.4.2.2.3.1.3. WSA/ISA:

- A Resource Advisor will be dispatched to all fires occurring in or threatening a WSA.
- Use of heavy equipment (bulldozers, etc.) will only be used in the Wilderness Study Areas if the fire is threatening human life or property. The Field Manger must approve the use of heavy equipment in all cases.
- Air resources including helicopters, and SEATS will be included in the WILDCAD system for all Wilderness Study Area fire suppression activities.
- Use of retardant must be approved by the Field Manager, if retardant is not approved water may be dropped from retardant aircraft.
- All fire suppression activities will use Minimum Impact Suppression Techniques (MIST) at all times.
- Hand crews may use conventional hand tools and may conservatively use chain saws for fire line construction. Chain saw use and line width should be kept to a minimum. Utilization of existing natural barriers, minimum "scratch line", and cold trailing is encouraged where feasible. Handline construction will be rehabilitated back to the natural contour.
- A "Leave No Trace" policy will be used in the Wilderness Study Areas. All evidence of human activity must be removed, to the maximum extent possible.
- Motorized vehicle use in the Wilderness Study Areas may only occur on existing routes. Any cross-country use of vehicles must be authorized by the Field Manager.
- No grading, blading, clearing or cutting of trees is permitted to accommodate vehicle access.
- Helibases, staging areas, and fire camps will be located outside of the Wilderness Study Areas, unless it is authorized by the Resource Advisor.
- Landing of helicopters will be kept to a minimum and will only occur in existing openings.

- Any impacts created by suppression activities should be rehabilitated prior to releasing fire crews and associated fire equipment following fire containment. If that is impossible, due to the need to commit resources to other ongoing fires, impacts will be rehabilitated as soon as feasible following fire containment.

A.3.4.2.2.3.1.4. Riparian or Mesquite/Acacia Habitats:

- Apply M.I.S.T. within riparian habitat
- In riparian areas, prioritize suppression actions to minimize damage to stands of native vegetation from wildfire or suppression operations
- Fire suppression in riparian habitat will be coordinated with the approved Resource Advisor
- In riparian areas, use natural barriers or openings in riparian vegetation where possible as the easiest, safest method to manage a riparian wildfire. Where possible and practical use wet firebreaks rather than constructing firelines by hand or with heavy equipment
- Avoid burning out unburned islands, whenever possible
- Utilize firing tactics only if necessary to protect firefighter or public safety
- Avoid surface disturbing suppression activities in riparian areas whenever possible
- Avoid dropping retardant within 300 feet of water sources, to the maximum extent feasible
- Unless given case-by-case approval from the US Fish and Wildlife Service, the Virgin River CAN NOT be used as a water source for suppression (dip site, pump drafting, etc.), due to the presence of federally listed threatened and endangered fish species.
- Use of containment systems for portable pumps to avoid fuel spills in riparian or aquatic systems will be required.

A.3.4.2.2.3.1.5. Noxious Weeds and Invasive Species Transport Control Procedures:

Las Vegas Field Office Noxious Weed Control and Fire Management Weed Transport Control:

- Off-district engines, crew carriers, overhead vehicles, and helitack/helicopter support vehicles will, upon check-in and prior to proceeding to the line, wash down at the, Logandale, Red Rock, Pahrump Fire Stations or a commercial truck washing station. This will be determined by the location of the units' last fire assignment and if they were cleaned at release from that assignment
    - The washdown will concentrate on the undercarriage, with special emphasis on axles, frame, crossmembers, motor mounts, and on and underneath steps, running boards, and front bumper/brushguard assemblies. Vehicle cabs will be swept out with refuse disposed of in waste receptacles. In wilderness areas, all portable equipment used on an incident (pumps, hose, fittings, etc) will be washed off to rid them of any seed or spores that may be attached from previous fires in noxious weed infested sites
    - During initial briefings, washdowns will be mentioned and facilities made available for oncoming crews.

- Las Vegas Field Office crews will follow the same procedures identified in Item 1 when returning from fieldwork or wildland fires, especially when vehicles are used in know noxious weed areas infested with known noxious or invasive species common to the Field Office area.
- Upon leaving the Field Office when released from an incident, all off-unit vehicles will follow aforementioned washdown procedures so that Las Vegas' noxious weed problems do not become someone else's problems.
- All equipment used off pavement will be cleaned of weed and grass seed stems, stalks, etc. prior to release from an incident. This includes, but is not limited to, tents, tarps, helicopter support equipment, foldatanks and free-standing tanks, mechanic's vehicles, and logistical support vehicles, trailers and equipment. These vehicles will be washed as in 1.a. above.

This Field Office policy will be followed by all equipment involved in fire suppression while on Las Vegas Field Office assignments. Vehicles will be cleared of washdown procedures during checkout and crew evaluations. In the event vehicles are released from fires away from the district office, the closest wash facility, (government or commercial) will be utilized.

A.3.4.2.2.4. FMU Wildland Fire Use Objectives & Strategies

Wildfire will not be used as a management tool within this FMU at this time.

A.3.4.2.2.5. Burned Acre Objective Review

IF the FMU decadal wildfire acre-burned target has been reached or exceeded PRIOR TO THE COMPLETION OF THE 10-YEAR PLANNING PERIOD, from either wildfire or prescribed fire, a review of fire management objectives and strategies will be initiated to develop new suppression criteria on wildland fire occurrence and prescribed fire acre goals.

A.3.4.2.2.6. FMU Prescribed Fire Objectives & Strategies

Prescribed Fire Objectives & Strategies: Prescribed fire will not be used as a management tool within this FMU at this time.

Rx Fire Annual & Decadal Acre Target: N/A

T & E Species Strategies: N/A

Air Quality Strategy: N/A

NEPA Compliance: Prior to implementation of any proposed projects, site-specific NEPA documentation will be completed, as applicable.

Rx Fire Monitoring Strategy: Monitoring will be completed for attainment/non-attainment of project specific resource management objectives, as applicable.

A.3.4.2.2.7. FMU Non-Fire Fuels Treatment Objectives & Strategies

Non-Fire Fuels Treatment Objectives & Strategies: Non-fire fuel treatments will not be used as a management tool within this FMU at this time.

Non-Fire Annual & Decadal Acre Target: N/A

T & E Species Strategies: N/A

Air Quality Strategies: N/A

NEPA Compliance: Prior to implementation of any proposed projects, site-specific NEPA documentation will be completed, as applicable.

Treatment Monitoring Strategy: N/A

A.3.4.2.2.8. FMU Post Fire Rehab/Restoration Objectives & Strategies

Restore plant productivity on disturbed areas of the public lands. Rehabilitate, reclaim, or revegetate areas subjected to surface-disturbing activities, where feasible. When rehabilitating, manage for optimum species diversity by seeding native species, except where non-native species are appropriate.

- In desert tortoise habitat, conduct all activities in accordance with the Reclamation Plan For Critical Tortoise Habitat In The Las Vegas Field Office (1998); Environmental Assessment no. NV-052-98-077.
- Within wilderness, rehabilitation and restoration will be conducted in accordance with the appropriate wilderness management plan(s).
- In the event that suppression efforts require off-road vehicle operations, replant and visually camouflage the first 200 feet of tire tracks in order to prevent further habitat impacts (due to public use of these track ways).
- Whenever feasible, utilize native species in seeding and/or re-planting treatments.
- Cultivate local supplies of live plant materials for use during riparian restoration efforts.
- Maintain a seed bank of locally collected native plant species for use in restoring both fire fuels treatments and fire-disturbed sites.
- Cultivate and develop varieties of locally grown native seed by means of plant material centers.

A.3.4.2.2.9. FMU Community Protection/Community Assistance Objectives & Strategies

Communities at Risk/WUI Areas: N/A

Community Protection/Community Assistance Objectives: N/A

Community Protection/Assistance Strategy: Prioritize suppression efforts within portions of this FMU abutting or surrounding WUI FMUs.

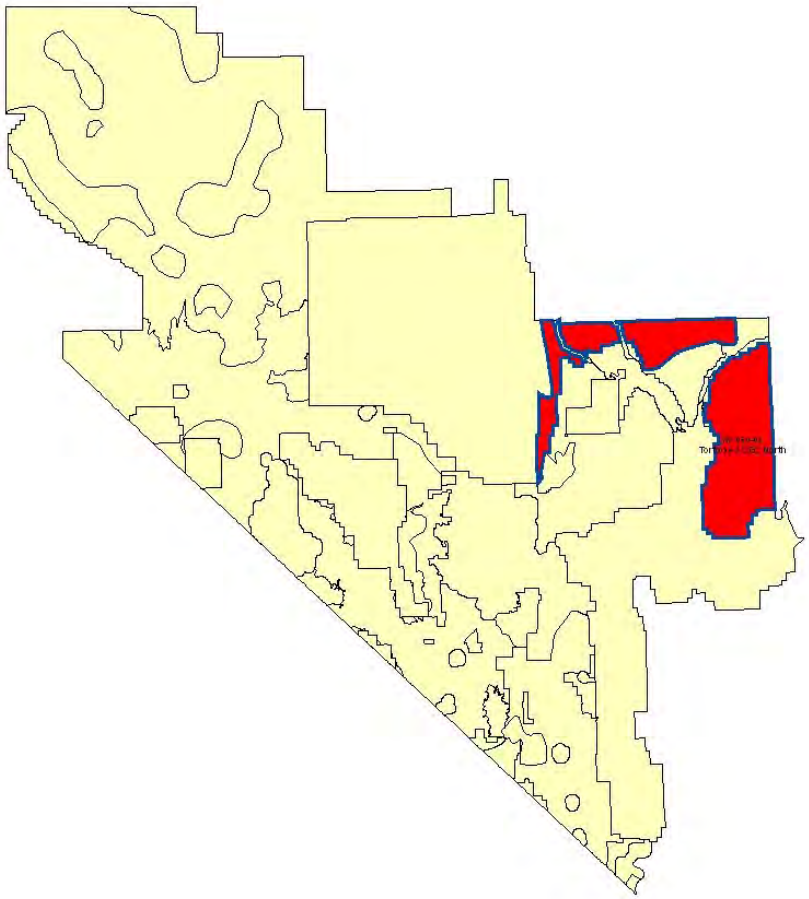
Community Wildfire Safety Education Strategy: N/A

A.3.4.2.3. FMU Fire Program Analysis - Quantifiable Objective Summary

Initial Attack Success	Decadal Wildfire Acres Burn Tolerance	WFU Decadal Target Acres	Rx Fire Acres Per Decade	Non-Fire Acres Per Decade
15 acres 90%	500	N/A	N/A	N/A

A.3.4.3. Tortoise ACEC North

NV050-02



FMU Name & Unit No.: Tortoise ACEC North; NV050-02

FMU Type/Category: Special Management Area (SMA)

A.3.4.3.1. FMU Description:

A.3.4.3.1.1. FMU Location Information

Geographic boundaries: This is a discontinuous FMU comprised of critical desert tortoise habitat, Coyote Springs desert tortoise ACEC, Mormon Mesa desert tortoise ACEC, and the Gold Butte ACEC. Geographically, this FMU lies on either side of the Interstate 15 corridor, in the northeast portion of the Las Vegas Field Office.

A.3.4.3.1.2. FMU Acre Total

Ownership by Acres and Percent		
NV 050-02	**Tortoise ACEC North**	
Ownership	**Acres**	**Percent**
Bureau of Land Management	554,904	96.8
Bureau of Reclamation	9,781	1.7
Department of Defense	201	0.0
Nevada State	547	0.1
Private	8,001	1.4
Total Acres	573,434	

A.3.4.3.1.3. Fire Occurrence and History

FMU Number	**Decadal (94-03)**	**24 Years (80-03)**	**Ignition Cause (80-03)**	
NV 050-02			Lightning	37
Number of Fires	27	78	Human/Other	41
Largest Fire (Acres)	5,700.0	5,700.0	**Multiple Fire Days (80-03)**	
Total Acres Burned	9,519.5	15,304.2	Total Multiple Fire Days (MFD)	31
Average Fire Size (Acres)	352.6	196.2	Number of MFD Fires	34
			Total Acres Burned by Multiple Fires	9,244.6

Narrative Description:

- Fires generally occur in the summer but are not uncommon in the spring, and occasionally occur late into the fall months
- Wildfires within this FMU are almost entirely dependent upon ephemeral buildups of invasive annual grasses, primarily red brome. Fire behavior and spread is most typically wind-driven, but slope influenced fire spread has been known to occur.

General Fire Protection Characteristics:

- The low elevation, desert shrub portion of this FMU comprises high suppression priority desert tortoise habitat.
- The higher elevation, pinyon juniper and mountain shrub portions of this FMU predominately consist of wilderness areas, WSAs, and the Virgin Peak ISA. Suppression priority and tactics utilized in these areas will be in accordance with the individual wilderness plans or the Las Vegas Field Office Interim Wilderness Management Plan (2003).

A.3.4.3.1.4. FMU Vegetation

FMU Vegetation/Fuel Types		
NV 050-02	**Tortoise ACEC North**	
Veg/Fuel Type	Acres	Percent
Grassland	1,212	0.2
Mojave	545,085	95.4
No Significant Vegetation	15,098	2.6
Pinyon/Juniper Woodlands	7,948	1.4
Sagebrush	1,768	0.3
Salt Desert Scrub/Shadscale	118	0.0
Grand Total	571,230	

Vegetation Narrative: Approximately 95% of this FMU consists of low elevation desert shrub communities, primarily the creosote bursage. The remaining 5% consists of mountain shrub communities, Pinyon/Juniper woodlands, and one remnant stand of White fir (Virgin Peak ISA)

A.3.4.3.1.5. FMU Fuel Models & Live Fuel Moisture Characteristics

Surface Fuel Model & Canopy Cover: With few exceptions, fine fuels drive the characteristics of wildland fires occurring in this FMU. These fine fuels are ephemeral and primarily consist of red brome and other non-native annual grasses.

Live Fuel Moisture Averages:

LFM Site	May	June	July	Aug	Sept	Oct
N5E	158%	96%	82%	77%	70%	81%

Live Fuel Moisture Characteristics:

- At live fuel moisture levels of 181% and above fires typically will exhibit Very Low Fire Behavior characteristics
- At live fuel moisture levels of 151% to 180% fires typically will exhibit Low Fire Behavior characteristics
- At live fuel moisture levels of 126% to 150% fires typically will exhibit Moderate Fire Behavior characteristics
- At live fuel moisture levels of 101% to 125% fires typically will exhibit High Fire Behavior characteristics
- At live fuel moisture levels of 75% to 100% fires typically will exhibit Extreme Fire Behavior characteristics
- At live fuel moisture levels of 75% and below fires typically will exhibit Advanced Fire Behavior characteristics

A.3.4.3.1.6. Fire Weather & Climate Related Impacts

(Detailed weather station data for this FMU will be added to the FMP Appendix upon completion of the national fire weather data validation/correction project.)

- Wet lightning is common in this area. Fires generally remain small when starts occur under these common conditions.
- Dry Lightning is possible in this area. Larger fires can occur with these erratic and gusty thunderstorm events.
- Larger fires occur when human ignitions occur under typical warm and windy summer weather.
- Fire behavior can be extreme under these conditions when there are heavy buildups of ephemeral light flashy fuels.
- Fire behavior can be extreme under these conditions in heavy brush and/or Pinyon-Juniper fuels.

A.3.4.3.1.7. Fire Regime

- Low elevation desert shrub: Fire Regime V; Condition Class II
- High elevation shrub/woodland: Fire Regime II; Condition Classes II and III.

FMU by Condition Class and Fire Regime			
NV 050-02		Tortoise ACEC North	
CC	FR	Acres	Percent
2	II	74,910	13.1
	IV	464,987	81.4
3	I	6,292	1.1
	II	23,486	4.1
	IV	1,424	0.2
Total		571,099	

A.3.4.3.1.8. FMU Physical Characteristics

Topography:

- Elevation Range: 1,599 feet to 7,998 feet
- Slope:
  - Low elevation desert shrub: less than 30%
  - High elevation shrub/woodland: 30% to vertical
- Aspect
  - Various
- Major topographical features
  - Coyote Springs valley
  - Mormon Mesa
  - Virgin Mountain Range

Access Information: Access consists only of unpaved roads and a large portion of this FMU is road-less.

A.3.4.3.1.9. FMU Resource Values & Attributes

Wildland-Urban Interface/Intermix: Juanita Springs in-holding and a few mine properties

Resource Use:

- Critical desert tortoise habitat
- Wilderness Areas and Wilderness Study Areas
- Dispersed recreation; hunting; special use permit activities
- Grazing - all allotments are closed in this FMU
- Power line ROW's
- Commercial reptile collecting
- Mines: Copper King, Key West, Great Eastern, Virgin Peak, etc.

Air Quality: This FMU contains portions of 3 non-attainment airsheds. Fire management activities in this FMU may include fire suppression, open burning, and light and heavy equipment mobilization. Fire Management Open burning (RX FIRE) is permitted in Clark County with a courtesy call to the Department of Health. Open burning is defined here "where fire is set either by OFFICERS of governmental agencies, in performance of their official duties or the purposes of training and instruction of firefighting and fire-rescue personnel". (*Section 42-Open Burning, Clark County Air Quality Regulations*).

Soils: Soils have formed under conditions of physical weathering (rather than chemical dissolution) because of the arid climate. Soils on lower portions of alluvial fans and valley floors contain very little organic material, are moderately to highly alkaline, and can contain high concentrations of gypsum and dissolved salts. A gravelly surface crust (called desert pavement) occurs throughout these areas. Desert pavement is very stable and protects underlying fine-grained soils from erosion. A cemented hardpan layer commonly occurs at shallow depths beneath surface soils throughout these areas. Mountain slopes tend to be covered by an unstable layer of large rocks, boulders, stones, and cobbles. Runoff from periodic rainstorms transports large amounts of material to lower elevations, forming alluvial fans of coarse material and depositing thick sequences of gravelly loams, sands, and finer grained sediments on valley floors.

Soils are susceptible to water and wind erosion. Water erosion occurs during periodic high-intensity, short duration summertime thunderstorms and less frequent, sustained wintertime rainstorms. Water erosion occurs by a combination of sheet flow, rill formation, splashing, and channelized flow in ephemeral washes and stream channels. Wind erosion occurs in areas where the desert pavement layer has been disturbed by human activities or heavy use by wild horses and burros, where large areas of vegetation have been burned by fire, sand dune areas, and as part of physical weathering processes. Soils in very high elevation areas have formed under conditions of greater rainfall. Resulting soils reflect a combination of physical weathering of rocks, chemical dissolution of rocks, and the decomposition of organic materials. Relative shallow soil layers occur on bedrock surfaces in these areas. Soils in these areas contain low to moderate amounts of organic material, are slightly to highly alkaline, and contain lower concentrations of dissolved salts than soils at lower elevations.

Cultural and Paleontological Values:

- Virgin Mountain/Gold Butte Traditional Lifeways Area
- Arrow Canyon ACEC
- Whitney Pockets ACEC
- Red Rock Springs ACEC
- Devils Throat ACEC
- Gold Butte Townsite ACEC
- Mud Wash (Prehistoric rock art sites)
- Cedar Basin (Prehistoric rock art sites)
- Old Spanish Trail/Mormon Road

T&E and Sensitive Species: Desert tortoise

Habitat Values:

- Critical desert tortoise habitat
- Bighorn sheep crucial habitat; Bighorn sheep winter range
- Mule deer crucial summer habitat; Mule deer winter range
- Sensitive species populations: Gila monster and 14 plant species
- Gold Butte wild horse and burro herd management area: a portion of this HMA lies within FMU NV050-02 but the Appropriate Management Level is set at zero horses and burros, due to desert tortoise critical habitat constraints

Hydrology and Water Quality: The Tortoise ACEC North FMU lies within the Colorado River Basin hydrographic region which is part of a regional flow system that drains portions of seven southwestern states. The Colorado River and its mainstem reservoirs (Lake Mead and Lake Mohave) are an important source of water for the Las Vegas Valley and millions of downstream users. Ephemeral wash channels drain most areas and only convey flow after periodic high-intensity summer thunderstorms or sustained winter rainstorms. The only perennial streams occur in the eastern and south-central portions of Clark County, within the Colorado River hydrographic region.

Wilderness or WSA:

- Jumbo Springs Wilderness
- Lime Canyon Wilderness
- Arrow Canyon Wilderness
- Million Hills WSA

- Mormon Mountains WSA
- Meadow Valley Range WSA
- Virgin Peak ISA

A.3.4.3.1.10. FMU Public Safety, Economic & Community Values at Risk

- Juanita Springs in-holding
- Mine properties
- Critical desert tortoise habitat
- Cultural ACEC's
- Virgin Valley watershed
- Virgin River water quality
- Power line ROW's
- Crucial bighorn sheep habitat
- Crucial Mule deer habitat

A.3.4.3.1.11. FMU Fire Protection Responsibility

Wildland fire protection on all BLM public lands within this FMU is provided by the Las Vegas Field Office. Structural fire protection on private lands within this FMU is provided by the Clark County Fire Department and/or the City of Mesquite Fire Department.

A.3.4.3.2. FMU Objectives & Strategies

A.3.4.3.2.1. FMU Fire Management Objectives Priority Statement

- Protect human life, safety of wildland firefighters, and protection of human safety and health *(National Fire Plan 2001).*
- Use approved fire suppression techniques in areas of critical environmental concern where there are concerns for habitat, threatened and endangered species, and urban/rural/wildland interface zones (LVFO RMP, 1998. Fire Management Direction FE-1-d).
- Provide fire suppression efforts commensurate with resource and adjacent property values at risk *(LVFO RMP, 1998. Fire Mgt Direction FE-1-a).*
- Determine specific hazard reduction priorities, including any noxious or invasive species infestations, and implement according to the existing budget (LVFO RMP, 1998. Fire Mgt Direction FE-2-a).

- Determine specific prescribed burn priorities annually, including any noxious or invasive species infestations, and implement where possible (LVFO RMP, 1998. Fire Mgt Direction FE-3-a).

- On watersheds that exhibit good potential for recovery, implement protective measures, including but not limited to fencing and removal of tamarisk (LVFO RMP, 1998. Soil Resource Mgt Objective SL-1).

- Manage 743,209 acres of the four desert tortoise areas of critical environmental concern specifically for tortoise recovery. Minimize impacts to tortoise habitat during fire suppression by minimizing the use of mechanized equipment and, where possible, staying on existing roads and trails. Give priority to keeping the wildfire to an absolute minimum (size). Require reclamation of disturbed lands so that predisturbed condition can be reached within a reasonable time frame (LVFO RMP 1998. Special Status Species Mgt Direction SS-3-a).

- Manage habitat to further sustain the populations of federally listed species so they would no longer need protection of the Endangered Species Act. Manage habitats for non-listed special status species to support viable populations so that future listing would not be necessary (LVFO RMP 1998. Special Status Species Mgt Objective SS-2).

- Manage special status species habitat at the potential natural community or desired plant community, according to the need of the species (LVFO RMP 1998. Special Status Species Mgt Objective SS-1).

- Maintain or improve the condition of vegetation on public lands to a Desired Plant Community or to a Potential Natural Community (LVFO RMP 1998. Vegetation Mgt Objective VG-1).

- Restore plant productivity on disturbed areas of the public lands. Rehabilitate, reclaim, or revegetate areas subjected to surface-disturbing activities, where feasible. When rehabilitating, manage for optimum species diversity by seeding native species, except where non-native species are appropriate (LVFO RMP 1998. Vegetation Mgt Objective VG-2).

- Wilderness areas are to be managed to provide for the protection, the preservation of their natural conditions, and the preservation of their wilderness character [Wilderness Act, Section 4(b), BLM Manual 8560 (.08A1)]. Specific objectives and management direction for the Jumbo Springs, Lime Canyon, and Arrow Canyon Wilderness Areas will be identified in Wilderness Management Plans for the areas *(LVFO RMP 1998. Wilderness Mgt Objective WS-2) and (BLM Manual 8560 (.21A)).*

- Ensure that characteristics on certain lands that caused them to be inventoried and designated as Wilderness Study Areas are maintained and not diminished or lessened in any way that might constrain or limit Congress' final wilderness designation decisions (LVFO RMP 1998. Wilderness Mgt Objective WS-1).

- Manage Wilderness Study Areas in accordance with the Interim Management Policy for Lands Under Wilderness Review (LVFO RMP 1998. Wilderness Mgt Direction WS-1-a).

- Maintain woodland and conifer forest where possible for all-aged stands, with understory vegetation forage value rating at moderate or better (LVFO RMP 1998. Forestry Mgt Objective FR-1).

- Use integrated weed management techniques to control and eradicate tamarisk, such as burning, chemical, biological or mechanical treatments, where potential for treatment is good. Rehabilitate with native species to help reduce the potential for tamarisk re-establishment and improve ecosystem health (LVFO RMP, 1998. Riparian Mgt Objective RP-1-f).

A.3.4.3.2.2. FMU Wildland Fire Suppression Objectives & Strategies

Fire Suppression Objectives:

- Minimize impacts to tortoise habitat during fire suppression by minimizing the use of mechanized equipment and, where possible, staying on existing roads and trails.
- Give priority to keeping the wildfire to an absolute minimum (size).
- Require reclamation of disturbed lands so that predisturbed condition can be reached within a reasonable time frame.

Fire Suppression Strategies:

- Wildland fires will be fought aggressively in order to minimize burned acreage in critical desert tortoise habitat and ACEC's. Actions will be dictated by Appropriate Management Response guidelines.
- Wildland fires in all wilderness areas, WSAs, and the Virgin Peak ISA will be fought using Minimum Impact Suppression Tactics (MIST)

Suppression/Protection Priorities:

- Mormon Mesa desert tortoise critical habitat unit
- Gold Butte desert tortoise critical habitat unit
- Coyote Springs ACEC
- Mormon Mesa ACEC
- Gold Butte Part A, B, and C ACEC's
- Virgin Peak ISA

FMU Target Individual Wildland Fire Size: 10 acres @ 90 %

FMU Target Acres Burned Per Decade: 250 acres

A.3.4.3.2.3. FMU Wildland Fire Operational Constraints, Objectives & Strategies

Special Fire Management Consideration/Areas:

- Mormon Mesa desert tortoise critical habitat unit
- Gold Butte desert tortoise critical habitat unit
- Coyote Springs ACEC

- Mormon Mesa ACEC
- Gold Butte Part A, B, and C ACEC's
- Jumbo Springs Wilderness
- Lime Canyon Wilderness
- Arrow Canyon Wilderness
- Million Hills WSA
- Mormon Mountains WSA
- Meadow Valley Range WSA
- Virgin Peak ISA

A.3.4.3.2.3.1. Wildland Fire Operational Constraints Objectives & Strategies:

A.3.4.3.2.3.1.1. Desert Tortoise:

- Initiate full suppression activities with minimum surface disturbances to reduce loss of tortoise cover and to minimize the spread of exotic annual grasses.
- Require consultation with a qualified Resource Advisor for all wildfires within desert tortoise habitat, particularly within ACEC's and designated critical habitat units.
- Restrict OHV travel and the use of tracked vehicles to the minimum necessary to suppress wildfires within desert tortoise habitat, particularly within ACEC's and designated critical habitat units; obliterate all tracks to reduce possibility of future use.
- Use of aerial retardant is authorized; foam or fugitive retardant is preferable to iron oxide retardant.
- Do not authorize burning out of unburned fingers or islands of vegetation. The exception to this case would be the removal of fuels for safety concerns.
- Establish fire camps, staging areas, and helispots in previously disturbed areas outside of ACEC's and designated critical habitat units, where possible, in consultation with a qualified Resource Advisor.
- Provide all firefighters and support personnel with a briefing on desert tortoises and their habitat to minimize take, particularly those associated with vehicle use.

A.3.4.3.2.3.1.2. Wilderness:

- A Resource Advisor will be dispatched to all fires occurring in or threatening a wilderness area.
- Use of Heavy equipment (bulldozers, etc.) will only be used in Wilderness if the fire is threatening human life or property. The Field Manager must approve the use of heavy equipment in all cases.

- Motorized vehicles used in fire suppression efforts will remain on "cherrystem" roads or predetermined existing ways inside Wilderness.
- Air resources including helicopters and SEAT's will be included in the WILDCAD system for all wilderness fire suppression activities.
- Helibases, staging areas, and fire camps will be located outside of wilderness areas, unless authorized by the Field Manager.
- Use of retardant must be approved by the Field Manager.
- If retardant is not approved, water may be dropped from aircraft.
- Landing of helicopters will be kept to a minimum and will only occur in existing openings.
- All fire suppression activities will use Minimum Impact Suppression Techniques (MIST) at all times. See attached MIST Guidelines.
- Hand crews may use conventional hand tools and, with approval from the Resource Advisor, may conservatively use chainsaws for fire line construction. Chainsaw use and line width should be kept to a minimum. Utilization of existing natural barriers, minimum "scratch line", and cold trailing is encouraged where feasible. Handline construction will be rehabilitated back to the natural contour.
- A "Leave No Trace" policy will be used in the wilderness area. All evidence of human activity must be removed, to the maximum extent possible.
- Noxious weeds will be controlled in conformance with the attached "Las Vegas Field Office Noxious Weed Control, Fire Management Weed Transport Control" guidelines.

A.3.4.3.2.3.1.3. WSA/ISA:

- A Resource Advisor will be dispatched to all fires occurring in or threatening a WSA.
- Use of heavy equipment (bulldozers, etc.) will only be used in the Wilderness Study Areas if the fire is threatening human life or property. The Field Manger must approve the use of heavy equipment in all cases.
- Air resources including helicopters and SEAT's will be included in the WILDCAD system for all Wilderness Study Area fire suppression activities.
- Use of retardant must be approved by the Field Manager, if retardant is not approved water may be dropped from retardant aircraft.
- All fire suppression activities will use Minimum Impact Suppression Techniques (MIST) at all times.
- Hand crews may use conventional hand tools and may conservatively use chain saws for fire line construction. Chain saw use and line width should be kept to a minimum. Utilization of existing natural barriers, minimum "scratch line", and cold trailing is encouraged where feasible. Handline construction will be rehabilitated back to the natural contour.

- A "Leave No Trace" policy will be used in the Wilderness Study Areas. All evidence of human activity must be removed, to the maximum extent possible.

- Motorized vehicle use in the Wilderness Study Areas may only occur on existing routes. Any cross-country use of vehicles must be authorized by the Field Manager.

- No grading, blading, clearing or cutting of trees is permitted to accommodate vehicle access.

- Helibases, staging areas, and fire camps will be located outside of the Wilderness Study Areas, unless it is authorized by the Resource Advisor.

- Landing of helicopters will be kept to a minimum and will only occur in existing openings.

- Any impacts created by suppression activities should be rehabilitated prior to releasing fire crews and associated fire equipment following fire containment. If that is impossible, due to the need to commit resources to other ongoing fires, impacts will be rehabilitated as soon as feasible following fire containment.

A.3.4.3.2.3.1.4. Noxious Weeds and Invasive Species Transport Control Procedures:

Las Vegas Field Office Noxious Weed Control and Fire Management Weed Transport Control:

- Off-district engines, crew carriers, overhead vehicles, and helitack/helicopter support vehicles will, upon check-in and prior to proceeding to the line, wash down at the, Logandale, Red Rock, Pahrump Fire Stations or a commercial truck washing station. This will be determined by the location of the units' last fire assignment and if they were cleaned at release from that assignment.

    - The washdown will concentrate on the undercarriage, with special emphasis on axles, frame, crossmembers, motor mounts, and on and underneath steps, running boards, and front bumper/brushguard assemblies. Vehicle cabs will be swept out with refuse disposed of in waste receptacles. In wilderness areas, all portable equipment used on an incident (pumps, hose, fittings, water storage items) will be washed off to rid them of any seed or spores that may be attached from previous fires in noxious weed infested sites.

    - During initial briefings, washdowns will be mentioned and facilities made available for oncoming crews.

- Las Vegas Field Office crews will follow the same procedures identified in Item 1 when returning from fieldwork or wildland fires, especially when vehicles are used in know noxious weed areas infested with known noxious or invasive species common to the Field Office area.

- Upon leaving the Field Office when released from an incident, all off-unit vehicles will follow aforementioned washdown procedures so that Las Vegas' noxious weed problems do not become someone else's problems.

- All equipment used off pavement will be cleaned of weed and grass seed stems, stalks, etc. prior to release from an incident. This includes, but is not limited to, tents, tarps, helicopter support equipment, foldatanks and free-standing tanks, mechanic's vehicles, and logistical support vehicles, trailers and equipment. These vehicles will be washed as in 1.a. above.

This Field Office policy will be followed by all equipment involved in fire suppression while on Las Vegas Field Office assignments. Vehicles will be cleared of washdown procedures during checkout and crew evaluations. In the event vehicles are released from fires away from the district office, the closest wash facility, (government or commercial) will be utilized.

A.3.4.3.2.4. FMU Wildland Fire Use Objectives & Strategies

Wildfire will not be used as a management tool within this FMU at this time.

A.3.4.3.2.5. Burned Acre Objective Review

IF the FMU decadal wildfire acre-burned target has been reached or exceeded PRIOR TO THE COMPLETION OF THE 10-YEAR PLANNING PERIOD, from either wildfire or prescribed fire, a review of fire management objectives and strategies will be initiated to develop new suppression criteria on wildland fire occurrence and prescribed fire acre goals.

A.3.4.3.2.6. FMU Prescribed Fire Objectives & Strategies

Prescribed Fire Objectives & Strategies: Prescribed fire will not be used as a management tool within this FMU at this time.

Rx Fire Annual & Decadal Acre Target: N/A

T & E Species Strategies: N/A

Air Quality Strategy: N/A

NEPA Compliance: Prior to implementation of any proposed projects, site-specific NEPA documentation will be completed, as applicable.

Rx Fire Monitoring Strategy: Monitoring will be completed for attainment/non-attainment of project specific resource management objectives, as applicable.

A.3.4.3.2.7. FMU Non-Fire Fuels Treatment Objectives & Strategies

Non-Fire Fuels Treatment Objectives & Strategies: Non-fire fuel treatments will not be used as a management tool within this FMU at this time.

Non-Fire Annual & Decadal Acre Target: N/A

T & E Species Strategies: N/A

Air Quality Strategies: N/A

NEPA Compliance: Prior to implementation of any proposed projects, site-specific NEPA documentation will be completed, as applicable.

Treatment Monitoring Strategy: Monitoring will be completed for attainment/non-attainment of project specific resource management objectives, as applicable

A.3.4.3.2.8. FMU Post Fire Rehab/Restoration Objectives & Strategies

Restore plant productivity on disturbed areas of the public lands. Rehabilitate, reclaim, or revegetate areas subjected to surface-disturbing activities, where feasible. When rehabilitating, manage for optimum species diversity by seeding native species, except where non-native species are appropriate.

- In desert tortoise habitat, conduct all activities in accordance with the Reclamation Plan For Critical Tortoise Habitat In The Las Vegas Field Office (1998); Environmental Assessment no. NV-052-98-077.

- Within wilderness, rehabilitation and restoration will be conducted in accordance with the appropriate wilderness management plan(s).

- In the event that suppression efforts require off-road vehicle operations, replant and visually camouflage the first 200 feet of tire tracks in order to prevent further habitat impacts (due to public use of these track ways).

- Whenever feasible, utilize native species in seeding and/or re-planting treatments.

- Cultivate local supplies of live plant materials for use during riparian restoration efforts.

- Maintain a seed bank of locally collected native plant species for use in restoring both fire fuels treatments and fire-disturbed sites.

- Cultivate and develop varieties of locally grown native seed by means of plant material centers.

A.3.4.3.2.9. FMU Community Protection/Community Assistance Objectives & Strategies

Communities at Risk/WUI Areas: Communities-at-risk, community protection/assistance and public education strategies and objectives will be further defined through the LVFO RAMS Fire Plan update, which is scheduled for 2005.

Community Protection/Community Assistance Objectives:

- Coordinate with Partners In Conservation (PIC) to facilitate outreach and fire education efforts toward the handful of private in holdings in this FMU (Juanita Springs, etc.).

- Prioritize suppression efforts within desert tortoise habitat abutting the Mesquite/Bunkerville WUI FMU (NV 050-11).

Community Protection/Community Assistance Strategy: Prioritize suppression efforts within desert tortoise habitat abutting the Mesquite/Bunkerville WUI FMU (NV 050-11).

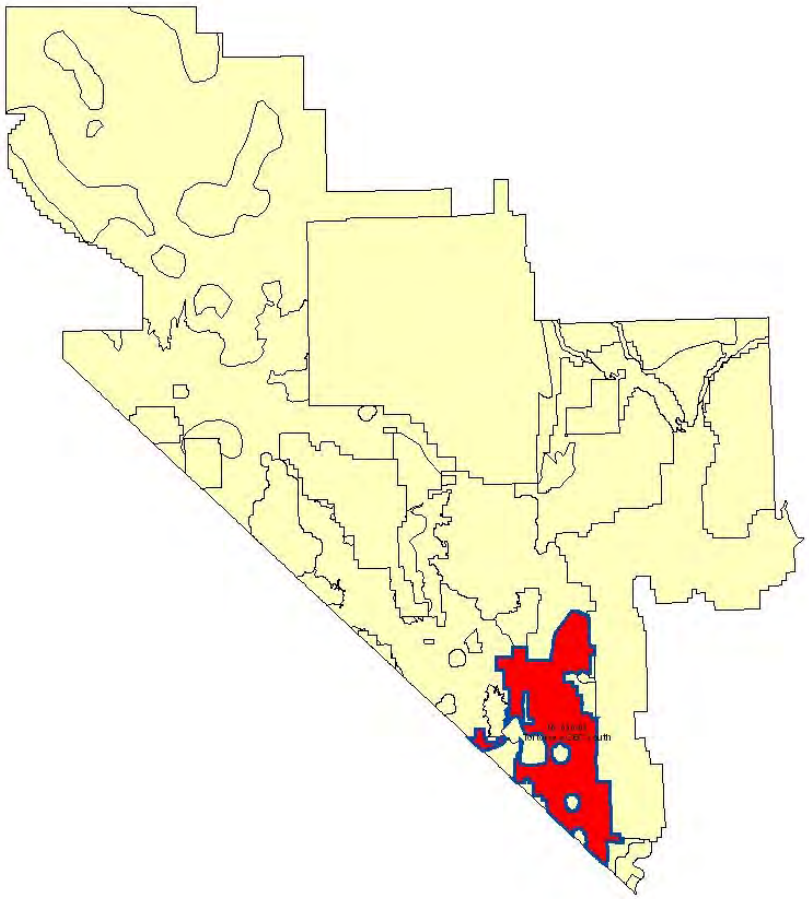
Community Wildfire Safety Education Strategy: Coordinate with Partners In Conservation (PIC) to facilitate outreach and fire education efforts toward the handful of private in-holdings in this FMU (Juanita Springs, etc.).

A.3.4.3.3. FMU Fire Program Analysis - Quantifiable Objective Summary

Initial Attack Success	Decadal Wildfire Acres Burn Tolerance	WFU Decadal Target Acres	Rx Fire Acres Per Decade	Non-Fire Acres Per Decade
10 acres @ 90%	250	N/A	N/A	N/A

A.3.4.4. Tortoise ACEC South

NV050-03



FMU Name & Unit No.: Tortoise ACEC South; NV050-03

FMU Type/Category: Special Management Area (SMA)

A.3.4.4.1. FMU Description:

A.3.4.4.1.1. FMU Location Information

Geographic boundaries: This is a discontinuous FMU comprised of critical desert tortoise habitat, and the Piute/Eldorado Valley desert tortoise ACEC. Geographically, this FMU occupies the southeast portion of the Las Vegas Field Office.

A.3.4.4.1.2. FMU Acre Total

Ownership by Acres and Percent		
NV 050-03	**Tortoise ACEC South**	
Ownership	**Acres**	**Percent**
Bureau of Land Management	368,729	83.9
Private	70,780	16.1
Total Acres	439,509	

A.3.4.4.1.3. Fire Occurrence and History

FMU Number	**Decadal (94-03)**	**24 Years (80-03)**	**Ignition Cause (80-03)**	
NV 050-03			Lightning	9
Number of Fires	8	19	Human/Other	10
Largest Fire (Acres)	40.0	250.0	**Multiple Fire Days (80-03)**	
Total Acres Burned	69.3	356.3	Total Multiple Fire Days (MFD)	4
Average Fire Size (Acres)	8.7	18.8	Number of MFD Fires	7
			Total Acres Burned by Multiple Fires	316.8

Narrative Description: Fires generally occur in the summer but are not uncommon in the spring, and occasionally occur late into the fall months. Wildfires within this FMU are almost entirely dependent upon ephemeral buildups of invasive annual grasses, primarily red brome. Fire behavior and spread is most typically wind-driven, but slope influenced fire spread has been known to occur.

General Fire Protection Characteristics:

- The low elevation, desert shrub portion of this FMU comprises high suppression priority desert tortoise habitat.
- The higher elevation, pinyon juniper and mountain shrub portions of this FMU predominately consist of wilderness areas and the Spirit Mountain Traditional Lifeways Area. For the latter, the suppression objective is to minimize burned acres. For the wilderness areas, suppression tactics and objectives will be in accordance with the individual wilderness plans, when written. In the meantime, fire suppression activities will comply with the Las Vegas Field Office Interim Wilderness Management Plan (2003).

A.3.4.4.1.4. FMU Vegetation

FMU Vegetation/Fuel Types		
NV 050-03	**Tortoise ACEC South**	
Veg/Fuel Type	Acres	Percent

Grassland	1,356	0.3
Mojave	436,428	99.1
Salt Desert Scrub/Shadscale	2,462	0.6
Grand Total	440,246	

Vegetation Narrative: Approximately 99% of this FMU consists of low elevation desert shrub communities, primarily creosote bursage. The remaining 1% consists of mountain shrub communities and pinyon juniper woodlands.

A.3.4.4.1.5. FMU Fuel Models & Live Fuel Moisture Characteristics

Surface Fuel Model & Canopy Cover: With few exceptions, fine fuels drive the characteristics of wildland fires occurring in this FMU. These fine fuels are ephemeral and primarily consist of red brome and other non-native annual grasses.

Live Fuel Moisture Averages:

LFM Site	May	June	July	Aug	Sept	Oct
N5G	167%	121%	96%	98%	88%	75%

Live Fuel Moisture Characteristics:

- At live fuel moisture levels of 181% and above fires typically will exhibit Very Low Fire Behavior characteristics
- At live fuel moisture levels of 151% to 180% fires typically will exhibit Low Fire Behavior characteristics
- At live fuel moisture levels of 126% to 150% fires typically will exhibit Moderate Fire Behavior characteristics
- At live fuel moisture levels of 101% to 125% fires typically will exhibit High Fire Behavior characteristics
- At live fuel moisture levels of 75% to 100% fires typically will exhibit Extreme Fire Behavior characteristics
- At live fuel moisture levels of 75% and below fires typically will exhibit Advanced Fire Behavior characteristics

A.3.4.4.1.6. Fire Weather & Climate Related Impacts

(Detailed weather station data for this FMU will be added to the FMP Appendix upon completion of the national fire weather data validation/correction project.)

- Wet lightning is common in this area. Fires generally remain small when starts occur under these common conditions.
- Dry Lightning is possible in this area. Larger fires can occur with these erratic and gusty thunderstorm events.
- Larger fires occur when human ignitions occur under typical warm and windy summer weather.

- Fire behavior can be extreme under these conditions when there are heavy buildups of ephemeral light flashy fuels.
- Fire behavior can be extreme under these conditions in heavy brush and/or Pinyon-Juniper fuels.

A.3.4.4.1.7. Fire Regime

- Low elevation desert shrub: Fire Regime V; Condition Class II

FMU by Condition Class and Fire Regime			
NV 050-03		**Tortoise ACEC South**	
CC	FR	Acres	Percent
2	II	62,743	14.3
	V	369,521	83.9
3	I	2,029	0.5
	II	196	0.0
	IV	5,727	1.3
Total		440,216	

A.3.4.4.1.8. FMU Physical Characteristics

Topography:

- Elevation Range: 1,799 feet to 5,199 feet
- Slope:
  - Low elevation desert shrub: less than 30%
  - High elevation shrub/woodland: 30-60%
- Aspect:
  - Various
- Major topographical features
  - Piute Valley
  - Eldorado Mountain Range
  - Newberry Mountain Range

Access Information: Access consists only of unpaved roads and a large portion of this FMU is road-less.

A.3.4.4.1.9. FMU Resource Values & Attributes

Wildland-Urban Interface/Intermix:

- Power line ROW's and fiber-optic line substations
- Coast Guard Loran Station
- Mines

- Dispersed recreation; hunting; special use permit activities
- Grazing - Jean Lake Allotment - Hidden Valley Allotment
- Power line ROW's
- Commercial reptile collecting

Resource Use:

- Critical desert tortoise habitat
- Wilderness Areas
- Spirit Mountain Traditional Lifeways Area

Air Quality: This FMU does not contain any non-attainment airsheds. Fire management activities in this FMU may include fire suppression, open burning, and light and heavy equipment mobilization. Fire Management Open burning (RX FIRE) is permitted in Clark County with a courtesy call to the Department of Health. Open burning is defined here "where fire is set either by OFFICERS of governmental agencies, in performance of their official duties or the purposes of training and instruction of firefighting and fire-rescue personnel". (*Section 42-Open Burning, Clark County Air Quality Regulations*).

Soils: Soils have formed under conditions of physical weathering (rather than chemical dissolution) because of the arid climate. Soils on lower portions of alluvial fans and valley floors contain very little organic material, are moderately to highly alkaline, and can contain high concentrations of gypsum and dissolved salts. A gravelly surface crust (called desert pavement) occurs throughout these areas. Desert pavement is very stable and protects underlying fine-grained soils from erosion. A cemented hardpan layer commonly occurs at shallow depths beneath surface soils throughout these areas. Mountain slopes tend to be covered by an unstable layer of large rocks, boulders, stones, and cobbles. Runoff from periodic rainstorms transports large amounts of material to lower elevations, forming alluvial fans of coarse material and depositing thick sequences of gravelly loams, sands, and finer grained sediments on valley floors.

Soils are susceptible to water and wind erosion. Water erosion occurs during periodic high-intensity, short duration summertime thunderstorms and less frequent, sustained wintertime rainstorms. Water erosion occurs by a combination of sheet flow, rill formation, splashing, and channelized flow in ephemeral washes and stream channels. Wind erosion occurs in areas where the desert pavement layer has been disturbed by human activities or heavy use by wild horses and burros, where large areas of vegetation have been burned by fire, sand dune areas, and as part of physical weathering processes.

Cultural and Paleontological Values:

- Spirit Mountain Traditional Lifeways Area
- Keyhole Canyon ACEC

T&E and Sensitive Species: Desert tortoise

Habitat Values:

- Critical desert tortoise habitat
- Bighorn sheep crucial habitat; Bighorn sheep winter range
- Mule deer crucial summer habitat; Mule deer winter range
- Sensitive species populations: Gila monster and 3 plant species
- Eldorado wild horse and burro herd management area

Hydrology and Water Quality: The Tortoise ACEC South FMU lies within the Colorado River Basin hydrographic region which is part of a regional flow system that drains portions of seven southwestern states. The Colorado River and its mainstem reservoirs (Lake Mead and Lake Mohave) are an important source of water for the Las Vegas Valley and millions of downstream users. Ephemeral wash channels drain most areas and only convey flow after periodic high-intensity summer thunderstorms or sustained winter rainstorms. The only perennial streams occur in the eastern and south-central portions of Clark County, within the Colorado River hydrographic region.

Wilderness or WSA:

- Ireteba Peaks Wilderness
- Spirit Mountain Wilderness
- Eldorado Wilderness
- South McCullough Wilderness

A.3.4.4.1.10. FMU Public Safety, Economic & Community Values at Risk

- Power line ROW's and fiber-optic line substations
- Coast Guard Loran Station
- Mines

A.3.4.4.1.11. FMU Fire Protection Responsibility

Wildland fire protection on all BLM public lands within this FMU is provided by the Las Vegas Field Office. Structural fire protection on private lands within this FMU is provided by the Clark County Fire Department and/or the Boulder City Fire Department.

A.3.4.4.2. FMU Objectives & Strategies

A.3.4.4.2.1. FMU Fire Management Objectives Priority Statement

- Protect human life, safety of wildland firefighters, and protection of human safety and health *(National Fire Plan 2001).*

- Use approved fire suppression techniques in areas of critical environmental concern where there are concerns for habitat, threatened and endangered species, and urban/rural/wildland interface zones (LVFO RMP, 1998. Fire Management Direction FE-1-d).

- Provide fire suppression efforts commensurate with resource and adjacent property values at risk *(LVFO RMP, 1998. Fire Mgt Direction FE-1-a).*

- Determine specific hazard reduction priorities, including any noxious or invasive species infestations, and implement according to the existing budget (LVFO RMP, 1998. Fire Mgt Direction FE-2-a).

- Determine specific prescribed burn priorities annually, including any noxious or invasive species infestations, and implement where possible (LVFO RMP, 1998. Fire Mgt Direction FE-3-a).

- On watersheds that exhibit good potential for recovery, implement protective measures, including but not limited to fencing and removal of tamarisk (LVFO RMP, 1998. Soil Resource Mgt Objective SL-1).

- Manage 743,209 acres of the four desert tortoise areas of critical environmental concern specifically for tortoise recovery. Minimize impacts to tortoise habitat during fire suppression by minimizing the use of mechanized equipment and, where possible, staying on existing roads and trails. Give priority to keeping the wildfire to an absolute minimum (size). Require reclamation of disturbed lands so that predisturbed condition can be reached within a reasonable time frame (LVFO RMP 1998. Special Status Species Mgt Direction SS-3-a).

- Manage habitat to further sustain the populations of federally listed species so they would no longer need protection of the Endangered Species Act. Manage habitats for non-listed special status species to support viable populations so that future listing would not be necessary (LVFO RMP 1998. Special Status Species Mgt Objective SS-2).

- Manage special status species habitat at the potential natural community or desired plant community, according to the need of the species (LVFO RMP 1998. Special Status Species Mgt Objective SS-1).

- Maintain or improve the condition of vegetation on public lands to a Desired Plant Community or to a Potential Natural Community (LVFO RMP 1998. Vegetation Mgt Objective VG-1).

- Restore plant productivity on disturbed areas of the public lands. Rehabilitate, reclaim, or revegetate areas subjected to surface-disturbing activities, where feasible. When rehabilitating, manage for optimum species diversity by seeding native species, except where non-native species are appropriate (LVFO RMP 1998. Vegetation Mgt Objective VG-2).

- Wilderness areas are to be managed to provide for the protection, the preservation of their natural conditions, and the preservation of their wilderness character [Wilderness Act, Section 4(b), BLM Manual 8560 (.08A1)]. Specific objectives and management direction for the Jumbo Springs, Lime Canyon, and Arrow Canyon Wilderness Areas will be identified in Wilderness Management Plans for the areas *(LVFO RMP 1998. Wilderness Mgt Objective WS-2) and (BLM Manual 8560 (.21A)).*

- Maintain woodland and conifer forest where possible for all-aged stands, with understory vegetation forage value rating at moderate or better (LVFO RMP 1998. Wilderness Mgt Objective WS-1).
- Use integrated weed management techniques to control and eradicate tamarisk, such as burning, chemical, biological or mechanical treatments, where potential for treatment is good. Rehabilitate with native species to help reduce the potential for tamarisk re-establishment and improve ecosystem health (LVFO RMP, 1998. Riparian Mgt Objective RP-1-f).

A.3.4.4.2.2. FMU Wildland Fire Suppression Objectives & Strategies

Fire Suppression Objectives:

- Minimize impacts to tortoise habitat during fire suppression by minimizing the use of mechanized equipment and, where possible, staying on existing roads and trails.
- Give priority to keeping the wildfire to an absolute minimum (size).
- Require reclamation of disturbed lands so that predisturbed condition can be reached within a reasonable time frame.

Fire Suppression Strategies:

- Wildland fires will be fought aggressively in order to minimize burned acreage in critical desert tortoise habitat and the tortoise ACEC. Actions will be dictated by Appropriate Management Response guidelines.
- Wildland fires in all wilderness areas will be fought using Minimum Impact Suppression Tactics (MIST)

Suppression/Protection Priorities:

- Piute/Eldorado desert tortoise critical habitat unit
- Piute/Eldorado desert tortoise ACEC
- Ireteba Peaks Wilderness
- Spirit Mountain Wilderness
- Eldorado Wilderness
- South McCullough Wilderness
- Spirit Traditional Lifeways Area

FMU Target Individual Wildland Fire Size: 10 acres @ 90 %

FMU Target Acres Burned Per Decade: 250 acres

A.3.4.4.2.3. FMU Wildland Fire Operational Constraints, Objectives & Strategies

Special Fire Management Consideration/Areas:

- Piute/Eldorado Valley desert tortoise critical habitat unit
- Piute/Eldorado Valley ACEC
- Ireteba Peaks Wilderness
- Spirit Mountain Wilderness
- Eldorado Wilderness
- South McCullough Wilderness
- Spirit Mountain Traditional Lifeways Area
- Power line ROW's

A.3.4.4.2.3.1. Wildland Fire Operational Constraints Objectives & Strategies:

A.3.4.4.2.3.1.1. Desert Tortoise:

- Initiate full suppression activities with minimum surface disturbances to reduce loss of tortoise cover and to minimize the spread of exotic annual grasses.
- Require consultation with a qualified Resource Advisor for all wildfires within desert tortoise habitat, particularly within ACEC's and designated critical habitat units.
- Restrict OHV travel and the use of tracked vehicles to the minimum necessary to suppress wildfires within desert tortoise habitat, particularly within ACEC's and designated critical habitat units; obliterate all tracks to reduce possibility of future use.
- Use of aerial retardant is authorized; foam or fugitive retardant is preferable to iron oxide retardant.
- Do not authorize burning out of unburned fingers or islands of vegetation. The exception to this case would be the removal of fuels for safety concerns.
- Establish fire camps, staging areas, and helispots in previously disturbed areas outside of ACEC's and designated critical habitat units, where possible, in consultation with a qualified Resource Advisor.
- Provide all firefighters and support personnel with a briefing on desert tortoises and their habitat to minimize take, particularly those associated with vehicle use.

A.3.4.4.2.3.1.2. Wilderness:

- A Resource Advisor will be dispatched to all fires occurring in or threatening a wilderness area.
- Use of Heavy equipment (bulldozers, etc.) will only be used in Wilderness if the fire is threatening human life or property. The Field Manager must approve the use of heavy equipment in all cases.
- Motorized vehicles used in fire suppression efforts will remain on "cherrystem" roads or predetermined existing ways inside Wilderness.

- Air resources including helicopters and SEAT's will be included in the WILDCAD system for all wilderness fire suppression activities.
- Helibases, staging areas, and fire camps will be located outside of wilderness areas, unless authorized by the Field Manager.
- Use of retardant must be approved by the Field Manager.
- If retardant is not approved, water may be dropped from aircraft.
- Landing of helicopters will be kept to a minimum and will only occur in existing openings.
- All fire suppression activities will use Minimum Impact Suppression Techniques (MIST) at all times. See attached MIST Guidelines.
- Hand crews may use conventional hand tools and, with approval from the Resource Advisor, may conservatively use chainsaws for fire line construction. Chainsaw use and line width should be kept to a minimum. Utilization of existing natural barriers, minimum "scratch line", and cold trailing is encouraged where feasible. Handline construction will be rehabilitated back to the natural contour.
- A "Leave No Trace" policy will be used in the wilderness area. All evidence of human activity must be removed, to the maximum extent possible.
- Noxious weeds will be controlled in conformance with the attached "Las Vegas Field Office Noxious Weed Control, Fire Management Weed Transport Control" guidelines.

A.3.4.4.2.3.1.3. Noxious Weeds and Invasive Species Transport Control Procedures:

Las Vegas Field Office Noxious Weed Control and Fire Management Weed Transport Control:

- Off-district engines, crew carriers, overhead vehicles, and helitack/helicopter support vehicles will, upon check-in and prior to proceeding to the line, wash down at the, Logandale, Red Rock, Pahrump Fire Stations or a commercial truck washing station. This will be determined by the location of the units' last fire assignment and if they were cleaned at release from that assignment.
    - The washdown will concentrate on the undercarriage, with special emphasis on axles, frame, crossmembers, motor mounts, and on and underneath steps, running boards, and front bumper/brushguard assemblies. Vehicle cabs will be swept out with refuse disposed of in waste receptacles. In wilderness areas, all portable equipment used on an incident (pumps, hose, fittings, water storage items) will be washed off to rid them of any seed or spores that may be attached from previous fires in noxious weed infested sites.
    - During initial briefings, washdowns will be mentioned and facilities made available for oncoming crews.
- Las Vegas Field Office crews will follow the same procedures identified in Item 1 when returning from fieldwork or wildland fires, especially when vehicles are used in know noxious weed areas infested with known noxious or invasive species common to the Field Office area.

- Upon leaving the Field Office when released from an incident, all off-unit vehicles will follow aforementioned washdown procedures so that Las Vegas' noxious weed problems do not become someone else's problems.

- All equipment used off pavement will be cleaned of weed and grass seed stems, stalks, etc. prior to release from an incident. This includes, but is not limited to, tents, tarps, helicopter support equipment, foldatanks and free-standing tanks, mechanic's vehicles, and logistical support vehicles, trailers and equipment. These vehicles will be washed as in 1.a. above.

This Field Office policy will be followed by all equipment involved in fire suppression while on Las Vegas Field Office assignments. Vehicles will be cleared of washdown procedures during checkout and crew evaluations. In the event vehicles are released from fires away from the district office, the closest wash facility, (government or commercial) will be utilized.

A.3.4.4.2.4. FMU Wildland Fire Use Objectives & Strategies

Wildland Fire Use Objectives:

- FMU WFU optimal wildland fire use size: Wildfire will not be used as a management tool within this FMU at this time.

- FMU WFU acres burned per decade: N/A

Wildland Fire Use Strategies: N/A

A.3.4.4.2.5. Burned Acre Objective Review

IF the FMU decadal wildfire acre-burned target has been reached or exceeded PRIOR TO THE COMPLETION OF THE 10-YEAR PLANNING PERIOD, from either wildfire or prescribed fire, a review of fire management objectives and strategies will be initiated to develop new suppression criteria on wildland fire occurrence and prescribed fire acre goals.

A.3.4.4.2.6. FMU Prescribed Fire Objectives & Strategies

Prescribed Fire Objectives & Strategies: Prescribed fire will not be used as a management tool within this FMU at this time.

Rx Fire Annual & Decadal Acre Target: N/A

T & E Species Strategies: N/A

Air Quality Strategy: N/A

NEPA Compliance: Prior to implementation of any proposed projects, site-specific NEPA documentation will be completed, as applicable.

Rx Fire Monitoring Strategy: Monitoring will be completed for attainment/non-attainment of project specific resource management objectives, as applicable.

A.3.4.4.2.7. FMU Non-Fire Fuels Treatment Objectives & Strategies

Non-Fire Fuels Treatment Objectives & Strategies: Non-fire fuels treatment will not be used as a management tool within this FMU at this time.

Non-Fire Annual & Decadal Acre Target: N/A

T & E Species Strategies: N/A

Air Quality Strategies: N/A

NEPA Compliance: Prior to implementation of any proposed projects, site-specific NEPA documentation will be completed, as applicable.

Treatment Monitoring Strategy: Monitoring will be completed for attainment/non-attainment of project specific resource management objectives, as applicable.

A.3.4.4.2.8. FMU Post Fire Rehab/Restoration Objectives & Strategies

Restore plant productivity on disturbed areas of the public lands. Rehabilitate, reclaim, or revegetate areas subjected to surface-disturbing activities, where feasible. When rehabilitating, manage for optimum species diversity by seeding native species, except where non-native species are appropriate.

- In desert tortoise habitat, conduct all activities in accordance with the Reclamation Plan For Critical Tortoise Habitat In The Las Vegas Field Office (1998); Environmental Assessment no. NV-052-98-077.
- Within wilderness, rehabilitation and restoration will be conducted in accordance with the appropriate wilderness management plan(s).
- In the event that suppression efforts require off-road vehicle operations, replant and visually camouflage the first 200 feet of tire tracks in order to prevent further habitat impacts (due to public use of these track ways).
- Whenever feasible, utilize native species in seeding and/or re-planting treatments.
- Cultivate local supplies of live plant materials for use during riparian restoration efforts.
- Maintain a seed bank of locally collected native plant species for use in restoring both fire fuels treatments and fire-disturbed sites.
- Cultivate and develop varieties of locally grown native seed by means of plant material centers.

A.3.4.4.2.9. FMU Community Protection/Community Assistance Objectives & Strategies

Communities at Risk/WUI Areas: N/A. Communities-at-risk, community protection/assistance and public education strategies and objectives will be further defined through the LVFO RAMS Fire Plan update, which is scheduled for 2005

Community Protection/Community Assistance Objectives: N/A

Community Protection/Community Assistance Strategy: N/A

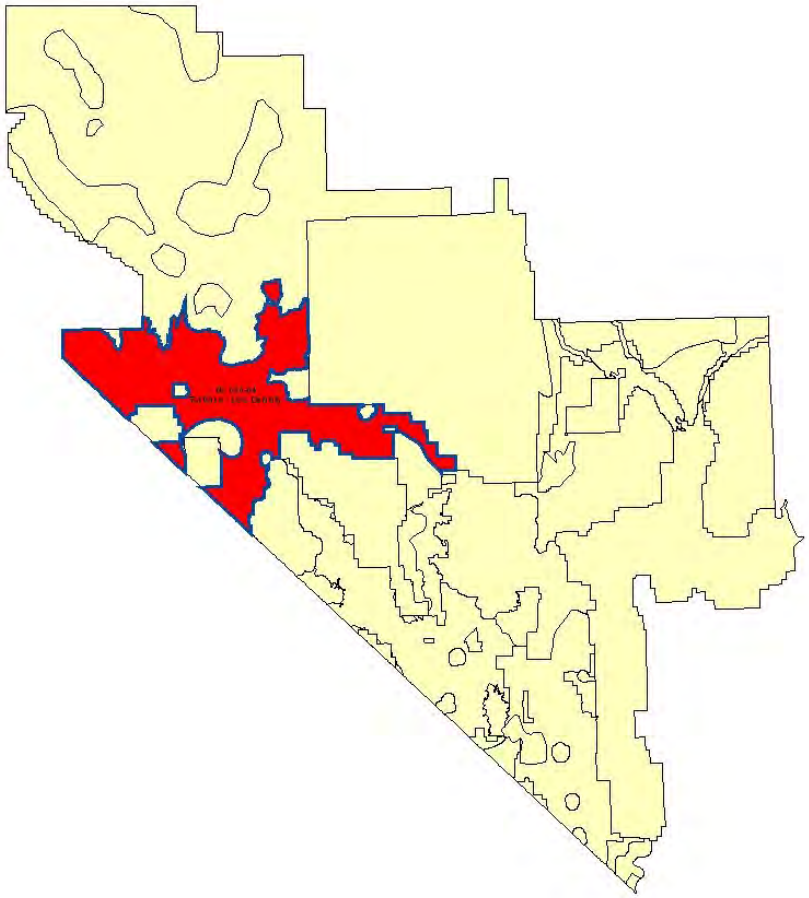
Community Wildfire Safety Education Strategy: N/A

A.3.4.4.3. FMU Fire Program Analysis - Quantifiable Objective Summary

Initial Attack Success	Decadal Wildfire Acres Burn Tolerance	WFU Decadal Target Acres	Rx Fire Acres Per Decade	Non-Fire Acres Per Decade
10 acres @ 90%	250	N/A	N/A	N/A

A.3.4.5. Tortoise – Low Density

NV050-04



FMU Name & Unit No.: **Tortoise – Low Density; NV050-04**

FMU Type/Category: **High Value Habitat (HVH)**

A.3.4.5.1. FMU Description:

A.3.4.5.1.1. FMU Location Information

Geographic boundaries: This FMU extends to the northern boundary of the occupied range of the T&E species Desert tortoise, and incorporates the northwestern third of the Las Vegas Field Office (exclusive of smaller FMUs which are nested within NV050-04). This FMU takes in the Nye County portion of the Las Vegas Field Office, and extends onto withdrawn lands administered by the National Nuclear Security Administration (Nevada Test Site) and the Department of Defense, Air Force (Nevada Test and Training Range).

A.3.4.5.1.2. FMU Acre Total

Ownership by Acres and Percent		
NV 050-04	**Tortoise - Low Density**	
Ownership	**Acres**	**Percent**
Bureau of Land Management	622,063	69.3
Department of Defense	39,478	4.4
Department of Energy	230,857	25.7
National Park Service	1,030	0.1
Private	3,857	0.4
Total Acres	897,285	

A.3.4.5.1.3. Fire Occurrence and History

FMU Number	**Decadal (94-03)**	**24 Years (80-03)**	**Ignition Cause (80-03)**	
NV 050-04			Lightning	38
Number of Fires	27	60	Human/Other	22
Largest Fire (Acres)	2.0	195.0	**Multiple Fire Days (80-03)**	
Total Acres Burned	8.1	217.7	Total Multiple Fire Days (MFD)	21
Average Fire Size (Acres)	0.3	3.6	Number of MFD Fires	27
			Total Acres Burned by Multiple Fires	198.3

Narrative Description: The few wildfires recorded for this FMU have typically occurred during the summer, in association with convective thunderstorms. The minimal wildfire occurrence and acreage in this FMU is in correlation to the poor productivity of the soils, the prevalence of desert pavements (i.e., increased fuelbed spacing) and the low stature of the shrubby plants. The potential does exist for fires of some size and severity to occur, when strong wind events and ephemeral spikes of invasive red brome build-ups are present together.

General Fire Protection Characteristics:

- The desert shrublands in this FMU constitute moderate suppression priority T&E species values (Desert tortoise habitat).
- Widely scattered throughout this large FMU are pockets of riparian and/or mesquite/acacia habitat. A secondary priority in this FMU is to protect all such habitats from substantial disturbance, either from wildfire or from the impacts caused during firefighting activities.

- Response times by ground forces can typically exceed one or more hours. The use of aerial suppression resources and tactics will be at a premium.

A.3.4.5.1.4. FMU Vegetation

FMU Vegetation/Fuel Types		
NV 050-04	**Tortoise - Low Density**	
Veg/Fuel Type	Acres	Percent
Mojave	812,863	90.5
No Significant Vegetation	11,754	1.3
Sagebrush	7,468	0.8
Salt Desert Scrub/Shadscale	65,864	7.3
Grand Total	897,949	

Vegetation Narrative: Approximately 98% of this FMU consists of desert shrub communities; primarily creosote bursage, blackbrush and salt scrub. The FMU does include scattered pockets of riparian, mesquite/acacia, mountain shrub, and pinyon-juniper savannah.

A.3.4.5.1.5. FMU Fuel Models & Live Fuel Moisture Characteristics

Surface Fuel Model & Canopy Cover: With few exceptions, fine fuels drive the characteristics of wildland fires occurring in this FMU. These fine fuels are ephemeral and primarily consist of red brome and other non-native annual grasses.

Live Fuel Moisture Averages:

LFM Site	May	June	July	Aug	Sept	Oct
N5C	189%	130%	93%	92%	99%	89%

Live Fuel Moisture Characteristics:

- At live fuel moisture levels of 181% and above fires typically will exhibit Very Low Fire Behavior characteristics
- At live fuel moisture levels of 151% to 180% fires typically will exhibit Low Fire Behavior characteristics
- At live fuel moisture levels of 126% to 150% fires typically will exhibit Moderate Fire Behavior characteristics
- At live fuel moisture levels of 101% to 125% fires typically will exhibit High Fire Behavior characteristics
- At live fuel moisture levels of 75% to 100% fires typically will exhibit Extreme Fire Behavior characteristics
- At live fuel moisture levels of 75% and below fires typically will exhibit Advanced Fire Behavior characteristics

A.3.4.5.1.6. Fire Weather & Climate Related Impacts

(Detailed weather station data for this FMU will be added to the FMP Appendix upon completion of the national fire weather data validation/correction project.)

- Wet lightning is common in this area. Fires generally remain small when starts occur under these common conditions.
- Dry Lightning is possible in this area. Larger fires can occur with these erratic and gusty thunderstorm events.
- Larger fires occur when human ignitions occur under typical warm and windy summer weather.
- Fire behavior can be extreme under these conditions when there are heavy buildups of ephemeral light flashy fuels.
- Fire behavior can be extreme under these conditions in heavy brush and/or Pinyon-Juniper fuels.

A.3.4.5.1.7. Fire Regime

- Fire Regime V; Condition Class II

FMU by Condition Class and Fire Regime			
NV 050-04		**Tortoise - Low Density**	
CC	FR	Acres	Percent
2	II	82,530	9.3
	IV	222	0.0
	V	710,842	80.4
3	I	237	0.0
	II	8,079	0.9
	IV	81,198	9.2
	V	1,164	0.1
Total		884,271	

A.3.4.5.1.8. FMU Physical Characteristics

Topography:

- Elevation Range: 2,599 feet to 6,398 feet
- Slope: mostly less than 10%; some areas of 10-40%
- Aspect: Various
- Major topographical features
  - Amargosa Desert
  - Spectre Range
  - Skull Mountain
  - Jackass Flats
  - Mercury Valley
  - Indian Springs Valley

Access Information: Access consists of US Highway 95, State Route 160, State Route 373 and numerous unpaved roads. Much of this FMU is roadless.

A.3.4.5.1.9. FMU Resource Values & Attributes

Wildland-Urban Interface/Intermix:

- Those areas of the FMU abutting the Pahrump WUI FMU and the Amargosa-Indian Springs WUI FMU
- Mines
- Utility line corridors and ROW's

Resource Use:

- Low density Desert tortoise habitat (T&E Species)
- Mount Stirling and Resting Spring Wilderness Study Areas
- Sensitive species habitat (plants, bats, birds, reptiles); including riparian areas and mesquite/acacia stands, the limestone ridges above Indian Springs, NV and the far northwestern edge of the Pahrump Valley (deep, sandy soil sites).

Air Quality: This FMU contains a small portion of one non-attainment airshed. Fire management activities in this FMU may include fire suppression, open burning, and light and heavy equipment mobilization. Fire Management Open burning (RX FIRE) is permitted in Clark County with a courtesy call to the Department of Health. Open burning is defined here "where fire is set either by OFFICERS of governmental agencies, in performance of their official duties or the purposes of training and instruction of firefighting and fire-rescue personnel". (*Section 42-Open Burning, Clark County Air Quality Regulations*). Rx fire burn plans within NYE County will have an approved variance (Open Burn Permit) from the State of Nevada, Division of Environmental Protection; Smoke Management Program.

Soils: Soils have formed under conditions of physical weathering (rather than chemical dissolution) because of the arid climate. Soils on lower portions of alluvial fans and valley floors contain very little organic material, are moderately to highly alkaline, and can contain high concentrations of gypsum and dissolved salts. A gravelly surface crust (called desert pavement) occurs throughout these areas. Desert pavement is very stable and protects underlying fine-grained soils from erosion. A cemented hardpan layer commonly occurs at shallow depths beneath surface soils throughout these areas. Mountain slopes tend to be covered by an unstable layer of large rocks, boulders, stones, and cobbles. Runoff from periodic rainstorms transports large amounts of material to lower elevations, forming alluvial fans of coarse material and depositing thick sequences of gravelly loams, sands, and finer grained sediments on valley floors.

Soils are susceptible to water and wind erosion. Water erosion occurs during periodic high-intensity, short duration summertime thunderstorms and less frequent, sustained wintertime rainstorms. Water erosion occurs by a combination of sheet flow, rill formation, splashing, and channelized flow in ephemeral washes and stream channels. Wind erosion occurs in areas where the desert pavement layer has been disturbed by human activities or heavy use by wild horses and burros, where large areas of vegetation have been burned by fire, sand dune areas, and as part of physical weathering processes.

Cultural and Paleontological Values:

- Johnnie historic mining district
- Mount Schader (rock art sites)

T&E and Sensitive Species: Desert tortoise

Habitat Values:

- Low density Desert tortoise habitat
- Sensitive plant species (7) mainly associated with limestone ridges above Indian Springs, NV, and in deep sand swales at the northern edge of Pahrump Valley.
- Riparian and mesquite/acacia habitats.
- Bighorn sheep crucial habitat; Bighorn sheep winter range.
- Mule deer crucial summer habitat; Mule deer winter range.
- Wild horse and burro range.

Hydrology and Water Quality: The Tortoise-Low Density FMU lies primarily within The Central Region hydrographic region, and is a topographically-closed, internally-drained basin. Ephemeral wash channels drain most of the Tortoise-Low Density FMU and only convey flow after periodic high-intensity summer thunderstorms or sustained winter rainstorms. Rapid runoff to ephemeral wash channels can produce flash flooding and transport large quantities of sediment as water flows from mountainous areas and alluvial fans towards valley floors.

Wilderness or WSA:

- Mount Stirling Wilderness Study Area
- Resting Spring Wilderness Study Area

A.3.4.5.1.10. FMU Public Safety, Economic & Community Values at Risk

- Life safety (public and firefighters)
- Low density Desert tortoise range (T&E Species)
- Sensitive plant species (7) mainly associated with limestone ridges above Indian Springs, NV, and in deep sand swales at the northern edge of Pahrump Valley.
- Riparian and mesquite/acacia habitats.
- Bighorn sheep crucial habitat; Bighorn sheep winter range.
- Mule deer crucial summer habitat; Mule deer winter range.
- Wild horse and burro range (3 Herd Management Areas)
- Mount Stirling Wilderness Study Area
- Resting Spring Wilderness Study Area

- Big Dune ACEC (sensitive species habitat)
- Johnnie historic mining district
- Mount Schader (rock art sites)
- Mines
- Utility line corridors and ROW's

A.3.4.5.1.11. FMU Fire Protection Responsibility

Wildland fire protection on all BLM public lands within this FMU is provided by the Las Vegas Field Office. Structural fire protection on private lands within this FMU is provided by the Clark County Fire Department, Pahrump Valley Fire Department, Amargosa Valley Volunteer Fire Department, Department of Energy (Nevada Test Site), and/or the Department of Defense (US Air Force, Indian Springs Auxiliary Airfield).

A.3.4.5.2. FMU Objectives & Strategies

A.3.4.5.2.1. FMU Fire Management Objectives Priority Statement

- Protect human life, safety of wildland firefighters, and protection of human safety and health *(National Fire Plan 2001).*
- Use approved fire suppression techniques in areas of critical environmental concern where there are concerns for habitat, threatened and endangered species, and urban/rural/wildland interface zones (LVFO RMP, 1998. Fire Management Direction FE-1-d).
- Provide fire suppression efforts commensurate with resource and adjacent property values at risk *(LVFO RMP, 1998. Fire Mgt Direction FE-1-a).*
- Manage habitat to further sustain the populations of federally listed species so they would no longer need protection of the Endangered Species Act. Manage habitats for non-listed special status species to support viable populations so that future listing would not be necessary *(LVFO RMP 1998. Special Status Species Mgt Objective SS-2).*
- Manage special status species habitat at the potential natural community or desired plant community, according to the need of the species (LVFO RMP 1998. Special Status Species Mgt Objective SS-1).
- Determine specific hazard reduction priorities, including any noxious or invasive species infestations, and implement according to the existing budget (LVFO RMP, 1998. Fire Mgt Direction FE-2-a).
- Maintain or improve the condition of vegetation on public lands to a Desired Plant Community or to a Potential Natural Community (LVFO RMP 1998. Vegetation Mgt Objective VG-1).
- Restore plant productivity on disturbed areas of the public lands. Rehabilitate, reclaim, or revegetate areas subjected to surface-disturbing activities, where feasible. When rehabilitating, manage for optimum species diversity by seeding native species, except where non-native species are appropriate (LVFO RMP 1998. Vegetation Mgt Objective VG-2).

- Manage Mesquite and Acacia woodlands for their value as wildlife habitat in the following areas: Amargosa Valley, Pahrump Valley, Stewart Valley, Hiko Wash, Piute Wash, Crystal and Stump Springs, or any other areas identified as being of significant wildlife value *(LVFO RMP, 1998. Fish, Wildlife and Special Status Species Management, Management Direction FW-3-a)*.
- Protect important resting/nesting habitats, such as riparian areas and mesquite/acacia woodlands *(LVFO RMP, 1998. Fish & Wildlife Mgt Direction FW-3-g)*.
- Ensure that characteristics on certain lands that caused them to be inventoried and designated as Wilderness Study Areas are maintained and not diminished or lessened in any way that might constrain or limit Congress' final wilderness designation decisions (LVFO RMP 1998. Wilderness Mgt Objective WS-1).
- Manage Wilderness Study Areas in accordance with the Interim Management Policy for Lands Under Wilderness Review (LVFO RMP 1998. Wilderness Mgt Direction WS-1-a).
- Use integrated weed management techniques to control and eradicate tamarisk, such as burning, chemical, biological or mechanical treatments, where potential for treatment is good. Rehabilitate with native species to help reduce the potential for tamarisk re-establishment and improve ecosystem health (LVFO RMP, 1998. Riparian Mgt Objective RP-1-f).

A.3.4.5.2.2. FMU Wildland Fire Suppression Objectives & Strategies

Fire Suppression Objectives:

- Minimize impacts to tortoise habitat during fire suppression by minimizing the use of mechanized equipment and, where possible, staying on existing roads and trails.
- Give priority to keeping each wildfire less than 25 acres in size.
- Utilize MIST and comply with identified operational constraints in scattered FMU locations of special management value, including: riparian habitats, mesquite/acacia woodland stands, Mount Stirling Wilderness Study Area, and the Resting Spring Wilderness Study Area.
- Require reclamation of disturbed lands so that predisturbed condition can be reached within a reasonable time frame.

Fire Suppression Strategies:

- Prioritize suppression of wildfires occurring in any portion of this FMU that abuts the Pahrump WUI FMU or the Amargosa-Indian Springs WUI FMU.
- Wildland fires will be fought aggressively in order to minimize burned acres in low density Desert tortoise habitat; employing Appropriate Management Response options.
- MIST will be employed on all wildfires in the Resting Springs WSA and the Mount Stirling WSA, as well as in any riparian or mesquite/acacia habitats.
- Unless human life or property is threatened, firefighting responses in this FMU will conform to the operational constraints identified (below): Desert tortoise; WSA; riparian/mesquite/acacia habitats; noxious /invasive weeds.

Suppression/Protection Priorities:

- Low density Desert tortoise habitat.
- Any riparian and mesquite/acacia habitats.

FMU Target Individual Wildland Fire Size: 25 acres @ 90 %

FMU Target Acres Burned Per Decade: 1,000 acres

A.3.4.5.2.3. FMU Wildland Fire Operational Constraints, Objectives & Strategies

Special Fire Management Consideration/Areas:

- Low density Desert tortoise range (T&E Species)
- Mount Stirling Wilderness Study Area
- Resting Spring Instant Study Area
- Riparian and/or mesquite/acacia habitats
- Big Dune ACEC (sensitive species habitat)
- Sensitive plant species habitats/populations (7 species), mainly on limestone ridges above Indian Springs, NV, and in deep sandy soils at the northern edge of the Pahrump Valley
- All pockets of riparian and/or mesquite/acacia vegetation.
- Wild horse & burro Amargosa Herd Management Area
- Wild horse & burro Johnnie Herd Management Area
- Wild horse & burro Ash Meadows Herd Management Area

A.3.4.5.2.3.1. Wildland Fire Operational Constraints Objectives & Strategies:

A.3.4.5.2.3.1.1. Desert Tortoise:

- Initiate full suppression activities with minimum surface disturbances to reduce loss of tortoise cover and to minimize the spread of exotic annual grasses.
- Require consultation with a qualified Resource Advisor for all wildfires within desert tortoise habitat, particularly within ACEC's and designated critical habitat units.
- Restrict OHV travel and the use of tracked vehicles to the minimum necessary to suppress wildfires within desert tortoise habitat, particularly within ACEC's and designated critical habitat units; obliterate all tracks to reduce possibility of future use.
- Use of aerial retardant is authorized; foam or fugitive retardant is preferable to iron oxide retardant.
- Do not authorize burning out of unburned fingers or islands of vegetation. The exception to this case would be the removal of fuels for safety concerns.

- Establish fire camps, staging areas, and helispots in previously disturbed areas outside of ACEC's and designated critical habitat units, where possible, in consultation with a qualified Resource Advisor.
- Provide all firefighters and support personnel with a briefing on desert tortoises and their habitat to minimize take, particularly those associated with vehicle use.

A.3.4.5.2.3.1.2. WSA/ISA:

- A Resource Advisor will be dispatched to all fires occurring in or threatening a WSA.
- Use of heavy equipment (bulldozers, etc.) will only be used in the Wilderness Study Areas if the fire is threatening human life or property. The Field Manger must approve the use of heavy equipment in all cases.
- Air resources including helicopters and SEAT's will be included in the WILDCAD system for all Wilderness Study Area fire suppression activities.
- Use of retardant must be approved by the Field Manager, if retardant is not approved water may be dropped from retardant aircraft.
- All fire suppression activities will use Minimum Impact Suppression Techniques (MIST) at all times.
- Hand crews may use conventional hand tools and may conservatively use chain saws for fire line construction. Chain saw use and line width should be kept to a minimum. Utilization of existing natural barriers, minimum "scratch line", and cold trailing is encouraged where feasible. Handline construction will be rehabilitated back to the natural contour.
- A "Leave No Trace" policy will be used in the Wilderness Study Areas. All evidence of human activity must be removed, to the maximum extent possible.
- Motorized vehicle use in the Wilderness Study Areas may only occur on existing routes. Any cross-country use of vehicles must be authorized by the Field Manager.
- No grading, blading, clearing or cutting of trees is permitted to accommodate vehicle access.
- Helibases, staging areas, and fire camps will be located outside of the Wilderness Study Areas, unless it is authorized by the Resource Advisor.
- Landing of helicopters will be kept to a minimum and will only occur in existing openings.
- Any impacts created by suppression activities should be rehabilitated prior to releasing fire crews and associated fire equipment following fire containment. If that is impossible, due to the need to commit resources to other ongoing fires, impacts will be rehabilitated as soon as feasible following fire containment.

A.3.4.5.2.3.1.3. Riparian or Mesquite/Acacia Habitats:

- Apply M.I.S.T. within riparian habitat
- In riparian areas, prioritize suppression actions to minimize damage to stands of native vegetation from wildfire or suppression operations

- Fire suppression in riparian habitat will be coordinated with the approved Resource Advisor
- In riparian areas, use natural barriers or openings in riparian vegetation where possible as the easiest, safest method to manage a riparian wildfire. Where possible and practical use wet firebreaks rather than constructing firelines by hand or with heavy equipment
- Avoid burning out unburned islands, whenever possible
- Utilize firing tactics only if necessary to protect firefighter or public safety
- Avoid surface disturbing suppression activities in riparian areas whenever possible
- Avoid dropping retardant within 300 feet of water sources, to the maximum extent feasible
- Use of containment systems for portable pumps to avoid fuel spills in riparian or aquatic systems will be required.

A.3.4.5.2.3.1.4. Noxious Weeds and Invasive Species Transport Control Procedures:

Las Vegas Field Office Noxious Weed Control and Fire Management Weed Transport Control:

- Off-district engines, crew carriers, overhead vehicles, and helitack/helicopter support vehicles will, upon check-in and prior to proceeding to the line, wash down at the, Logandale, Red Rock, Pahrump Fire Stations or a commercial truck washing station. This will be determined by the location of the units' last fire assignment and if they were cleaned at release from that assignment.
    - The washdown will concentrate on the undercarriage, with special emphasis on axles, frame, crossmembers, motor mounts, and on and underneath steps, running boards, and front bumper/brushguard assemblies. Vehicle cabs will be swept out with refuse disposed of in waste receptacles. In wilderness areas, all portable equipment used on an incident (pumps, hose, fittings, water storage items) will be washed off to rid them of any seed or spores that may be attached from previous fires in noxious weed infested sites.
    - During initial briefings, washdowns will be mentioned and facilities made available for oncoming crews.
- Las Vegas Field Office crews will follow the same procedures identified in Item 1 when returning from fieldwork or wildland fires, especially when vehicles are used in know noxious weed areas infested with known noxious or invasive species common to the Field Office area.
- Upon leaving the Field Office when released from an incident, all off-unit vehicles will follow aforementioned washdown procedures so that Las Vegas' noxious weed problems do not become someone else's problems.
- All equipment used off pavement will be cleaned of weed and grass seed stems, stalks, etc. prior to release from an incident. This includes, but is not limited to, tents, tarps, helicopter support equipment, foldatanks and free-standing tanks, mechanic's vehicles, and logistical support vehicles, trailers and equipment. These vehicles will be washed as in 1.a. above.

This Field Office policy will be followed by all equipment involved in fire suppression while on Las Vegas Field Office assignments. Vehicles will be cleared of washdown procedures during

checkout and crew evaluations. In the event vehicles are released from fires away from the district office, the closest wash facility, (government or commercial) will be utilized.

A.3.4.5.2.4. FMU Wildland Fire Use Objectives & Strategies

Wildfire will not be used as a management tool within this FMU at this time.

A.3.4.5.2.5. Burned Acre Objective Review

IF the FMU decadal wildfire acre-burned target has been reached or exceeded PRIOR TO THE COMPLETION OF THE 10-YEAR PLANNING PERIOD, from either wildfire or prescribed fire, a review of fire management objectives and strategies will be initiated to develop new suppression criteria on wildland fire occurrence and prescribed fire acre goals.

A.3.4.5.2.6. FMU Prescribed Fire Objectives & Strategies

Prescribed Fire Objectives & Strategies: Prescribed fire will not be used as a management tool within this FMU at this time.

Rx Fire Annual & Decadal Acre Target: N/A

T & E Species Strategies: N/A

Air Quality Strategy: N/A

NEPA Compliance: Prior to implementation of any proposed projects, site-specific NEPA documentation will be completed, as applicable.

Rx Fire Monitoring Strategy: Monitoring will be completed for attainment/non-attainment of project specific resource management objectives, as applicable.

A.3.4.5.2.7. FMU Non-Fire Fuels Treatment Objectives & Strategies

Non-Fire Fuels Treatment Objectives & Strategies: Non-fire fuels treatments will not be used as a management tool within this FMU at this time.

Non-Fire Annual & Decadal Acre Target: N/A

T & E Species Strategies: N/A

Air Quality Strategies: N/A

NEPA Compliance: Prior to implementation of any proposed projects, site-specific NEPA documentation will be completed, as applicable.

Treatment Monitoring Strategy: Monitoring will be completed for attainment/non-attainment of project specific resource management objectives, as applicable.

A.3.4.5.2.8. FMU Post Fire Rehab/Restoration Objectives & Strategies

Restore plant productivity on disturbed areas of the public lands. Rehabilitate, reclaim, or revegetate areas subjected to surface-disturbing activities, where feasible. When rehabilitating,

manage for optimum species diversity by seeding native species, except where non-native species are appropriate. Treatments will comply with the Las Vegas BLM Normal Fire Rehabilitation Plan and Environmental Assessment (E.A. No. NV-054-9-24).

- In the event that suppression efforts require off-road vehicle operations, replant and visually camouflage the first 200 feet of tire tracks in order to prevent further habitat impacts (due to public use of these track ways).
- Whenever feasible, utilize native species in seeding and/or re-planting treatments.
- Cultivate local supplies of live plant materials for use during riparian restoration efforts.
- Maintain a seed bank of locally collected native plant species for use in restoring both fire fuels treatments and fire-disturbed sites.
- Cultivate and develop varieties of locally grown native seed by means of plant material centers.

A.3.4.5.2.9. FMU Community Protection/Community Assistance Objectives & Strategies

Communities at Risk/WUI Areas: N/A. Communities-at-risk, community protection/assistance and public education strategies and objectives will be further defined through the LVFO RAMS Fire Plan update, which is scheduled for 2005.

Community Protection/Community Assistance Objectives: N/A

Community Protection/Community Assistance Strategy: Prioritize suppression efforts within portions of this FMU abutting the Pahrump WUI FMU and Amargosa-Indian Springs WUI FMU.

Community Wildfire Safety Education Strategy: N/A

A.3.4.5.3. FMU Fire Program Analysis - Quantifiable Objective Summary

Initial Attack Success	Decadal Wildfire Acres Burn Tolerance	WFU Decadal Target Acres	Rx Fire Acres Per Decade	Non-Fire Acres Per Decade
25 acres @ 90%	1,000	N/A	N/A	N/A

A.3.4.6. Sloan NCA

FMU Name & Unit No.: **Sloan NCA; NV050-05**

FMU Type/Category: **Special Management Area (SMA)**

A.3.4.6.1. FMU Description:

A.3.4.6.1.1. FMU Location Information

Geographic boundaries: This FMU is comprised of the Sloan Canyon National Conservation Area, Sloan Rock Cultural ACEC, and desert tortoise habitat. This FMU lies adjacent to the City of Henderson, along the southern boundary of the Las Vegas Valley.

A.3.4.6.1.2. FMU Acre Total

Ownership by Acres and Percent		
NV 050-05	**Sloan NCA**	
Ownership	**Acres**	**Percent**
Bureau of Land Management	48,385	100.0
Total Acres	48,385	

A.3.4.6.1.3. Fire Occurrence and History

FMU Number	**Decadal (94-03)**	**24 Years (80-03)**	**Ignition Cause (80-03)**	
NV 050-05			Lightning	0
Number of Fires	0	1	Human/Other	1
Largest Fire (Acres)	0.0	0.0	**Multiple Fire Days (80-03)**	
Total Acres Burned	0.0	0.0	Total Multiple Fire Days (MFD)	0
Average Fire Size (Acres)	0.0	0.0	Number of MFD Fires	0
			Total Acres Burned by Multiple Fires	0.0

Narrative Description: Fires in the vicinity of this FMU generally occur in the summer but are not uncommon in the spring, and occasionally occur late into the fall months. There is no record of recent wildfire occurrence in this FMU.

General Fire Protection Characteristics: There is little to no fire occurrence in this FMU, due to the sparseness and low stature of the shrub vegetation. Even in years of ephemeral buildup of non-native annual grasses, the rockiness of the terrain and discontinuity of the fuel bed minimizes the risk of wildfire spread.

A.3.4.6.1.4. FMU Vegetation

FMU Vegetation/Fuel Types		
NV 050-05	**Sloan NCA**	
Veg/Fuel Type	Acres	Percent
Mojave	46,340	95.7
Pinyon/Juniper Woodlands	2,102	4.3
Grand Total	48,442	

Vegetation Narrative: Approximately 96 % of this FMU consists of shrub vegetation types, dominated by Creosote/Bursage in the lower elevations and Mojave Desert scrub at the higher elevations. The remaining 4% consists of Pinyon/Juniper woodlands.

A.3.4.6.1.5. FMU Fuel Models & Live Fuel Moisture Characteristics

Surface Fuel Model & Canopy Cover: With few exceptions, fine fuels drive the characteristics of wildland fires occurring in the vicinity of this FMU. These fine fuels are ephemeral and mainly consist of red brome and other non-native annual grasses.

Live Fuel Moisture Averages:

LFM Site	May	June	July	Aug	Sept	Oct
N5F	154%	94%	81%	76%	74%	82%

Live Fuel Moisture Characteristics:

- At live fuel moisture levels of 181% and above fires typically will exhibit Very Low Fire Behavior characteristics
- At live fuel moisture levels of 151% to 180% fires typically will exhibit Low Fire Behavior characteristics
- At live fuel moisture levels of 126% to 150% fires typically will exhibit Moderate Fire Behavior characteristics
- At live fuel moisture levels of 101% to 125% fires typically will exhibit High Fire Behavior characteristics
- At live fuel moisture levels of 75% to 100% fires typically will exhibit Extreme Fire Behavior characteristics
- At live fuel moisture levels of 75% and below fires typically will exhibit Advanced Fire Behavior characteristics

A.3.4.6.1.6. Fire Weather & Climate Related Impacts

(Detailed weather station data for this FMU will be added to the FMP Appendix upon completion of the national fire weather data validation/correction project.)

- Wet lightning is common in this area. Fires generally remain small when starts occur under these common conditions.
- Dry Lightning is possible in this area. Larger fires can occur with these erratic and gusty thunderstorm events.
- Larger fires occur when human ignitions occur under typical warm and windy summer weather.
- Fire behavior can be extreme under these conditions when there are heavy buildups of ephemeral light flashy fuels.

A.3.4.6.1.7. Fire Regime

- Fire Regime V; Condition Class II

FMU by Condition Class and Fire Regime			
NV 050-05		**Sloan NCA**	
CC	FR	Acres	Percent
2	II	6,633	13.7
	V	40,590	83.8
3	I	332	0.7
	II	737	1.5
	IV	138	0.3
Total		48,430	

A.3.4.6.1.8. FMU Physical Characteristics

Topography:

- Elevation Range: 2,000 feet to 4,999 feet

- Slope:
  - Valley basins: less than 30%
  - Ridges: 30-60%
- Aspect: Various
- Major topographical features:
  - Black Mountain
  - North McCullough Mountain
  - Hidden Valley
  - Sloan Canyon

Access Information: Access consists only of unpaved roads and most of this FMU is road-less.

A.3.4.6.1.9. FMU Resource Values & Attributes

Wildland-Urban Interface/Intermix:

- City of Henderson lies along the northern FMU boundary
- Power line ROW's parallel the eastern FMU boundary

Resource Use:

- Cultural resources
- North McCullough Wilderness
- Moderate density desert tortoise habitat
- Recreation
- Grazing - Hidden Valley Allotment
- Commercial reptile collecting
- Dispersed recreation; hunting; special use permit activities

Air Quality: This FMU contains a portion of one non-attainment airshed. Fire management activities in this FMU may include fire suppression, open burning, and light and heavy equipment mobilization. Fire Management Open burning (RX FIRE) is permitted in Clark County with a courtesy call to the Department of Health. Open burning is defined here "where fire is set either by OFFICERS of governmental agencies, in performance of their official duties or the purposes of training and instruction of firefighting and fire-rescue personnel". (*Section 42-Open Burning, Clark County Air Quality Regulations*).

Soils: Soils have formed under conditions of physical weathering (rather than chemical dissolution) because of the arid climate. Soils on lower portions of alluvial fans and valley floors contain very little organic material, are moderately to highly alkaline, and can contain

high concentrations of gypsum and dissolved salts. A gravelly surface crust (called desert pavement) occurs throughout these areas. Desert pavement is very stable and protects underlying fine-grained soils from erosion. A cemented hardpan layer commonly occurs at shallow depths beneath surface soils throughout these areas. Mountain slopes tend to be covered by an unstable layer of large rocks, boulders, stones, and cobbles. Runoff from periodic rainstorms transports large amounts of material to lower elevations, forming alluvial fans of coarse material and depositing thick sequences of gravelly loams, sands, and finer grained sediments on valley floors.

Soils are susceptible to water and wind erosion. Water erosion occurs during periodic high-intensity, short duration summertime thunderstorms and less frequent, sustained wintertime rainstorms. Water erosion occurs by a combination of sheet flow, rill formation, splashing, and channelized flow in ephemeral washes and stream channels. Wind erosion occurs in areas where the desert pavement layer has been disturbed by human activities or heavy use by wild horses and burros, where large areas of vegetation have been burned by fire, sand dune areas, and as part of physical weathering processes.

Cultural and Paleontological Values: Sloan Rock Cultural ACEC

T&E and Sensitive Species: Desert tortoise

Habitat Values:

- Moderate density desert tortoise habitat
- Bighorn sheep crucial habitat; Bighorn sheep winter range
- Sensitive species: Gila monster; chuckwalla, White-margined penstemon

Hydrology and Water Quality: The Sloan NCA FMU lies within the Colorado River Basin hydrographic region which is part of a regional flow system that drains portions of seven southwestern states. The Colorado River and its mainstem reservoirs (Lake Mead and Lake Mohave) are an important source of water for the Las Vegas Valley and millions of downstream users. Ephemeral wash channels drain most areas and only convey flow after periodic high-intensity summer thunderstorms or sustained winter rainstorms. The only perennial streams occur in the eastern and south-central portions of Clark County, within the Colorado River hydrographic region.

Wilderness or WSA: North McCullough Wilderness

A.3.4.6.1.10. FMU Public Safety, Economic & Community Values at Risk

- City of Henderson lies along the northern FMU boundary
- Power line ROW's parallel the eastern FMU boundary

A.3.4.6.1.11. FMU Fire Protection Responsibility

Wildland fire protection on all BLM public lands within this FMU is provided by the Las Vegas Field Office. Structural fire protection on private lands within this FMU is provided by the City of Henderson Fire Department and/or the Clark County Fire Department.

A.3.4.6.2. FMU Objectives & Strategies

A.3.4.6.2.1. FMU Fire Management Objectives Priority Statement

- Protect human life, safety of wildland firefighters, and protection of human safety and health *(National Fire Plan 2001)*.
- Use approved fire suppression techniques in areas of critical environmental concern where there are concerns for habitat, threatened and endangered species, and urban/rural/wildland interface zones (LVFO RMP, 1998. Fire Management Direction FE-1-d).
- Provide fire suppression efforts commensurate with resource and adjacent property values at risk *(LVFO RMP, 1998. Fire Mgt Direction FE-1-a)*.
- Determine specific hazard reduction priorities, including any noxious or invasive species infestations, and implement according to the existing budget (LVFO RMP, 1998. Fire Mgt Direction FE-2-a).
- Manage habitat to further sustain the populations of federally listed species so they would no longer need protection of the Endangered Species Act. Manage habitats for non-listed special status species to support viable populations so that future listing would not be necessary *(LVFO RMP 1998. Special Status Species Mgt Objective SS-2)*.
- Manage special status species habitat at the potential natural community or desired plant community, according to the need of the species (LVFO RMP 1998. Special Status Species Mgt Objective SS-1).
- Maintain or improve the condition of vegetation on public lands to a Desired Plant Community or to a Potential Natural Community (LVFO RMP 1998. Vegetation Mgt Objective VG-1).
- Restore plant productivity on disturbed areas of the public lands. Rehabilitate, reclaim, or revegetate areas subjected to surface-disturbing activities, where feasible. When rehabilitating, manage for optimum species diversity by seeding native species, except where non-native species are appropriate (LVFO RMP 1998. Vegetation Mgt Objective VG-2).
- Wilderness areas are to be managed to provide for the protection, the preservation of their natural conditions, and the preservation of their wilderness character [Wilderness Act, Section 4(b), BLM Manual 8560 (.08A1)]. Specific objectives and management direction for the North McCullough Wilderness will be identified in Wilderness Management Plan for the area (LVFO RMP 1998. Wilderness Mgt Objective WS-2) and (BLM Manual 8560 (.21A)).

A.3.4.6.2.2. FMU Wildland Fire Suppression Objectives & Strategies

Fire Suppression Objectives:

- Minimize impacts to tortoise habitat and NCA visual resources during fire suppression by minimizing the use of mechanized equipment and, where possible, staying on existing roads and trails.
- Give priority to keeping the wildfire to an absolute minimum (size), in order to prevent type conversion to red brome and other non-native grasses.

- Require reclamation of disturbed lands so that predisturbed condition can be reached within a reasonable time frame.

Fire Suppression Strategies:

- Wildland fires will be fought aggressively in order to minimize burned acreage in desert tortoise habitat and the Sloan Canyon NCA. Actions will be dictated by Appropriate Management Response guidelines.
- Wildland fires in the North McCullough Wilderness will be fought using Minimum Impact Suppression Tactics (MIST)

Suppression/Protection Priorities:

- Sloan Canyon National Conservation Area (NCA)
- Sloan Rock Cultural ACEC
- North McCullough Wilderness
- Moderate density desert tortoise habitat

FMU Target Individual Wildland Fire Size: 1 acre @ 90 %

FMU Target Acres Burned Per Decade: 50 acres

A.3.4.6.2.3. FMU Wildland Fire Operational Constraints, Objectives & Strategies

Special Fire Management Consideration/Areas:

- Sloan Canyon NCA
- Sloan Rock Cultural ACEC
- North McCullough Wilderness
- Moderate density desert tortoise habitat

A.3.4.6.2.3.1. Wildland Fire Operational Constraints Objectives & Strategies:

A.3.4.6.2.3.1.1. Sloan Canyon NCA, Cultural Resources, and Desert Tortoise:

- Initiate full suppression activities with minimum surface disturbances to reduce loss of tortoise cover and to minimize the spread of exotic annual grasses.
- Require consultation with a qualified Resource Advisor for all wildfires within desert tortoise habitat, particularly within ACEC's and designated critical habitat units.
- Restrict OHV travel and the use of tracked vehicles to the minimum necessary to suppress wildfires within desert tortoise habitat, particularly within ACEC's and designated critical habitat units; obliterate all tracks to reduce possibility of future use.

- Use of aerial retardant is authorized; foam or fugitive retardant is preferable to iron oxide retardant.
- Do not authorize burning out of unburned fingers or islands of vegetation. The exception to this case would be the removal of fuels for safety concerns.
- Establish fire camps, staging areas, and helispots in previously disturbed areas outside of ACEC's and designated critical habitat units, where possible, in consultation with a qualified Resource Advisor.
- Provide all firefighters and support personnel with a briefing on desert tortoises and their habitat to minimize take, particularly those associated with vehicle use.

A.3.4.6.2.3.1.2. Wilderness:

- A Resource Advisor will be dispatched to all fires occurring in or threatening a wilderness area.
- Use of Heavy equipment (bulldozers, etc.) will only be used in Wilderness if the fire is threatening human life or property. The Field Manager must approve the use of heavy equipment in all cases.
- Motorized vehicles used in fire suppression efforts will remain on "cherrystem" roads or predetermined existing ways inside Wilderness.
- Air resources including helicopters and SEAT's will be included in the WILDCAD system for all wilderness fire suppression activities.
- Helibases, staging areas, and fire camps will be located outside of wilderness areas, unless authorized by the Field Manager.
- Use of retardant must be approved by the Field Manager.
- If retardant is not approved, water may be dropped from aircraft.
- Landing of helicopters will be kept to a minimum and will only occur in existing openings.
- All fire suppression activities will use Minimum Impact Suppression Techniques (MIST) at all times. See attached MIST Guidelines.
- Hand crews may use conventional hand tools and, with approval from the Resource Advisor, may conservatively use chainsaws for fire line construction. Chainsaw use and line width should be kept to a minimum. Utilization of existing natural barriers, minimum "scratch line", and cold trailing is encouraged where feasible. Handline construction will be rehabilitated back to the natural contour.
- A "Leave No Trace" policy will be used in the wilderness area. All evidence of human activity must be removed, to the maximum extent possible.
- Noxious weeds will be controlled in conformance with the attached "Las Vegas Field Office Noxious Weed Control, Fire Management Weed Transport Control" guidelines.

A.3.4.6.2.3.1.3. Noxious Weeds and Invasive Species Transport Control Procedures:

Las Vegas Field Office Noxious Weed Control and Fire Management Weed Transport Control:

- Off-district engines, crew carriers, overhead vehicles, and helitack/helicopter support vehicles will, upon check-in and prior to proceeding to the line, wash down at the, Logandale, Red Rock, Pahrump Fire Stations or a commercial truck washing station. This will be determined by the location of the units' last fire assignment and if they were cleaned at release from that assignment.
    - The washdown will concentrate on the undercarriage, with special emphasis on axles, frame, crossmembers, motor mounts, and on and underneath steps, running boards, and front bumper/brushguard assemblies. Vehicle cabs will be swept out with refuse disposed of in waste receptacles. In wilderness areas, all portable equipment used on an incident (pumps, hose, fittings, water storage items) will be washed off to rid them of any seed or spores that may be attached from previous fires in noxious weed infested sites.
    - During initial briefings, washdowns will be mentioned and facilities made available for oncoming crews.
- Las Vegas Field Office crews will follow the same procedures identified in Item 1 when returning from fieldwork or wildland fires, especially when vehicles are used in know noxious weed areas infested with known noxious or invasive species common to the Field Office area.
- Upon leaving the Field Office when released from an incident, all off-unit vehicles will follow aforementioned washdown procedures so that Las Vegas' noxious weed problems do not become someone else's problems.
- All equipment used off pavement will be cleaned of weed and grass seed stems, stalks, etc. prior to release from an incident. This includes, but is not limited to, tents, tarps, helicopter support equipment, foldatanks and free-standing tanks, mechanic's vehicles, and logistical support vehicles, trailers and equipment. These vehicles will be washed as in 1.a. above.

This Field Office policy will be followed by all equipment involved in fire suppression while on Las Vegas Field Office assignments. Vehicles will be cleared of washdown procedures during checkout and crew evaluations. In the event vehicles are released from fires away from the district office, the closest wash facility, (government or commercial) will be utilized.

A.3.4.6.2.4. FMU Wildland Fire Use Objectives & Strategies

Wildfire will not be used as a management tool within this FMU at this time.

A.3.4.6.2.5. Burned Acre Objective Review

IF the FMU decadal wildfire acre-burned target has been reached or exceeded PRIOR TO THE COMPLETION OF THE 10-YEAR PLANNING PERIOD, from either wildfire or prescribed fire, a review of fire management objectives and strategies will be initiated to develop new suppression criteria on wildland fire occurrence and prescribed fire acre goals.

A.3.4.6.2.6. FMU Prescribed Fire Objectives & Strategies

Prescribed Fire Objectives & Strategies: Prescribed fire will not be used as a management tool within this FMU at this time.

Rx Fire Annual & Decadal Acre Target: N/A

T & E Species Strategies: N/A

Air Quality Strategy: N/A

NEPA Compliance: Prior to implementation of any proposed projects, site-specific NEPA documentation will be completed, as applicable.

Rx Fire Monitoring Strategy: Monitoring will be completed for attainment/non-attainment of project specific resource management objectives, as applicable.

A.3.4.6.2.7. FMU Non-Fire Fuels Treatment Objectives & Strategies

Non-Fire Fuels Treatment Objectives & Strategies: Non-fire fuels will not be used as a management tool within this FMU at this time.

Non-Fire Annual & Decadal Acre Target: N/A

T & E Species Strategies: N/A

Air Quality Strategies: N/A

NEPA Compliance: Prior to implementation of any proposed projects, site-specific NEPA documentation will be completed, as applicable.

Treatment Monitoring Strategy: Monitoring will be completed for attainment/non-attainment of project specific resource management objectives, as applicable.

A.3.4.6.2.8. FMU Post Fire Rehab/Restoration Objectives & Strategies

Restore plant productivity on disturbed areas of the public lands. Rehabilitate, reclaim, or revegetate areas subjected to surface-disturbing activities, where feasible. When rehabilitating, manage for optimum species diversity by seeding native species, except where non-native species are appropriate.

- Conduct all treatment activities in accordance with the Las Vegas Field Office Normal Year Fire Rehabilitation Plan (1990); Environmental Assessment no. NV-054-90-24.
- Within wilderness, rehabilitation and restoration will be conducted in accordance with the North McCullough Wilderness Management Plan (in preparation).
- In the event that suppression efforts require off-road vehicle operations, replant and visually camouflage the first 200 feet of tire tracks in order to prevent further habitat impacts (due to public use of these track ways).
- Whenever feasible, utilize native species in seeding and/or re-planting treatments.

- Cultivate local supplies of live plant materials for use during riparian restoration efforts.
- Maintain a seed bank of locally collected native plant species for use in restoring both fire fuels treatments and fire-disturbed sites.
- Cultivate and develop varieties of locally grown native seed by means of plant material centers.

A.3.4.6.2.9. FMU Community Protection/Community Assistance Objectives & Strategies

Communities at Risk/WUI Areas: N/A. Communities-at-risk, community protection/assistance and public education strategies and objectives will be further defined through the LVFO RAMS Fire Plan update, which is scheduled for 2005.

Community Protection/Community Assistance Objectives: N/A

Community Protection/Community Assistance Strategy: N/A

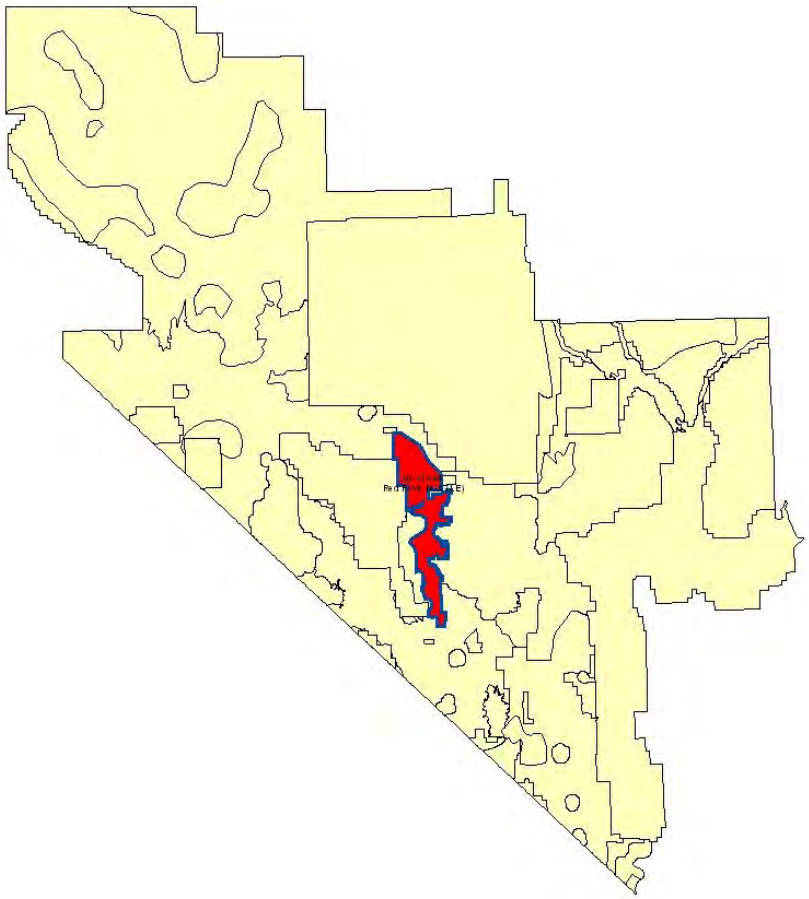
Community Wildfire Safety Education Strategy: N/A

A.3.4.6.3. FMU Fire Program Analysis - Quantifiable Objective Summary

Initial Attack Success	Decadal Wildfire Acres Burn Tolerance	WFU Decadal Target Acres	Rx Fire Acres Per Decade	Non-Fire Acres Per Decade
1 acre @ 90%	50	N/A	N/A	N/A

A.3.4.7. Red Rock NCA (LE)

NV050-06



FMU Name & Unit No.: **Red Rock NCA (LE); NV050-06**

FMU Type/Category: **Special Management Area (SMA)**

A.3.4.7.1. FMU Description:

A.3.4.7.1.1. FMU Location Information

Geographic boundaries: This FMU consists of the lower elevation, eastern tier of the Red Rock Canyon National Conservation Area, including lower Kyle and Lee Canyons, Cottonwood Valley, and the Bird Springs Range. The FMU forms the western boundary of the heavily urbanized Las Vegas Valley.

A.3.4.7.1.2. FMU Acre Total

Ownership by Acres and Percent		
NV 050-06	**Red Rock NCA (LE)**	
Ownership	**Acres**	**Percent**
Bureau of Land Management	146,379	97.7
Nevada State	529	0.4
Private	2,992	2.0
Total Acres	149,899	

A.3.4.7.1.3. Fire Occurrence and History

FMU Number	Decadal (94-03)	24 Years (80-03)	Ignition Cause (80-03)	
NV 050-06			Lightning	94
Number of Fires	75	270	Human/Other	176
Largest Fire (Acres)	774.0	774.0	**Multiple Fire Days (80-03)**	
Total Acres Burned	859.2	929.9	Total Multiple Fire Days (MFD)	79
Average Fire Size (Acres)	11.5	3.4	Number of MFD Fires	108
			Total Acres Burned by Multiple Fires	45.6

Narrative Description: Human caused fires can occur year round. Lightning fires typically occur in the summer, due to convective thunderstorms in association with Gulf of Mexico monsoonal airflows. Wildfire spread in this FMU is highly dependent upon ephemeral buildups of invasive annual grasses, primarily red brome. Most wildfires here are wind-driven, but occasionally slope also influences fire behavior.

General Fire Protection Characteristics:

- Due to its urban setting, large areas of native desert shrub vegetation in this FMU have already suffered type conversion to invasive red brome. This fact, in combination with the special status of the NCA unit, places a high priority on keeping burned acres to an absolute minimum. A large proportion of this FMU is also habitat for the T & E species desert tortoise.
- Wildfire suppression tactics must balance Appropriate Management Response procedures with the need to protect human life and property, and minimize habitat loss from fire, while insuring that fire fighting actions do not impact sensitive species, cultural resources, or NCA landscape values.

A.3.4.7.1.4. FMU Vegetation

FMU Vegetation/Fuel Types		
NV 050-06	**Red Rock NCA (LE)**	
Veg/Fuel Type	Acres	Percent
Grassland	1,430	1.0
Mojave	137,343	95.5
Pinyon/Juniper Woodlands	579	0.4
Sagebrush	4,472	3.1
Grand Total	143,826	

Vegetation Narrative: Approximately 95% of this FMU consists of low elevation desert shrub communities, including Mojave Desert scrub, creosote bursage, and blackbrush. In the Kyle and Lee Canyon areas, this FMU also includes small-scattered patches of pinyon-juniper woodland.

Desert wash and riparian communities are scattered throughout the FMU, mainly along the base of the Red Rock Escarpment; including remnant stringers of Ponderosa pine.

A.3.4.7.1.5. FMU Fuel Models & Live Fuel Moisture Characteristics

Surface Fuel Model & Canopy Cover:

- With few exceptions, fine fuels drive the characteristics of wildland fires occurring in this FMU. These fine fuels are ephemeral and primarily consist of red brome and other non-native annual grasses.
- The larger fires are generally wind driven.

Live Fuel Moisture Averages:

LFM Site	May	June	July	Aug	Sept	Oct
N5E	158%	96%	82%	77%	70%	81%

Live Fuel Moisture Characteristics:

- At live fuel moisture levels of 181% and above fires typically will exhibit Very Low Fire Behavior characteristics
- At live fuel moisture levels of 151% to 180% fires typically will exhibit Low Fire Behavior characteristics
- At live fuel moisture levels of 126% to 150% fires typically will exhibit Moderate Fire Behavior characteristics
- At live fuel moisture levels of 101% to 125% fires typically will exhibit High Fire Behavior characteristics
- At live fuel moisture levels of 75% to 100% fires typically will exhibit Extreme Fire Behavior characteristics
- At live fuel moisture levels of 75% and below fires typically will exhibit Advanced Fire Behavior characteristics

A.3.4.7.1.6. Fire Weather & Climate Related Impacts

(Detailed weather station data for this FMU will be added to the FMP Appendix upon completion of the national fire weather data validation/correction project.)

- Wet lightning is common in this area. Fires generally remain small when starts occur under these common conditions.
- Dry Lightning is possible in this area. Larger fires can occur with these erratic and gusty thunderstorm events.
- Larger fires occur when human ignitions occur under typical warm and windy summer weather.
- Fire behavior can be extreme under these conditions when there are heavy buildups of ephemeral light flashy fuels.

- Fire behavior can be extreme under these conditions in heavy brush and/or Pinyon-Juniper fuels.

A.3.4.7.1.7. Fire Regime

- Low elevation desert shrub: Fire Regime V; Condition Class II

FMU by Condition Class and Fire Regime			
NV 050-06		**Red Rock NCA (LE)**	
CC	FR	Acres	Percent
2	II	71,026	47.6
	V	58,510	39.2
3	I	4,166	2.8
	II	5,896	3.9
	IV	9,690	6.5
Total		149,289	

A.3.4.7.1.8. FMU Physical Characteristics

Topography:

- Elevation Range: 2,998 feet to 6,998 feet
- Slope:
  - Low elevation desert shrub: 0 to 45%
  - Pinyon-juniper woodland: 30 to 60%
- Aspect: Mainly east
- Major topographical features:
  - Lee Canyon
  - Kyle Canyon
  - Red Rock Wash
  - Blue Diamond Hill
  - Bird Spring Range

Access Information: Per NCA direction, vehicular travel is restricted to existing roads. Access consists State Routes 156, 157, 159, and 160 and unpaved roads. A large portion of this FMU is road-less.

A.3.4.7.1.9. FMU Resource Values & Attributes

Wildland-Urban Interface/Intermix:

- Blue Diamond Township
- Calico Basin residential in-holdings
- Bonnie Springs Resort and dispersed residential properties

- Mountain Springs Township (adjacent to FMU)
- Spring Mountain Ranch State Park
- Red Rock Canyon NCA Visitor Center and Scenic Loop Drive
- Moenkopi Campground and Red Rock Fire Station (BLM)
- Red Spring and Willow Spring Day Use Areas
- Wheeler Camp Spring Audubon Sanctuary
- Various residential subdivisions along eastern FMU boundary
- Red Rock Country Club (adjacent to FMU)
- Commercial horse riding facilities
- Desert Sportsmen commercial shooting range (adjacent to FMU)
- State Routes 156, 157, 159, and 160
- Power line ROW's and substations

Resource Use:

- Biodiversity conservation
- Tourism
- Recreation
- Dispersed recreation; hunting; special use permit activities
- Power line ROW's and substations
- Commercial reptile collecting
- Mines
- Commercial tours (vehicle, hiking, mountain biking)
- Commercial horse riding

Air Quality: This FMU contains a portion of one non-attainment airshed. Fire management activities in this FMU may include fire suppression, open burning, and light and heavy equipment mobilization. Fire Management Open burning (RX FIRE) is permitted in Clark County with a courtesy call to the Department of Health. Open burning is defined here "where fire is set either by OFFICERS of governmental agencies, in performance of their official duties or the purposes of training and instruction of firefighting and fire-rescue personnel". (*Section 42-Open Burning, Clark County Air Quality Regulations*).

Soils: Soils have formed under conditions of physical weathering (rather than chemical dissolution) because of the arid climate. Soils on lower portions of alluvial fans and valley floors contain very little organic material, are moderately to highly alkaline, and can contain

high concentrations of gypsum and dissolved salts. A gravelly surface crust (called desert pavement) occurs throughout these areas. Desert pavement is very stable and protects underlying fine-grained soils from erosion. A cemented hardpan layer commonly occurs at shallow depths beneath surface soils throughout these areas. Mountain slopes tend to be covered by an unstable layer of large rocks, boulders, stones, and cobbles. Runoff from periodic rainstorms transports large amounts of material to lower elevations, forming alluvial fans of coarse material and depositing thick sequences of gravelly loams, sands, and finer grained sediments on valley floors.

Soils are susceptible to water and wind erosion. Water erosion occurs during periodic high-intensity, short duration summertime thunderstorms and less frequent, sustained wintertime rainstorms. Water erosion occurs by a combination of sheet flow, rill formation, splashing, and channelized flow in ephemeral washes and stream channels. Wind erosion occurs in areas where the desert pavement layer has been disturbed by human activities or heavy use by wild horses and burros, where large areas of vegetation have been burned by fire, sand dune areas, and as part of physical weathering processes.

Cultural and Paleontological Values:

- Bird Spring ACEC
- Old Spanish Trail/Mormon Road
- Sandstone Quarry
- Prehistoric rock art sites (Brownstone Canyon, Red Spring, Willow Spring, Lone Grapevine Spring)

T&E and Sensitive Species:

- Desert tortoise
- Blue Diamond cholla (candidate)
- Peregrine falcon (no confirmed nest sites; foraging use only)

Habitat Values:

- Candidate T & E species: Blue Diamond cholla
- 30+ sensitive and/or endemic species (upland and riparian)
- Pine Creek Natural Area (ferns and sensitive species)
- Moderate density desert tortoise habitat
- Biologically sensitive riparian areas (plants, bats, amphibians, endemic spring snails)
- Remnant stands of Ponderosa pine
- Bighorn sheep crucial habitat; Bighorn sheep winter range
- Mule deer crucial summer habitat; Mule deer winter range
- Red Rock Canyon wild horse and burro herd management area

Hydrology and Water Quality: The Red Rock NCA (LE) FMU lies within the Colorado River Basin hydrographic region which is part of a regional flow system that drains portions of seven southwestern states. The Colorado River and its mainstem reservoirs (Lake Mead and Lake Mohave) are an important source of water for the Las Vegas Valley and millions of downstream users. Ephemeral wash channels drain most areas and only convey flow after periodic high-intensity summer thunderstorms or sustained winter rainstorms. The only perennial streams occur in the eastern and south-central portions of Clark County, within the Colorado River hydrographic region.

Wilderness or WSA:

- Rainbow Mountain Wilderness
- La Madre Mountain Wilderness

A.3.4.7.1.10. FMU Public Safety, Economic & Community Values at Risk

- Red Rock Canyon National Conservation Area
- Bird Spring Cultural ACEC
- Pine Creek Natural Area
- Moderate density desert tortoise habitat
- Biologically sensitive riparian areas
- Remnant stands of Ponderosa pine
- Rainbow Mountain Wilderness
- La Madre Mountain Wilderness
- Candidate T & E species: Blue Diamond cholla
- 30+ sensitive species, including many endemics
- Blue Diamond Township
- Calico Basin residential in-holdings
- Bonnie Springs Resort and dispersed residential properties
- Mountain Springs Township (adjacent to FMU)
- Spring Mountain Ranch State Park
- Red Rock Canyon NCA Visitor Center and Scenic Loop Drive
- Moenkopi Campground and Red Rock Fire Station (BLM)
- Red Spring and Willow Spring Day Use Areas
- Wheeler Camp Spring Audubon Sanctuary

- Various residential subdivisions along eastern FMU boundary
- Red Rock Country Club (adjacent to FMU)
- Commercial horse riding facilities
- Desert Sportsmen commercial shooting range (adjacent to FMU)
- State Routes 156, 157, 159, and 160
- Power line ROW's and substations

A.3.4.7.1.11. FMU Fire Protection Responsibility

Wildland fire protection on all BLM public lands within this FMU is provided by the Las Vegas Field Office. Structural fire protection on private lands within this FMU is provided by the Clark County Fire Department and/or Las Vegas Fire and Rescue.

A.3.4.7.2. FMU Objectives & Strategies

A.3.4.7.2.1. FMU Fire Management Objectives Priority Statement

[Note: the Red Rock Canyon NCA General Management Plan (i.e. RMP) has been prepared and is awaiting signature. If necessary, the LVFO FMP will be revised to reflect any changes in specific land use plan direction for this FMU.]

- Protect human life, safety of wildland firefighters, and protection of human safety and health *(National Fire Plan 2001).*
- Use approved fire suppression techniques in areas of critical environmental concern where there are concerns for habitat, threatened and endangered species, and urban/rural/wildland interface zones (LVFO RMP, 1998. Fire Management Direction FE-1-d).
- Provide fire suppression efforts commensurate with resource and adjacent property values at risk *(LVFO RMP, 1998. Fire Mgt Direction FE-1-a).*
- Determine specific hazard reduction priorities, including any noxious or invasive species infestations, and implement according to the existing budget (LVFO RMP, 1998. Fire Mgt Direction FE-2-a).
- On watersheds that exhibit good potential for recovery, implement protective measures, including but not limited to fencing and removal of tamarisk (LVFO RMP, 1998. Soil Resource Mgt Objective SL-1).
- Manage habitat to further sustain the populations of federally listed species so they would no longer need protection of the Endangered Species Act. Manage habitats for non-listed special status species to support viable populations so that future listing would not be necessary *(LVFO RMP 1998. Special Status Species Mgt Objective SS-2).*
- Manage special status species habitat at the potential natural community or desired plant community, according to the need of the species (LVFO RMP 1998. Special Status Species Mgt Objective SS-1).

- Maintain or improve the condition of vegetation on public lands to a Desired Plant Community or to a Potential Natural Community (LVFO RMP 1998. Vegetation Mgt Objective VG-1).
- Restore plant productivity on disturbed areas of the public lands. Rehabilitate, reclaim, or revegetate areas subjected to surface-disturbing activities, where feasible. When rehabilitating, manage for optimum species diversity by seeding native species, except where non-native species are appropriate (LVFO RMP 1998. Vegetation Mgt Objective VG-2).
- Use integrated weed management techniques to control and eradicate tamarisk, such as *burning*, chemical, biological or mechanical treatments, where potential for treatment is good. Rehabilitate with native species to help reduce the potential for tamarisk re-establishment and improve ecosystem health.
- Wilderness areas are to be managed to provide for the protection, the preservation of their natural conditions, and the preservation of their wilderness character [Wilderness Act, Section 4(b), BLM Manual 8560 (.08A1)]. Specific objectives and management direction for the Rainbow Mountain and La Madre Mountain Wilderness Areas will be identified in Wilderness Management Plans for the areas (LVFO RMP 1998. Wilderness Mgt Objective WS-2) and (BLM Manual 8560 (.21A)).
- Maintain woodland and conifer forest where possible for all-aged stands, with understory vegetation forage value rating at moderate or better (LVFO RMP 1998. Forestry Mgt Objective FR-1).

A.3.4.7.2.2. FMU Wildland Fire Suppression Objectives & Strategies

Fire Suppression Objectives:

- Minimize impacts to tortoise habitat during fire suppression by minimizing the use of mechanized equipment and, where possible, staying on existing roads and trails.
- Give priority to keeping the wildfire to an absolute minimum (size), in order to prevent type conversion of blackbrush and other low elevation desert shrub communities to invasive red brome.
- Require reclamation of disturbed lands so that predisturbed condition can be reached within a reasonable time frame.

Fire Suppression Strategies:

- Wildland fires will be fought aggressively in order to minimize burned acreage in this entire FMU. Actions will be dictated by Appropriate Management Response guidelines.
- Wildland fires in all wilderness areas will be fought using Minimum Impact Suppression Tactics (MIST)
- A qualified resource advisor will be notified of all wildland fire starts in this FMU.
- Absent a threat to human life or property, prioritize fire suppression efforts on the following biologically sensitive areas: southern Blue Diamond Hill (only known global population of the endemic Blue Diamond cholla), all springs and riparian areas, and blackbrush habitats.

Suppression/Protection Priorities:

- Blue Diamond Township
- Calico Basin residential in-holdings
- Bonnie Springs Resort and dispersed residential properties
- Mountain Springs Township (adjacent to FMU)
- Spring Mountain Ranch State Park
- Red Rock Canyon NCA Visitor Center and Scenic Loop Drive
- Moenkopi Campground and Red Rock Fire Station (BLM)
- Various residential subdivisions along eastern FMU boundary
- Red Rock Country Club (adjacent to FMU)
- Commercial horse riding facilities
- Desert Sportsmen commercial shooting range (adjacent to FMU)
- State Routes 156, 157, 159, and 160
- Power line ROW's and substations
- Biologically sensitive riparian areas
- Candidate T & E species: Blue Diamond cholla
- 30+ sensitive species, including many endemics
- Bird Spring Cultural ACEC
- Pine Creek Natural Area
- Moderate density desert tortoise habitat
- Remnant stands of Ponderosa pine
- Rainbow Mountain Wilderness
- La Madre Mountain Wilderness
- Red Spring and Willow Spring Day Use Areas
- Wheeler Camp Spring Audubon Sanctuary
- Prehistoric rock art sites: Brownstone Canyon, Red Spring, Willow Spring, and Lone Grapevine Spring.

FMU Target Individual Wildland Fire Size: 1 acre @ 90 %

FMU Target Acres Burned Per Decade: 150 acres

A.3.4.7.2.3. FMU Wildland Fire Operational Constraints, Objectives & Strategies

Special Fire Management Consideration/Areas:

- Red Rock Canyon National Conservation Area
- Bird Spring Cultural ACEC
- Rainbow Mountain Wilderness
- La Madre Mountain Wilderness
- Pine Creek Natural Area
- Moderate density desert tortoise habitat
- Biologically sensitive riparian areas
- Remnant stands of Ponderosa pine
- Rainbow Mountain Wilderness
- Candidate T & E species: Blue Diamond cholla
- 30+ sensitive species, including many endemics
- Blue Diamond Township
- Calico Basin residential in-holdings
- Bonnie Springs Resort and dispersed residential properties
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- Red Rock Canyon NCA Visitor Center and Scenic Loop Drive
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- Various residential subdivisions along eastern FMU boundary
- Red Rock Country Club (adjacent to FMU)
- Commercial horse riding facilities
- Desert Sportsmen commercial shooting range (adjacent to FMU)
- State Routes 156, 157, 159, and 160
- Power line ROW's and substations

- Prehistoric rock art sites: Brownstone Canyon, Red Spring, Willow Spring, and Lone Grapevine Spring.

A.3.4.7.2.3.1. Wildland Fire Operational Constraints Objectives & Strategies:

A.3.4.7.2.3.1.1. NCA, Cultural Resources, and Desert Tortoise:

- Initiate full suppression activities with minimum surface disturbances to reduce loss of tortoise cover and to minimize the spread of exotic annual grasses.
- Require consultation with a qualified Resource Advisor for all wildfires within desert tortoise habitat, particularly within ACEC's and designated critical habitat units.
- Restrict OHV travel and the use of tracked vehicles to the minimum necessary to suppress wildfires within desert tortoise habitat, particularly within ACEC's and designated critical habitat units; obliterate all tracks to reduce possibility of future use.
- Use of aerial retardant is authorized; foam or fugitive retardant is preferable to iron oxide retardant.
- Do not authorize burning out of unburned fingers or islands of vegetation. The exception to this case would be the removal of fuels for safety concerns.
- Establish fire camps, staging areas, and helispots in previously disturbed areas outside of ACEC's and designated critical habitat units, where possible, in consultation with a qualified Resource Advisor.
- Provide all firefighters and support personnel with a briefing on desert tortoises and their habitat to minimize take, particularly those associated with vehicle use.

A.3.4.7.2.3.1.2. Riparian Areas:

- Apply M.I.S.T. within riparian habitat
- In riparian areas, prioritize suppression actions to minimize damage to stands of native vegetation from wildfire or suppression operations
- Fire suppression in riparian habitat will be coordinated with the approved Resource Advisor
- In riparian areas, use natural barriers or openings in riparian vegetation where possible as the easiest, safest method to manage a riparian wildfire. Where possible and practical use wet firebreaks rather than constructing firelines by hand or with heavy equipment
- Avoid burning out unburned islands, whenever possible
- Utilize firing tactics only if necessary to protect firefighter or public safety
- Avoid surface disturbing suppression activities in riparian areas whenever possible
- Avoid dropping retardant within 300 feet of water sources, to the maximum extent feasible

- Do not use the following springs as suppression water sources, due to the presence of rare, endemic spring snail species: Red Spring, Lost Creek Spring, Willow Spring, La Madre Spring, and Rainbow Spring.
- Use of containment systems for portable pumps to avoid fuel spills in riparian or aquatic systems will be required.

A.3.4.7.2.3.1.3. Wilderness:

- A Resource Advisor will be dispatched to all fires occurring in or threatening a wilderness area.
- Use of Heavy equipment (bulldozers, etc.) will only be used in Wilderness if the fire is threatening human life or property. The Field Manager must approve the use of heavy equipment in all cases.
- Motorized vehicles used in fire suppression efforts will remain on "cherrystem" roads or predetermined existing ways inside Wilderness.
- Air resources including helicopters and SEAT's will be included in the WILDCAD system for all wilderness fire suppression activities.
- Helibases, staging areas, and fire camps will be located outside of wilderness areas, unless authorized by the Field Manager.
- Use of retardant must be approved by the Field Manager.
- If retardant is not approved, water may be dropped from aircraft.
- Landing of helicopters will be kept to a minimum and will only occur in existing openings.
- All fire suppression activities will use Minimum Impact Suppression Techniques (MIST) at all times. See attached MIST Guidelines.
- Hand crews may use conventional hand tools and, with approval from the Resource Advisor, may conservatively use chainsaws for fire line construction. Chainsaw use and line width should be kept to a minimum. Utilization of existing natural barriers, minimum "scratch line", and cold trailing is encouraged where feasible. Handline construction will be rehabilitated back to the natural contour.
- A "Leave No Trace" policy will be used in the wilderness area. All evidence of human activity must be removed, to the maximum extent possible.
- Noxious weeds will be controlled in conformance with the attached "Las Vegas Field Office Noxious Weed Control, Fire Management Weed Transport Control" guidelines.

A.3.4.7.2.3.1.4. Noxious Weeds and Invasive Species Transport Control Procedures:

Las Vegas Field Office Noxious Weed Control and Fire Management Weed Transport Control:

- Off-district engines, crew carriers, overhead vehicles, and helitack/helicopter support vehicles will, upon check-in and prior to proceeding to the line, wash down at the, Logandale, Red Rock, Pahrump Fire Stations or a commercial truck washing station. This will be determined

by the location of the units' last fire assignment and if they were cleaned at release from that assignment.

  - The washdown will concentrate on the undercarriage, with special emphasis on axles, frame, crossmembers, motor mounts, and on and underneath steps, running boards, and front bumper/brushguard assemblies. Vehicle cabs will be swept out with refuse disposed of in waste receptacles. In wilderness areas, all portable equipment used on an incident (pumps, hose, fittings, water storage items) will be washed off to rid them of any seed or spores that may be attached from previous fires in noxious weed infested sites.

  - During initial briefings, washdowns will be mentioned and facilities made available for oncoming crews.

- Las Vegas Field Office crews will follow the same procedures identified in Item 1 when returning from fieldwork or wildland fires, especially when vehicles are used in know noxious weed areas infested with known noxious or invasive species common to the Field Office area.

- Upon leaving the Field Office when released from an incident, all off-unit vehicles will follow aforementioned washdown procedures so that Las Vegas' noxious weed problems do not become someone else's problems.

- All equipment used off pavement will be cleaned of weed and grass seed stems, stalks, etc. prior to release from an incident. This includes, but is not limited to, tents, tarps, helicopter support equipment, foldatanks and free-standing tanks, mechanic's vehicles, and logistical support vehicles, trailers and equipment. These vehicles will be washed as in 1.a. above.

This Field Office policy will be followed by all equipment involved in fire suppression while on Las Vegas Field Office assignments. Vehicles will be cleared of washdown procedures during checkout and crew evaluations. In the event vehicles are released from fires away from the district office, the closest wash facility, (government or commercial) will be utilized.

A.3.4.7.2.4. FMU Wildland Fire Use Objectives & Strategies

Wildfire will not be used as a management tool within this FMU at this time.

A.3.4.7.2.5. Burned Acre Objective Review

IF the FMU decadal wildfire acre-burned target has been reached or exceeded PRIOR TO THE COMPLETION OF THE 10-YEAR PLANNING PERIOD, from either wildfire or prescribed fire, a review of fire management objectives and strategies will be initiated to develop new suppression criteria on wildland fire occurrence and prescribed fire acre goals.

A.3.4.7.2.6. FMU Prescribed Fire Objectives & Strategies

Prescribed Fire Objectives & Strategies: Prescribed fire will not be used as a management tool within this FMU at this time.

Rx Fire Annual & Decadal Acre Target: N/A

T & E Species Strategies: N/A

Air Quality Strategy: N/A

NEPA Compliance: Prior to implementation of any proposed projects, site-specific NEPA documentation will be completed, as applicable.

Rx Fire Monitoring Strategy: Monitoring will be completed for attainment/non-attainment of project specific resource management objectives, as applicable.

A.3.4.7.2.7. FMU Non-Fire Fuels Treatment Objectives & Strategies

Non-Fire Fuels Treatment Objectives & Strategies: Non-fire fuel treatments will not be used as a management tool within this FMU at this time. [In future, if a target specific herbicide becomes available, then selective removal of red brome and other non-native annuals will be implemented to reduce the fire hazard potential in Blue Diamond cholla habitat.]

Non-Fire Annual & Decadal Acre Target: N/A

T & E Species Strategies: N/A

Air Quality Strategies: N/A

NEPA Compliance: Prior to implementation of any proposed projects, site-specific NEPA documentation will be completed, as applicable.

Treatment Monitoring Strategy: Monitoring will be completed for attainment/non-attainment of project specific resource management objectives, as applicable.

A.3.4.7.2.8. FMU Post Fire Rehab/Restoration Objectives & Strategies

Restore plant productivity on disturbed areas of the public lands. Rehabilitate, reclaim, or revegetate areas subjected to surface-disturbing activities, where feasible. When rehabilitating, manage for optimum species diversity by seeding native species, except where non-native species are appropriate.

- In desert tortoise habitat, conduct all activities in accordance with the Reclamation Plan For Critical Tortoise Habitat In The Las Vegas Field Office (1998); Environmental Assessment no. NV-052-98-077.
- Within wilderness, rehabilitation and restoration will be conducted in accordance with the appropriate wilderness management plan(s).
- In the event that suppression efforts require off-road vehicle operations, replant and visually camouflage the first 200 feet of tire tracks in order to prevent further habitat impacts (due to public use of these track ways).
- Whenever feasible, utilize native species in seeding and/or re-planting treatments.
- Cultivate local supplies of live plant materials for use during riparian restoration efforts.
- Maintain a seed bank of locally collected native plant species for use in restoring both fire fuels treatments and fire-disturbed sites.
- Cultivate and develop varieties of locally grown native seed by means of plant material centers.

A.3.4.7.2.9. FMU Community Protection/Community Assistance Objectives & Strategies

Communities at Risk/WUI Areas: N/A. Communities-at-risk, community protection/assistance and public education strategies and objectives will be further defined through the LVFO RAMS Fire Plan update, which is scheduled for 2005.

Community Protection/Community Assistance Objectives:

- Educate/work with communities on defensible space issues and wildfire hazards
- Pursue establishment of local Fire Safe Council Chapter(s)
- Promote collaborative efforts to mitigate fuel hazards with cooperators
- Continue wildland fire education programs at Red Rock Visitor Center special events

Community Protection/Community Assistance Strategy:

- Coordinate through Nevada State Office to implement Rural Fire Assistance and Community Assistance programs, as identified
- Prepare risk assessments and hazard mitigation plans
- Educate/work with communities on defensible space issues and wildfire hazards
- Pursue establishment of local Fire Safe Council Chapter(s)
- Promote collaborative efforts to mitigate fuel hazards with cooperators
- Continue wildland fire education programs at Red Rock Visitor Center special events

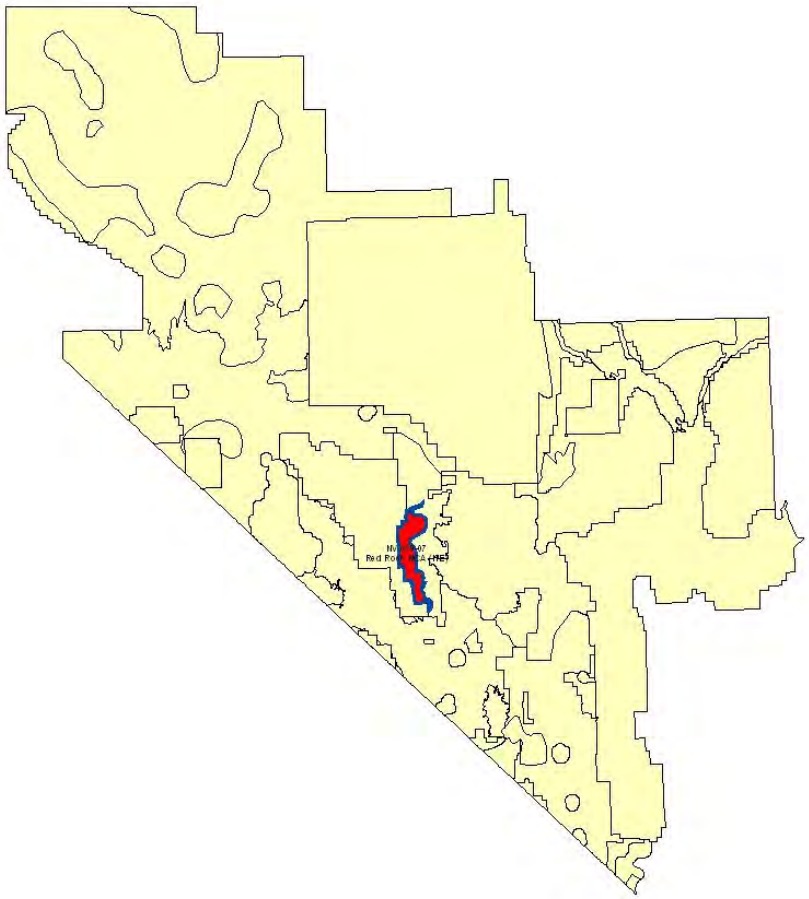
Community Wildfire Safety Education Strategy: N/A

A.3.4.7.3. FMU Fire Program Analysis - Quantifiable Objective Summary

Initial Attack Success	Decadal Wildfire Acres Burn Tolerance	WFU Decadal Target Acres	Rx Fire Acres Per Decade	Non-Fire Acres Per Decade
1 acre @ 90%	150	N/A	N/A	N/A

A.3.4.8. Red Rock NCA (HE)

NV050-07



FMU Name & Unit No.: **Red Rock NCA (HE); NV050-07**

FMU Type/Category: **Special Management Area (SMA)**

A.3.4.8.1. FMU Description:

A.3.4.8.1.1. FMU Location Information

Geographic boundaries: This FMU consists of the higher elevation portions of the Red Rock Canyon National Conservation Area, primarily consisting of La Madre Mountain, the Red Rock Escarpment, and the eastern fins of Potosi Mountain. Most of the FMU is contained within the Rainbow Mountain and La Madre Mountain Wilderness Areas. Overall, the FMU occupies the southern end of the Spring Mountain Range, due west of the Las Vegas Valley.

A.3.4.8.1.2. FMU Acre Total

Ownership by Acres and Percent		
NV 050-07	**Red Rock NCA (HE)**	
Ownership	**Acres**	**Percent**
Bureau of Land Management	48,064	100.0
Total Acres	48,064	

A.3.4.8.1.3. Fire Occurrence and History

FMU Number	Decadal (94-03)	24 Years (80-03)	Ignition Cause (80-03)	
NV 050-07			Lightning	80
Number of Fires	43	142	Human/Other	62
Largest Fire (Acres)	75.0	1,250.0	**Multiple Fire Days (80-03)**	
Total Acres Burned	85.1	1,664.0	Total Multiple Fire Days (MFD)	45
Average Fire Size (Acres)	2.0	11.7	Number of MFD Fires	60
			Total Acres Burned by Multiple Fires	241.4

Narrative Description: Most wildfires in this FMU occur in summer, due to human causes or in association with thunderstorm events, which are typically monsoonal. Single tree fires are the norm in this FMU. Larger, wind driven fires in closed canopy pinyon-juniper stands also occur with less frequency. Fine fuel buildups have minimal effect on fire behavior in this FMU.

General Fire Protection Characteristics: The vegetation in this FMU is comprised of fire disturbance tolerant plant communities, including ponderosa pine, pinyon pine-Utah juniper, and mountain chaparral. Until such time as fire use plans and prescriptions can be put in place, it would be desirable from a resource standpoint to allow non-human caused wildfires to burn small (under 25-acres), mosaic openings in the over-mature, closed canopy pinyon-juniper stands that now exist, partly as a result of decades of aggressive fire suppression practices. Due to the proximity of this FMU to urban Las Vegas, and the non-attainment airshed, careful application of Appropriate Management Response options must be exercised in order to balance resource goals against public health and public perception considerations.

A.3.4.8.1.4. FMU Vegetation

FMU Vegetation/Fuel Types		
NV 050-07	**Red Rock NCA (HE)**	
Veg/Fuel Type	Acres	Percent
Grassland	5,793	12.0
Mojave	13,746	28.5
Mountain Shrub	11,478	23.8
Pinyon/Juniper Woodlands	9,257	19.2
Sagebrush	7,885	16.4
Grand Total	48,159	

Vegetation Narrative: Approximately 20% of this FMU consists of pinyon-juniper woodland. The remainder consists of mountain chaparral communities in the slot escarpment canyons, a remnant stand of white fir at the crest of La Madre Mountain, and remnant stands of ponderosa pine both in the slot canyons and on the sandstone rim of the Red Rock Escarpment.

A.3.4.8.1.5. FMU Fuel Models & Live Fuel Moisture Characteristics

Surface Fuel Model & Canopy Cover: Surface fuels mainly consist of dead and downed branches and limbs (10 hour and 100 hour fuels). There can be an ephemeral buildup of fine fuels consisting of forbs and non-native annual grasses. Generally the canopy cover is closed and would support a wind driven crown fire.

Live Fuel Moisture Averages:

LFM Site	May	June	July	Aug	Sept	Oct
N5E	158%	96%	82%	77%	70%	81%

Live Fuel Moisture Characteristics:

- At live fuel moisture levels of 181% and above fires typically will exhibit Very Low Fire Behavior characteristics
- At live fuel moisture levels of 151% to 180% fires typically will exhibit Low Fire Behavior characteristics
- At live fuel moisture levels of 126% to 150% fires typically will exhibit Moderate Fire Behavior characteristics
- At live fuel moisture levels of 101% to 125% fires typically will exhibit High Fire Behavior characteristics
- At live fuel moisture levels of 75% to 100% fires typically will exhibit Extreme Fire Behavior characteristics
- At live fuel moisture levels of 75% and below fires typically will exhibit Advanced Fire Behavior characteristics

A.3.4.8.1.6. Fire Weather & Climate Related Impacts

(Detailed weather station data for this FMU will be added to the FMP Appendix upon completion of the national fire weather data validation/correction project.)

- Wet lightning is common in this area. Fires generally remain small when starts occur under these common conditions.
- Dry Lightning is possible in this area. Larger fires can occur with these erratic and gusty thunderstorm events.
- Larger fires occur when human ignitions occur under typical warm and windy summer weather.
- Fire behavior can be extreme under these conditions in heavy brush and/or Pinyon-Juniper fuels.

A.3.4.8.1.7. Fire Regime

- Low elevation desert shrub: Fire Regime I; Condition Class II

FMU by Condition Class and Fire Regime			
NV 050-07		Red Rock NCA (HE)	
CC	FR	Acres	Percent

2	II	16,760	34.9
	V	399	0.8
3	I	6,394	13.3
	II	22,845	47.5
	IV	1,666	3.5
Total		48,063	

A.3.4.8.1.8. FMU Physical Characteristics

Topography:

- Elevation Range: 1,158 feet to 8,197 feet
- Slope: 10 to 60+%
- Aspect: Variable
- Major topographical features:
  - La Madre Mountain
  - Red Rock Escarpment
  - Eastern foothills of Potosi Mountain

Access Information: Per NCA and wilderness management direction, vehicular travel is restricted to existing roads. Access consists of State Route 157, State Route 160, and unpaved roads. Most of this FMU is road-less.

A.3.4.8.1.9. FMU Resource Values & Attributes

Wildland-Urban Interface/Intermix:

- Bonnie Springs Resort (adjacent to FMU)
- Mountain Springs Township (adjacent to FMU)
- Spring Mountain Ranch State Park (adjacent to FMU)
- Private in-holdings: White Beauty Gypsum property; Cabin Springs and Prospect Spring properties (adjacent to FMU)
- State Route 160
- Power line ROW's

Resource Use:

- Biodiversity conservation
- Tourism
- Recreation
- Dispersed recreation; hunting; special use permit activities

- Commercial rock climbing
- Power line ROW's
- Mines
- Commercial tours (vehicle, hiking, mountain biking)
- Commercial horse riding

Air Quality: This FMU contains a portion of one non-attainment airshed. Fire management activities in this FMU may include fire suppression, open burning, and light and heavy equipment mobilization. Fire Management Open burning (RX FIRE) is permitted in Clark County with a courtesy call to the Department of Health. Open burning is defined here "where fire is set either by OFFICERS of governmental agencies, in performance of their official duties or the purposes of training and instruction of firefighting and fire-rescue personnel". (*Section 42-Open Burning, Clark County Air Quality Regulations*).

Soils: Soils have formed under conditions of physical weathering (rather than chemical dissolution) because of the arid climate. Mountain slopes tend to be covered by an unstable layer of large rocks, boulders, stones, and cobbles. Runoff from periodic rainstorms transports large amounts of material to lower elevations, forming alluvial fans of coarse material and depositing thick sequences of gravelly loams, sands, and finer grained sediments on valley floors.

Soils are susceptible to water and wind erosion. Water erosion occurs during periodic high-intensity, short duration summertime thunderstorms and less frequent, sustained wintertime rainstorms. Water erosion occurs by a combination of sheet flow, rill formation, splashing, and channelized flow in ephemeral washes and stream channels. Wind erosion occurs in areas where the desert pavement layer has been disturbed by human activities or heavy use by wild horses and burros, where large areas of vegetation have been burned by fire, sand dune areas, and as part of physical weathering processes. Soils in very high elevation areas have formed under conditions of greater rainfall. Resulting soils reflect a combination of physical weathering of rocks, chemical dissolution of rocks, and the decomposition of organic materials. Relative shallow soil layers occur on bedrock surfaces in these areas. Soils in these areas contain low to moderate amounts of organic material, are slightly to highly alkaline, and contain lower concentrations of dissolved salts than soils at lower elevations.

Cultural and Paleontological Values:

- Lucky Strike Canyon (prehistoric/historic values)
- Prehistoric rock art sites (Brownstone Canyon)

T&E and Sensitive Species:

- Desert tortoise
- Peregrine falcon (no confirmed nest sites; foraging use only)

Habitat Values:

- Pine Creek Natural Area

- T&E Species habitat: Peregrine falcon (Bridge Mountain)
- Biologically sensitive riparian areas
- Remnant stands of ponderosa pine and white fir
- Single population endemic species: Red Rock Canyon aster
- 25+ sensitive species, including endemics (bats, plants, butterflies).
- Bighorn sheep crucial habitat; Bighorn sheep winter range
- Mule deer crucial summer habitat; Mule deer winter range
- Red Rock Canyon wild horse and burro herd management area

Hydrology and Water Quality: The Red Rock NCA (HE) FMU lies within the Colorado River Basin hydrographic region which is part of a regional flow system that drains portions of seven southwestern states. The Colorado River and its mainstem reservoirs (Lake Mead and Lake Mohave) are an important source of water for the Las Vegas Valley and millions of downstream users. Ephemeral wash channels drain most areas and only convey flow after periodic high-intensity summer thunderstorms or sustained winter rainstorms. The only perennial streams occur in the eastern and south-central portions of Clark County, within the Colorado River hydrographic region.

Wilderness or WSA:

- Rainbow Mountain Wilderness
- La Madre Mountain Wilderness

A.3.4.8.1.10. FMU Public Safety, Economic & Community Values at Risk

- Red Rock Canyon National Conservation Area
- Pine Creek Natural Area
- T&E Species habitat: Peregrine falcon (Bridge Mountain)
- Biologically sensitive riparian areas
- Remnant stands of ponderosa pine and white fir
- Rainbow Mountain Wilderness
- La Madre Mountain Wilderness
- Single population endemic species: Red Rock Canyon aster
- 25+ sensitive species, including endemics (bats, plants, butterflies).
- Bonnie Springs Resort (adjacent to FMU)
- Mountain Springs Township (adjacent to FMU)

- Spring Mountain Ranch State Park (adjacent to FMU)
- Private in-holdings: White Beauty Gypsum property; Cabin Springs and Prospect Spring properties (adjacent to FMU)
- State Route 160
- Power line ROW's

A.3.4.8.1.11. FMU Fire Protection Responsibility

Wildland fire protection on all BLM public lands within this FMU is provided by the Las Vegas Field Office. Structural fire protection on private lands within this FMU is provided by the Clark County Fire Department.

A.3.4.8.2. FMU Objectives & Strategies

A.3.4.8.2.1. FMU Fire Management Objectives Priority Statement

[Note: the Red Rock Canyon NCA General Management Plan (i.e. RMP) has been prepared and is awaiting signature. If necessary, the LVFO FMP will be revised to reflect any changes in specific land use plan direction for this FMU.]

- Protect human life, safety of wildland firefighters, and protection of human safety and health *(National Fire Plan 2001).*
- Use approved fire suppression techniques in areas of critical environmental concern where there are concerns for habitat, threatened and endangered species, and urban/rural/wildland interface zones (LVFO RMP, 1998. Fire Management Direction FE-1-d).
- Provide fire suppression efforts commensurate with resource and adjacent property values at risk *(LVFO RMP, 1998. Fire Mgt Direction FE-1-a).*
- Determine specific hazard reduction priorities, including any noxious or invasive species infestations, and implement according to the existing budget (LVFO RMP, 1998. Fire Mgt Direction FE-2-a).
- On watersheds that exhibit good potential for recovery, implement protective measures, including but not limited to fencing and removal of tamarisk (LVFO RMP, 1998. Soil Resource Mgt Objective SL-1).
- Manage habitat to further sustain the populations of federally listed species so they would no longer need protection of the Endangered Species Act. Manage habitats for non-listed special status species to support viable populations so that future listing would not be necessary (LVFO RMP 1998. Special Status Species Mgt Objective SS-2).
- Manage special status species habitat at the potential natural community or desired plant community, according to the need of the species (LVFO RMP 1998. Special Status Species Mgt Objective SS-1).
- Maintain or improve the condition of vegetation on public lands to a Desired Plant Community or to a Potential Natural Community (LVFO RMP 1998. Vegetation Mgt Objective VG-1).

- Restore plant productivity on disturbed areas of the public lands. Rehabilitate, reclaim, or revegetate areas subjected to surface-disturbing activities, where feasible. When rehabilitating, manage for optimum species diversity by seeding native species, except where non-native species are appropriate (LVFO RMP 1998. Vegetation Mgt Objective VG-2).

- Use integrated weed management techniques to control and eradicate tamarisk, such as *burning*, chemical, biological or mechanical treatments, where potential for treatment is good. Rehabilitate with native species to help reduce the potential for tamarisk re-establishment and improve ecosystem health.

- Wilderness areas are to be managed to provide for the protection, the preservation of their natural conditions, and the preservation of their wilderness character [Wilderness Act, Section 4(b), BLM Manual 8560 (.08A1)]. Specific objectives and management direction for the Rainbow Mountain and La Madre Mountain Wilderness Areas will be identified in Wilderness Management Plans for the areas (LVFO RMP 1998. Wilderness Mgt Objective WS-2) and (BLM Manual 8560 (.21A)).

- Maintain woodland and conifer forest where possible for all-aged stands, with understory vegetation forage value rating at moderate or better (LVFO RMP 1998. Forestry Mgt Objective FR-1).

A.3.4.8.2.2. FMU Wildland Fire Suppression Objectives & Strategies

Fire Suppression Objectives:

- Protect wilderness values in the two designated wilderness areas

- Employ Appropriate Management Response practices in order to allow lightning caused wildfires to create openings in the closed canopy pinyon-juniper woodlands.

- Prioritize the protection of the Bridge Mountain/North Fork Pine Creek "biodiversity hotspots"; to include minimizing any unnecessary impacts from fire suppression activities.

Fire Suppression Strategies:

- A qualified resource advisor will be notified of all wildland fire starts in this FMU.

- Wildland fires in all wilderness areas will be fought using Minimum Impact Suppression Tactics (MIST)

- When not deemed a threat to fire fighter and/or public safety, adjust the Appropriate Management Response tactics to allow low intensity fires to open the closed pinyon-juniper canopy, in a mosaic pattern replicating the historical role of fire.

- Prioritize the use of aerial fire fighting equipment and tactics over ground based resources.

- Take whatever suppression actions are necessary to prevent catastrophic wildfire in the Bridge Mountain/North Fork Pine Creek "biodiversity hotspot" area (Red Rock Canyon aster, Peregrine falcon nest territory, 7 sensitive plants, 3 sensitive bats, 10 ferns/fern allies).

- Minimize the use of intrusive fire fighting methods, particularly in the Bridge Mountain, North Fork Pine Creek, and all riparian areas.

Suppression/Protection Priorities:

- Red Rock Canyon National Conservation Area
- Pine Creek Natural Area
- T&E Species habitat: Peregrine falcon (Bridge Mountain)
- Biologically sensitive riparian areas
- Remnant stands of ponderosa pine and white fir
- Rainbow Mountain Wilderness
- La Madre Mountain Wilderness
- Single population endemic species: Red Rock Canyon aster
- 25+ sensitive species, including endemics (bats, plants, butterflies).
- Bonnie Springs Resort (adjacent to FMU)
- Mountain Springs Township (adjacent to FMU)
- Spring Mountain Ranch State Park (adjacent to FMU)
- Private in-holdings: White Beauty Gypsum property; Cabin Springs and Prospect Spring properties (adjacent to FMU)
- State Route 160
- Power line ROW's

FMU Target Individual Wildland Fire Size: 25 acres @ 90 %

FMU Target Acres Burned Per Decade: 1,000 acres

A.3.4.8.2.3. FMU Wildland Fire Operational Constraints, Objectives & Strategies

Special Fire Management Consideration/Areas:

- Red Rock Canyon National Conservation Area
- Rainbow Mountain Wilderness
- La Madre Mountain Wilderness
- Bridge Mountain/North Fork Pine Creek "biodiversity hotspot"
- Power line ROW's
- Pine Creek Natural Area
- T&E Species habitat: Peregrine falcon (Bridge Mountain)
- Biologically sensitive riparian areas

- Remnant stands of ponderosa pine and white fir
- Single population endemic species: Red Rock Canyon aster
- 25+ sensitive species, including endemics (bats, plants, butterflies).
- Bonnie Springs Resort (adjacent to FMU)
- Mountain Springs Township (adjacent to FMU)
- Spring Mountain Ranch State Park (adjacent to FMU)
- Private in-holdings: White Beauty Gypsum property; Cabin Springs and Prospect Spring properties (adjacent to FMU)
- State Route 160

A.3.4.8.2.3.1. Wildland Fire Operational Constraints Objectives & Strategies:

A.3.4.8.2.3.1.1. NCA and T&E/Sensitive Species:

- Conduct suppression activities with minimum surface disturbance to reduce the impacts to numerous sensitive species/habitats.
- Unless fire fighter safety is jeopardized, minimize the falling of Ponderosa pine trees (in order to provide habitat for cavity nesting sensitive bat species). Minimize suppression impacts to the white fir stand at the peak of La Madre Mountain.
- All wildfires in this FMU will require timely involvement by a qualified Resource Advisor.
- Restrict OHV travel and the use of tracked vehicles to the minimum necessary to suppress wildfires within the NCA. Obliterate all tracks to reduce possibility of future use.
- Use of aerial retardant is authorized. Foam or fugitive retardant is preferable to iron oxide retardant.
- Do not authorize burning out of unburned fingers or islands of vegetation. The exception to this case would be the removal of fuels for safety concerns.
- Establish fire camps, staging areas, and helispots in previously disturbed areas, in consultation with a qualified Resource Advisor.
- Provide all firefighters and support personnel with a briefing on desert tortoises and their habitat to minimize take, particularly those associated with vehicle use.

A.3.4.8.2.3.1.2. Riparian Areas:

- Apply M.I.S.T. within riparian habitat
- In riparian areas, prioritize suppression actions to minimize damage to stands of native vegetation from wildfire or suppression operations
- Fire suppression in riparian habitat will be coordinated with the approved Resource Advisor

- In riparian areas, use natural barriers or openings in riparian vegetation where possible as the easiest, safest method to manage a riparian wildfire. Where possible and practical use wet firebreaks rather than constructing firelines by hand or with heavy equipment
- Avoid burning out unburned islands, whenever possible
- Utilize firing tactics only if necessary to protect firefighter or public safety
- Avoid surface disturbing suppression activities in riparian areas whenever possible
- Avoid dropping retardant within 300 feet of water sources, to the maximum extent feasible
- Do not use the following springs as suppression water sources, due to the presence of rare, endemic spring snail species: La Madre Spring and Rainbow Spring.
- Use of containment systems for portable pumps to avoid fuel spills in riparian or aquatic systems will be required.

A.3.4.8.2.3.1.3. Wilderness:

- A Resource Advisor will be dispatched to all fires occurring in or threatening a wilderness area.
- Use of Heavy equipment (bulldozers, etc.) will only be used in Wilderness if the fire is threatening human life or property. The Field Manager must approve the use of heavy equipment in all cases.
- Motorized vehicles used in fire suppression efforts will remain on “cherrystem” roads or predetermined existing ways inside Wilderness.
- Air resources including helicopters and SEAT’s will be included in the WILDCAD system for all wilderness fire suppression activities.
- Helibases, staging areas, and fire camps will be located outside of Wilderness Areas, unless authorized by the Field Manager.
- Use of retardant must be approved by the Field Manager.
- If retardant is not approved, water may be dropped from aircraft.
- Landing of helicopters will be kept to a minimum and will only occur in existing openings.
- All fire suppression activities will use Minimum Impact Suppression Techniques (MIST) at all times. See attached MIST Guidelines.
- Hand crews may use conventional hand tools and, with approval from the Resource Advisor, may conservatively use chainsaws for fire line construction. Chainsaw use and line width should be kept to a minimum. Utilization of existing natural barriers, minimum “scratch line”, and cold trailing is encouraged where feasible. Handline construction will be rehabilitated back to the natural contour.
- A “Leave No Trace” policy will be used in the wilderness area. All evidence of human activity must be removed, to the maximum extent possible.

- Noxious weeds will be controlled in conformance with the attached "Las Vegas Field Office Noxious Weed Control, Fire Management Weed Transport Control" guidelines.

A.3.4.8.2.3.1.4. Noxious Weeds and Invasive Species Transport Control Procedures:

Las Vegas Field Office Noxious Weed Control and Fire Management Weed Transport Control:

- Off-district engines, crew carriers, overhead vehicles, and helitack/helicopter support vehicles will, upon check-in and prior to proceeding to the line, wash down at the, Logandale, Red Rock, Pahrump Fire Stations or a commercial truck washing station. This will be determined by the location of the units' last fire assignment and if they were cleaned at release from that assignment.
    - The washdown will concentrate on the undercarriage, with special emphasis on axles, frame, crossmembers, motor mounts, and on and underneath steps, running boards, and front bumper/brushguard assemblies. Vehicle cabs will be swept out with refuse disposed of in waste receptacles. In wilderness areas, all portable equipment used on an incident (pumps, hose, fittings, water storage items) will be washed off to rid them of any seed or spores that may be attached from previous fires in noxious weed infested sites.
    - During initial briefings, washdowns will be mentioned and facilities made available for oncoming crews.
- Las Vegas Field Office crews will follow the same procedures identified in Item 1 when returning from fieldwork or wildland fires, especially when vehicles are used in know noxious weed areas infested with known noxious or invasive species common to the Field Office area.
- Upon leaving the Field Office when released from an incident, all off-unit vehicles will follow aforementioned washdown procedures so that Las Vegas' noxious weed problems do not become someone else's problems.
- All equipment used off pavement will be cleaned of weed and grass seed stems, stalks, etc. prior to release from an incident. This includes, but is not limited to, tents, tarps, helicopter support equipment, foldatanks and free-standing tanks, mechanic's vehicles, and logistical support vehicles, trailers and equipment. These vehicles will be washed as in 1.a. above.

This Field Office policy will be followed by all equipment involved in fire suppression while on Las Vegas Field Office assignments. Vehicles will be cleared of washdown procedures during checkout and crew evaluations. In the event vehicles are released from fires away from the district office, the closest wash facility, (government or commercial) will be utilized.

A.3.4.8.2.4. FMU Wildland Fire Use Objectives & Strategies

Wildfire will be used as a management tool within this FMU at this time.

A.3.4.8.2.5. Burned Acre Objective Review

IF the FMU decadal wildfire acre-burned target has been reached or exceeded PRIOR TO THE COMPLETION OF THE 10-YEAR PLANNING PERIOD, from either wildfire or prescribed fire, a review of fire management objectives and strategies will be initiated to develop new suppression criteria on wildland fire occurrence and prescribed fire acre goals.

A.3.4.8.2.6. FMU Prescribed Fire Objectives & Strategies

Prescribed Fire Objectives & Strategies:

Prescribed fire will not be used as a management tool within this FMU at this time.

Rx Fire Annual & Decadal Acre Target: N/A

T & E Species Strategies: N/A

Air Quality Strategy: N/A

NEPA Compliance: Prior to implementation of any proposed projects, site-specific NEPA documentation will be completed, as applicable.

Rx Fire Monitoring Strategy: Monitoring will be completed for attainment/non-attainment of project specific resource management objectives, as applicable.

A.3.4.8.2.7. FMU Non-Fire Fuels Treatment Objectives & Strategies

Non-Fire Fuels Treatment Objectives & Strategies: Non-fire fuels treatments will not be used as a management tool within this FMU at this time.

Non-Fire Annual & Decadal Acre Target: N/A

T & E Species Strategies: N/A

Air Quality Strategies: N/A

NEPA Compliance: Prior to implementation of any proposed projects, site-specific NEPA documentation will be completed, as applicable.

Treatment Monitoring Strategy: Monitoring will be completed for attainment/non-attainment of project specific resource management objectives, as applicable.

A.3.4.8.2.8. FMU Post Fire Rehab/Restoration Objectives & Strategies

Restore plant productivity on disturbed areas of the public lands. Rehabilitate, reclaim, or revegetate areas subjected to surface-disturbing activities, where feasible. When rehabilitating, manage for optimum species diversity by seeding native species, except where non-native species are appropriate.

- Conduct all treatment activities in accordance with the Las Vegas Field Office Normal Year Fire Rehabilitation Plan (1990); Environmental Assessment no. NV-054-90-24.
- In desert tortoise habitat, conduct all activities in accordance with the Reclamation Plan For Critical Tortoise Habitat In The Las Vegas Field Office (1998); Environmental Assessment no. NV-052-98-077.
- Within wilderness, rehabilitation and restoration will be conducted in accordance with the appropriate wilderness management plan(s).

- In the event that suppression efforts require off-road vehicle operations, replant and visually camouflage the first 200 feet of tire tracks in order to prevent further habitat impacts (due to public use of these track ways).
- Whenever feasible, utilize native species in seeding and/or re-planting treatments.
- Cultivate local supplies of live plant materials for use during riparian restoration efforts.
- Maintain a seed bank of locally collected native plant species for use in restoring both fire fuels treatments and fire-disturbed sites.
- Cultivate and develop varieties of locally grown native seed by means of plant material centers.

A.3.4.8.2.9. FMU Community Protection/Community Assistance Objectives & Strategies

Communities at Risk/WUI Areas: N/A. Communities-at-risk, community protection/assistance and public education strategies and objectives will be further defined through the LVFO RAMS Fire Plan update, which is scheduled for 2005.

Community Protection/Community Assistance Objectives:

- Educate/work with property owners on defensible space issues and wildfire hazards
- Promote collaborative efforts to mitigate fuel hazards with cooperators
- Continue wildland fire education programs at Red Rock Visitor Center special events

Community Protection/Community Assistance Strategy:

- Prepare risk assessments and hazard mitigation plans
- Educate/work with property owners on defensible space issues and wildfire hazards
- Promote collaborative efforts to mitigate fuel hazards with cooperators
- Continue wildland fire education programs at Red Rock Visitor Center special events

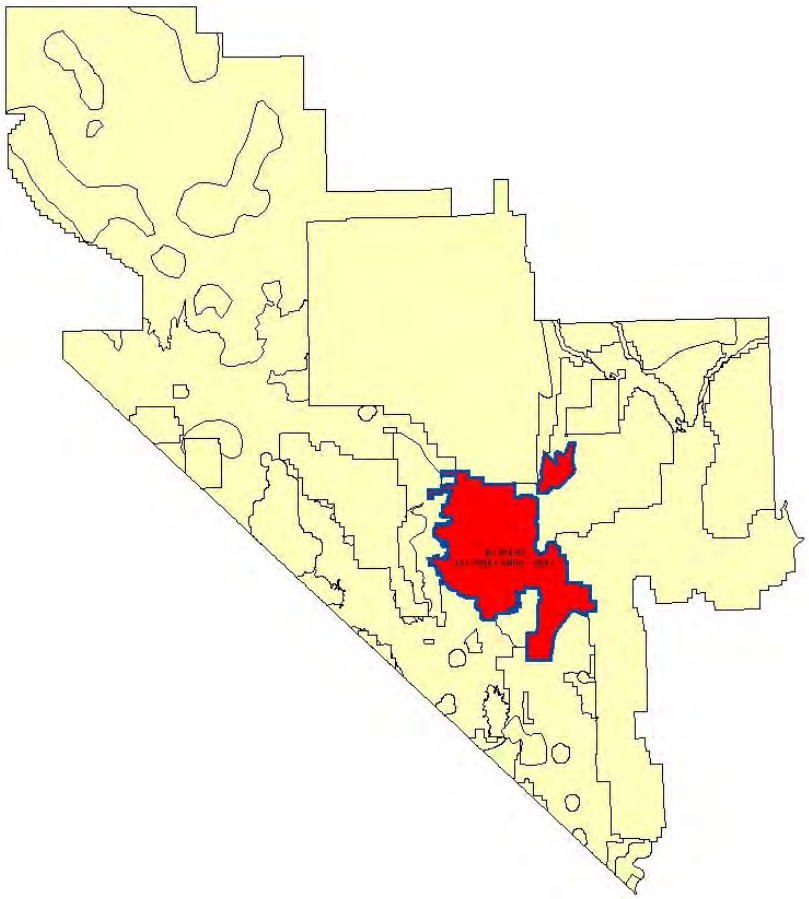
Community Wildfire Safety Education Strategy: N/A

A.3.4.8.3. FMU Fire Program Analysis - Quantifiable Objective Summary

Initial Attack Success	Decadal Wildfire Acres Burn Tolerance	WFU Decadal Target Acres	Rx Fire Acres Per Decade	Non-Fire Acres Per Decade
25 acres @ 90%	1,000	N/A	N/A	N/A

A.3.4.9. Las Vegas Valley-Apex

NV050-08



FMU Name & Unit No.: **Las Vegas Valley-Apex; NV050-08**

FMU Type/Category: **Wildland Urban Interface (WUI)**

A.3.4.9.1. FMU Description:

A.3.4.9.1.1. FMU Location Information

Geographic boundaries: FMU NV050-08 includes the greater Las Vegas Metropolitan area. This FMU consists of isolated pockets of BLM managed lands amidst a heavily urbanized valley, plus a discontinuous section 5 miles to the northeast at the junction of Interstate 15 and US 93 (i.e., Apex Industrial Park and power plant complex). BLM ownership in the Las Vegas Valley includes some riparian habitat along the Las Vegas and Flamingo Washes, and scattered pockets of medium and low density Desert tortoise habitat. Also included within this FMU is the 52,021-acre Las Vegas Valley disposal area.

A.3.4.9.1.2. FMU Acre Total

Ownership by Acres and Percent		
NV 050-08	**Las Vegas Valley - Apex**	
Ownership	**Acres**	**Percent**
Bureau of Land Management	142,601	27.9
Bureau of Reclamation	10,253	2.0
Department of Defense	6,114	1.2
Nevada State	710	0.1
Private	351,183	68.7
Total Acres	510,862	

A.3.4.9.1.3. Fire Occurrence and History

FMU Number	**Decadal (94-03)**	**24 Years (80-03)**	**Ignition Cause (80-03)**	
NV 050-08			Lightning	36
Number of Fires	54	316	Human/Other	280
Largest Fire (Acres)	40.0	253.0	**Multiple Fire Days (80-03)**	
Total Acres Burned	120.2	990.6	Total Multiple Fire Days (MFD)	83
Average Fire Size (Acres)	2.2	3.1	Number of MFD Fires	106
			Total Acres Burned by Multiple Fires	107.8

Narrative Description: The upland portion of this FMU is dominated by creosote bursage habitat, which in certain years is heavily infested with the invasive annual grass red brome. The riparian portion of the FMU is dominated by the invasive woody species tamarisk. Wildland fire played a minor to limited role in each of these habitats prior to their present disturbed state.

Most wildfires in this FMU occur in the tamarisk-infested portions of the Las Vegas and Flamingo Washes riparian corridor. Typically these fires are wind driven and are of moderate to high intensity. Small, low intensity wildfires in tamarisk are less common but do occur.

General Fire Protection Characteristics: This FMU consists of pockets of BLM managed lands interspersed within a densely developed urban metropolitan area. BLM land includes riparian areas along the Las Vegas and Flamingo Washes, patches of medium/low density Desert tortoise habitat (creosote bursage), and three sensitive plant species populations. Riparian habitats are heavily tamarisk infested and pose the greatest wildfire threat within the FMU. However, the majority of the riparian habitats occur on private, city or county lands (primarily consisting of the Las Vegas Wash).

A.3.4.9.1.4. FMU Vegetation

FMU Vegetation/Fuel Types		
NV 050-08	**Las Vegas Valley - Apex**	
Veg/Fuel Type	Acres	Percent
Grassland	145	0.0
Mojave	304,804	59.7
No Significant Vegetation	180,244	35.3
Salt Desert Scrub/Shadscale	25,674	5.0
Grand Total	510,867	

Vegetation Narrative: The vast majority of this FMU consists of creosote bursage. The remainder consists of riparian habitat, which is predominated by tamarisk infestations but which also includes remnant pockets of native riparian graminoid (salt grass, rush, sedge), shrub, mesquite/acacia, and cottonwood/willow vegetation types

A.3.4.9.1.5. FMU Fuel Models & Live Fuel Moisture Characteristics

Surface Fuel Model & Canopy Cover: Wildland fires in the upland portion are generally dependent upon ephemeral buildups of red brome and other fine fuels. Wildland fires in the riparian portion occur almost exclusively in tamarisk, as opposed to the pockets of native riparian vegetation.

Live Fuel Moisture Averages:

LFM Site	May	June	July	Aug	Sept	Oct
N5F	154%	94%	81%	76%	74%	82%

Live Fuel Moisture Characteristics:

- At live fuel moisture levels of 181% and above fires typically will exhibit Very Low Fire Behavior characteristics
- At live fuel moisture levels of 151% to 180% fires typically will exhibit Low Fire Behavior characteristics
- At live fuel moisture levels of 126% to 150% fires typically will exhibit Moderate Fire Behavior characteristics
- At live fuel moisture levels of 101% to 125% fires typically will exhibit High Fire Behavior characteristics
- At live fuel moisture levels of 75% to 100% fires typically will exhibit Extreme Fire Behavior characteristics
- At live fuel moisture levels of 75% and below fires typically will exhibit Advanced Fire Behavior characteristics

A.3.4.9.1.6. Fire Weather & Climate Related Impacts

(Detailed weather station data for this FMU will be added to the FMP Appendix upon completion of the national fire weather data validation/correction project.)

- Wet lightning is common in this area. Fires generally remain small when starts occur under these common conditions.
- Dry Lightning is possible in this area. Larger fires can occur with these erratic and gusty thunderstorm events.
- Larger fires occur when human ignitions occur under typical warm and windy summer weather.
- Fire behavior can be extreme under these conditions in heavily infested tamarisk riparian areas.
- Fire behavior can be extreme under these conditions when there are heavy buildups of ephemeral light flashy fuels.

A.3.4.9.1.7. Fire Regime

- Fire regime: Largely urban (N/A)
- Condition Class III

FMU by Condition Class and Fire Regime			
NV 050-08		**Las Vegas Valley - Apex**	
CC	FR	Acres	Percent
2	II	3,005	0.9
	V	298,506	90.7
3	I	526	0.2
	III	182	0.1
	IV	26,727	8.1
Total		328,948	

A.3.4.9.1.8. FMU Physical Characteristics

Topography:

- Elevation Range: 1,400 to 4,799 feet
- Slope:
  - Riparian: less than 10%
  - Upland: valley bottom - less than 10%; bajadas and ridgelines - 10 to 30+%
- Aspect:
  - Riparian: flat
  - Upland: variable
- Major topographical features: This FMU comprises the Las Vegas Valley and the discontinuous Apex area (junction Interstate 15 and US 93). The FMU is bounded by the Spring Mountain Range (west), Las Vegas Range (north), North McCullough Mountains (south) and Frenchman/Sunrise Mountain (east).

Access Information: Major access routes include Interstate 15, State Routes 93, 95, 157, 159, and 160. The FMU contains numerous paved arterial entry and exit roads.

A.3.4.9.1.9. FMU Resource Values & Attributes

Wildland-Urban Interface/Intermix: The present Wildland Urban Interface zone of Las Vegas extends into both the upland and riparian habitats. Eventually, additional urban build-out will occur on the 52,021 acre “Las Vegas Valley disposal area”.

Resource Use:

- Human life and property values, primarily located in the Las Vegas Valley urban area.
- Public lands:

  - Power production facilities
  - Utility line ROW's
  - Community gravel pits
  - Northern edge of Hidden Valley grazing allotment
- Non-federal lands:
  - Extensive urban industrial and residential activity
  - Commercial airports
  - Major highway corridors
  - Mines and gypsum plants
  - Utility line ROW's
  - Communication towers and facilities
  - Apex Landfill
  - Floyd Lamb State Park
  - Nellis Air Force Base
- Dispersed recreation; special use permit activities

Air Quality: This FMU contains a non-attainment airshed. Fire management activities in this FMU may include fire suppression, open burning, and light and heavy equipment mobilization. Fire Management Open burning (RX FIRE) is permitted in Clark County with a courtesy call to the Department of Health. Open burning is defined here "where fire is set either by OFFICERS of governmental agencies, in performance of their official duties or the purposes of training and instruction of firefighting and fire-rescue personnel". (*Section 42-Open Burning, Clark County Air Quality Regulations*).

Soils: Soils have formed under conditions of physical weathering (rather than chemical dissolution) because of the arid climate. Soils on lower portions of alluvial fans and valley floors contain very little organic material, are moderately to highly alkaline, and can contain high concentrations of gypsum and dissolved salts. A gravelly surface crust (called desert pavement) occurs throughout these areas. Desert pavement is very stable and protects underlying fine-grained soils from erosion. A cemented hardpan layer commonly occurs at shallow depths beneath surface soils throughout these areas. Mountain slopes tend to be covered by an unstable layer of large rocks, boulders, stones, and cobbles. Runoff from periodic rainstorms transports large amounts of material to lower elevations, forming alluvial fans of coarse material and depositing thick sequences of gravelly loams, sands, and finer grained sediments on valley floors.

Soils are susceptible to water and wind erosion. Water erosion occurs during periodic high-intensity, short duration summertime thunderstorms and less frequent, sustained wintertime rainstorms. Water erosion occurs by a combination of sheet flow, rill formation, splashing, and channelized flow in ephemeral washes and stream channels. Wind erosion occurs in areas where the desert pavement layer has been disturbed by human activities or heavy use by wild horses and

burros, where large areas of vegetation have been burned by fire, sand dune areas, and as part of physical weathering processes.

Cultural and Paleontological Values:

- Rainbow Gardens ACEC
- Old Spanish Trail/Mormon Road

T&E and Sensitive Species:

- Desert tortoise
- Yuma clapper rail (county land in Las Vegas Wash)

Habitat Values:

- Scattered moderate/low density Desert tortoise habitat
- Scattered populations of six sensitive species:
  - Las Vegas bearpoppy
  - Merriam bearpoppy
  - Las Vegas buckwheat
  - Gila monster
  - California leaf-nosed bat (inactive mines)
  - Townsend's big-eared bat (inactive mines)
- Bighorn sheep winter use areas

Hydrology and Water Quality: The Las Vegas Valley-Apex FMU lies within the Colorado River Basin hydrographic region which is part of a regional flow system that drains portions of seven southwestern states. The Colorado River and its mainstem reservoirs (Lake Mead and Lake Mohave) are an important source of water for the Las Vegas Valley and millions of downstream users. Ephemeral wash channels drain most areas and only convey flow after periodic high-intensity summer thunderstorms or sustained winter rainstorms. The only perennial streams occur in the eastern and south-central portions of Clark County, within the Colorado River hydrographic region.

The Las Vegas Wash transports treated wastewater effluent, urban and storm water runoff, and shallow groundwater discharge from the Las Vegas Valley to Las Vegas Bay of Lake Mead.

A.3.4.9.1.10. FMU Public Safety, Economic & Community Values at Risk

- Life safety (public and firefighters)
- Clark County metropolitan area, including unincorporated townships
- City of Las Vegas

- City of Henderson
- City of North Las Vegas
- Boulder City
- Dispersed properties and developments (homes, ranches, etc.)
- Desert tortoise habitat (low and moderate density)
- Sensitive species habitats, including all riparian areas
- Utility line ROW's

A.3.4.9.1.11. FMU Fire Protection Responsibility

Wildland fire protection on all BLM public lands within this FMU is provided by the Las Vegas Field Office. Structural fire protection on private lands within this FMU is provided by the Clark County Fire Department, Las Vegas Fire & Rescue, North Las Vegas Fire Department, Henderson Fire Department, and the Boulder City Fire Department.

A.3.4.9.2. FMU Objectives & Strategies

A.3.4.9.2.1. FMU Fire Management Objectives Priority Statement

- Protect human life, safety of wildland firefighters, and protection of human safety and health *(National Fire Plan 2001).*
- Use approved fire suppression techniques in areas of critical environmental concern where there are concerns for habitat, threatened and endangered species, and urban/rural/wildland interface zones (LVFO RMP, 1998. Fire Management Direction FE-1-d).
- Provide fire suppression efforts commensurate with resource and adjacent property values at risk (LVFO RMP, 1998. Fire Mgt Direction FE-1-a).
- Determine specific hazard reduction priorities, including any noxious or invasive species infestations, and implement according to the existing budget (LVFO RMP, 1998. Fire Mgt Direction FE-2-a).
- Determine specific prescribed burn priorities annually, including any noxious or invasive species infestations, and implement where possible (LVFO RMP, 1998. Fire Mgt Direction FE-3-a).
- Maintain or improve the condition of vegetation on public lands to a Desired Plant Community or to a Potential Natural Community (LVFO RMP, 1998. Vegetation Mgt Objective VG-1).
- Restore plant productivity on disturbed areas of the public lands (LVFO RMP, 1998. Vegetation Mgt Objective VG-2).
- Rehabilitate, reclaim, or revegetate areas subjected to surface-disturbing activities, where feasible. When rehabilitating, manage for optimum species diversity by seeding native species,

except where non-native species are appropriate (LVFO RMP, 1998. Vegetation Mgt Direction VG-2a).

- Improve disturbed non-game bird habitat, including the water table supporting these habitats, by emphasizing maintenance and enhancement of natural biodiversity (LVFO RMP, 1998. Fish & Wildlife Mgt Direction FW-3-h).

- Manage special status species habitat at the potential natural community or desired plant community, according to the need of the species (LVFO RMP, 1998. Special Status Species Objective SS-1).

- Manage habitat to further sustain the populations of federally listed species so they would no longer need protection of the Endangered Species Act. Manage habitats for non-listed special status species to support viable populations so that future listing would not be necessary (LVFO RMP, 1998. Special Status Species Objective SS-2).

- Use integrated weed management techniques to control and eradicate tamarisk, such as burning, chemical, biological or mechanical treatments, where potential for treatment is good. Rehabilitate with native species to help reduce the potential for tamarisk re-establishment and improve ecosystem health (LVFO RMP, 1998. Riparian Mgt Objective RP-1-f).

- Manage Mesquite and Acacia woodlands for their value as wildlife habitat in the following areas: Amargosa Valley, Pahrump Valley, Stewart Valley, Hiko Wash, Piute Wash, Crystal and Stump Springs, or any other areas identified as being of significant wildlife value *(LVFO RMP, 1998. Fish, Wildlife and Special Status Species Management, Management Direction FW-3-a)*.

- Protect important resting/nesting habitats, such as riparian areas and mesquite/acacia woodlands *(LVFO RMP, 1998. Fish & Wildlife Mgt Direction FW-3-g)*.

- Ensure that characteristics on certain lands that caused them to be inventoried and designated as Wilderness Study Areas are maintained and not diminished or lessened in any way that might constrain or limit Congress' final wilderness designation decisions (LVFO RMP 1998. Wilderness Mgt Objective WS-1).

- Manage Wilderness Study Areas in accordance with the Interim Management Policy for Lands Under Wilderness Review (LVFO RMP 1998. Wilderness Mgt Direction WS-1-a).

- Manage 743,209 acres of the four desert tortoise areas of critical environmental concern specifically for tortoise recovery. Implement the management actions listed below:

- …Minimize impacts to tortoise habitat during fire suppression by minimizing the use of mechanized equipment and, where possible, staying on existing roads and trails. Give priority to keeping the wildfire to an absolute minimum size (LVFO RMP, 1998. Special Status Species Mgt Direction SS-3-a).

A.3.4.9.2.2. FMU Wildland Fire Suppression Objectives & Strategies

Fire Suppression Objectives: Primary Wildland Fire Protection/Suppression Objective: Protect human life and property values while minimizing impacts to T&E Species populations and habitat.

Fire Suppression Strategies:

- Appropriate Management Response will be utilized as the primary fire suppression strategy to implement wildland fire suppression objectives as identified for this FMU.
- Wildland fires will be fought aggressively to minimize threats or impacts to human life, safety, and property values in the communities of the greater Las Vegas Valley Metropolitan area.

Suppression/Protection Priorities:

- Life safety (public and firefighters)
- Protection of human communities, including community infrastructure:
  - Clark County metropolitan area, including unincorporated townships
  - City of Las Vegas
  - City of Henderson
  - City of North Las Vegas
  - Boulder City, including Desert Tortoise Conservation Easement
- Protection of other property and improvements, including power line ROW's
- Protection of T&E species:
  - Desert tortoise
  - Yuma clapper rail (Clark County land ownership-Las Vegas Wash)
- Protection of sensitive species habitats:
  - Las Vegas bearpoppy
  - Merriam bearpoppy
  - Las Vegas buckwheat
  - Townsend's big-eared bat
  - Gila Monster
- Protection of other natural resources
- Protection cultural resources, including Old Spanish Trail/Mormon Road
- Dispersed WUI values (homes, ranches, power plants, etc.)
- Federally listed T&E species populations and habitats.
- Protection of aquatic and riparian habitat

FMU Target Individual Wildland Fire Size: 1 acre @ 90%

FMU Target Acres Burned Per Decade: 100 acres

A.3.4.9.2.3. FMU Wildland Fire Operational Constraints, Objectives & Strategies

Special Fire Management Consideration/Areas:

- This FMU contains an extensively urbanized area, small portions of medium density desert tortoise habitat, and small portions of riparian habitat. WUI protection objectives and tactics must be weighed against T&E species and habitat concerns and constraints.
- All fires in the Las Vegas Valley-Apex FMU will require notification of a BLM approved Resource Advisor.

A.3.4.9.2.3.1. Wildland Fire Operational Constraints Objectives & Strategies:

A.3.4.9.2.3.1.1. General Wildlife and Mesquite/Acacia:

- Apply M.I.S.T. when possible
- Fire suppression will be coordinated with the approved Resource Advisor
- Use natural barriers or openings where possible as the easiest, safest method to manage a wildfire. Where possible and practical use wet firebreaks rather than constructing firelines by hand or with heavy equipment
- Avoid burning out unburned islands, whenever possible
- Utilize firing tactics only if necessary to protect firefighter or public safety
- Avoid surface disturbing suppression activities whenever possible
- Avoid dropping retardant within 300 feet of water sources, to the maximum extent feasible
- Use of containment systems for portable pumps to avoid fuel spills will be required.

A.3.4.9.2.3.1.2. Additional Desert Tortoise:

- Initiate full suppression activities with minimum surface disturbances to reduce loss of tortoise cover and to minimize the spread of exotic annual grasses.
- Require consultation with a qualified Resource Advisor for all wildfires within desert tortoise habitat, particularly within ACEC's and designated critical habitat units.
- Restrict OHV travel and the use of tracked vehicles to the minimum necessary to suppress wildfires within desert tortoise habitat, particularly within ACEC's and designated critical habitat units; obliterate all tracks to reduce possibility of future use.
- Use of aerial retardant is authorized; foam or fugitive retardant is preferable to iron oxide retardant.
- Do not authorize burning out of unburned fingers or islands of vegetation. The exception to this case would be the removal of fuels for safety concerns.

- Establish fire camps, staging areas, and helispots in previously disturbed areas outside of ACEC's and designated critical habitat units, where possible, in consultation with a qualified Resource Advisor.
- Provide all firefighters and support personnel with a briefing on desert tortoises and their habitat to minimize take, particularly those associated with vehicle use.

A.3.4.9.2.3.1.3. WSA/ISA:

- A Resource Advisor will be dispatched to all fires occurring in or threatening a WSA.
- Use of heavy equipment (bulldozers, etc.) will only be used in the Wilderness Study Areas if the fire is threatening human life or property. The Field Manger must approve the use of heavy equipment in all cases.
- Air resources including helicopters and SEAT's will be included in the WILDCAD system for all Wilderness Study Area fire suppression activities.
- Use of retardant must be approved by the Field Manager, if retardant is not approved water may be dropped from retardant aircraft.
- All fire suppression activities will use Minimum Impact Suppression Techniques (MIST) at all times.
- Hand crews may use conventional hand tools and may conservatively use chain saws for fire line construction. Chain saw use and line width should be kept to a minimum. Utilization of existing natural barriers, minimum "scratch line", and cold trailing is encouraged where feasible. Handline construction will be rehabilitated back to the natural contour.
- A "Leave No Trace" policy will be used in the Wilderness Study Areas. All evidence of human activity must be removed, to the maximum extent possible.
- Motorized vehicle use in the Wilderness Study Areas may only occur on existing routes. Any cross-country use of vehicles must be authorized by the Field Manager.
- No grading, blading, clearing or cutting of trees is permitted to accommodate vehicle access.
- Helibases, staging areas, and fire camps will be located outside of the Wilderness Study Areas, unless it is authorized by the Resource Advisor.
- Landing of helicopters will be kept to a minimum and will only occur in existing openings.
- Any impacts created by suppression activities should be rehabilitated prior to releasing fire crews and associated fire equipment following fire containment. If that is impossible, due to the need to commit resources to other ongoing fires, impacts will be rehabilitated as soon as feasible following fire containment.

A.3.4.9.2.3.1.4. Riparian Habitat:

- Apply M.I.S.T. whenever possible
- In riparian areas, prioritize suppression actions to minimize damage to stands of native vegetation from wildfire or suppression operations

- Fire suppression in riparian habitat will be coordinated with the approved Resource Advisor
- In riparian areas, use natural barriers or openings in riparian vegetation where possible as the easiest, safest method to manage a riparian wildfire. Where possible and practical use wet firebreaks rather than constructing firelines by hand or with heavy equipment
- Avoid burning out unburned islands, whenever possible
- Utilize firing tactics only if necessary to protect firefighter or public safety
- Avoid surface disturbing suppression activities in riparian areas whenever possible
- Avoid dropping retardant within 300 feet of water sources, to the maximum extent feasible
- Use of containment systems for portable pumps to avoid fuel spills in riparian or aquatic systems will be required.

A.3.4.9.2.3.1.5. Noxious Weeds and Invasive Species Transport Control Procedures:

Las Vegas Field Office Noxious Weed Control and Fire Management Weed Transport Control:

- Off-district engines, crew carriers, overhead vehicles, and helitack/helicopter support vehicles will, upon check-in and prior to proceeding to the line, wash down at the, Logandale, Red Rock, Pahrump Fire Stations or a commercial truck washing station. This will be determined by the location of the units' last fire assignment and if they were cleaned at release from that assignment.
    - The washdown will concentrate on the undercarriage, with special emphasis on axles, frame, crossmembers, motor mounts, and on and underneath steps, running boards, and front bumper/brushguard assemblies. Vehicle cabs will be swept out with refuse disposed of in waste receptacles. In wilderness areas, all portable equipment used on an incident (pumps, hose, fittings, water storage items) will be washed off to rid them of any seed or spores that may be attached from previous fires in noxious weed infested sites.
    - During initial briefings, washdowns will be mentioned and facilities made available for oncoming crews.
- Las Vegas Field Office crews will follow the same procedures identified in Item 1 when returning from fieldwork or wildland fires, especially when vehicles are used in know noxious weed areas infested with known noxious or invasive species common to the Field Office area.
- Upon leaving the Field Office when released from an incident, all off-unit vehicles will follow aforementioned washdown procedures so that Las Vegas' noxious weed problems do not become someone else's problems.
- All equipment used off pavement will be cleaned of weed and grass seed stems, stalks, etc. prior to release from an incident. This includes, but is not limited to, tents, tarps, helicopter support equipment, foldatanks and free-standing tanks, mechanic's vehicles, and logistical support vehicles, trailers and equipment. These vehicles will be washed as in 1.a. above.

This Field Office policy will be followed by all equipment involved in fire suppression while on Las Vegas Field Office assignments. Vehicles will be cleared of washdown procedures during

checkout and crew evaluations. In the event vehicles are released from fires away from the district office, the closest wash facility, (government or commercial) will be utilized.

A.3.4.9.2.4. FMU Wildland Fire Use Objectives & Strategies

Wildfire will not be used as a management tool within this FMU at this time.

A.3.4.9.2.5. Burned Acre Objective Review

IF the FMU decadal wildfire acre-burned target has been reached or exceeded PRIOR TO THE COMPLETION OF THE 10-YEAR PLANNING PERIOD, from either wildfire or prescribed fire, a review of fire management objectives and strategies will be initiated to develop new suppression criteria on wildland fire occurrence and prescribed fire acre goals.

A.3.4.9.2.6. FMU Prescribed Fire Objectives & Strategies

Prescribed Fire Objectives: Use prescribed fire to reduce or eliminate landscaping debris piles that pose a fuel hazard threat to adjacent improvements or to habitats. Pile burning may also occur in conjunction with tamarisk control efforts.

Prescribed Fire Strategies: Note: Landscaping debris piles or cut tamarisk piles will be the only vegetation burned, and then only when deemed necessary to eliminate hazard fuel threats to adjacent improvements or habitats.

Rx Fire Annual & Decadal Acre Target:

- Annual: maximum of 5
- Decadal: 50 acres

T & E Species Strategies: There are presently no prescribed fire treatments planned in this FMU, but future treatments are probable. Endangered Species Act Section 7 consultation procedures and Fish and Wildlife Service concurrence will be achieved, prior to the commencement of any future on-the-ground treatments. At the discretion of the Service, the consultation process will either entail a formal programmatic consultation for the entire FMU or else individual project-level informal consultations. All terms and conditions, minimization measures, and other stipulations in those consultation agreements will be adhered to during the implementation of any BLM treatments in this FMU.

Air Quality Strategy: Any prescribed fire treatments would be done in accordance with an approved project-specific burn plan containing a smoke management plan. his entire FMU is located within a non-attainment airshed (Las Vegas Valley). Any burning operations will be conducted to minimize smoke impacts to urban communities, dispersed residences, and nearby highway traffic.

NEPA Compliance: Prior to implementation of any proposed projects, site-specific NEPA documentation will be completed, as applicable.

Rx Fire Monitoring Strategy: Monitoring will be conducted to identify: treatment effectiveness, site recruitment by invasive species, and presence of cultural resources.

A.3.4.9.2.7. FMU Non-Fire Fuels Treatment Objectives & Strategies

Non-Fire Fuels Treatment Objectives: Use mechanical treatments to remove and properly dispose of landscaping debris piles that pose a fuel hazard threat to adjacent improvements or habitats. Use integrated mechanical and chemical treatment methods to control stands of invasive tamarisk.

Non-Fire Fuels Treatment Strategies: Use mechanical treatments to remove and properly dispose of landscaping debris piles or standing tamarisk vegetation that pose a fuel hazard threat to adjacent improvements or habitats.

Non-Fire Annual & Decadal Acre Target:

- Annual: Maximum of 5
- Decadal: 50 acres

T & E Species Strategies: There are presently no non-fire treatments planned in this FMU, but future treatments are probable. Endangered Species Act Section 7 consultation procedures and Fish and Wildlife Service concurrence will be achieved, prior to the commencement of any future on-the-ground treatments. At the discretion of the Service, the consultation process will either entail a formal programmatic consultation for the entire FMU or else individual project-level informal consultations. All terms and conditions, minimization measures, and other stipulations in those consultation agreements will be adhered to during the implementation of any BLM treatments in this FMU.

Air Quality Strategies: This FMU does not contain any non-attainment airsheds. Any future tamarisk fuels treatments will have a positive long-term effect on air quality, resulting from improved soil stabilization and erosion resistance of the native vegetation, and to reduced incidence of large, intense wildfires. The brief use of small-mechanized equipment will entail slight soil disturbance, with minor local spikes in PM10 emission. The Clark County Implementation Plan (IP) is independent of the State IP and is administered by the Department of Air Quality Management (DAQM). In 2002, DAQM determined that the BLM Virgin River tamarisk projects are exempt from Dust Control Permit requirements (Clark County Air Quality Regulations, revised 01/23/97), per Exception 17.2.1(1): “agricultural operations”.

If the dust plumes generated during mechanical treatment activities result in any complaints from the public, the operation will be re-evaluated in order to identify possible dust mitigation measures that could be implemented cost-effectively and without undue delays to the overall project schedule.

NEPA Compliance:

The following procedures will be completed for all fuels treatment projects:

- Chemical applications:
  - Operational compliance with EPA label restrictions
  - File for and obtain BLM Pesticide Use Permits (PUP’s’)
  - Complete daily Pesticide Application Records (PAR’s)

  - Submit annual Pesticide Use Reports to the Nevada Department of Agriculture
  - Obtain/Maintain Nevada Pesticide Applicator Certification training for designated Field Office personnel
  - Ensure that all contractors obtain/possess current Nevada Pesticide Applicators Commercial License
- NEPA compliance:
  - Ensure all projects comply with LUP direction
  - Prepare appropriate project level and/or programmatic NEPA documents (EA's, DNA's, ROD, etc.)
- ESA compliance:
  - Complete project level and/or programmatic Section 7 consultations for all fuels treatments, in early and close coordination with USFWS
  - If project conditions change, initiate re-consultation procedures as appropriate.

Treatment Monitoring Strategy: Monitoring will be conducted to identify: treatment effectiveness, site recruitment by invasive species, and presence of cultural resources.

A.3.4.9.2.8. FMU Post Fire Rehab/Restoration Objectives & Strategies

Restore plant productivity on disturbed areas of the public lands. Rehabilitate, reclaim, or revegetate areas subjected to surface-disturbing activities, where feasible. When rehabilitating, manage for optimum species diversity by seeding native species, except where non-native species are appropriate.

- Conduct all treatment activities in accordance with the Las Vegas Field Office Normal Year Fire Rehabilitation Plan (1990); Environmental Assessment no. NV-054-90-24.
- In the event that suppression efforts require off-road vehicle operations, replant and visually camouflage the first 200 feet of tire tracks in order to prevent further habitat impacts (due to public use of these track ways).
- Whenever feasible, utilize native species in seeding and/or re-planting treatments.
- Cultivate local supplies of live plant materials for use during riparian restoration efforts.
- Maintain a seed bank of locally collected native plant species for use in restoring both fire fuels treatments and fire-disturbed sites.
- Cultivate and develop varieties of locally grown native seed by means of plant material centers.

A.3.4.9.2.9. FMU Community Protection/Community Assistance Objectives & Strategies

Communities at Risk/WUI Areas:

- Clark County metropolitan area
  - City of Las Vegas
  - City of Henderson
  - City of North Las Vegas
  - Boulder City
  - Apex Industrial Park

Community Protection/Community Assistance Objectives:

- Educate/work with communities on defensible space issues and wildfire hazards
- Pursue establishment of local Fire Safe Council Chapter
- Promote collaborative efforts to mitigate fuel hazards with cooperators
- Continue dialogue with Clark County, City of Las Vegas, Henderson, and North Las Vegas officials toward implementation of the above-mentioned objectives.

Community Protection/Community Assistance Strategy:

- Continue to address localized hazard fuel buildups of landscaping debris by use of prescribed fire and mechanical removal of piles.
- Prepare risk assessments and hazard mitigation plans for the Clark County metropolitan area, City of Las Vegas, City of Henderson, City of North Las Vegas, and Boulder City.
- Educate/work with communities on defensible space issues and wildfire hazards
- Pursue establishment of local Fire Safe Council Chapter
- Promote collaborative efforts to mitigate fuel hazards with cooperators
- Continue dialogue with Clark County, City of Las Vegas, City of Henderson, City of North Las Vegas, and Boulder City officials toward the implementation of the above-mentioned strategies.

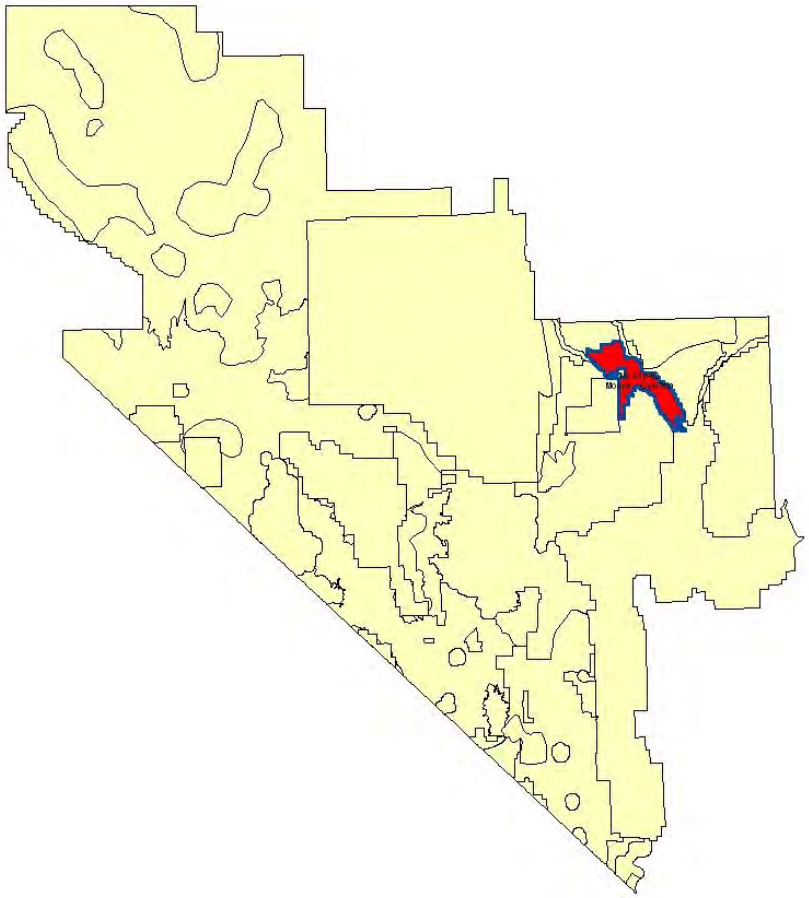
Community Wildfire Safety Education Strategy: Coordinate with Clark County Fire Department, City of Las Vegas Fire Department, City of Henderson Fire Department, City of North Las Vegas Fire Department, Boulder City Fire Department, local citizen groups (Friends of Red Rock Canyon etc.) and local schools to provide public education and prevention programs in accordance with the National Fire Plan

A.3.4.9.3. FMU Fire Program Analysis - Quantifiable Objective Summary

Initial Attack Success	Decadal Wildfire Acres Burn Tolerance	WFU Decadal Target Acres	Rx Fire Acres Per Decade	Non-Fire Acres Per Decade
1 acres @ 90%	100	N/A	50	50

A.3.4.10. Moapa-Overton BLM-FWS

NV050-09



FMU Name & Unit No.: **Moapa-Overton BLM-FWS; NV050-09**

FMU Type/Category: **Wildland Urban Interface (WUI)**

A.3.4.10.1. FMU Description:

A.3.4.10.1.1. FMU Location Information

Geographic boundaries: This FMU is comprised of the existing Overton, Logandale, Glendale, and Moapa WUI zones, the embedded 106 acre US Fish and Wildlife Service Moapa Valley National Wildlife Refuge, the 40,950 acre Moapa/Glendale public land disposal area, and the segment of the Muddy River riparian corridor from the public land disposal area boundary

downstream to the boundary with Lake Mead National Recreation Area (NPS). The FMU also includes upland habitats.

A.3.4.10.1.2. FMU Acre Total

Ownership by Acres and Percent		
NV 050-09	**Moapa - Overton**	
Ownership	**Acres**	**Percent**
Bureau of Land Management	63,521	71.6
Bureau of Reclamation	3,852	4.3
Nevada State	402	0.5
Private	20,953	23.6
Total Acres	88,727	

A.3.4.10.1.3. Fire Occurrence and History

FMU Number	Decadal (94-03)	24 Years (80-03)	Ignition Cause (80-03)	
NV 050-09			Lightning	7
Number of Fires	12	28	Human/Other	21
Largest Fire (Acres)	40.0	140.0	**Multiple Fire Days (80-03)**	
Total Acres Burned	64.4	226.0	Total Multiple Fire Days (MFD)	8
Average Fire Size (Acres)	5.4	8.1	Number of MFD Fires	10
			Total Acres Burned by Multiple Fires	7.9

Narrative Description: The upland portion of this FMU is dominated by creosote bursage habitat, which in certain years is heavily infested with the invasive annual grass red brome. The riparian portion of the FMU is dominated by the invasive woody species tamarisk. Wildland fire played a minor to limited role in each of these habitats prior to their present disturbed state. Fires generally occur in the late spring through September but can occur year round. Most wildfires in this FMU occur in the tamarisk-infested portions of the Muddy River riparian corridor. Typically these fires are wind driven and are of moderate to high intensity. Small, low intensity wildfires in tamarisk are less common but do occur.

General Fire Protection Characteristics: This FMU consists of three distinct resource components: the WUI zones of the Cities of Moapa, Glendale, Logandale, Overton and the Moapa National Wildlife Refuge; scattered stands of mesquite/acacia habitat, and the Muddy River riparian corridor. The FMU contains T&E species populations in upland (Desert tortoise) and riparian habitats (1 listed; 7 Candidate spp.), the latter occurring both on BLM lands and on the embedded Moapa Valley National Wildlife Refuge (USFWS jurisdiction). For wildfires in this FMU, human life and property protection tactics must be weighed against high-priority sensitive species and T&E species considerations and operational constraints.

A.3.4.10.1.4. FMU Vegetation

FMU Vegetation/Fuel Types		
NV 050-09	**Moapa - Overton**	
Veg/Fuel Type	Acres	Percent
Grassland	749	0.8
Mojave	75,249	84.8
No Significant Vegetation	12,729	14.3
Grand Total	88,727	

Vegetation Narrative: Approximately 85% of this FMU consists of creosote bursage. The remainder consists of riparian habitat, which is predominated by tamarisk infestations but which also includes remnant pockets of native riparian graminoid (salt grass, rush, sedge), shrub, mesquite/acacia, and cottonwood/willow vegetation types.

A.3.4.10.1.5. FMU Fuel Models & Live Fuel Moisture Characteristics

Surface Fuel Model & Canopy Cover:

- Wildland fires in the upland portion are generally dependent upon ephemeral buildups of red brome and other fine fuels.
- Wildland fires in the riparian portion occur almost exclusively in tamarisk, as opposed to the pockets of native riparian vegetation.

Live Fuel Moisture Averages:

LFM Site	May	June	July	Aug	Sept	Oct
N5E	158%	96%	82%	77%	70%	81%

Live Fuel Moisture Characteristics:

- At live fuel moisture levels of 181% and above fires typically will exhibit Very Low Fire Behavior characteristics
- At live fuel moisture levels of 151% to 180% fires typically will exhibit Low Fire Behavior characteristics
- At live fuel moisture levels of 126% to 150% fires typically will exhibit Moderate Fire Behavior characteristics
- At live fuel moisture levels of 101% to 125% fires typically will exhibit High Fire Behavior characteristics
- At live fuel moisture levels of 75% to 100% fires typically will exhibit Extreme Fire Behavior characteristics
- At live fuel moisture levels of 75% and below fires typically will exhibit Advanced Fire Behavior characteristics

A.3.4.10.1.6. Fire Weather & Climate Related Impacts

(Detailed weather station data for this FMU will be added to the FMP Appendix upon completion of the national fire weather data validation/correction project.)

- Wet lightning is common in this area. Fires generally remain small when starts occur under these common conditions.
- Dry Lightning is possible in this area. Larger fires can occur with these erratic and gusty thunderstorm events.
- Larger fires occur when human ignitions occur under typical warm and windy summer weather.
- Fire behavior can be extreme under these conditions in heavily infested tamarisk riparian areas.

- Fire behavior can be extreme under these conditions when there are heavy buildups of ephemeral light flashy fuels.

A.3.4.10.1.7. Fire Regime

- Upland Vegetation: Fire Regime V; Condition Class II
- Riparian Vegetation: Fire Regime III; Condition Class III

FMU by Condition Class and Fire Regime			
NV 050-09		**Moapa - Overton**	
CC	FR	Acres	Percent
2	V	73,927	97.3
3	III	1,050	1.4
	IV	999	1.3
Total		75,977	

A.3.4.10.1.8. FMU Physical Characteristics

Topography:

- Elevation Range: 1,400 to 2,599 feet
- Slope:
  - Riparian: less than 10%
  - Upland: generally less than 10% (10 to 40% on bajadas; mesas)
- Aspect:
  - Riparian: flat
  - Upland: variable
- Major topographical features: The FMU is located within the Moapa Valley, formed by the Muddy River that separates Mormon Mesa (outside the FMU boundary) from the Arrow Canyon Mountains to the west (outside the FMU boundary).

Access Information: Major access routes include Interstate 15, State Routes 168 and 169, North Shore Drive (NPS), Bitter Spring Back Country Byway (BLM), and numerous unpaved roads.

A.3.4.10.1.9. FMU Resource Values & Attributes

Wildland-Urban Interface/Intermix: The present WUI zone of Moapa/Glendale/Logandale/Overton, and the Moapa Valley National Wildlife Refuge extends into both upland and riparian habitats; the latter primarily consisting of approximately 14 discontinuous miles of the Muddy River and its floodplain. Additional future WUI build-out will occur on the 40,950 acre "Moapa/Glendale public land disposal area", which is located on Mormon Mesa, in upland habitat.

Resource Use:

- Human life and property values, in the communities of Moapa, Glendale, Logandale, Overton, The Moapa Valley National Wildlife Refuge and in dispersed areas.

  - Dispersed recreation; hunting; fishing; special use permit activities
- Public lands:
  - Grazing – Muddy River Allotment is open but inactive
  - Power line ROW's
  - Railroad line ROW's
  - Commercial reptile collecting
- Non-federal lands:
  - Urban industrial and residential activity
  - Commercial airport
  - Farming, ranching
  - Power line ROW's
  - Railroad line ROW's;

Air Quality: There are no non-attainment airsheds in this FMU. Fire management activities in this FMU may include fire suppression, open burning, and light and heavy equipment mobilization. Fire Management Open burning (RX FIRE) is permitted in Clark County with a courtesy call to the Department of Health. Open burning is defined here "where fire is set either by OFFICERS of governmental agencies, in performance of their official duties or the purposes of training and instruction of firefighting and fire-rescue personnel". (*Section 42-Open Burning, Clark County Air Quality Regulations*).

Soils: Soils have formed under conditions of physical weathering (rather than chemical dissolution) because of the arid climate. Soils on lower portions of alluvial fans and valley floors contain very little organic material, are moderately to highly alkaline, and can contain high concentrations of gypsum and dissolved salts. A gravelly surface crust (called desert pavement) occurs throughout these areas. Desert pavement is very stable and protects underlying fine-grained soils from erosion. A cemented hardpan layer commonly occurs at shallow depths beneath surface soils throughout these areas. Mountain slopes tend to be covered by an unstable layer of large rocks, boulders, stones, and cobbles. Runoff from periodic rainstorms transports large amounts of material to lower elevations, forming alluvial fans of coarse material and depositing thick sequences of gravelly loams, sands, and finer grained sediments on valley floors.

Soils are susceptible to water and wind erosion. Water erosion occurs during periodic high-intensity, short duration summertime thunderstorms and less frequent, sustained wintertime rainstorms. Water erosion occurs by a combination of sheet flow, rill formation, splashing, and channelized flow in ephemeral washes and stream channels. Wind erosion occurs in areas where the desert pavement layer has been disturbed by human activities or heavy use by wild horses and burros, where large areas of vegetation have been burned by fire, sand dune areas, and as part of physical weathering processes.

Cultural and Paleontological Values: N/A

T&E and Sensitive Species:

- Desert tortoise
- Yuma clapper rail
- Moapa dace
- Virgin River chub (Candidate)
- Moapa speckled dace (Candidate)
- Moapa White River Springfish (Candidate)
- Moapa pebblesnail (Candidate)
- Grated tryonia (Candidate)
- Moapa Warm Spring riffle beetle (Candidate)
- Amargosa naucorid (Candidate)

Habitat Values:

- Upland: moderate density tortoise habitat
- Riparian/aquatic:
  - Moapa dace (on adjacent FWS land)
  - Yuma clapper rail (marsh habitat)
  - Candidate spp.: 7 total (on BLM and FWS lands)
- Bighorn sheep winter range (North Muddy Mountains)
- Mesquite/acacia woodlands (Phainopepla habitat)
- 3 sensitive spp. in creosote bursage habitat: Gila monster;
- Astragalus geyeri var. triquetrus; Eriogonum viscidulum
- 2 sensitive spp. in riparian habitat: Western yellow bat; Spotted bat

Hydrology and Water Quality: The Moapa-Overton FMU lies within the Colorado River Basin hydrographic region, which is part of a regional flow system that drains portions of seven southwestern states. The Colorado River and its mainstream reservoirs (Lake Mead and Lake Mohave) are an important source of water for the Las Vegas Valley and millions of downstream users. Ephemeral wash channels drain most areas and only convey flow after periodic high-intensity summer thunderstorms or sustained winter rainstorms. The only perennial streams occur in the eastern and south-central portions of Clark County, within the Colorado River hydrographic region. Within the Moapa-Overton FMU the Muddy River is a perennial stream that discharges into the Overton Arm of Lake Mead and sustains riparian and aquatic habitats.

Wilderness or WSA: N/A

A.3.4.10.1.10. FMU Public Safety, Economic & Community Values at Risk

- City of Moapa
- City of Glendale
- City of Logandale
- City of Overton
- The Moapa Valley National Wildlife Refuge
- Dispersed properties and developments (homes, ranches, etc.)
- Riparian and aquatic T&E species habitat (Muddy River flood plain)
- Desert tortoise habitat (moderate density)
- Moapa Valley watershed and Muddy River water quality
- Sensitive species habitats (Gila monster; plants; bats; birds)
- Power line ROW's
- Railroad line ROW's
- Clark County Fairgrounds

A.3.4.10.1.11. FMU Fire Protection Responsibility

Wildland fire protection on all BLM public lands within this FMU is provided by the Las Vegas Field Office. Structural fire protection on private lands within this FMU is provided by the Clark County Fire Department.

A.3.4.10.2. FMU Objectives & Strategies

A.3.4.10.2.1. FMU Fire Management Objectives Priority Statement

- Protect human life, safety of wildland firefighters, and protection of human safety and health *(National Fire Plan 2001)*.
- Use approved fire suppression techniques in areas of critical environmental concern where there are concerns for habitat, threatened and endangered species, and urban/rural/wildland interface zones (LVFO RMP, 1998. Fire Management Direction FE-1-d).
- Provide fire suppression efforts commensurate with resource and adjacent property values at risk *(LVFO RMP, 1998. Fire Mgt Direction FE-1-a)*.
- Improve approximately 400 acres of aquatic and riparian habitat on the Virgin River, Muddy River, and Meadow Valley Wash from its existing poor-to-fair condition to good-or-better condition by replacing Tamarix with native species (LVFO RMP, 1998. Special Status Species Mgt Direction SS-1-a).

- Manage Mesquite and Acacia woodlands for their value as wildlife habitat in the following areas: Amargosa Valley, Pahrump Valley, Stewart Valley, Hiko Wash, Piute Wash, Crystal and Stump Springs, or any other areas identified as being of significant wildlife value *(LVFO RMP, 1998. Fish, Wildlife and Special Status Species Management, Management Direction FW-3-a)*.

- Determine specific hazard reduction priorities, including any noxious or invasive species infestations, and implement according to the existing budget (LVFO RMP, 1998. Fire Mgt Direction FE-2-a).

- Determine specific prescribed burn priorities annually, including any noxious or invasive species infestations, and implement where possible (LVFO RMP, 1998. Fire Mgt Direction FE-3-a).

- On watersheds that exhibit good potential for recovery, implement protective measures, including but not limited to fencing and removal of tamarisk (LVFO RMP, 1998. Soil Resource Mgt Objective SL-1).

- Maintain or reduce salt yields originating from public lands to meet State-adopted and EPA approved water quality standards for the Colorado River (LVFO RMP, 1998. Water Resource Objective WT-2).

- Use integrated weed management techniques to control and eradicate tamarisk, such as burning, chemical, biological or mechanical treatments, where potential for treatment is good. Rehabilitate with native species to help reduce the potential for tamarisk re-establishment and improve ecosystem health (LVFO RMP, 1998. Riparian Mgt Objective RP-1-f).

- Maintain or improve the condition of vegetation on public lands to a Desired Plant Community or to a Potential Natural Community (LVFO RMP, 1998. Vegetation Mgt Objective VG-1).

- Restore plant productivity on disturbed areas of the public lands (LVFO RMP, 1998. Vegetation Mgt Objective VG-2).

- Rehabilitate, reclaim, or revegetate areas subjected to surface-disturbing activities, where feasible. When rehabilitating, manage for optimum species diversity by seeding native species, except where non-native species are appropriate (LVFO RMP, 1998. Vegetation Mgt Direction VG-2a).

- Protect important resting/nesting habitats, such as riparian areas and mesquite/acacia woodlands *(LVFO RMP, 1998. Fish & Wildlife Mgt Direction FW-3-g)*.

- Improve disturbed non-game bird habitat, including the water table supporting these habitats, by emphasizing maintenance and enhancement of natural biodiversity (LVFO RMP, 1998. Fish & Wildlife Mgt Direction FW-3-h).

- Manage special status species habitat at the potential natural community or desired plant community, according to the need of the species (LVFO RMP, 1998. Special Status Species Objective SS-1).

- Manage habitat to further sustain the populations of federally listed species so they would no longer need protection of the Endangered Species Act. Manage habitats for non-listed special status species to support viable populations so that future listing would not be necessary *(LVFO RMP, 1998. Special Status Species Objective SS-2)*.

Wildfire Management Priorities:

- Life safety (public and firefighters)
- Protection of human communities and infrastructure:
  - Overton
  - Logandale
  - Moapa
  - Glendale
  - Moapa Valley National Wildlife Refuge (USFWS) buildings
- Protection of other property and improvements
- Protection of natural and cultural resources
- Protection of Mesquite/Acacia woodlands
- Improve aquatic and riparian habitat on the Muddy River from its existing poor-to-fair condition to good-or-better condition by replacing *Tamarix* with native species.

A.3.4.10.2.2. FMU Wildland Fire Suppression Objectives & Strategies

Fire Suppression Objectives: Primary Wildland Fire Protection/Suppression Objective: Protect human life and property values while minimizing impacts to T&E and sensitive species populations/habitats, especially within the Muddy River riparian corridor and mesquite/acacia woodlands.

Fire Suppression Strategies:

- Appropriate Management Response will be utilized as the primary fire suppression strategy to implement wildland fire suppression objectives as identified for this FMU.
- Wildland fires will be fought aggressively to minimize threats or impacts to human life, safety, and property values in the communities of Moapa, Glendale, Logandale, Overton, The Moapa Valley National Wildlife Refuge and adjacent areas of dispersed development.
- Life and property WUI protection objectives and tactics must be weighed against T&E species constraints. All fires in the riparian corridor and in mesquite/acacia habitats will require on-site coordination with a BLM approved Resource Advisor.

Suppression/Protection Priorities:

- City of Moapa, NV
- City of Glendale, NV
- City of Logandale, NV
- City of Overton, NV

- The Moapa Valley National Wildlife Refuge
- Dispersed WUI values (ranches, homes, power lines, etc.)
- Federally listed T&E species populations
- Mesquite/acacia woodlands
- All aquatic and riparian habitat

FMU Target Individual Wildland Fire Size: 1 acre @ 90%

FMU Target Acres Burned Per Decade: 100 acres

A.3.4.10.2.3. FMU Wildland Fire Operational Constraints, Objectives & Strategies

Special Fire Management Consideration/Areas: This FMU contains an upland urbanized areas (including USFWS Moapa Valley National Wildlife Refuge), mesquite/acacia woodlands, and segments of the Muddy River floodplain and riparian corridor. Life and property WUI protection objectives and tactics must be weighed against T&E species and habitat concerns and constraints. All fires in the riparian corridor and in mesquite/acacia habitats will require on-site coordination with a BLM approved Resource Advisor.

A.3.4.10.2.3.1. Wildland Fire Operational Constraints Objectives & Strategies:

A.3.4.10.2.3.1.1. Desert Tortoise:

- Initiate full suppression activities with minimum surface disturbances to reduce loss of tortoise cover and to minimize the spread of exotic annual grasses.
- Require consultation with a qualified Resource Advisor for all wildfires within desert tortoise habitat, particularly within ACEC's and designated critical habitat units.
- Restrict OHV travel and the use of tracked vehicles to the minimum necessary to suppress wildfires within desert tortoise habitat, particularly within ACEC's and designated critical habitat units; obliterate all tracks to reduce possibility of future use.
- Use of aerial retardant is authorized; foam or fugitive retardant is preferable to iron oxide retardant.
- Do not authorize burning out of unburned fingers or islands of vegetation. The exception to this case would be the removal of fuels for safety concerns.
- Establish fire camps, staging areas, and helispots in previously disturbed areas outside of ACEC's and designated critical habitat units, where possible, in consultation with a qualified Resource Advisor.
- Provide all firefighters and support personnel with a briefing on desert tortoises and their habitat to minimize take, particularly those associated with vehicle use.

A.3.4.10.2.3.1.2. Riparian Habitat:

- Apply M.I.S.T. within riparian habitat
- In riparian areas, prioritize suppression actions to minimize damage to stands of native vegetation from wildfire or suppression operations
- Fire suppression in riparian habitat will be coordinated with the approved Resource Advisor
- In riparian areas, use natural barriers or openings in riparian vegetation where possible as the easiest, safest method to manage a riparian wildfire. Where possible and practical use wet firebreaks rather than constructing firelines by hand or with heavy equipment
- Avoid burning out unburned islands, whenever possible
- Utilize firing tactics only if necessary to protect firefighter or public safety
- Avoid surface disturbing suppression activities in riparian areas whenever possible
- Avoid dropping retardant within 300 feet of water sources, to the maximum extent feasible
- Unless given case by case approval from the US Fish and Wildlife Service, the Muddy River CAN NOT be used as a water source for suppression (dip site, pump drafting, etc.), due to the presence of federally-listed threatened and endangered fish species. EXCEPTION: Imminent threat to life or valuable property as determined by the Incident Commander.
- Use of containment systems for portable pumps to avoid fuel spills in riparian or aquatic systems will be required.

A.3.4.10.2.3.1.3. Noxious Weeds and Invasive Species Transport Control Procedures:

Las Vegas Field Office Noxious Weed Control and Fire Management Weed Transport Control:

- Off-district engines, crew carriers, overhead vehicles, and helitack/helicopter support vehicles will, upon check-in and prior to proceeding to the line, wash down at the, Logandale, Red Rock, Pahrump Fire Stations or a commercial truck washing station. This will be determined by the location of the units' last fire assignment and if they were cleaned at release from that assignment.
    - The washdown will concentrate on the undercarriage, with special emphasis on axles, frame, crossmembers, motor mounts, and on and underneath steps, running boards, and front bumper/brushguard assemblies. Vehicle cabs will be swept out with refuse disposed of in waste receptacles. In wilderness areas, all portable equipment used on an incident (pumps, hose, fittings, water storage items) will be washed off to rid them of any seed or spores that may be attached from previous fires in noxious weed infested sites.
    - During initial briefings, washdowns will be mentioned and facilities made available for oncoming crews.
- Las Vegas Field Office crews will follow the same procedures identified in Item 1 when returning from fieldwork or wildland fires, especially when vehicles are used in know noxious weed areas infested with known noxious or invasive species common to the Field Office area.

- Upon leaving the Field Office when released from an incident, all off-unit vehicles will follow aforementioned washdown procedures so that Las Vegas' noxious weed problems do not become someone else's problems.
- All equipment used off pavement will be cleaned of weed and grass seed stems, stalks, etc. prior to release from an incident. This includes, but is not limited to, tents, tarps, helicopter support equipment, foldatanks and free-standing tanks, mechanic's vehicles, and logistical support vehicles, trailers and equipment. These vehicles will be washed as in 1.a. above.

This Field Office policy will be followed by all equipment involved in fire suppression while on Las Vegas Field Office assignments. Vehicles will be cleared of washdown procedures during checkout and crew evaluations. In the event vehicles are released from fires away from the district office, the closest wash facility, (government or commercial) will be utilized.

A.3.4.10.2.4. FMU Wildland Fire Use Objectives & Strategies

Wildfire will not be used as a management tool within this FMU at this time.

A.3.4.10.2.5. Burned Acre Objective Review

IF the FMU decadal wildfire acre-burned target has been reached or exceeded PRIOR TO THE COMPLETION OF THE 10-YEAR PLANNING PERIOD, from either wildfire or prescribed fire, a review of fire management objectives and strategies will be initiated to develop new suppression criteria on wildland fire occurrence and prescribed fire acre goals.

A.3.4.10.2.6. FMU Prescribed Fire Objectives & Strategies

Prescribed Fire Objectives: Use integrated weed management techniques to control and eradicate tamarisk, such as *burning*, chemical, biological or mechanical treatments, where potential for treatment is good. Rehabilitate with native species to help reduce the potential for tamarisk re-establishment and improve ecosystem health (RMP, RP-1-f).

Prescribed Fire Strategies: Note: Noxious/Invasive species will be the only vegetation burned, and then only when deemed necessary to eliminate dozer piles or to reduce standing biomass preparatory to mechanical treatment.

Rx Fire Annual & Decadal Acre Target:

- Annual: maximum of 150 (Tamarisk treatments only)
- Decadal: 1,500 acres

T & E Species Strategies: There are presently no prescribed fire tamarisk treatments planned or in operation in this FMU, but future tamarisk treatments are probable. Endangered Species Act Section 7 consultation procedures and Fish and Wildlife Service concurrence will be achieved, prior to the commencement of any future on-the-ground treatments. At the discretion of the Service, the tamarisk treatment consultation process will either entail a formal programmatic consultation for the for the entire Muddy River ecosystem or else individual project-level informal consultations. All terms and conditions, minimization measures, and other stipulations in those consultation agreements will be adhered to during the implementation of any BLM tamarisk treatments in this FMU.

Air Quality Strategy: Any burning operations will be conducted to minimize smoke impacts to urban communities, dispersed residences, and nearby highway traffic. Project level prescribed fire plans will address smoke management.

NEPA Compliance: Prior to implementation of any proposed projects, site-specific NEPA documentation will be completed, as applicable.

Rx Fire Monitoring Strategy: Any use of prescribed fire will be in conjunction with the Muddy River tamarisk restoration treatments as a whole. In all phases of this multi-year project, the monitoring, documentation, and dissemination and sharing of treatment effectiveness data is an integral priority.

A.3.4.10.2.7. FMU Non-Fire Fuels Treatment Objectives & Strategies

Non-Fire Fuels Treatment Objectives:

- Use integrated weed management techniques to control and eradicate tamarisk, such as *burning*, chemical, biological or mechanical treatments, where potential for treatment is good. Rehabilitate with native species to help reduce the potential for tamarisk re-establishment and improve ecosystem health (RMP, RP-1-f).

Note: Noxious/Invasive/undesirable species (tamarisk and/or Mexican fan palms) will be the only vegetation removed, using a combination of mechanical and chemical methods (with possible future use of biological control methods).

- Evaluate and implement accordingly, fuel break treatments to protect key mesquite/acacia stands from wildfires originating from adjacent uplands.

Note: The Muddy River tamarisk treatments are intended to achieve WUI hazardous fuels abatement objectives; noxious weed control objectives; and lotic riparian restoration objectives. These are multi-phased, multi-year treatments, some of which may entail pile and or broadcast burning in conjunction/combination with mechanical and chemical applications.

Non-Fire Fuels Treatment Strategies: Note: Noxious/Invasive/undesirable species (tamarisk and/or Mexican fan palms) will be the only vegetation removed, using a combination of mechanical and chemical methods (with possible future use of biological control methods).

Non-Fire Annual & Decadal Acre Target:

- Annual: maximum of 150 (Tamarisk only)

- Decadal: 1,500 acres

T & E Species Strategies: There are presently no non-fire tamarisk treatments planned or in operation in this FMU, but future tamarisk treatments are probable. Endangered Species Act Section 7 consultation procedures and Fish and Wildlife Service concurrence will be achieved, prior to the commencement of any future on-the-ground treatments. At the discretion of the Service, the tamarisk treatment consultation process will either entail a formal programmatic consultation for the for the entire Muddy River ecosystem or else individual project-level informal consultations. All terms and conditions, minimization measures, and other stipulations in those consultation agreements will be adhered to during the implementation of any BLM tamarisk treatments in this FMU.

Air Quality Strategies: This FMU does not contain any non-attainment airsheds. Any future tamarisk fuels treatments will have a positive long-term effect on air quality, resulting from improved soil stabilization and erosion resistance of the native vegetation, and to reduced incidence of large, intense wildfires. The brief use of small-mechanized equipment will entail slight soil disturbance, with minor local spikes in PM10 emission. The Clark County Implementation Plan (IP) is independent of the State IP and is administered by the Department of Air Quality Management (DAQM). In 2002, DAQM determined that the BLM Virgin River tamarisk projects are exempt from Dust Control Permit requirements (Clark County Air Quality Regulations, revised 01/23/97), per Exception 17.2.1(1): "agricultural operations".

If the dust plumes generated during mechanical treatment activities result in any complaints from the public, the operation will be re-evaluated in order to identify possible dust mitigation measures that could be implemented cost-effectively and without undue delays to the overall project schedule.

NEPA Compliance: The following procedures will be completed for all fuels treatment projects:

- Chemical applications:
  - Operational compliance with EPA label restrictions
  - File for and obtain BLM Pesticide Use Permits (PUP's)
  - Complete daily Pesticide Application Records (PAR's)
  - Submit annual Pesticide Use Reports to the Nevada Department of Agriculture
  - Obtain/Maintain Nevada Pesticide Applicator Certification training for designated Field Office personnel
  - Ensure that all contractors obtain/possess current Nevada Pesticide Applicators Commercial License
- NEPA compliance:
  - Ensure all projects comply with LUP direction
  - Prepare appropriate project level and/or programmatic NEPA documents (EA's, DNA's, ROD, etc.)
- ESA compliance:
  - Complete project level and/or programmatic Section 7 consultations for all fuels treatments, in early and close coordination with USFWS
  - If project conditions change, initiate re-consultation procedures as appropriate.

Treatment Monitoring Strategy:

- Treatment effectiveness monitoring may be conducted in partnership with USGS, UNR, UNLV, and other parties as identified
- Treatment sites will be monitored for re-infestation by noxious species

- Photo-monitoring will be used to track native plant recruitment and status of active re-vegetation treatments.

A.3.4.10.2.8. FMU Post Fire Rehab/Restoration Objectives & Strategies

Treatments will comply with the Las Vegas BLM Normal Fire Rehabilitation Plan and Environmental Assessment (E.A. No. NV-054-9-24), with one exception. The NFRP stipulates that rehabilitation treatments will only be considered for those areas receiving mean annual precipitation of 8 inches or more. Due to the presence of high surface water tables in the Muddy River floodplain, re-seeding has shown success and will continue to be applied.

- In the event that suppression efforts require off-road vehicle operations, replant and visually camouflage the first 200 feet of tire tracks in order to prevent further habitat impacts (due to public use of these track ways).
- Whenever feasible, utilize native species in seeding and/or re-planting treatments.
- Cultivate local supplies of live plant materials for use during riparian restoration efforts.
- Maintain a seed bank of locally collected native plant species for use in restoring both fire fuels treatments and fire-disturbed sites.
- Cultivate and develop varieties of locally grown native seed by means of plant material centers.

A.3.4.10.2.9. FMU Community Protection/Community Assistance Objectives & Strategies

Communities at Risk/WUI Areas:

- City of Moapa, NV
- City of Glendale, NV
- City of Logandale, NV
- City of Overton, NV
- The Moapa Valley National Wildlife refuge
- Dispersed WUI values (ranches, homes, power lines etc.)

Community Protection/Community Assistance Objectives:

- Educate/work with communities on defensible space issues and wildfire hazards
- Pursue establishment of local Fire Safe Council Chapter(s)
- Promote collaborative efforts to mitigate fuel hazards with cooperators
- Continue dialogue with Partners In Conservation (PIC), Cities of Logandale, Overton, Moapa and Glendale officials, the Virgin River Conservation Partnership Group, and Clark County officials toward implementation of the above-mentioned objectives.

Community Protection/Community Assistance Strategy:

- Initiate tamarisk treatments throughout the riparian portion of this FMU to protect dispersed residences and developments.
- Coordinate through Nevada State Office to implement Rural Fire Assistance and Community Assistance programs, as identified.
- Prepare risk assessments and hazard mitigation plans for the Cities of Moapa, Glendale, Logandale, and Overton.
- Educate/work with communities on defensible space issues and wildfire hazards.
- Pursue establishment of local Fire Safe Council Chapter(s).
- Promote collaborative efforts to mitigate fuel hazards with cooperators.
- Continue dialogue with Partners In Conservation (PIC), Cities of Moapa, Glendale, Logandale, and Moapa officials, the Virgin River Conservation Partnership Group, and Clark County officials toward the implementation of the above-mentioned objectives.

Community Wildfire Safety Education Strategy: Coordinate with Clark County Fire Department, Cities of Moapa, Glendale, Logandale, and Overton VFD's, and citizen groups (Partners In Conservation-PIC; Virgin River Partnership Group, etc.) to provide public education and prevention programs in accordance with the National Fire Plan.

A.3.4.10.3. FMU Fire Program Analysis - Quantifiable Objective Summary

Initial Attack Success	Decadal Wildfire Acres Burn Tolerance	WFU Decadal Target Acres	Rx Fire Acres Per Decade	Non-Fire Acres Per Decade
1 acre @ 90%	100	N/A	1,500	1,500

A.3.4.11. Mesquite – Bunkerville

NV050-10

FMU Name & Unit No.: **Mesquite – Bunkerville; NV050-10**

FMU Type/Category: **Wildland Urban Interface (WUI)**

A.3.4.11.1. FMU Description:

A.3.4.11.1.1. FMU Location Information

Geographic boundaries: FMU NV050-10 includes the Virgin River riparian corridor from the AZ/NV Stateline to Halfway Wash (boundary with private lands and the Nevada State Overton Wildlife Management Area), as well as the upland area encompassing the Bunkerville Township and the City of Mesquite (including the 6,000 acre conveyance from the BLM, i.e., Mesquite Land Sale Area)

A.3.4.11.1.2. FMU Acre Total

Ownership by Acres and Percent		
NV 050-10	**Mesquite - Bunkerville**	
Ownership	**Acres**	**Percent**
Bureau of Land Management	26,433	75.7
Private	8,496	24.3
Total Acres	34,929	

A.3.4.11.1.3. Fire Occurrence and History

FMU Number	Decadal (94-03)	24 Years (80-03)	Ignition Cause (80-03)	
NV 050-10			Lightning	4
Number of Fires	11	41	Human/Other	37
Largest Fire (Acres)	180.0	225.0	**Multiple Fire Days (80-03)**	
Total Acres Burned	216.9	1,025.4	Total Multiple Fire Days (MFD)	6
Average Fire Size (Acres)	19.7	25.0	Number of MFD Fires	7
			Total Acres Burned by Multiple Fires	240.0

Narrative Description: The upland portion of this FMU is dominated by creosote bursage habitat, which in certain years is heavily infested with the invasive annual grass red brome. The riparian portion of the FMU is dominated by the invasive woody species tamarisk. Wildland fire played a minor to limited role in each of these habitats prior to their present disturbed state. Fires generally occur in the late spring through September but can occur year round. Most wildfires in this FMU occur in the tamarisk-infested portions of the Virgin River riparian corridor. Typically these fires are wind driven and are of moderate to high intensity. Small, low intensity wildfires in tamarisk are less common but do occur.

General Fire Protection Characteristics: This FMU consists of two distinct resource components. One is the "traditional" WUI zone consisting of Bunkerville Township and the City of Mesquite. The other is the Virgin River riparian corridor, in which T&E species populations and habitats are the major consideration.

A.3.4.11.1.4. FMU Vegetation

FMU Vegetation/Fuel Types		
NV 050-10	**Mesquite - Bunkerville**	
Veg/Fuel Type	Acres	Percent
Grassland	3,586	10.4
Mojave	26,552	77.1
No Significant Vegetation	4,293	12.5
Grand Total	34,430	

Vegetation Narrative: Approximately 77% of this FMU consists of creosote bursage. The remainder consists of riparian habitat, which is predominated by tamarisk infestations but which also includes remnant pockets of native riparian graminoid (salt grass, rush spp, and sedge spp), shrub, mesquite/acacia, and cottonwood/willow vegetation types.

A.3.4.11.1.5. FMU Fuel Models & Live Fuel Moisture Characteristics

Surface Fuel Model & Canopy Cover:

- Wildland fires in the upland portion are generally dependent upon ephemeral buildups of red brome and other fine fuels.
- Wildland fires in the riparian portion occur almost exclusively in tamarisk, as opposed to the pockets of native riparian vegetation.

Live Fuel Moisture Averages:

LFM Site	May	June	July	Aug	Sept	Oct
N5F	154%	94%	81%	76%	74%	82%

Live Fuel Moisture Characteristics:

- At live fuel moisture levels of 181% and above fires typically will exhibit Very Low Fire Behavior characteristics
- At live fuel moisture levels of 151% to 180% fires typically will exhibit Low Fire Behavior characteristics
- At live fuel moisture levels of 126% to 150% fires typically will exhibit Moderate Fire Behavior characteristics
- At live fuel moisture levels of 101% to 125% fires typically will exhibit High Fire Behavior characteristics
- At live fuel moisture levels of 75% to 100% fires typically will exhibit Extreme Fire Behavior characteristics
- At live fuel moisture levels of 75% and below fires typically will exhibit Advanced Fire Behavior characteristics

A.3.4.11.1.6. Fire Weather & Climate Related Impacts

(Detailed weather station data for this FMU will be added to the FMP Appendix upon completion of the national fire weather data validation/correction project.)

- Wet lightning is common in this area. Fires generally remain small when starts occur under these common conditions.
- Dry Lightning is possible in this area. Larger fires can occur with these erratic and gusty thunderstorm events.
- Larger fires occur when human ignitions occur under typical warm and windy summer weather.
- Fire behavior can be extreme under these conditions in heavily infested tamarisk riparian areas.
- Fire behavior can be extreme under these conditions when there are heavy buildups of ephemeral light flashy fuels

A.3.4.11.1.7. Fire Regime

- Upland Vegetation: Fire Regime V; Condition Class II
- Riparian Vegetation: Fire Regime III; Condition Class III

FMU by Condition Class and Fire Regime			
NV 050-10		**Mesquite - Bunkerville**	
CC	FR	Acres	Percent
2	V	26,572	88.2
3	III	3,569	11.8
Total		30,141	

A.3.4.11.1.8. FMU Physical Characteristics

Topography:

- Elevation Range: 1,300 feet to 2,638
- Slope:
  - Riparian: Less than 10%
  - Upland: Generally 0-15%, but with steeper slopes on the mesa edges.
- Aspect:
  - Riparian: flat
  - Upland: variable
- Major topographical features: The FMU is located within the Virgin Valley, formed by the Virgin River that separates Mormon Mesa from the Virgin Mountains to the south (outside the FMU boundary).

Access Information: Major access routes include Interstate 15, State Route 170, Gold Butte Back Country Byway, and numerous unpaved roads

A.3.4.11.1.9. FMU Resource Values & Attributes

Wildland-Urban Interface/Intermix: The present Wildland Urban Interface zone of Bunkerville/Mesquite extends into both upland and riparian habitats, the latter occurring along a linear, approximately twelve mile segment of the Virgin River. Eventually, additional urban build-out will occur on the 6,000-acre "Mesquite Sale Area" which is located in upland habitat, primarily on Mormon Mesa. At present this build-out is anticipated to occur over a 30-year span.

Resource Use:

- Human life and property values, primarily located in the Bunkerville/Mesquite urban area.
  - Dispersed recreation; hunting; fishing; special use permit activities
  - Public lands:
  - Grazing – Upper Mormon Mesa Allotment is open but inactive
  - Power line ROW's
  - Commercial reptile collecting

- Non-federal lands: Urban industrial and residential activity; farming; ranching; power line ROW's; commercial airport
- Dispersed recreation; hunting; fishing; special use permit activities

Air Quality: There are no non-attainment airsheds in this FMU. Fire management activities in this FMU may include fire suppression, open burning, and light and heavy equipment mobilization. Fire Management Open burning (RX FIRE) is permitted in Clark County with a courtesy call to the Department of Health. Open burning is defined here "where fire is set either by OFFICERS of governmental agencies, in performance of their official duties or the purposes of training and instruction of firefighting and fire-rescue personnel". (*Section 42-Open Burning, Clark County Air Quality Regulations*).

Soils: Soils have formed under conditions of physical weathering (rather than chemical dissolution) because of the arid climate. Soils on lower portions of alluvial fans and valley floors contain very little organic material, are moderately to highly alkaline, and can contain high concentrations of gypsum and dissolved salts. A gravelly surface crust (called desert pavement) occurs throughout these areas. Desert pavement is very stable and protects underlying fine-grained soils from erosion. A cemented hardpan layer commonly occurs at shallow depths beneath surface soils throughout these areas. Mountain slopes tend to be covered by an unstable layer of large rocks, boulders, stones, and cobbles. Runoff from periodic rainstorms transports large amounts of material to lower elevations, forming alluvial fans of coarse material and depositing thick sequences of gravelly loams, sands, and finer grained sediments on valley floors.

Soils are susceptible to water and wind erosion. Water erosion occurs during periodic high-intensity, short duration summertime thunderstorms and less frequent, sustained wintertime rainstorms. Water erosion occurs by a combination of sheet flow, rill formation, splashing, and channelized flow in ephemeral washes and stream channels. Wind erosion occurs in areas where the desert pavement layer has been disturbed by human activities or heavy use by wild horses and burros, where large areas of vegetation have been burned by fire, sand dune areas, and as part of physical weathering processes.

Cultural and Paleontological Values: N/A

T&E and Sensitive Species:

- Desert tortoise
- Southwester willow flycatcher
- Yuma clapper rail
- Yellow-billed cuckoo (Candidate)
- Woundfin
- Virgin River chub

Habitat Values: Sensitive Species populations in creosote bursage habitat types: 1 reptile (Gila monster), 3 plants (Astragalus geyeri var. triquetrus, Eriogonum viscidulum, Pediomelum castoreum).

- Upland:

  - A portion of the Gold Butte desert tortoise ACEC
  - Moderate density tortoise habitat at the eastern edge of Mormon Mesa
- Riparian:
  - Populations of four Listed and one Candidate T&E
  - Species (2 fish and 3 birds)
  - Designated critical habitat (fish) = the entire river
  - Segment within this FMU
- Virgin River ACEC in its entirety (general wildlife ACEC)

Hydrology and Water Quality: The Mesquite-Bunkerville FMU lies within the Colorado River Basin hydrographic region, which is part of a regional flow system that drains portions of seven southwestern states. The Colorado River and its mainstream reservoirs (Lake Mead and Lake Mohave) are an important source of water for the Las Vegas Valley and millions of downstream users. Ephemeral wash channels drain most areas and only convey flow after periodic high-intensity summer thunderstorms or sustained winter rainstorms. The only perennial streams occur in the eastern and south-central portions of Clark County, within the Colorado River hydrographic region. Within the Mesquite-Bunkerville FMU the Virgin River is a perennial stream, that discharges into the Overton Arm of Lake Mead and sustains riparian and aquatic habitats.

Wilderness or WSA: N/A

A.3.4.11.1.10. FMU Public Safety, Economic & Community Values at Risk

- City of Mesquite
- Bunkerville Township
- Dispersed properties and developments (homes, ranches, etc.)
- Riparian and aquatic T&E species habitat (Virgin River flood plain)
- Desert tortoise habitat (moderate density)
- Virgin Valley watershed and Virgin River water quality
- Gila Monster and sensitive plant species habitats
- Power line ROW's

A.3.4.11.1.11. FMU Fire Protection Responsibility

Wildland fire protection on all BLM public lands within this FMU is provided by the Las Vegas Field Office. Structural fire protection on private lands within this FMU is provided by the Clark County Fire Department, and the City of Mesquite Fire Department.

A.3.4.11.2. FMU Objectives & Strategies

A.3.4.11.2.1. FMU Fire Management Objectives Priority Statement

- Protect human life, safety of wildland firefighters, and protection of human safety and health *(National Fire Plan 2001).*
- Use approved fire suppression techniques in areas of critical environmental concern where there are concerns for habitat, threatened and endangered species, and urban/rural/wildland interface zones (LVFO RMP, 1998. Fire Management Direction FE-1-d).
- Provide fire suppression efforts commensurate with resource and adjacent property values at risk *(LVFO RMP, 1998. Fire Mgt Direction FE-1-a).*
- Determine specific hazard reduction priorities, including any noxious or invasive species infestations, and implement according to the existing budget (LVFO RMP, 1998. Fire Mgt Direction FE-2-a).
- Determine specific prescribed burn priorities annually, including any noxious or invasive species infestations, and implement where possible (LVFO RMP, 1998. Fire Mgt Direction FE-3-a).
- On watersheds that exhibit good potential for recovery, implement protective measures, including but not limited to fencing and removal of tamarisk (LVFO RMP, 1998. Soil Resource Mgt Objective SL-1).
- Maintain or reduce salt yields originating from public lands to meet State-adopted and EPA approved water quality standards for the Colorado River (LVFO RMP, 1998. Water Resource Objective WT-2).
- Use integrated weed management techniques to control and eradicate tamarisk, such as burning, chemical, biological or mechanical treatments, where potential for treatment is good. Rehabilitate with native species to help reduce the potential for tamarisk re-establishment and improve ecosystem health (LVFO RMP, 1998. Riparian Mgt Objective RP-1-f).
- Maintain or improve the condition of vegetation on public lands to a Desired Plant Community or to a Potential Natural Community (LVFO RMP, 1998. Vegetation Mgt Objective VG-1).
- Restore plant productivity on disturbed areas of the public lands (LVFO RMP, 1998. Vegetation Mgt Objective VG-2).
- Rehabilitate, reclaim, or revegetate areas subjected to surface-disturbing activities, where feasible. When rehabilitating, manage for optimum species diversity by seeding native species, except where non-native species are appropriate (LVFO RMP, 1998. Vegetation Mgt Direction VG-2a).
- Protect important resting/nesting habitats, such as riparian areas and mesquite/acacia woodlands *(LVFO RMP, 1998. Fish & Wildlife Mgt Direction FW-3-g).*
- Improve disturbed non-game bird habitat, including the water table supporting these habitats, by emphasizing maintenance and enhancement of natural biodiversity (LVFO RMP, 1998. Fish & Wildlife Mgt Direction FW-3-h).

- Manage special status species habitat at the potential natural community or desired plant community, according to the need of the species (LVFO RMP, 1998. Special Status Species Objective SS-1).
- Improve approximately 400 acres of aquatic and riparian habitat on the Virgin River, Muddy River, and Meadow Valley Wash from its existing poor-to-fair condition to good-or-better condition by replacing Tamarix with native species (LVFO RMP, 1998. Special Status Species Mgt Direction SS-1-a).
- Manage habitat to further sustain the populations of federally listed species so they would no longer need protection of the Endangered Species Act. Manage habitats for non-listed special status species to support viable populations so that future listing would not be necessary (LVFO RMP, 1998. Special Status Species Objective SS-2).
- Manage 743,209 acres of the four desert tortoise areas of critical environmental concern specifically for tortoise recovery. Implement the management actions listed below:
- …Minimize impacts to tortoise habitat during fire suppression by minimizing the use of mechanized equipment and, where possible, staying on existing roads and trails. Give priority to keeping the wildfire to an absolute minimum size (LVFO RMP, 1998. Special Status Species Mgt Direction SS-3-a).
- Manage Mesquite and Acacia woodlands for their value as wildlife habitat in the following areas: Amargosa Valley, Pahrump Valley, Stewart Valley, Hiko Wash, Piute Wash, Crystal and Stump Springs, or any other areas identified as being of significant wildlife value *(LVFO RMP, 1998. Fish, Wildlife and Special Status Species Management, Management Direction FW-3-a)*.

Wildfire Management Priorities:

- Life safety (public and firefighters)
- Protection of human communities (including community infrastructure)
  - City of Mesquite
  - City of Bunkerville
- Protection of other property and improvements
- Protection of natural and cultural resources
- Improve aquatic and riparian habitat on the Virgin River from its existing poor-to-fair condition to good-or-better condition by replacing *Tamarix* with native species.

A.3.4.11.2.2. FMU Wildland Fire Suppression Objectives & Strategies

Fire Suppression Objectives: Primary Wildland Fire Protection/Suppression Objective: Protect human life and property values while minimizing impacts to T&E Species populations and habitat, especially within the Virgin River riparian corridor.

Fire Suppression Strategies: Appropriate Management Response will be utilized as the primary fire suppression strategy to implement wildland fire suppression objectives as identified for this FMU.

Wildland fires will be fought aggressively to minimize threats or impacts to human life, safety, and property values in the communities of Mesquite and Bunkerville, NV and adjacent areas of dispersed development in both Nevada and Arizona.

Suppression/Protection Priorities:

- City of Mesquite, NV
- Community of Bunkerville, NV
- Dispersed WUI values (ranches, homes, power lines, etc.)
- Federally listed T&E species populations and designated critical habitat
- All other aquatic and riparian habitat

FMU Target Individual Wildland Fire Size: 1 acre @ 90%

FMU Target Acres Burned Per Decade: 100 acres

A.3.4.11.2.3. FMU Wildland Fire Operational Constraints, Objectives & Strategies

Special Fire Management Consideration/Areas: This FMU contains both an upland urbanized area and a portion of the Virgin River floodplain and riparian corridor. In the latter, WUI protection objectives and tactics must be weighed against T&E species and habitat concerns and constraints. All fires in the Virgin River riparian corridor will require on-site coordination with a BLM approved Resource Advisor.

A.3.4.11.2.3.1. Wildland Fire Operational Constraints Objectives & Strategies:

A.3.4.11.2.3.1.1. Desert Tortoise:

- Initiate full suppression activities with minimum surface disturbances to reduce loss of tortoise cover and to minimize the spread of exotic annual grasses.
- Require consultation with a qualified Resource Advisor for all wildfires within desert tortoise habitat, particularly within ACEC's and designated critical habitat units.
- Restrict OHV travel and the use of tracked vehicles to the minimum necessary to suppress wildfires within desert tortoise habitat, particularly within ACEC's and designated critical habitat units; obliterate all tracks to reduce possibility of future use.
- Use of aerial retardant is authorized; foam or fugitive retardant is preferable to iron oxide retardant.
- Do not authorize burning out of unburned fingers or islands of vegetation. The exception to this case would be the removal of fuels for safety concerns.
- Establish fire camps, staging areas, and helispots in previously disturbed areas outside of ACEC's and designated critical habitat units, where possible, in consultation with a qualified Resource Advisor.

- Provide all firefighters and support personnel with a briefing on desert tortoises and their habitat to minimize take, particularly those associated with vehicle use.

A.3.4.11.2.3.1.2. Riparian Habitat:

- Apply M.I.S.T. within riparian habitat
- In riparian areas, prioritize suppression actions to minimize damage to stands of native vegetation from wildfire or suppression operations
- Fire suppression in riparian habitat will be coordinated with the approved Resource Advisor
- In riparian areas, use natural barriers or openings in riparian vegetation where possible as the easiest, safest method to manage a riparian wildfire. Where possible and practical use wet firebreaks rather than constructing firelines by hand or with heavy equipment
- Avoid burning out unburned islands, whenever possible
- Utilize firing tactics only if necessary to protect firefighter or public safety
- Avoid surface disturbing suppression activities in riparian areas whenever possible
- Avoid dropping retardant within 300 feet of water sources, to the maximum extent feasible
- Unless given case by case approval from the US Fish and Wildlife Service, the Muddy River CAN NOT be used as a water source for suppression (dip site, pump drafting, etc.), due to the presence of federally-listed threatened and endangered fish species. EXCEPTION: Imminent threat to life or valuable property as determined by the Incident Commander.
- Use of containment systems for portable pumps to avoid fuel spills in riparian or aquatic systems will be required.

A.3.4.11.2.3.1.3. Noxious Weeds and Invasive Species Transport Control Procedures:

Las Vegas Field Office Noxious Weed Control and Fire Management Weed Transport Control:

- Off-district engines, crew carriers, overhead vehicles, and helitack/helicopter support vehicles will, upon check-in and prior to proceeding to the line, wash down at the, Logandale, Red Rock, Pahrump Fire Stations or a commercial truck washing station. This will be determined by the location of the units' last fire assignment and if they were cleaned at release from that assignment.
    - The washdown will concentrate on the undercarriage, with special emphasis on axles, frame, crossmembers, motor mounts, and on and underneath steps, running boards, and front bumper/brushguard assemblies. Vehicle cabs will be swept out with refuse disposed of in waste receptacles. In wilderness areas, all portable equipment used on an incident (pumps, hose, fittings, water storage items) will be washed off to rid them of any seed or spores that may be attached from previous fires in noxious weed infested sites.
    - During initial briefings, washdowns will be mentioned and facilities made available for oncoming crews.

- Las Vegas Field Office crews will follow the same procedures identified in Item 1 when returning from fieldwork or wildland fires, especially when vehicles are used in know noxious weed areas infested with known noxious or invasive species common to the Field Office area.
- Upon leaving the Field Office when released from an incident, all off-unit vehicles will follow aforementioned washdown procedures so that Las Vegas' noxious weed problems do not become someone else's problems.
- All equipment used off pavement will be cleaned of weed and grass seed stems, stalks, etc. prior to release from an incident. This includes, but is not limited to, tents, tarps, helicopter support equipment, foldatanks and free-standing tanks, mechanic's vehicles, and logistical support vehicles, trailers and equipment. These vehicles will be washed as in 1.a. above.

This Field Office policy will be followed by all equipment involved in fire suppression while on Las Vegas Field Office assignments. Vehicles will be cleared of washdown procedures during checkout and crew evaluations. In the event vehicles are released from fires away from the district office, the closest wash facility, (government or commercial) will be utilized.

A.3.4.11.2.4. FMU Wildland Fire Use Objectives & Strategies

Wildfire will not be used as a management tool within this FMU at this time.

A.3.4.11.2.5. Burned Acre Objective Review

IF the FMU decadal wildfire acre-burned target has been reached or exceeded PRIOR TO THE COMPLETION OF THE 10-YEAR PLANNING PERIOD, from either wildfire or prescribed fire, a review of fire management objectives and strategies will be initiated to develop new suppression criteria on wildland fire occurrence and prescribed fire acre goals.

A.3.4.11.2.6. FMU Prescribed Fire Objectives & Strategies

Prescribed Fire Objectives: Use integrated weed management techniques to control and eradicate tamarisk, such as *burning*, chemical, biological or mechanical treatments, where potential for treatment is good. Rehabilitate with native species to help reduce the potential for tamarisk re-establishment and improve ecosystem health (RMP, RP-1-f).

Prescribed Fire Strategies: Note: Noxious/Invasive species will be the only vegetation burned, and then only when deemed necessary to eliminate dozer piles or to reduce standing biomass preparatory to mechanical treatment.

Rx Fire Annual & Decadal Acre Target:

- Annual: Maximum of 300 (Tamarisk only)
- Decadal: 3,000 acres

T & E Species Strategies: There are presently no prescribed fire treatments planned in this FMU, but future treatments are probable. Endangered Species Act Section 7 consultation procedures and Fish and Wildlife Service concurrence will be achieved, prior to the commencement of any future on-the-ground treatments. At the discretion of the Service, the consultation process will either entail a formal programmatic consultation for the entire FMU or else individual

project-level informal consultations. All terms and conditions, minimization measures, and other stipulations in those consultation agreements will be adhered to during the implementation of any BLM treatments in this FMU.

Air Quality Strategy: Any burning operations will be conducted to minimize smoke impacts to urban communities, dispersed residences, and nearby highway traffic. Project level prescribed fire plans will address smoke management.

NEPA Compliance: Prior to implementation of any proposed projects, site-specific NEPA documentation will be completed, as applicable.

Rx Fire Monitoring Strategy: Any use of Rx fire will be in conjunction with the Virgin River tamarisk restoration treatments as a whole. In all phases of this multi-year project, including any Rx fire, the monitoring, documentation, and dissemination and sharing of treatment effectiveness data is an integral priority.

A.3.4.11.2.7. FMU Non-Fire Fuels Treatment Objectives & Strategies

Non-Fire Fuels Treatment Objectives: Use integrated weed management techniques to control and eradicate tamarisk, such as *burning*, chemical, biological or mechanical treatments, where potential for treatment is good. Rehabilitate with native species to help reduce the potential for tamarisk re-establishment and improve ecosystem health (RMP, RP-1-f).

Non-Fire Fuels Treatment Strategies: *Note:* Noxious/Invasive species will be the only vegetation removed, using a combination of mechanical and chemical methods (with possible future use of biological control methods).

Non-Fire Annual & Decadal Acre Target:

- Annual: Maximum of 300 (Tamarisk only)
- Decadal: 3,000 acres

T & E Species Strategies: Per terms of Informal Consultation file numbers 1-5-98-I-316 (fuels project JE15); 1-5-03-I-438 (fuels project JE22); 1-5-03-I-510 (fuels project JE23); and 1-5-03-I-535 (fuels project JE25), these minimization measures are in effect for LVFO tamarisk projects on the Virgin River:

- In the field, BLM and FWS personnel will jointly identify and GIS the Year-1 treatment plot within the (light gray) mechanical treatment polygons in Treatment Zone 1. Depending on time constraints and logistical considerations, this joint effort may result in identifying the entire plot scheme for Treatment Zone 1, which is estimated to extend through no later than project Year-3.
- Commencing in FY04, all (dark gray) hand-treatment category project acres in Treatment Zone 1 will be surveyed for the presence or absence of the Southwestern willow flycatcher, using the FWS approved protocols. The surveys will occur in three successive years, during the May-July peak nesting period, and will be conducted by qualified personnel contracted by the BLM Las Vegas Field Office. No treatment action will occur on any plot within the Zone 1 hand-treatment polygons without three years of successive negative occurrence data for SWFL. In addition, any plots identified by the survey contractor as meeting the FWS-defined criteria for suitable SWFL habitat conditions will be demarked on the JE25 project maps. Tamarisk treatment in such areas will proceed on a “no net loss” basis. All acres in which the vegetative

structural condition is altered or impaired (for SWFL nesting purposes) as a result of Project JE25 must be "replaced" by an equal number of acres that have been fully revegetated or which display a trend that indicates site success.

- Any new survey results showing additional SWFL occupied habitat locations in the JE25 project area will trigger an immediate updating of the project GIS map, in order to include the new acres under the non-treatment category. If the source surveys do not report such new SWFL territories in polygon format, the point locations will be mapped inclusive of a 200-foot radius.

- Mechanical treatment of unburned tamarisk will be scheduled outside the Southwestern willow flycatcher-breeding season in Nevada, which is May 1 through September 15.

- Annual coordination meetings with the FWS Southern Nevada Field Office will be held specific to Project JE25, during the course of its operational life. The meetings will be held in January. FWS and BLM will agree to a format for recording and formalizing the meeting results, for inclusion in the official case file records of both agencies. In addition to coordination, the meetings will serve as adaptive management assessment opportunities, with all operational aspects of the project open to potential re-evaluation and design (including the selection of individual plot treatments, FY acreage targets, and the redetermination of treatment-type categories, based on project-funded SWFL survey results and other new information sources). New, less-intrusive fuels reduction methods might also be negotiated, if such become available in future. One possibility is prescriptive (goat) grazing, which is now being field-trialed on private-land tamarisk stands located on the nearby Muddy River.

- To prevent chemical/sediment run-off, a minimum 30-foot buffer strip will remain untreated along the edge of all open water bodies, including both banks of the Virgin River. No mechanical, hand-clearing or chemical treatment activity will occur within the 30-foot buffer strips.

- Masticated tamarisk "mulch" will be left in place in order to provide dust abatement; enhanced soil stabilization; decreased run-off/siltation; absorption and retention of over-sprayed herbicide, and insulation of the surface soil horizon from solar heating.

- Buffer structures (silt fences, straw wattles, etc) will be installed on individual treatment plots to remediate run-off impacts, where fish monitoring studies indicate such a need.

- No native trees will be cut, shredded, crushed or otherwise intentionally impacted by this action. Patches of native, non-halophytic shrubs (minimum patch diameter 15-feet) will be avoided from mechanical treatment. Tamarisk within these avoidance areas will be cut by hand tools or chainsaws and then backhauled.

- Where post-treatment monitoring reveals that a given plot is receiving unacceptable levels of use disturbance (OHVs; trespass cattle grazing; etc), protective enclosure fences may be constructed. If so, the fence layout will be designed to minimize any clearing of native vegetation. Only OHV equipment will be used during any fence construction located within the wet terrace or semi-wet terrace positions of the floodplain.

- Non-toxic marking dye will be added to the Garlon solution to insure adequate coverage and to avoid redundant spraying of individual target plants.

- Weather reports will be monitored. Chemical applications will not occur within 24-hours of forecasted precipitation, nor whenever ground level wind speeds exceed 10 mph.

- To minimize triclopyr volatilization, Garlon use will occur in late fall and early spring or when air temperatures are between 60-90° F.
- Mixing of chemicals/equipment transfer will occur on tarps, 200-feet from the daily high water mark, in order to catch spillage and to minimize exposure to non-target areas.
- Containers/equipment will be handled per the Garlon label instructions. Spills will be responded to in accord with the Las Vegas District Hazardous Materials Incident Contingency Plan (1992).
- Access will be by existing road. Vehicles will not exceed 25 mph on unposted dirt roads.
- Except during mechanical treatment operations, the use of full-sized vehicles will be avoided in favor of OHV equipment for *all* project needs (seeding, harrowing, materials delivery). On dry terrace treatment plots a greater degree of latitude may be exercised.
- No excavation or earthmoving will occur that would trigger the Section 404 Clean Water Act permit process with the U.S. Army Corps of Engineers.
- Monitoring will be conducted to detect initial presence or post-treatment recruitment of invasive or noxious weed species, including tamarisk. Monitoring and control efforts will comply with BLM Manual 9025.8 and the Nevada Weed Management Strategy.
- Actions will conform to terms & conditions of Biological Opinion File no. 1-5-97-F-251.
- The project proponents/contractors will exercise due diligence to prevent work-related wildfires. Due diligence will consist of adhering to these specific measures:
  - Hot chainsaws will only be set down on bare ground. If bare ground is not present, the crew will clear ground cover vegetation/duff in an appropriate, minimum dimension.
  - All chainsaws shall be equipped with OSHA-standard spark arrestors.
  - No open flames shall be permitted in the project area (i.e., cooking or warming fires, etc).
  - No smoking shall be permitted in the project area.
  - Crews operating chainsaws shall be equipped with one 10-lb fire extinguisher and two fire shovels, at minimum. This suppression gear shall be kept in immediate reach at all times during chainsaw operations.
- If the above due diligence is exercised but an unintentional wildfire nonetheless is caused by the project proponents/contractors, the Bureau will consult with the Service on a case-by-case basis to identify appropriate rehabilitation treatment options.

Air Quality Strategies: Air quality in this FMU vicinity is influenced by the non-attainment Las Vegas Valley; the Reid-Gardner Power Plant; urban activity in Mesquite-Bunkerville; agriculture; paved roadways; Interstate 15, and vehicle emissions. Air quality is generally less than adopted federal and State standards for carbon monoxide, nitrogen dioxide, inhalable particulate matter (PM10) and other factors (USDI FWS, 2002b). The JE25 project area is outside of any non-attainment airshed. Tamarisk fuels treatments will have a positive long-term effect on air quality, due to the superior soil stabilization and erosion resistance of the restored native vegetation, and due to the reduced incidence of large, intense wildfires. The brief use of small-mechanized equipment will entail slight soil disturbance, with minor local spikes in

PM10 emission. The Clark County Implementation Plan (IP) is independent of the State IP and is administered by the Department of Air Quality Management (DAQM). In 2002, DAQM determined that the BLM Virgin River tamarisk projects are exempt from Dust Control Permit requirements (Clark County Air Quality Regulations, revised 01/23/97), per Exception 17.2.1(1): "agricultural operations".

If the dust plumes generated during mechanical treatment activities result in any complaints from the public, the operation will be re-evaluated in order to identify possible dust mitigation measures that could be implemented cost-effectively and without undue delays to the overall project schedule.

NEPA Compliance: The following procedures will be completed for all fuels treatment projects:

- Chemical applications:
  - Operational compliance with EPA label restrictions
  - File for and obtain BLM Pesticide Use Permits (PUP's)
  - Complete daily Pesticide Application Records (PAR's)
  - Submit annual Pesticide Use Reports to the Nevada Department of Agriculture
  - Obtain/Maintain Nevada Pesticide Applicator Certification training for designated Field Office personnel
  - Ensure that all contractors obtain/possess current Nevada Pesticide Applicators Commercial License
- NEPA compliance:
  - Ensure all projects comply with LUP direction
  - Prepare appropriate project level and/or programmatic NEPA documents (EA's, DNA's, ROD, etc.)
- ESA compliance:
  - Complete project level and/or programmatic Section 7 consultations for all fuels treatments, in early and close coordination with USFWS
  - If project conditions change, initiate re-consultation procedures as appropriate.

Treatment Monitoring Strategy:

- Treatment effectiveness monitoring will be conducted in partnership with USGS, UNR, UNLV, and other parties as identified
- Monitoring treatment sites for invasive species re-infestation will be conducted
- Existing photo monitoring studies will be continued to track post treatment revegetation status and progress

A.3.4.11.2.8. FMU Post Fire Rehab/Restoration Objectives & Strategies

- Treatments will comply with the LVFO Normal Fire Rehabilitation Plan and Environmental Assessment (E.A. No. NV-054-9-24), with one exception. The NFRP stipulates that rehabilitation treatments will only be considered for those areas receiving mean annual precipitation of 8 inches or more. Due to the high surface water tables in the Virgin floodplain, re-seeding has shown success and will continue to be applied.
- In the event that suppression efforts require off-road vehicle operations, replant and visually camouflage the first 200 feet of tire tracks in order to prevent further habitat impacts (due to public use of these track ways).
- Whenever feasible, utilize native species in seeding and/or re-planting treatments.
- Cultivate local supplies of live plant materials for use during riparian restoration efforts.
- Maintain a seed bank of locally collected native plant species for use in restoring both fire fuels treatments and fire-disturbed sites.
- Cultivate and develop varieties of locally collected native seed by means of plant material centers.

A.3.4.11.2.9. FMU Community Protection/Community Assistance Objectives & Strategies

Communities at Risk/WUI Areas: N/A. Communities-at-risk, community protection/assistance and public education strategies and objectives will be further defined through the LVFO RAMS Fire Plan update, which is scheduled for 2005.

Community Protection/Community Assistance Objectives:

- Educate/work with communities on defensible space issues and wildfire hazards
- Pursue establishment of local Fire Safe Council Chapter
- Promote collaborative efforts to mitigate fuel hazards with cooperators
- Continue dialogue with Partners In Conservation (PIC), City of Mesquite officials, the Virgin River Conservation Partnership Group, and Clark County officials toward implementation of the above-mentioned objectives.

Community Protection/Community Assistance Strategy: N/A

Community Wildfire Safety Education Strategy: N/A

A.3.4.11.3. FMU Fire Program Analysis - Quantifiable Objective Summary

Initial Attack Success	Decadal Wildfire Acres Burn Tolerance	WFU Decadal Target Acres	Rx Fire Acres Per Decade	Non-Fire Acres Per Decade
1 acre @ 90%	100	N/A	3,000	3,000

A.3.4.12. Virgin-Muddy-Meadow

NV050-11

FMU Name & Unit No.: **Virgin-Muddy-Meadow; NV050-11**

FMU Type/Category: **Wildland Urban Interface (WUI)**

A.3.4.12.1. FMU Description:

A.3.4.12.1.1. FMU Location Information

Geographic boundaries: This discontinuous FMU is comprised of the non-urban segments of the floodplain and riparian corridor of the Virgin River (from Halfway wash to Lake Mead), the Muddy River (upstream of the Moapa WUI FMU), and Meadow Valley Wash (upstream of

the Moapa WUI FMU). The FMU is centered approximately 90 road miles northeast of Las Vegas, Nevada.

A.3.4.12.1.2. FMU Acre Total

Ownership by Acres and Percent		
NV 050-11	**Virgin - Muddy - Meadow**	
Ownership	**Acres**	**Percent**
Bureau of Land Management	14,442	76.8
Bureau of Reclamation	318	1.7
Private	4,037	21.5
Total Acres	18,797	

A.3.4.12.1.3. Fire Occurrence and History

FMU Number	Decadal (94-03)	24 Years (80-03)	Ignition Cause (80-03)	
NV 050-11			Lightning	2
Number of Fires	1	4	Human/Other	2
Largest Fire (Acres)	0.1	3.0	**Multiple Fire Days (80-03)**	
Total Acres Burned	0.1	6.2	Total Multiple Fire Days (MFD)	1
Average Fire Size (Acres)	0.1	1.6	Number of MFD Fires	1
			Total Acres Burned by Multiple Fires	3.0

Narrative Description: The riparian portion of the FMU is dominated by the invasive woody species tamarisk. Wildland fire played a minor to limited role in each of these habitats prior to their present disturbed state. Fires generally occur in the late spring through September but can occur year round. Most wildfires in this FMU occur in the tamarisk-infested portions of the Virgin River, Muddy River, and Meadow Valley Wash riparian corridor. Typically these fires are wind driven and are of moderate to high intensity. Small, low intensity wildfires in tamarisk are less common but do occur.

General Fire Protection Characteristics: This FMU consists of one distinct resource component- the Virgin River, Muddy River, and Meadow Valley Wash riparian corridors, in which T&E species populations and habitats are the major consideration.

A.3.4.12.1.4. FMU Vegetation

FMU Vegetation/Fuel Types		
NV 050-11	**Virgin - Muddy - Meadow**	
Veg/Fuel Type	Acres	Percent
Grassland	2,134	11.5
Mojave	16,343	87.8
Salt Desert Scrub/Shadscale	143	0.8
Grand Total	18,621	

Vegetation Narrative: This FMU consists of riparian habitat, which is predominated by tamarisk infestations but which also includes remnant pockets of native riparian graminoid (salt grass, rush spp, and sedge spp), shrub, mesquite/acacia, and cottonwood/ willow vegetation types.

A.3.4.12.1.5. FMU Fuel Models & Live Fuel Moisture Characteristics

Surface Fuel Model & Canopy Cover: Wildland fires in the riparian portion occur almost exclusively in tamarisk, as opposed to the pockets of native riparian vegetation.

Live Fuel Moisture Averages:

LFM Site	May	June	July	Aug	Sept	Oct
N5F	154%	94%	81%	76%	74%	82%

Live Fuel Moisture Characteristics:

- At live fuel moisture levels of 181% and above fires typically will exhibit Very Low Fire Behavior characteristics
- At live fuel moisture levels of 151% to 180% fires typically will exhibit Low Fire Behavior characteristics
- At live fuel moisture levels of 126% to 150% fires typically will exhibit Moderate Fire Behavior characteristics
- At live fuel moisture levels of 101% to 125% fires typically will exhibit High Fire Behavior characteristics
- At live fuel moisture levels of 75% to 100% fires typically will exhibit Extreme Fire Behavior characteristics
- At live fuel moisture levels of 75% and below fires typically will exhibit Advanced Fire Behavior characteristics

A.3.4.12.1.6. Fire Weather & Climate Related Impacts

(Detailed weather station data for this FMU will be added to the FMP Appendix upon completion of the national fire weather data validation/correction project.)

- Wet lightning is common in this area. Fires generally remain small when starts occur under these common conditions.
- Dry Lightning is possible in this area. Larger fires can occur with these erratic and gusty thunderstorm events.
- Larger fires occur when human ignitions occur under typical warm and windy summer weather.
- Fire behavior can be extreme under these conditions in heavily infested tamarisk riparian areas.

A.3.4.12.1.7. Fire Regime

- Riparian Vegetation: Fire Regime IIII; Condition Class III

FMU by Condition Class and Fire Regime			
NV 050-11		Virgin - Muddy - Meadow	
CC	FR	Acres	Percent
2	V	16,187	86.9

3	III	2,148	11.5
	IV	285	1.5
Total		18,621	

A.3.4.12.1.8. FMU Physical Characteristics

Topography:

- Elevation Range: 1,399 feet to 2,599 feet
- Slope: 10-20%
- Aspect: Generally flat
- Major topographical features: Three lotic riparian segments comprise this FMU. The Virgin River portion is located in the Virgin Valley, bounded by Mormon Mesa and Bunkerville Ridge. The Muddy River portion is located in the Moapa Valley, bounded by the Arrow Canyon Range and Mormon Mesa. The Meadow Valley Wash portion of the FMU runs through Mormon Mesa, northeast of Moapa Valley.

Access Information: Major access routes include Interstate 15, State Routes 168 and 170, Gold Butte Back Country Byway, the Meadow Valley Road, and numerous unpaved roads. Much of this FMU is infested with impenetrable stands of invasive tamarisk.

A.3.4.12.1.9. FMU Resource Values & Attributes

Wildland-Urban Interface/Intermix: Eventually, urban build-out will occur adjacent to the FMU on the 40,950-acre Moapa/Glendale public land disposal area.

Resource Use:

- Municipal watersheds for Las Vegas, Moapa, Glendale, Overton and Logandale
- Human life and dispersed property values
- T&E species populations and habitats (5)
- Municipal watersheds
- Utility line ROW's and dispersed private properties and developments
- Railroad ROW's
- Grazing – Upper Mormon Mesa Allotment is open but inactive
- Commercial reptile collecting
- Dispersed recreation; hunting; fishing; special use permit activities

Air Quality: There are no non-attainment airsheds in this FMU. Fire management activities in this FMU may include fire suppression, open burning, and light and heavy equipment mobilization. Fire Management Open burning (RX FIRE) is permitted in Clark County with a courtesy call to the Department of Health. Open burning is defined here "where fire is set either by OFFICERS of governmental agencies, in performance of their official duties or the purposes of

training and instruction of firefighting and fire-rescue personnel". (*Section 42-Open Burning, Clark County Air Quality Regulations*).

Soils: Soils have formed under conditions of physical weathering (rather than chemical dissolution) because of the arid climate. Soils on lower portions of alluvial fans and valley floors contain very little organic material, are moderately to highly alkaline, and can contain high concentrations of gypsum and dissolved salts. A gravelly surface crust (called desert pavement) occurs throughout these areas. Desert pavement is very stable and protects underlying fine-grained soils from erosion. A cemented hardpan layer commonly occurs at shallow depths beneath surface soils throughout these areas. Mountain slopes tend to be covered by an unstable layer of large rocks, boulders, stones, and cobbles. Runoff from periodic rainstorms transports large amounts of material to lower elevations, forming alluvial fans of coarse material and depositing thick sequences of gravelly loams, sands, and finer grained sediments on valley floors.

Soils are susceptible to water and wind erosion. Water erosion occurs during periodic high-intensity, short duration summertime thunderstorms and less frequent, sustained wintertime rainstorms. Water erosion occurs by a combination of sheet flow, rill formation, splashing, and channelized flow in ephemeral washes and stream channels. Wind erosion occurs in areas where the desert pavement layer has been disturbed by human activities or heavy use by wild horses and burros, where large areas of vegetation have been burned by fire, sand dune areas, and as part of physical weathering processes.

Cultural and Paleontological Values: Arrow Canyon cultural resource ACEC

T&E and Sensitive Species:

- Virgin River chub (Candidate-soon to be listed)
- Woundfin
- Southwestern willow flycatcher
- Yuma clapper rail
- Yellow-billed cuckoo (Candidate)

Habitat Values:

- Desert tortoise Critical Habitat (abutting this FMU)

Hydrology and Water Quality: The Virgin-Muddy-Meadow FMU lies within the Colorado River Basin hydrographic region, which is part of a regional flow system that drains portions of seven southwestern states. The Colorado River and its mainstream reservoirs (Lake Mead and Lake Mohave) are an important source of water for the Las Vegas Valley and millions of downstream users. Ephemeral wash channels drain most areas and only convey flow after periodic high-intensity summer thunderstorms or sustained winter rainstorms. The only perennial streams occur in the eastern and south-central portions of Clark County, within the Colorado River hydrographic region. Within the Virgin-Muddy-Meadow FMU the Virgin and Muddy Rivers are perennial streams that discharge into the Overton Arm of Lake Mead and sustain riparian and aquatic habitats. The Meadow Valley Wash is an intermittent stream that drains into the Muddy River near Glendale, NV and sustains riparian habitat.

Wilderness or WSA: Arrow Canyon Wilderness

A.3.4.12.1.10. FMU Public Safety, Economic & Community Values at Risk

- Dispersed properties and developments (homes, ranches, etc.)
- Riparian and aquatic T&E species habitat
- Virgin Valley watershed and Virgin River water quality
- Moapa Valley watershed and Muddy River water quality
- Meadow Valley watershed and Meadow Valley Wash water quality
- Utility line ROW's
- Railroad ROW's

A.3.4.12.1.11. FMU Fire Protection Responsibility

Wildland fire protection on all BLM public lands within this FMU is provided by the Las Vegas Field Office. Structural fire protection on private lands within this FMU is provided by the Clark County Fire Department.

A.3.4.12.2. FMU Objectives & Strategies

A.3.4.12.2.1. FMU Fire Management Objectives Priority Statement

- Protect human life, safety of wildland firefighters, and protection of human safety and health *(National Fire Plan 2001)*.
- Use approved fire suppression techniques in areas of critical environmental concern where there are concerns for habitat, threatened and endangered species, and urban/rural/wildland interface zones (LVFO RMP, 1998. Fire Management Direction FE-1-d).
- Provide fire suppression efforts commensurate with resource and adjacent property values at risk (LVFO RMP, 1998. Fire Mgt Direction FE-1-a).
- Determine specific hazard reduction priorities, including any noxious or invasive species infestations, and implement according to the existing budget (LVFO RMP, 1998. Fire Mgt Direction FE-2-a).
- Determine specific prescribed burn priorities annually, including any noxious or invasive species infestations, and implement where possible (LVFO RMP, 1998. Fire Mgt Direction FE-3-a).
- On watersheds that exhibit good potential for recovery, implement protective measures, including but not limited to fencing and removal of tamarisk (LVFO RMP, 1998. Soil Resource Mgt Objective SL-1).
- Maintain or reduce salt yields originating from public lands to meet State-adopted and EPA approved water quality standards for the Colorado River (LVFO RMP, 1998. Water Resource Objective WT-2).

- Use integrated weed management techniques to control and eradicate tamarisk, such as burning, chemical, biological or mechanical treatments, where potential for treatment is good. Rehabilitate with native species to help reduce the potential for tamarisk re-establishment and improve ecosystem health (LVFO RMP, 1998. Riparian Mgt Objective RP-1-f).

- Maintain or improve the condition of vegetation on public lands to a Desired Plant Community or to a Potential Natural Community (LVFO RMP, 1998. Vegetation Mgt Objective VG-1).

- Restore plant productivity on disturbed areas of the public lands (LVFO RMP, 1998. Vegetation Mgt Objective VG-2).

- Rehabilitate, reclaim, or revegetate areas subjected to surface-disturbing activities, where feasible. When rehabilitating, manage for optimum species diversity by seeding native species, except where non-native species are appropriate (LVFO RMP, 1998. Vegetation Mgt Direction VG-2a).

- Protect important resting/nesting habitats, such as riparian areas and mesquite/acacia woodlands *(LVFO RMP, 1998. Fish & Wildlife Mgt Direction FW-3-g).*

- Improve disturbed non-game bird habitat, including the water table supporting these habitats, by emphasizing maintenance and enhancement of natural biodiversity (LVFO RMP, 1998. Fish & Wildlife Mgt Direction FW-3-h).

- Manage special status species habitat at the potential natural community or desired plant community, according to the need of the species (LVFO RMP, 1998. Special Status Species Objective SS-1).

- Improve approximately 400 acres of aquatic and riparian habitat on the Virgin River, Muddy River, and Meadow Valley Wash from its existing poor-to-fair condition to good-or-better condition by replacing Tamarix with native species (LVFO RMP, 1998. Special Status Species Mgt Direction SS-1-a).

- Manage habitat to further sustain the populations of federally listed species so they would no longer need protection of the Endangered Species Act. Manage habitats for non-listed special status species to support viable populations so that future listing would not be necessary *(LVFO RMP, 1998. Special Status Species Objective SS-2).*

- Manage 743,209 acres of the four desert tortoise areas of critical environmental concern specifically for tortoise recovery. Implement the management actions listed below:

- …Minimize impacts to tortoise habitat during fire suppression by minimizing the use of mechanized equipment and, where possible, staying on existing roads and trails. Give priority to keeping the wildfire to an absolute minimum size (LVFO RMP, 1998. Special Status Species Mgt Direction SS-3-a).

Wildfire Management Priorities:

- Life safety (public and firefighters)

- Dispersed private properties and developments

- T&E Species populations and habitats, both aquatic and riparian

- Arrow Canyon WSA
- Protection of other natural resources and cultural resources
- Improve aquatic and riparian habitat on the Virgin River, Muddy River, and Meadow Valley Wash from its existing poor-to-fair condition to good-or-better condition by replacing *Tamarix* with native species.

A.3.4.12.2.2. FMU Wildland Fire Suppression Objectives & Strategies

Fire Suppression Objectives: Primary Wildland Fire Protection/Suppression Objective: Protect human life and property values while minimizing impacts to T&E Species populations and habitat, especially within the Virgin River, Muddy River, and Meadow Valley Wash riparian corridors.

Fire Suppression Strategies: Appropriate Management Response will be applied toward the primary resource objective of preventing large, high-intensity wildfires in the riparian corridor of the Virgin River, the Muddy River, and Meadow Valley Wash.

Wildland fires will be fought aggressively to minimize threats or impacts to human life, safety, and property values.

Life and property protection tactics must be weighed against T&E/sensitive species constraints. All fires in this FMU will require on-site coordination with an approved Resource Advisor. All fires in this FMU will be fought using Minimum Impact Suppression Tactics, to the maximum extent feasible.

Suppression/Protection Priorities:

- Regional municipal watershed protection and enhancement
- Dispersed private properties and developments
- T&E and sensitive species populations
- All aquatic and riparian habitat

FMU Target Individual Wildland Fire Size: 25 acre(s) @ 90%

FMU Target Acres Burned Per Decade: 250 acres

A.3.4.12.2.3. FMU Wildland Fire Operational Constraints, Objectives & Strategies

Special Fire Management Consideration/Areas: This discontinuous FMU consists of the non-urban segments of the riparian corridors of the Virgin River, Muddy River and Meadow Valley Wash. These lotic riparian systems provide habitat to numerous T&E/sensitive species, including local endemics. Life and property protection tactics within this FMU must be weighed against T&E species and habitat constraints. All fires in the Virgin River, Muddy River, and Meadow Valley Wash riparian corridor will require on-site coordination with a BLM approved Resource Advisor.

A.3.4.12.2.3.1. Wildland Fire Operational Constraints Objectives & Strategies:

A.3.4.12.2.3.1.1. Riparian/aquatic Habitat Constraints:

- Apply M.I.S.T. within all riparian habitat
- In riparian areas, prioritize suppression actions to minimize damage to stands of native vegetation from wildfire or suppression operations
- Fire suppression in riparian habitat will be coordinated with the approved Resource Advisor
- In riparian areas, use natural barriers or openings in riparian vegetation where possible as the easiest, safest method to manage a riparian wildfire. Where possible and practical use wet firebreaks rather than constructing firelines by hand or with heavy equipment
- Avoid burning out unburned islands, whenever possible
- Utilize firing tactics only if necessary to protect firefighter or public safety
- Avoid surface disturbing suppression activities in riparian areas whenever possible
- Avoid dropping retardant within 300 feet of water sources, to the maximum extent feasible
- Unless given case by case approval from the US Fish and Wildlife Service, the Virgin River above Halfway Wash and the Muddy River CAN NOT be used as a water source for suppression (dip site, pump drafting, etc.), due to the presence of federally-listed threatened and endangered fish species. EXCEPTION: Imminent threat to life or valuable property as determined by the Incident Commander.
- Use of containment systems for portable pumps to avoid fuel spills in riparian or aquatic systems will be required.

A.3.4.12.2.3.1.2. Desert Tortoise:

- Initiate full suppression activities with minimum surface disturbances to reduce loss of tortoise cover and to minimize the spread of exotic annual grasses.
- Require consultation with a qualified Resource Advisor for all wildfires within desert tortoise habitat, particularly within ACEC's and designated critical habitat units.
- Restrict OHV travel and the use of tracked vehicles to the minimum necessary to suppress wildfires within desert tortoise habitat, particularly within ACEC's and designated critical habitat units; obliterate all tracks to reduce possibility of future use.
- Use of aerial retardant is authorized; foam or fugitive retardant is preferable to iron oxide retardant.
- Do not authorize burning out of unburned fingers or islands of vegetation. The exception to this case would be the removal of fuels for safety concerns.

- Establish fire camps, staging areas, and helispots in previously disturbed areas outside of ACEC's and designated critical habitat units, where possible, in consultation with a qualified Resource Advisor.
- Provide all firefighters and support personnel with a briefing on desert tortoises and their habitat to minimize take, particularly those associated with vehicle use.

A.3.4.12.2.3.1.3. Wilderness:

- A Resource Advisor will be dispatched to all fires occurring in or threatening a wilderness area.
- Use of Heavy equipment (bulldozers, etc.) will only be used in Wilderness if the fire is threatening human life or property. The Field Manager must approve the use of heavy equipment in all cases.
- Motorized vehicles used in fire suppression efforts will remain on "cherrystem" roads or predetermined existing ways inside Wilderness.
- Air resources including helicopters and SEAT's will be included in the WILDCAD system for all wilderness fire suppression activities.
- Helibases, staging areas, and fire camps will be located outside of wilderness areas, unless authorized by the Field Manager.
- Use of retardant must be approved by the Field Manager.
- If retardant is not approved, water may be dropped from aircraft.
- Landing of helicopters will be kept to a minimum and will only occur in existing openings.
- All fire suppression activities will use Minimum Impact Suppression Techniques (MIST) at all times. See attached MIST Guidelines.
- Hand crews may use conventional hand tools and, with approval from the Resource Advisor, may conservatively use chainsaws for fire line construction. Chainsaw use and line width should be kept to a minimum. Utilization of existing natural barriers, minimum "scratch line", and cold trailing is encouraged where feasible. Handline construction will be rehabilitated back to the natural contour.
- A "Leave No Trace" policy will be used in the wilderness area. All evidence of human activity must be removed, to the maximum extent possible.
- Noxious weeds will be controlled in conformance with the attached "Las Vegas Field Office Noxious Weed Control, Fire Management Weed Transport Control" guidelines.

A.3.4.12.2.3.1.4. Noxious Weeds and Invasive Species Transport Control Procedures:

Las Vegas Field Office Noxious Weed Control and Fire Management Weed Transport Control:

- Off-district engines, crew carriers, overhead vehicles, and helitack/helicopter support vehicles will, upon check-in and prior to proceeding to the line, wash down at the, Logandale, Red Rock, Pahrump Fire Stations or a commercial truck washing station. This will be determined

by the location of the units' last fire assignment and if they were cleaned at release from that assignment.

  - The washdown will concentrate on the undercarriage, with special emphasis on axles, frame, crossmembers, motor mounts, and on and underneath steps, running boards, and front bumper/brushguard assemblies. Vehicle cabs will be swept out with refuse disposed of in waste receptacles. In wilderness areas, all portable equipment used on an incident (pumps, hose, fittings, water storage items) will be washed off to rid them of any seed or spores that may be attached from previous fires in noxious weed infested sites.

  - During initial briefings, washdowns will be mentioned and facilities made available for oncoming crews.

- Las Vegas Field Office crews will follow the same procedures identified in Item 1 when returning from fieldwork or wildland fires, especially when vehicles are used in know noxious weed areas infested with known noxious or invasive species common to the Field Office area.

- Upon leaving the Field Office when released from an incident, all off-unit vehicles will follow aforementioned washdown procedures so that Las Vegas' noxious weed problems do not become someone else's problems.

- All equipment used off pavement will be cleaned of weed and grass seed stems, stalks, etc. prior to release from an incident. This includes, but is not limited to, tents, tarps, helicopter support equipment, foldatanks and free-standing tanks, mechanic's vehicles, and logistical support vehicles, trailers and equipment. These vehicles will be washed as in 1.a. above.

This Field Office policy will be followed by all equipment involved in fire suppression while on Las Vegas Field Office assignments. Vehicles will be cleared of washdown procedures during checkout and crew evaluations. In the event vehicles are released from fires away from the district office, the closest wash facility, (government or commercial) will be utilized.

A.3.4.12.2.4. FMU Wildland Fire Use Objectives & Strategies

Wildfire will not be used as a management tool within this FMU at this time.

A.3.4.12.2.5. Burned Acre Objective Review

IF the FMU decadal wildfire acre-burned target has been reached or exceeded PRIOR TO THE COMPLETION OF THE 10-YEAR PLANNING PERIOD, from either wildfire or prescribed fire, a review of fire management objectives and strategies will be initiated to develop new suppression criteria on wildland fire occurrence and prescribed fire acre goals.

A.3.4.12.2.6. FMU Prescribed Fire Objectives & Strategies

Prescribed Fire Objectives: Use integrated weed management techniques to control and eradicate tamarisk, such as *burning*, chemical, biological or mechanical treatments, where potential for treatment is good. Rehabilitate with native species to help reduce the potential for tamarisk re-establishment and improve ecosystem health (RMP, RP-1-f).

Prescribed Fire Strategies: *Note:* Noxious/Invasive species will be the only vegetation burned, and then only when deemed necessary to eliminate dozer piles or to reduce standing biomass preparatory to mechanical treatment.

Rx Fire Annual & Decadal Acre Target:

- Annual: Maximum of 150 (Tamarisk only)
- Decadal: 1,500 acres

T & E Species Strategies: There are presently no prescribed fire treatments planned in this FMU, but future treatments are probable. Endangered Species Act Section 7 consultation procedures and Fish and Wildlife Service concurrence will be achieved, prior to the commencement of any future on-the-ground treatments. At the discretion of the Service, the consultation process will either entail a formal programmatic consultation for the entire FMU or else individual project-level informal consultations. All terms and conditions, minimization measures, and other stipulations in those consultation agreements will be adhered to during the implementation of any BLM treatments in this FMU.

Air Quality Strategy: Any burning operations will be conducted to minimize smoke impacts to urban communities, dispersed residences, and nearby highway traffic.

Project level prescribed fire plans will address smoke management.

NEPA Compliance: Prior to implementation of any proposed projects, site-specific NEPA documentation will be completed, as applicable.

Rx Fire Monitoring Strategy: Any use of Rx fire will be in conjunction with Virgin River, Muddy River, and Meadow Valley Wash tamarisk restoration treatments. In all phases of this undertaking, including any use of Rx fire, the monitoring, documentation, and dissemination of treatment effectiveness data will be a priority action.

A.3.4.12.2.7. FMU Non-Fire Fuels Treatment Objectives & Strategies

Non-Fire Fuels Treatment Objectives: Use integrated weed management techniques to control and eradicate tamarisk, such as *burning*, chemical, biological or mechanical treatments, where potential for treatment is good. Rehabilitate with native species to help reduce the potential for tamarisk re-establishment and improve ecosystem health (RMP, RP-1-f).

The current and future tamarisk treatments within this FMU will contribute to WUI watershed enhancement, lotic riparian habitat restoration, invasive noxious weed control, and T&E Species conservation and/or recovery. These multi-phase, multi-year treatments may entail pile and or broadcast burning in conjunction with mechanical and chemical tamarisk removal.

Non-Fire Fuels Treatment Strategies: *Note:* Noxious/Invasive species will be the only vegetation burned, and then only when deemed necessary to eliminate dozer piles or to reduce standing biomass preparatory to mechanical treatment.

Non-Fire Annual & Decadal Acre Target:

- Annual: maximum of 150 (Tamarisk only)
- Decadal: 1,500 acres

T & E Species Strategies: Any vegetative (tamarisk) treatments in the Virgin River, Muddy River or Meadow Valley riparian systems will be designed in early and close collaboration with the USFWS, due to multiple T&E species issues. Endangered Species Act Section 7 consultation procedures and FWS concurrence will be accomplished, prior to the commencement of any on-the-ground treatment activity. All Section 7 terms and conditions, minimization measures, and stipulations will be enforced throughout the duration of each treatment project or activity phase.

Air Quality Strategies: This FMU does not contain any non-attainment airsheds. Fire management activities in this FMU may include fire suppression, open burning, light and heavy equipment mobilization and fuels treatment activities, both chemical and biological. Fire management activities in this FMU may include fire suppression, open burning, and light and heavy equipment mobilization. Fire Management Open burning (RX FIRE) is permitted in Clark County with a courtesy call to the Department of Health. Open burning is defined here "where fire is set either by OFFICERS of governmental agencies, in performance of their official duties or the purposes of training and instruction of firefighting and fire-rescue personnel". (*Section 42-Open Burning, Clark County Air Quality Regulations*).

The Clark County Implementation Plan (IP) is independent of the state IP and is administered by the Department of Air Quality Management (DAQM). In 2002, DAQM determined that the BLM Virgin River tamarisk projects are exempt from Dust Control Permit requirements (Clark County Air Quality Regulations, revised 01/23/97), per Exception 17.2.1(1): "agricultural operations".

The short-term use of small-mechanized equipment used for the project may cause some minor soil disturbances and potential increases in PM10 emissions, however it is anticipated that there will be no significant impact to air quality. Where applicable, water will be used as a dust control measure.

If dust emissions during mechanical treatment activities result in any complaints from the public, the operation will be re-evaluated to identify dust mitigation measures that can be implemented cost-effectively and without undue delays to the overall project schedule.

NEPA Compliance: The following procedures will be completed for all fuels treatment projects:

- Chemical applications:
  - Operational compliance with EPA label restrictions
  - File for and obtain BLM Pesticide Use Permits (PUP's)
  - Complete daily Pesticide Application Records (PAR's)
  - Submit annual Pesticide Use Reports to the Nevada Department of Agriculture
  - Obtain/Maintain Nevada Pesticide Applicator Certification training for designated Field Office personnel
  - Ensure that all contractors obtain/possess current Nevada Pesticide Applicators Commercial License
- NEPA compliance:
  - Ensure all projects comply with LUP direction

  - Prepare appropriate project level and/or programmatic NEPA documents (EA's, DNA's, ROD, etc.)

- ESA compliance:
  - Complete project level and/or programmatic Section 7 consultations for all fuels treatments, in early and close coordination with USFWS
  - If project conditions change, initiate re-consultation procedures as appropriate.

Treatment Monitoring Strategy:

- Treatment effectiveness monitoring will be conducted in partnership with USGS, UNR, UNLV, and other parties as identified
- Monitoring treatment sites for invasive species re-infestation will be conducted
- Continue photo-monitoring studies to track post-treatment revegetation success, native plant recruitment progress and successional patterns.

A.3.4.12.2.8. FMU Post Fire Rehab/Restoration Objectives & Strategies

- Treatments will comply with the LVFO Normal Fire Rehabilitation Plan and Environmental Assessment (E.A. No. NV-054-9-24), with one exception. The NFRP stipulates that rehabilitation treatments will only be considered for those areas receiving mean annual precipitation of 8 inches or more. Due to the high surface water tables in the riparian floodplains, re-seeding has shown success and will continue to be applied.
- In the event that suppression efforts require off-road vehicle operations, replant and visually camouflage the first 200 feet of tire tracks in order to prevent further habitat impacts (due to public use of these track ways).
- Whenever feasible, utilize native species in seeding and/or re-planting treatments.
- Cultivate local supplies of live plant materials for use during riparian restoration efforts.
- Maintain a seed bank of locally collected native plant species for use in restoring both fire fuels treatments and fire-disturbed sites.
- Cultivate and develop varieties of locally collected native seed by means of plant material centers.

A.3.4.12.2.9. FMU Community Protection/Community Assistance Objectives & Strategies

Communities at Risk/WUI Areas: There are no communities at risk in this FMU. Communities-at-risk, community protection/assistance and public education strategies and objectives will be further defined through the LVFO RAMS Fire Plan update, which is scheduled for 2005.

Community Protection/Community Assistance Objectives: N/A

Community Protection/Community Assistance Strategy:

- Complete the 1,700-acre Mesquite/Bunkerville Healthy Forests Initiative tamarisk fuels reduction project. This project will include the restoration of non-fire prone native riparian vegetation, which will minimize the future threat of large, high-intensity wildland fires in this FMU.

- Complete and/or initiate additional tamarisk treatments throughout this lotic riparian FMU to protect WUI watershed and T&E species values.

Community Wildfire Safety Education Strategy: N/A

A.3.4.12.3. FMU Fire Program Analysis - Quantifiable Objective Summary

Initial Attack Success	Decadal Wildfire Acres Burn Tolerance	WFU Decadal Target Acres	Rx Fire Acres Per Decade	Non-Fire Acres Per Decade
25 acres @ 90%	250	N/A	1,500	1,500

A.3.4.13. High Juniper

NV050 - 12

FMU Name & Unit No.: **High Juniper; NV050-12**

FMU Type/Category: **High Value Habitat (HVH)**

A.3.4.13.1. FMU Description:

A.3.4.13.1.1. FMU Location Information

Geographic boundaries: This discontinuous FMU consists of pinyon-juniper woodland in the South McCullough Range and on the western edge of the Spring Range. The FMU unifying attribute is crucial habitat for bighorn sheep and Mule deer. Most of the South McCullough portion of the FMU is Wilderness.

A.3.4.13.1.2. FMU Acre Total

Ownership by Acres and Percent		
NV 050-12	**High Juniper**	
Ownership	**Acres**	**Percent**
Bureau of Land Management	36,403	100.0
Total Acres	36,403	

A.3.4.13.1.3. Fire Occurrence and History

FMU Number	**Decadal (94-03)**	**24 Years (80-03)**	**Ignition Cause (80-03)**	
NV 050-12			Lightning	10
Number of Fires	8	13	Human/Other	3
Largest Fire (Acres)	38.0	38.0	**Multiple Fire Days (80-03)**	
Total Acres Burned	59.5	93.0	Total Multiple Fire Days (MFD)	7
Average Fire Size (Acres)	7.4	7.2	Number of MFD Fires	7
			Total Acres Burned by Multiple Fires	22.4

Narrative Description: In comparison to the core portion of the Spring Range, which has similar vegetation and topography, wildfire has not played a major role in the South McCulloughs in recent decades. This may in part reflect the absence of human presence in this remote area, which greatly decreases the incidence of human-caused ignitions. Lack of a fine fuel understory in the closed pinyon-juniper stands further contributes to the "asbestos" reputation of the South McCulloughs. However, the vegetation in this FMU also includes mountain shrub types as well as open canopy pinyon-juniper stands. In years of ephemeral build-up of red brome, cheatgrass and other non-native annuals, the potential will exist for fires to exhibit unusual spread and intensity, including the possibility of running crown fire and spotting behavior. Wildfires in this FMU typically occur during the summer, associated with convective thunderstorms resulting from monsoonal airflows from the Gulf of Mexico.

General Fire Protection Characteristics: The vegetation in this FMU comprises fire-tolerant mountain chaparral and pinyon pine-Utah juniper woodlands. Until such time as a Fire Use Plan is completed for this FMU, it is desirable to allow lightning fires to burn small mosaic openings in the pinyon-juniper, both to improve bighorn sheep and Mule deer forage and to mimic fire's natural role in the Mount Charleston and South McCullough ecosystems. These beneficial objectives must be balanced against the priority to avoid catastrophic fire size and intensity. Due to the virtual roadlessness of this FMU, aerial firefighting tactics and equipment will be mission critical.

A.3.4.13.1.4. FMU Vegetation

FMU Vegetation/Fuel Types		
NV 050-12	**High Juniper**	
Veg/Fuel Type	Acres	Percent
Grassland	150	0.4
Mojave	13,382	36.8
Mountain Shrub	5,825	16.0
Pinyon/Juniper Woodlands	6,023	16.5
Sagebrush	10,919	30.0
Salt Desert Scrub/Shadscale	104	0.3
Grand Total	36,403	

Vegetation Narrative: Mountain chaparral (mountain mahogany, scrub oak, bitterbrush, mountain sagebrush, etc) occurs on prior disturbed areas and in washes and canyons. Pinyon-juniper dominates the slopes and ridges. The higher elevations tend to be close-canopied stands, giving way to open canopy stands and pinyon-juniper savannah in some lower elevational locales within the FMU.

A.3.4.13.1.5. FMU Fuel Models & Live Fuel Moisture Characteristics

Surface Fuel Model & Canopy Cover: There is negligible understory vegetation in much of the pinyon-juniper portion of this FMU. In some years, non-native annual grasses may be present, though not necessarily in fuelbed densities that would support fire spread or intensity. Strong wind events would likely be necessary under any scenario of sizable fire occurrence or potential.

Live Fuel Moisture Averages:

LFM Site	May	June	July	Aug	Sept	Oct
N5G	167%	121%	96%	98%	88%	75%

Live Fuel Moisture Characteristics:

- At live fuel moisture levels of 181% and above fires typically will exhibit Very Low Fire Behavior characteristics
- At live fuel moisture levels of 151% to 180% fires typically will exhibit Low Fire Behavior characteristics
- At live fuel moisture levels of 126% to 150% fires typically will exhibit Moderate Fire Behavior characteristics
- At live fuel moisture levels of 101% to 125% fires typically will exhibit High Fire Behavior characteristics
- At live fuel moisture levels of 75% to 100% fires typically will exhibit Extreme Fire Behavior characteristics
- At live fuel moisture levels of 75% and below fires typically will exhibit Advanced Fire Behavior characteristics

A.3.4.13.1.6. Fire Weather & Climate Related Impacts

(Detailed weather station data for this FMU will be added to the FMP Appendix upon completion of the national fire weather data validation/correction project.)

- Wet lightning is common in this area. Fires generally remain small when starts occur under these common conditions.
- Dry Lightning is possible in this area. Larger fires can occur with these erratic and gusty thunderstorm events.
- Larger fires occur when human ignitions occur under typical warm and windy summer weather.
- Fire behavior can be extreme under these conditions when there are heavy buildups of ephemeral light flashy fuels.

- Fire behavior can be extreme under these conditions in heavy brush and/or Pinyon-Juniper fuels.

A.3.4.13.1.7. Fire Regime

- Fire Regime II; Condition Class II

FMU by Condition Class and Fire Regime			
NV 050-12		**High Juniper**	
CC	FR	Acres	Percent
2	II	14,931	41.0
3	I	648	1.8
	II	20,623	56.7
	IV	194	0.5
Total		36,395	

A.3.4.13.1.8. FMU Physical Characteristics

Topography:

- Elevation Range: 3,998 feet to 6,998 feet
- Slope:
  - Piedmonts and bajadas: 10-30%
  - Ridges: 30 to 40+%
- Aspect: Variable
- Major topographical features:
  - McCullough Mountain
  - Wilson Pass
  - Carpenter Canyon ridge

Access Information: Except for a few unpaved roads, this FMU is almost entirely road-less.

A.3.4.13.1.9. FMU Resource Values & Attributes

Wildland-Urban Interface/Intermix: Communication towers above Wilson Pass

Resource Use:

- Bighorn sheep crucial habitat; Bighorn sheep winter range.
- Mule deer crucial summer habitat; Mule deer winter range.
- Wilderness
- Grazing: Jean Dry Lake Allotment
- Communication towers above Wilson Pass

- Hunting and other forms of dispersed recreation

Air Quality: This FMU does not contain any non-attainment airsheds. Fire management activities in this FMU may include fire suppression, open burning, and light and heavy equipment mobilization. Fire management activities in this FMU may include fire suppression, open burning, and light and heavy equipment mobilization. Fire Management Open burning (RX FIRE) is permitted in Clark County with a courtesy call to the Department of Health. Open burning is defined here "where fire is set either by OFFICERS of governmental agencies, in performance of their official duties or the purposes of training and instruction of firefighting and fire-rescue personnel". (*Section 42-Open Burning, Clark County Air Quality Regulations*).

Rx fire burn plans within NYE County will have an approved variance (Open Burn Permit) from the State of Nevada, Division of Environmental Protection; Smoke Management Program.

Soils: Soils have formed under conditions of physical weathering (rather than chemical dissolution) because of the arid climate. Soils on lower portions of alluvial fans and valley floors contain very little organic material, are moderately to highly alkaline, and can contain high concentrations of gypsum and dissolved salts. A gravelly surface crust (called desert pavement) occurs throughout these areas. Desert pavement is very stable and protects underlying fine-grained soils from erosion. A cemented hardpan layer commonly occurs at shallow depths beneath surface soils throughout these areas. Mountain slopes tend to be covered by an unstable layer of large rocks, boulders, stones, and cobbles. Runoff from periodic rainstorms transports large amounts of material to lower elevations, forming alluvial fans of coarse material and depositing thick sequences of gravelly loams, sands, and finer grained sediments on valley floors.

Soils are susceptible to water and wind erosion. Water erosion occurs during periodic high-intensity, short duration summertime thunderstorms and less frequent, sustained wintertime rainstorms. Water erosion occurs by a combination of sheet flow, rill formation, splashing, and channelized flow in ephemeral washes and stream channels. Wind erosion occurs in areas where the desert pavement layer has been disturbed by human activities or heavy use by wild horses and burros, where large areas of vegetation have been burned by fire, sand dune areas, and as part of physical weathering processes. Soils in very high elevation areas have formed under conditions of greater rainfall. Resulting soils reflect a combination of physical weathering of rocks, chemical dissolution of rocks, and the decomposition of organic materials. Relative shallow soil layers occur on bedrock surfaces in these areas. Soils in these areas contain low to moderate amounts of organic material, are slightly to highly alkaline, and contain lower concentrations of dissolved salts than soils at lower elevations.

Cultural and Paleontological Values: N/A

T&E and Sensitive Species: N/A

Habitat Values:

- Bighorn sheep crucial habitat; Bighorn sheep winter range.
- Mule deer crucial summer habitat; Mule deer winter range
- Springs/riparian areas: Kiup Spring; Pine Spring; Cave Spring; Railroad Spring
- Wild horse and burro Wheeler Pass Herd Management Area

- Raptor nesting and forage habitat

Hydrology and Water Quality: The High Juniper FMU lies primarily within The Central Region hydrographic region, and is a topographically-closed, internally-drained basin. Ephemeral wash channels drain most of the High Juniper FMU and only convey flow after periodic high-intensity summer thunderstorms or sustained winter rainstorms. Rapid runoff to ephemeral wash channels can produce flash flooding and transport large quantities of sediment as water flows from mountainous areas and alluvial fans towards valley floors.

Wilderness or WSA:

- Mt. Charleston Wilderness
- South McCullough Wilderness

A.3.4.13.1.10. FMU Public Safety, Economic & Community Values at Risk

- Life safety (public and firefighters)
- Mt. Charleston Wilderness
- South McCullough Wilderness
- Bighorn sheep crucial habitat
- Mule deer crucial habitat
- Cave Spring and riparian habitat
- Kiup Spring and riparian habitat
- Other springs and riparian habitats
- Wild horse and burro range
- Raptor nesting and forage habitat
- Jean Dry Lake Grazing Allotment
- Communication towers above Wilson Pass

A.3.4.13.1.11. FMU Fire Protection Responsibility

Wildland fire protection on all BLM public lands within this FMU is provided by the Las Vegas Field Office. Structural fire protection on private lands within this FMU is provided by the Clark County Fire Department.

A.3.4.13.2. FMU Objectives & Strategies

A.3.4.13.2.1. FMU Fire Management Objectives Priority Statement

- Protect human life, safety of wildland firefighters, and protection of human safety and health (National Fire Plan 2001).

- Provide fire suppression efforts commensurate with resource and adjacent property values at risk *(LVFO RMP, 1998. Fire Mgt Direction FE-1-a)*.

- Maintain woodland and conifer forest where possible for all-aged stands, with understory vegetation forage value rating at moderate or better (LVFO RMP 1998. Forestry Mgt Objective FR-1).

- Restore plant productivity on disturbed areas of the public lands. Rehabilitate, reclaim, or revegetate areas subjected to surface-disturbing activities, where feasible. When rehabilitating, manage for optimum species diversity by seeding native species, except where non-native species are appropriate (LVFO RMP 1998. Vegetation Mgt Objective VG-2).

- Wilderness areas are to be managed to provide for the protection, the preservation of their natural conditions, and the preservation of their wilderness character [Wilderness Act, Section 4(b), BLM Manual 8560 (.08A1)]. Specific objectives and management direction for the South McCullough and Mt. Charleston Wilderness Areas will be identified in Wilderness Management Plans for the areas (LVFO RMP 1998. Wilderness Mgt Objective WS-2) and (BLM Manual 8560 (.21A)).

- Protect important resting/nesting habitats, such as riparian areas and mesquite/acacia woodlands *(LVFO RMP, 1998. Fish & Wildlife Mgt Direction FW-3-g)*.

Wildfire Management Priorities:

- Prevent catastrophic loss of bighorn sheep and Mule deer habitat from wildfire.

Employ Appropriate Management Response to allow lightning caused occurrences to mimic the natural role of fire in mountain pinyon-juniper.

A.3.4.13.2.2. FMU Wildland Fire Suppression Objectives & Strategies

Fire Suppression Objectives:

- Improve Bighorn sheep and Mule deer browse and forage habitat, by scaling suppression efforts to allow lightning fires to create mosaic openings in the closed canopy pinyon-juniper canopy.

- Insure that firefighting tactics and applications do not impair characteristic values of the Mt. Charleston and South McCullough Wilderness Areas.

- Prioritize the protection of springs/riparian areas, including from impacts due to firefighting tactics or applications.

Fire Suppression Strategies:

- When no threat to fire fighter or public safety is present, use Appropriate Management Response tactics to allow low intensity, lightning caused fire to create small, mosaic-pattern openings in pinyon-juniper closed canopy stands (not to exceed 25 acres per incident).

- Employ aggressive suppression practices whenever the wildfire behavior or site conditions indicate the potential for catastrophic spread or intensity.

- The majority of this FMU is Wilderness, and the FMU includes important local wildlife water sources (especially Kiup and Pine Springs). Use MIST in all Wilderness and/or riparian portions of this FMU, in accordance with the constraints stipulated below.

Suppression/Protection Priorities:

- Life safety (public and firefighters)
- Bighorn sheep crucial habitat
- Mule deer crucial habitat
- Springs and riparian areas
- Mt. Charleston Wilderness
- South McCullough Wilderness

FMU Target Individual Wildland Fire Size: 25 acres @ 90%

FMU Target Acres Burned Per Decade: 1,000 acres

A.3.4.13.2.3. FMU Wildland Fire Operational Constraints, Objectives & Strategies

Special Fire Management Consideration/Areas:

- Bighorn sheep crucial habitat; Bighorn sheep winter range.
- Mule deer crucial summer habitat; Mule deer winter range.
- Springs and riparian habitats
- Wild horse and burro Wheeler Pass Herd Management Area
- Grazing: Jean Dry Lake Allotment
- Mt. Charleston Wilderness
- South McCullough Wilderness

A.3.4.13.2.3.1. Wildland Fire Operational Constraints Objectives & Strategies:

A.3.4.13.2.3.1.1. Wilderness:

- A Resource Advisor will be dispatched to all fires occurring in or threatening a wilderness area.
- Use of Heavy equipment (bulldozers, etc.) will only be used in Wilderness if the fire is threatening human life or property. The Field Manager must approve the use of heavy equipment in all cases.
- Motorized vehicles used in fire suppression efforts will remain on “cherrystem” roads or predetermined existing ways inside Wilderness.

- Air resources including helicopters and SEAT's will be included in the WILDCAD system for all wilderness fire suppression activities.
- Helibases, staging areas, and fire camps will be located outside of wilderness areas, unless authorized by the Field Manager.
- Use of retardant must be approved by the Field Manager.
- If retardant is not approved, water may be dropped from aircraft.
- Landing of helicopters will be kept to a minimum and will only occur in existing openings.
- All fire suppression activities will use Minimum Impact Suppression Techniques (MIST) at all times. See attached MIST Guidelines.
- Hand crews may use conventional hand tools and, with approval from the Resource Advisor, may conservatively use chainsaws for fire line construction. Chainsaw use and line width should be kept to a minimum. Utilization of existing natural barriers, minimum "scratch line", and cold trailing is encouraged where feasible. Handline construction will be rehabilitated back to the natural contour.
- A "Leave No Trace" policy will be used in the wilderness area. All evidence of human activity must be removed, to the maximum extent possible.
- Noxious weeds will be controlled in conformance with the attached "Las Vegas Field Office Noxious Weed Control, Fire Management Weed Transport Control" guidelines.

A.3.4.13.2.3.1.2. Riparian Areas:

- Apply M.I.S.T. within riparian habitat
- In riparian areas, prioritize suppression actions to minimize damage to native vegetation from wildfire or suppression operations
- Fire suppression in riparian habitat will be coordinated with the approved Resource Advisor
- In riparian areas, use natural barriers or openings in riparian vegetation where possible as the easiest, safest method to manage a riparian wildfire. Where possible and practical use wet firebreaks rather than constructing firelines by hand or with heavy equipment
- Avoid burning out unburned islands, whenever possible
- Utilize firing tactics only if necessary to protect firefighter or public safety
- Avoid surface disturbing suppression activities in riparian areas whenever possible
- Avoid dropping retardant within 300 feet of water sources, to the maximum extent feasible
- Use of containment systems for portable pumps to avoid fuel spills in riparian or aquatic systems will be required.

A.3.4.13.2.3.1.3. Noxious Weeds and Invasive Species Transport Control Procedures:

Las Vegas Field Office Noxious Weed Control and Fire Management Weed Transport Control:

- Off-district engines, crew carriers, overhead vehicles, and helitack/helicopter support vehicles will, upon check-in and prior to proceeding to the line, wash down at the, Logandale, Red Rock, Pahrump Fire Stations or a commercial truck washing station. This will be determined by the location of the units' last fire assignment and if they were cleaned at release from that assignment.
    - The washdown will concentrate on the undercarriage, with special emphasis on axles, frame, crossmembers, motor mounts, and on and underneath steps, running boards, and front bumper/brushguard assemblies. Vehicle cabs will be swept out with refuse disposed of in waste receptacles. In wilderness areas, all portable equipment used on an incident (pumps, hose, fittings, water storage items) will be washed off to rid them of any seed or spores that may be attached from previous fires in noxious weed infested sites.
    - During initial briefings, washdowns will be mentioned and facilities made available for oncoming crews.
- Las Vegas Field Office crews will follow the same procedures identified in Item 1 when returning from fieldwork or wildland fires, especially when vehicles are used in know noxious weed areas infested with known noxious or invasive species common to the Field Office area.
- Upon leaving the Field Office when released from an incident, all off-unit vehicles will follow aforementioned washdown procedures so that Las Vegas' noxious weed problems do not become someone else's problems.
- All equipment used off pavement will be cleaned of weed and grass seed stems, stalks, etc. prior to release from an incident. This includes, but is not limited to, tents, tarps, helicopter support equipment, foldatanks and free-standing tanks, mechanic's vehicles, and logistical support vehicles, trailers and equipment. These vehicles will be washed as in 1.a. above.

This Field Office policy will be followed by all equipment involved in fire suppression while on Las Vegas Field Office assignments. Vehicles will be cleared of washdown procedures during checkout and crew evaluations. In the event vehicles are released from fires away from the district office, the closest wash facility, (government or commercial) will be utilized.

A.3.4.13.2.4. FMU Wildland Fire Use Objectives & Strategies

Wildfire will not be used as a management tool within this FMU at this time.

A.3.4.13.2.5. Burned Acre Objective Review

IF the FMU decadal wildfire acre-burned target has been reached or exceeded PRIOR TO THE COMPLETION OF THE 10-YEAR PLANNING PERIOD, from either wildfire or prescribed fire, a review of fire management objectives and strategies will be initiated to develop new suppression criteria on wildland fire occurrence and prescribed fire acre goals.

A.3.4.13.2.6. FMU Prescribed Fire Objectives & Strategies

Prescribed Fire Objectives & Strategies: Prescribed fire will not be used as a management tool within this FMU at this time.

Rx Fire Annual & Decadal Acre Target: N/A

T & E Species Strategies: N/A

Air Quality Strategy: N/A

NEPA Compliance: Prior to implementation of any proposed projects, site-specific NEPA documentation will be completed, as applicable.

Rx Fire Monitoring Strategy: Monitoring will be completed for attainment/non-attainment of project specific resource management objectives, as applicable.

A.3.4.13.2.7. FMU Non-Fire Fuels Treatment Objectives & Strategies

Non-Fire Fuels Treatment Objectives & Strategies: Non-fire fuels treatments will not be used as a management tool within this FMU at this time.

Non-Fire Annual & Decadal Acre Target: N/A

T & E Species Strategies: N/A

Air Quality Strategies: N/A

NEPA Compliance: Prior to implementation of any proposed projects, site-specific NEPA documentation will be completed, as applicable.

Treatment Monitoring Strategy: Monitoring will be completed for attainment/non-attainment of project specific resource management objectives, as applicable.

A.3.4.13.2.8. FMU Post Fire Rehab/Restoration Objectives & Strategies

Restore plant productivity on disturbed areas of the public lands. Rehabilitate, reclaim, or revegetate areas subjected to surface-disturbing activities, where feasible. When rehabilitating, manage for optimum species diversity by seeding native species, except where non-native species are appropriate.

- In the event that suppression efforts require off-road vehicle operations, replant and visually camouflage the first 200 feet of tire tracks in order to prevent further habitat impacts (due to public use of these track ways).
- Whenever feasible, utilize native species in seeding and/or re-planting treatments.
- Cultivate local supplies of live plant materials for use during riparian restoration efforts.
- Maintain a seed bank of locally collected native plant species for use in restoring both fire fuels treatments and fire-disturbed sites.
- Cultivate and develop varieties of locally grown native seed by means of plant material centers.

A.3.4.13.2.9. FMU Community Protection/Community Assistance Objectives & Strategies

Communities at Risk/WUI Areas: N/A. Communities-at-risk, community protection/assistance and public education strategies and objectives will be further defined through the LVFO RAMS Fire Plan update, which is scheduled for 2005.

Community Protection/Community Assistance Objectives: N/A

Community Protection/Community Assistance Strategy: N/A

Community Wildfire Safety Education Strategy: N/A

A.3.4.13.3. FMU Fire Program Analysis - Quantifiable Objective Summary

Initial Attack Success	Decadal Wildfire Acres Burn Tolerance	WFU Decadal Target Acres	Rx Fire Acres Per Decade	Non-Fire Acres Per Decade
25 acres @ 90%	1000	N/A	N/A	N/A

A.3.4.14. Ash Meadows

NV050-13

FMU Name & Unit No.: **Ash Meadows; NV050-13**

FMU Type/Category: **Special Management Area (SMA)**

A.3.4.14.1. FMU Description:

A.3.4.14.1.1. FMU Location Information

Geographic boundaries: This FMU incorporates the Ash Meadows National Wildlife Refuge, plus 9,460 acres of imbedded BLM land that is pending as a withdrawal to the USFWS; together with surrounding BLM lands that are managed as the Ash Meadows ACEC. The FMU abuts the California/Nevada border, 120 highway miles northwest of Las Vegas Valley.

A.3.4.14.1.2. FMU Acre Total

Ownership by Acres and Percent		
NV 050-13	**Ash Meadows**	
Ownership	**Acres**	**Percent**
Bureau of Land Management	37,478	71.5
Private	14,918	28.5
Total Acres	52,396	

A.3.4.14.1.3. Fire Occurrence and History

FMU Number	Decadal (94-03)	24 Years (80-03)	Ignition Cause (80-03)	
NV 050-13			Lightning	1
Number of Fires	4	7	Human/Other	6
Largest Fire (Acres)	1,100.0	1,100.0	**Multiple Fire Days (80-03)**	
Total Acres Burned	1,360.3	1,444.3	Total Multiple Fire Days (MFD)	1
Average Fire Size (Acres)	340.1	206.3	Number of MFD Fires	1
			Total Acres Burned by Multiple Fires	10.0

Narrative Description: The riparian/marsh portion of this FMU is infested with tamarisk, mainly along a series of irrigation channels. These introduced non-native fuels allow transport of fire into the interior of the marsh system. Tamarisk and other undesirable plant species also promote wildfires of larger size and intensity, versus the historical norm for this ecosystem.

Most wildfires in this FMU occur on the National Wildlife Refuge, and generally involve tamarisk as the carrier fuel. Tamarisk fires in this FMU tend to be fuel driven, rather than wind dependent. Aside from tamarisk, the other vegetative type that is prone to fire within this FMU consists of scattered stands of mesquite/acacia woodland. Tamarisk fires here have exhibited high intensity and spread, whereas fires in the mesquite/acacia are usually single tree. Fires generally occur from April through October.

General Fire Protection Characteristics: This FMU boundary covers the Ash Meadows National Wildlife Refuge, plus imbedded BLM land that is in the process of being withdrawn to the USFWS, plus a surrounding ring of BLM land (Ash Meadows ACEC). The unified attribute of this FMU is that it contains a concentration of springs and seeps supporting 23 endemic species and other T&E/sensitive species. Ash Meadows is listed as a Ramsar Wetland of International Importance. This FMU contains private residential and commercial in-holdings, and the NWR administrative and residential facility. Property protection tactics in this FMU must be balanced against the priority constraint to minimize impacts to T&E/sensitive/endemic species populations and habitat, both from fire and from firefighting activities.

A.3.4.14.1.4. FMU Vegetation

FMU Vegetation/Fuel Types		
NV 050-13	**Ash Meadows**	
Veg/Fuel Type	Acres	Percent
Aspen/Ash	12,026	22.9
Mojave	29,181	55.5
Salt Desert Scrub/Shadscale	11,412	21.7
Grand Total	52,620	

Vegetation Narrative: Approximately 23% of this FMU is riparian and marsh vegetation. In undisturbed areas of this habitat, saltgrass is the carrier fuel and will burn at moderate intensity and spread. The remainder of the FMU (the surrounding ACEC) is predominately creosote bursage and saltbush, with scattered stands of mesquite/acacia.

A.3.4.14.1.5. FMU Fuel Models & Live Fuel Moisture Characteristics

Surface Fuel Model & Canopy Cover: Wildfires in this portion of the FMU are rare, and generally depend upon ephemeral buildups of red brome and other introduced fine fuels.

Live Fuel Moisture Averages:

LFM Site	May	June	July	Aug	Sept	Oct
N5C	189%	130%	93%	92%	99%	89%

Live Fuel Moisture Characteristics:

- At live fuel moisture levels of 181% and above fires typically will exhibit Very Low Fire Behavior characteristics
- At live fuel moisture levels of 151% to 180% fires typically will exhibit Low Fire Behavior characteristics
- At live fuel moisture levels of 126% to 150% fires typically will exhibit Moderate Fire Behavior characteristics
- At live fuel moisture levels of 101% to 125% fires typically will exhibit High Fire Behavior characteristics
- At live fuel moisture levels of 75% to 100% fires typically will exhibit Extreme Fire Behavior characteristics
- At live fuel moisture levels of 75% and below fires typically will exhibit Advanced Fire Behavior characteristics

A.3.4.14.1.6. Fire Weather & Climate Related Impacts

(Detailed weather station data for this FMU will be added to the FMP Appendix upon completion of the national fire weather data validation/correction project.)

- Wet lightning is common in this area. Fires generally remain small when starts occur under these common conditions.
- Dry Lightning is possible in this area. Larger fires can occur with these erratic and gusty thunderstorm events.
- Larger fires occur when human ignitions occur under typical warm and windy summer weather.
- Fire behavior can be extreme under these conditions in heavily infested tamarisk riparian areas.
- Fire behavior can be extreme under these conditions when there are heavy buildups of ephemeral light flashy fuels.
- Fire behavior can be extreme under these conditions in heavy brush and/or Pinyon-Juniper fuels.

A.3.4.14.1.7. Fire Regime

- Upland Vegetation: Fire Regime V; Condition Class II
- Riparian Vegetation: Fire Regime II; Condition Class III

FMU by Condition Class and Fire Regime			
NV 050-13		**Ash Meadows**	
CC	FR	Acres	Percent
1	IV	11,659	22.4
2	V	24,619	47.4
3	IV	12,096	23.3
	V	3,616	7.0
Total		51,991	

A.3.4.14.1.8. FMU Physical Characteristics

Topography:

- Elevation Range: 2,150 feet to 4,000
- Slope: Generally less than 10%; with 10-30% on the eastern ridgeline
- Aspect: Flat
- Major topographical features:
  - Ash Meadows
  - Carson Slough
  - "East Hills"
  - Crystal Reservoir

Access Information: The main access consists of State Route 373. The FMU has numerous unpaved roads.

A.3.4.14.1.9. FMU Resource Values & Attributes

Wildland-Urban Interface/Intermix:

- Private in-holding residences
- Private in-holding mine operations
- USFWS administrative and residential facility
- Dispersed utility line ROW's

Resource Use:

- T&E/sensitive/endemic species habitats and populations (65)
- Desert springs and seeps

- NWR administrative and residential facility
- Residential in-holdings
- Utility line ROW's
- Commercial in-holdings (clay mines)
- Dispersed recreation; hunting; fishing; special use permit activities

Air Quality: There are no non-attainment airsheds in this FMU. Rx fire burn plans within NYE County will have an approved variance (Open Burn Permit) from the State of Nevada, Division of Environmental Protection; Smoke Management Program.

Soils: Soils have formed under conditions of physical weathering (rather than chemical dissolution) because of the arid climate. Soils on lower portions of alluvial fans and valley floors contain very little organic material, are moderately to highly alkaline, and can contain high concentrations of gypsum and dissolved salts. A gravelly surface crust (called desert pavement) occurs throughout these areas. Desert pavement is very stable and protects underlying fine-grained soils from erosion. A cemented hardpan layer commonly occurs at shallow depths beneath surface soils throughout these areas. Mountain slopes tend to be covered by an unstable layer of large rocks, boulders, stones, and cobbles. Runoff from periodic rainstorms transports large amounts of material to lower elevations, forming alluvial fans of coarse material and depositing thick sequences of gravelly loams, sands, and finer grained sediments on valley floors.

Soils are susceptible to water and wind erosion. Water erosion occurs during periodic high-intensity, short duration summertime thunderstorms and less frequent, sustained wintertime rainstorms. Water erosion occurs by a combination of sheet flow, rill formation, splashing, and channelized flow in ephemeral washes and stream channels. Wind erosion occurs in areas where the desert pavement layer has been disturbed by human activities or heavy use by wild horses and burros, where large areas of vegetation have been burned by fire, sand dune areas, and as part of physical weathering processes.

Cultural and Paleontological Values: N/A

T&E and Sensitive Species:

- Ash Meadows naucorid (endemic)
- Devil's Hole pupfish (endemic)
- Ash Meadows Amargosa pupfish (endemic)
- Warm Spring Amargosa pupfish (endemic)
- Nevada speckled dace (endemic)
- Desert tortoise, low density habitat
- Southwestern willow flycatcher
- Yuma clapper rail
- Ash Meadows milkvetch (endemic)

- Spring-loving centaury
- Ash Meadows sunray (endemic)
- Ash Meadows gum plant (endemic)
- Ash Meadows ivesia (endemic)
- Ash Meadows blazing star (endemic)
- Amargosa niterwort (endemic)

Habitat Values:

- T&E and/or endemic species (15), including Devil's Hole pupfish, Nevada speckled dace, Southwestern willow flycatcher, Yuma clapper rail, Ash Meadows gum plant, Ash Meadows ivesia
- Sensitive and/or endemic species (50), including Fairbanks spring snail, Amargosa naucorid, Phainopepla, Lucy's warbler, Spotted bat, Death Valley sage, Ash Meadows mountain vole
- Desert springs and seeps
- Bighorn sheep crucial habitat; Bighorn sheep winter habitat

Hydrology and Water Quality: The Ash Meadows FMU lies primarily within The Death Valley Basin hydrographic region, and is a topographically-closed, internally-drained basin. Ephemeral wash channels drain most of the Ash Meadows FMU and only convey flow after periodic high-intensity summer thunderstorms or sustained winter rainstorms. Rapid runoff to ephemeral wash channels can produce flash flooding and transport large quantities of sediment as water flows from mountainous areas and alluvial fans towards valley floors.

Wilderness or WSA: N/A

A.3.4.14.1.10. FMU Public Safety, Economic & Community Values at Risk

- T&E/sensitive/endemic species habitats and populations (65)
- Desert springs and seeps
- NWR administrative and residential facility
- Residential in-holdings
- Utility line ROW's
- Commercial in-holdings (clay mines)

A.3.4.14.1.11. FMU Fire Protection Responsibility

Wildland fire protection on all BLM public lands within this FMU is provided by the Las Vegas Field Office. Structural fire protection on private lands within this FMU is provided by the Amargosa Volunteer Fire Department and Pahrump Valley Fire Department.

A.3.4.14.2. FMU Objectives & Strategies

A.3.4.14.2.1. FMU Fire Management Objectives Priority Statement

- Protect human life, safety of wildland firefighters, and protection of human safety and health (National Fire Plan 2001).

- Use approved fire suppression techniques in areas of critical environmental concern where there are concerns for habitat, threatened and endangered species, and urban/rural/wildland interface zones (LVFO RMP, 1998. Fire Management Direction FE-1-d).

- Provide fire suppression efforts commensurate with resource and adjacent property values at risk (LVFO RMP, 1998. Fire Mgt Direction FE-1-a).

- Manage habitat to further sustain the populations of federally listed species so they would no longer need protection of the Endangered Species Act. Manage habitats for non-listed special status species to support viable populations so that future listing would not be necessary *(LVFO RMP, 1998. Special Status Species Objective SS-2).*

- Determine specific hazard reduction priorities, including any noxious or invasive species infestations, and implement according to the existing budget (LVFO RMP, 1998. Fire Mgt Direction FE-2-a).

- Determine specific prescribed burn priorities annually, including any noxious or invasive species infestations, and implement where possible (LVFO RMP, 1998. Fire Mgt Direction FE-3-a).

- Use integrated weed management techniques to control and eradicate tamarisk, such as burning, chemical, biological or mechanical treatments, where potential for treatment is good. Rehabilitate with native species to help reduce the potential for tamarisk re-establishment and improve ecosystem health (LVFO RMP, 1998. Riparian Mgt Objective RP-1-f).

- Maintain or improve the condition of vegetation on public lands to a Desired Plant Community or to a Potential Natural Community (LVFO RMP, 1998. Vegetation Mgt Objective VG-1).

- Restore plant productivity on disturbed areas of the public lands (LVFO RMP, 1998. Vegetation Mgt Objective VG-2).

- Rehabilitate, reclaim, or revegetate areas subjected to surface-disturbing activities, where feasible. When rehabilitating, manage for optimum species diversity by seeding native species, except where non-native species are appropriate (LVFO RMP, 1998. Vegetation Mgt Direction VG-2a).

- Protect important resting/nesting habitats, such as riparian areas and mesquite/acacia woodlands *(LVFO RMP, 1998. Fish & Wildlife Mgt Direction FW-3-g).*

- Improve disturbed non-game bird habitat, including the water table supporting these habitats, by emphasizing maintenance and enhancement of natural biodiversity (LVFO RMP, 1998. Fish & Wildlife Mgt Direction FW-3-h).

- Manage special status species habitat at the potential natural community or desired plant community, according to the need of the species (LVFO RMP, 1998. Special Status Species Objective SS-1).

- Manage Mesquite and Acacia woodlands for their value as wildlife habitat in … Amargosa Valley… as being of significant wildlife value *(LVFO RMP, 1998. Fish, Wildlife and Special Status Species Management, Management Direction FW-3-a).*

Wildfire Management Priorities:

- Life safety (public and firefighters)

- Protection of private in-holding residences, commercial property and other developments and infrastructure

- Protection of habitats for 24 endemic species, including T&E/sensitive species

- Protection of cultural/historical resources

A.3.4.14.2.2. FMU Wildland Fire Suppression Objectives & Strategies

Fire Suppression Objectives: Protect human life and property values while minimizing impacts to T&E, sensitive and/or endemic species populations and habitat, both from wildfire and from firefighting activities.

Fire Suppression Strategies:

- Appropriate Management Response will be utilized toward the primary resource objective of preventing large, high-intensity wildfire in the riparian/marsh habitat portion of this FMU.

- Wildland fires will be fought aggressively to minimize threats or impacts to human life, safety, and property values.

- Life and property protection tactics must be weighed against T&E/sensitive species constraints. All fires in this FMU will require on-site coordination with an approved Resource Advisor.

Suppression/Protection Priorities:

- Residential in-holdings (i.e., within the NWR)

- Commercial mines, in-holdings within both BLM and USFWS

- Utility line ROW's and other dispersed infrastructure/developments

- T&E/sensitive/endemic species populations

- All aquatic and riparian/marsh habitats

- Mesquite/acacia woodlands

FMU Target Individual Wildland Fire Size: 5 acres @ 90%

FMU Target Acres Burned Per Decade: 500 acres

A.3.4.14.2.3. FMU Wildland Fire Operational Constraints, Objectives & Strategies

Special Fire Management Consideration/Areas: This FMU primarily is comprised of rare, endemic species habitats. The bulk of the FMU consists of Ash Meadows NWR, together with surrounding public lands currently administered by the BLM. Included in the latter is a proposed 9,460-withdrawal area that would transfer to USFWS (pending action). There are also private land in-holdings within the NWR. WUI protection objectives and tactics within this FMU must be weighed against T&E/sensitive/endemic species constraints. All fires in this FMU will require on-site coordination with an approved Resource Advisor.

A.3.4.14.2.3.1. Wildland Fire Operational Constraints Objectives & Strategies:

A.3.4.14.2.3.1.1. Riparian/Marsh Habitats:

- Apply M.I.S.T. within riparian habitat
- In riparian areas, prioritize suppression actions to minimize damage to native vegetation from wildfire or suppression operations
- Fire suppression in riparian habitat will be coordinated with the approved Resource Advisor
- In riparian areas, use natural barriers or openings in riparian vegetation where possible as the easiest, safest method to manage a riparian wildfire. Where possible and practical use wet firebreaks rather than constructing firelines by hand or with heavy equipment
- Avoid burning out unburned islands, whenever possible
- Utilize firing tactics only if necessary to protect firefighter or public safety
- Avoid surface disturbing suppression activities in riparian areas whenever possible
- Avoid dropping retardant within 300 feet of water sources, to the maximum extent feasible
- Use of containment systems for portable pumps to avoid fuel spills in riparian or aquatic systems will be required.

A.3.4.14.2.3.1.2. Desert Tortoise:

- Initiate full suppression activities with minimum surface disturbances to reduce loss of tortoise cover and to minimize the spread of exotic annual grasses.
- Require consultation with a qualified Resource Advisor for all wildfires within desert tortoise habitat, particularly within ACEC's and designated critical habitat units.
- Restrict OHV travel and the use of tracked vehicles to the minimum necessary to suppress wildfires within desert tortoise habitat, particularly within ACEC's and designated critical habitat units; obliterate all tracks to reduce possibility of future use.
- Use of aerial retardant is authorized; foam or fugitive retardant is preferable to iron oxide retardant.

- Do not authorize burning out of unburned fingers or islands of vegetation. The exception to this case would be the removal of fuels for safety concerns.
- Establish fire camps, staging areas, and helispots in previously disturbed areas outside of ACEC's and designated critical habitat units, where possible, in consultation with a qualified Resource Advisor.
- Provide all firefighters and support personnel with a briefing on desert tortoises and their habitat to minimize take, particularly those associated with vehicle use.

A.3.4.14.2.3.1.3. Noxious Weeds and Invasive Species Transport Control Procedures:

Las Vegas Field Office Noxious Weed Control and Fire Management Weed Transport Control:

- Off-district engines, crew carriers, overhead vehicles, and helitack/helicopter support vehicles will, upon check-in and prior to proceeding to the line, wash down at the, Logandale, Red Rock, Pahrump Fire Stations or a commercial truck washing station. This will be determined by the location of the units' last fire assignment and if they were cleaned at release from that assignment.
    - The washdown will concentrate on the undercarriage, with special emphasis on axles, frame, crossmembers, motor mounts, and on and underneath steps, running boards, and front bumper/brushguard assemblies. Vehicle cabs will be swept out with refuse disposed of in waste receptacles. In wilderness areas, all portable equipment used on an incident (pumps, hose, fittings, water storage items) will be washed off to rid them of any seed or spores that may be attached from previous fires in noxious weed infested sites.
    - During initial briefings, washdowns will be mentioned and facilities made available for oncoming crews.
- Las Vegas Field Office crews will follow the same procedures identified in Item 1 when returning from fieldwork or wildland fires, especially when vehicles are used in know noxious weed areas infested with known noxious or invasive species common to the Field Office area.
- Upon leaving the Field Office when released from an incident, all off-unit vehicles will follow aforementioned washdown procedures so that Las Vegas' noxious weed problems do not become someone else's problems.
- All equipment used off pavement will be cleaned of weed and grass seed stems, stalks, etc. prior to release from an incident. This includes, but is not limited to, tents, tarps, helicopter support equipment, foldatanks and free-standing tanks, mechanic's vehicles, and logistical support vehicles, trailers and equipment. These vehicles will be washed as in 1.a. above.

This Field Office policy will be followed by all equipment involved in fire suppression while on Las Vegas Field Office assignments. Vehicles will be cleared of washdown procedures during checkout and crew evaluations. In the event vehicles are released from fires away from the district office, the closest wash facility, (government or commercial) will be utilized.

A.3.4.14.2.4. FMU Wildland Fire Use Objectives & Strategies

Fire Use is not planned within this FMU at this time.

A.3.4.14.2.5. Burned Acre Objective Review

IF the FMU decadal wildfire acre-burned target has been reached or exceeded PRIOR TO THE COMPLETION OF THE 10-YEAR PLANNING PERIOD, from either wildfire or prescribed fire, a review of fire management objectives and strategies will be initiated to develop new suppression criteria on wildland fire occurrence and prescribed fire acre goals.

A.3.4.14.2.6. FMU Prescribed Fire Objectives & Strategies

Prescribed Fire Objectives: Use integrated techniques to control tamarisk, Russian olive, knapweed, and other undesirable non-native plant species. Broadcast burning and/or pile burning will be conducted in conjunction with mechanical, chemical, or biological treatments.

Prescribed Fire Strategies: Treatments will target undesirable species. The bulk of the treatments will occur within the existing NWR boundary or within the proposed USFWS withdrawal portion of the FMU. These treatments will be conducted cooperatively with the BLM. Prescribed fire treatments may include broadcast burning of standing vegetation, broadcast burning of lop and scatter residue, or residue pile burning (in conjunction with integrated mechanical treatments).

Rx Fire Annual & Decadal Acre Target:

- Annual: 50 acres
- Decadal: 500 acres

T & E Species Strategies: Any prescribed fire treatments in this FMU will be cooperative projects of the FWS and BLM. Endangered Species Act Section 7 consultation procedures and FWS concurrence will be met, prior to commencement of on-the-ground treatment. All Section 7 terms and conditions, minimization measures, and stipulations will be complied with throughout the project implementation.

Air Quality Strategy: Burning operations will be conducted to minimize smoke impacts to private properties, road traffic, and T&E/sensitive species populations. Prescribed burn project plans will address appropriate smoke management and mitigation.

NEPA Compliance: Prior to implementation of any proposed projects, site-specific NEPA documentation will be completed, as applicable.

Rx Fire Monitoring Strategy: Prescribed fire use will support the objective of T&E/sensitive species habitat protection and restoration. In all phases of this multi-year project, the monitoring, documentation, and dissemination and sharing of treatment effectiveness data is an integral priority.

A.3.4.14.2.7. FMU Non-Fire Fuels Treatment Objectives & Strategies

Non-Fire Fuels Treatment Objectives: Use mechanical, chemical, or biological techniques to control tamarisk, Russian olive, knapweed, and other undesirable non-native plant species. Treated acres will be revegetated to reduce potential for re-establishment of undesirable species.

Non-Fire Fuels Treatment Strategies: Treatments will target undesirable species. Treatments will be conducted chiefly within the NWR, but in close cooperation with BLM. Integrated Rx fire, chemical, mechanical and/or biological treatments may be utilized.

Non-Fire Annual & Decadal Acre Target:

- Annual: 50 acres
- Decadal: 500 acres

T & E Species Strategies: Any vegetative treatments in this FMU will be cooperative projects of the FWS and BLM. Endangered Species Act Section 7 consultation procedures and FWS concurrence will be met, prior to commencement of on-the-ground treatment. All Section 7 terms and conditions, minimization measures, and stipulations will be complied with throughout the project implementation.

Air Quality Strategies: Vegetative treatments will have a positive long-term effect on air quality, by reducing the occurrence of large, high-intensity wildfires. Rx fire burn plans will have an approved variance (Open Burn Permit) from the State of Nevada, Division of Environmental Protection; Smoke Management Program.

NEPA Compliance: The following procedures will be completed for all fuels treatment projects:

- Chemical applications:
  - Operational compliance with EPA label restrictions
  - File for and obtain BLM Pesticide Use Permits (PUP's)
  - Complete daily Pesticide Application Records (PAR's)
  - Submit annual Pesticide Use Reports to the Nevada Department of Agriculture
  - Obtain/Maintain Nevada Pesticide Applicator Certification training for designated Field Office personnel
  - Ensure that all contractors obtain/possess current Nevada Pesticide Applicators Commercial License
- NEPA compliance:
  - Ensure all projects comply with LUP direction
  - Prepare appropriate project level and/or programmatic NEPA documents (EA's, DNA's, ROD, etc.)
- ESA compliance:
  - Complete project level and/or programmatic Section 7 consultations for all fuels treatments, in early and close coordination with USFWS
  - If project conditions change, initiate re-consultation procedures as appropriate.

Treatment Monitoring Strategy:

- Treatment effectiveness monitoring may be conducted in partnership with USFWS, and other parties as identified
- Treatment sites will be monitored for re-infestation by noxious species
- Photo monitoring may be used to track native plant recruitment and status of active re-vegetation treatments.

A.3.4.14.2.8. FMU Post Fire Rehab/Restoration Objectives & Strategies

Restore plant productivity on disturbed areas of the public lands. Rehabilitate, reclaim, or revegetate areas subjected to surface-disturbing activities, where feasible. When rehabilitating, manage for optimum species diversity by seeding native species, except where non-native species are appropriate.

- Treatments will comply with the Las Vegas Field Office Normal Year Fire Rehabilitation Plan (1990); Environmental Assessment no. NV-054-90-24.
- In the event that suppression efforts require off-road vehicle operations, replant and visually camouflage the first 200 feet of tire tracks in order to prevent further habitat impacts (due to public use of these track ways).
- Whenever feasible, utilize native species in seeding and/or re-planting treatments.
- Cultivate local supplies of live plant materials for use during riparian restoration efforts.
- Maintain a seed bank of locally collected native plant species for use in restoring both fire fuels treatments and fire-disturbed sites.
- Cultivate and develop varieties of locally grown native seed by means of plant material centers.

A.3.4.14.2.9. FMU Community Protection/Community Assistance Objectives & Strategies

Communities at Risk/WUI Areas: Dispersed WUI values (ranches, homes, power lines etc.). Communities-at-risk, community protection/assistance and public education strategies and objectives will be further defined through the LVFO RAMS Fire Plan update, which is scheduled for 2005.

Community Protection/Community Assistance Objectives:

- Educate/work with private landowners on defensible space issues and wildfire hazards
- Promote collaborative efforts with USFWS to mitigate fuel hazards

Community Protection/Community Assistance Strategy:

- Initiate fuels treatments to protect dispersed residences/developments.
- Coordinate through NSO to implement Rural Fire Assistance and Community Assistance programs, involving the Amargosa Valley VFD and Nye County Emergency Services.
- Educate/work with involved parties on defensible space issues and wildfire hazards.

- Pursue establishment of local Fire Safe Council Chapter(s).
- Promote collaborative efforts to mitigate fuel hazards with cooperators.

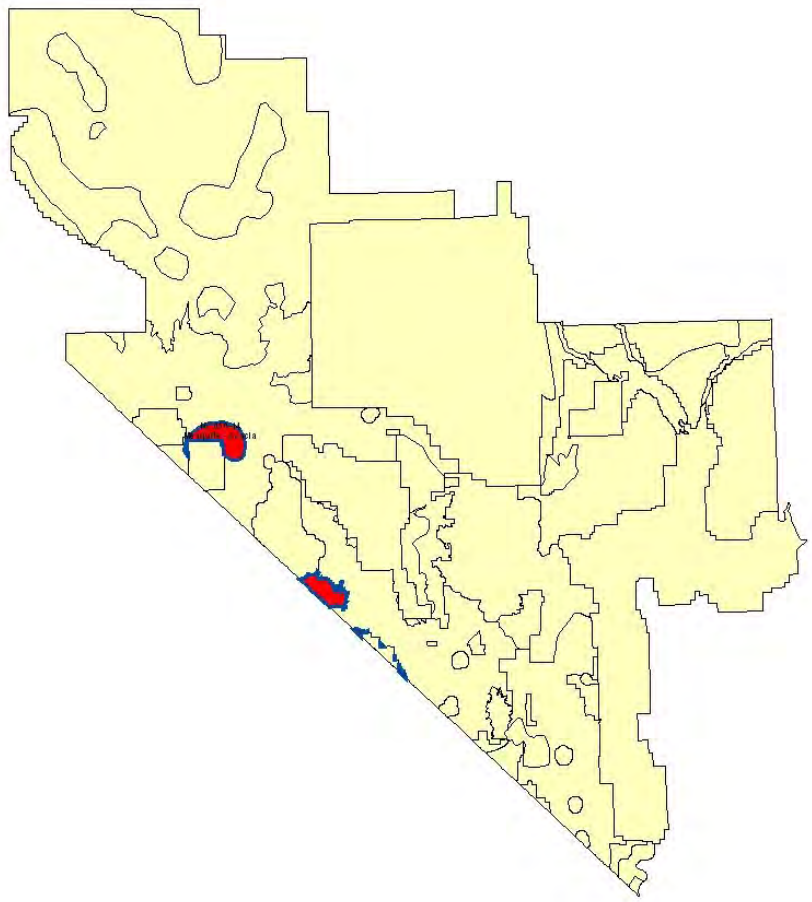
Community Wildfire Safety Education Strategy: Educate/work with private landowners on defensible space issues and wildfire hazards

A.3.4.14.3. FMU Fire Program Analysis - Quantifiable Objective Summary

Initial Attack Success	Decadal Wildfire Acres Burn Tolerance	WFU Decadal Target Acres	Rx Fire Acres Per Decade	Non-Fire Acres Per Decade
5 acres @ 90%	500	N/A	500	500

A.3.4.15. Mesquite – Acacia

NV050-14



FMU Name & Unit No.: Mesquite – Acacia; NV050-14

FMU Type/Category: High Value Habitat (HVH)

A.3.4.15.1. FMU Description:

A.3.4.15.1.1. FMU Location Information

Geographic boundaries: This discontinuous FMU is made up of those remaining large stands of mesquite/acacia in the BLM Las Vegas Field Office, which are not located within WUI FMU's. These stands are located in valley bottoms on the west side of the Spring Range, adjacent to or near California.

A.3.4.15.1.2. FMU Acre Total

Ownership by Acres and Percent		
NV 050-14	**Mesquite - Acacia**	
Ownership	**Acres**	**Percent**
Bureau of Land Management	62,191	92.2
Private	5,283	7.8
Total Acres	67,474	

A.3.4.15.1.3. Fire Occurrence and History

FMU Number	Decadal (94-03)	24 Years (80-03)	Ignition Cause (80-03)	
NV 050-14			Lightning	0
Number of Fires	1	3	Human/Other	3
Largest Fire (Acres)	0.1	15.0	**Multiple Fire Days (80-03)**	
Total Acres Burned	0.1	15.1	Total Multiple Fire Days (MFD)	0
Average Fire Size (Acres)	0.1	5.0	Number of MFD Fires	0
			Total Acres Burned by Multiple Fires	0.0

Narrative Description: In recent decades, fires in portions of this FMU have burned with uncharacteristic intensity; fueled by either tamarisk infestations or the build-up of understory litter resulting from illegal mesquite woodcutting. All recent wildfires in this FMU have been human-caused. The peak of convective thunderstorm activity occurs during late summer.

Human-caused fires in this FMU generally occur in spring and summer, but may occur virtually year-round. Most wildfires in this FMU have occurred in the Pahrump Valley stand of mesquite/acacia. Of the five FMU stands, the proportion of tamarisk infestation is heaviest in Pahrump Valley, as is the incidence of illegal human activities, including mesquite firewood cutting, trash dumping and off-road vehicle use. All of these factors increase the threat of fire.

General Fire Protection Characteristics: This FMU contains the five remaining large stands of mesquite/acacia vegetative type in Southern Nevada lying outside of urbanized environments. These stands face fewer human-caused threats versus those stands located inside the Indian Springs, Las Vegas and Moapa WUI FMU's, and hence offer the best chance for conservation success. Regional importance has been assigned to these stands. Under the draft Southern Nevada Mesquite Woodland Habitat Management Plan (1999), each of the five stands in this FMU would gain Habitat Management Area (HMA) designation; one of which would revert to ACEC status

(via Amendment to the LVFO RMP). No Record of Decision has been signed for the Mesquite HMP. However, the sensitivity of this resource is such that the LVFO practice has been to go ahead and comply with some of the Plan's management recommendations, including those for fire suppression and fuels management.

Wildfires in this FMU will require use of Minimum Impact Suppression Tactics, in on-site coordination with an approved Resource Advisor. Life and property protection tactics must be weighed against the need to protect this high value natural resource and to avoid undue impacts from firefighting activities.

A.3.4.15.1.4. FMU Vegetation

FMU Vegetation/Fuel Types		
NV 050-14	**Mesquite - Acacia**	
Veg/Fuel Type	Acres	Percent
Mojave	57,635	85.0
Salt Desert Scrub/Shadscale	10,152	15.0
Grand Total	67,787	

Vegetation Narrative: Approximately 85% of This FMU consists of woodland stands composed of Honey mesquite and/or Acacia, of varying canopy heights and structural arrangements. Honey mesquite may occur in either clumping, shrubby growth-form or in more of a true woodland canopy configuration. The former is typically associated with sites that have received disturbance and setback of the mesquite growth stage.

A.3.4.15.1.5. FMU Fuel Models & Live Fuel Moisture Characteristics

Surface Fuel Model & Canopy Cover: This FMU consists entirely of woodland stands composed of Honey mesquite and/or Acacia, of varying canopy heights and structural arrangements. Honey mesquite may occur in either clumping, shrubby growth-form or in more of a true woodland canopy configuration. The former is typically associated with sites that have received disturbance and setback of the mesquite growth stage.

Live Fuel Moisture Averages:

LFM Site	May	June	July	Aug	Sept	Oct
N5D	198%	178%	134%	107%	112%	110%

Live Fuel Moisture Characteristics:

- At live fuel moisture levels of 181% and above fires typically will exhibit Very Low Fire Behavior characteristics
- At live fuel moisture levels of 151% to 180% fires typically will exhibit Low Fire Behavior characteristics
- At live fuel moisture levels of 126% to 150% fires typically will exhibit Moderate Fire Behavior characteristics
- At live fuel moisture levels of 101% to 125% fires typically will exhibit High Fire Behavior characteristics

- At live fuel moisture levels of 75% to 100% fires typically will exhibit Extreme Fire Behavior characteristics
- At live fuel moisture levels of 75% and below fires typically will exhibit Advanced Fire Behavior characteristics

A.3.4.15.1.6. Fire Weather & Climate Related Impacts

(Detailed weather station data for this FMU will be added to the FMP Appendix upon completion of the national fire weather data validation/correction project.)

- Wet lightning is common in this area. Fires generally remain small when starts occur under these common conditions.
- Dry Lightning is possible in this area. Larger fires can occur with these erratic and gusty thunderstorm events.
- Larger fires occur when human ignitions occur under typical warm and windy summer weather.
- Fire behavior can be extreme under these conditions in heavily infested tamarisk riparian areas.
- Fire behavior can be extreme under these conditions when there are heavy buildups of ephemeral light flashy fuels.
- Fire behavior can be extreme under these conditions in heavy brush and/or Pinyon-Juniper fuels.

A.3.4.15.1.7. Fire Regime

- Fire Regime V; Condition Class III (mainly due to xerification)

FMU by Condition Class and Fire Regime			
NV 050-14		**Mesquite - Acacia**	
CC	FR	Acres	Percent
2	V	49,385	73.4
3	IV	11,729	17.4
	V	6,150	9.1
Total		67,264	

A.3.4.15.1.8. FMU Physical Characteristics

Topography:

- Elevation Range: 2,199 feet to 3,800
- Slope: Generally less than 10%
- Aspect: Flat
- Major topographical features:
  - Pahrump Valley
  - Amargosa Valley

Access Information: FMU access consists of State Route 373, the paved Bell Vista Road and a limited number of dirt roads and tracks. Much of the FMU is road-less.

A.3.4.15.1.9. FMU Resource Values & Attributes

Wildland-Urban Interface/Intermix:

- City of Pahrump (adjacent to FMU)
- Agricultural community of Crystal/Amargosa Valley (adjacent to FMU)
- Unincorporated Sandy Valley community (adjacent to FMU)
- Private property parcels, including homes and ranches
- Utility line ROW'S and other dispersed infrastructure and developments

Resource Use:

- Sensitive habitats: Southern Nevada remnant mesquite/acacia woodland
- Sensitive species populations associated with mesquite/acacia (4)
- Spring source and riparian habitat (Stump Spring)
- Dispersed recreation; hunting; special use permit activities
- Private property, including residences
- Utility line ROW's; other dispersed infrastructure and developments
- Grazing- Wheeler Wash Allotment (open but inactive)

Air Quality: There are no non-attainment airsheds in this FMU. Rx fire burn plans will have an approved variance (Open Burn Permit) from the State of Nevada, Division of Environmental Protection; Smoke Management Program.

Soils: Soils have formed under conditions of physical weathering (rather than chemical dissolution) because of the arid climate. Soils on lower portions of alluvial fans and valley floors contain very little organic material, are moderately to highly alkaline, and can contain high concentrations of gypsum and dissolved salts. A gravelly surface crust (called desert pavement) occurs throughout these areas. Desert pavement is very stable and protects underlying fine-grained soils from erosion. A cemented hardpan layer commonly occurs at shallow depths beneath surface soils throughout these areas. Mountain slopes tend to be covered by an unstable layer of large rocks, boulders, stones, and cobbles. Runoff from periodic rainstorms transports large amounts of material to lower elevations, forming alluvial fans of coarse material and depositing thick sequences of gravelly loams, sands, and finer grained sediments on valley floors.

Soils are susceptible to water and wind erosion. Water erosion occurs during periodic high-intensity, short duration summertime thunderstorms and less frequent, sustained wintertime rainstorms. Water erosion occurs by a combination of sheet flow, rill formation, splashing, and channelized flow in ephemeral washes and stream channels. Wind erosion occurs in areas where the desert pavement layer has been disturbed by human activities or heavy use by wild horses and

burros, where large areas of vegetation have been burned by fire, sand dune areas, and as part of physical weathering processes.

Cultural and Paleontological Values: Stump Spring cultural resource ACEC.

T&E and Sensitive Species: Desert tortoise habitat surrounds each portion of this FMU.

Habitat Values:

- Regionally important mesquite/acacia woodlands (proposed HMA's):
  - Amargosa Flat (proposed Habitat Management Area)
  - Pahrump (proposed Habitat Management Area)
  - Stump Spring (proposed Habitat Management Area)
  - Sandy Valley (proposed Habitat Management Area)
  - Stewart Valley (proposed Habitat Management Area)
- Current/proposed wildlife ACEC's:
  - Amargosa Mesquite ACEC
  - Stewart Valley Mesquite ACEC (proposed)
- Known sensitive species populations in FMU mesquite/acacia stands:
  - Phainopepla
  - Lucy's warbler
  - Pahrump Valley buckwheat
  - Parish's phacelia
- Unsurveyed sensitive bird species that use mesquite/acacia habitat (10)
- Spring source and riparian habitat (Stump Spring)
- Desert tortoise habitat (surrounding all portions of this FMU)
- Wild horse and burro Johnnie Herd Management Area
- Wild horse and burro Ash Meadows Herd Management Area

Hydrology and Water Quality: The Mesquite-Acacia FMU lies primarily within The Death Valley Basin hydrographic region, and is a topographically-closed, internally-drained basin. Ephemeral wash channels drain most of the Mesquite-Acacia FMU and only convey flow after periodic high-intensity summer thunderstorms or sustained winter rainstorms. Rapid runoff to ephemeral wash channels can produce flash flooding and transport large quantities of sediment as water flows from mountainous areas and alluvial fans towards valley floors.

Wilderness or WSA: N/A

A.3.4.15.1.10. FMU Public Safety, Economic & Community Values at Risk

- City of Pahrump (adjacent to FMU)
- Farming community of Crystal/Amargosa Valley (adjacent to FMU)
- Unincorporated Sandy Valley community (adjacent to FMU)
- Private property, including residences
- Utility line ROW's; other dispersed infrastructure and developments
- Regionally important mesquite/acacia woodlands (proposed HMA's):
  - Amargosa Flat (proposed Habitat Management Area)
  - Pahrump (proposed Habitat Management Area)
  - Stump Spring (proposed Habitat Management Area)
  - Sandy Valley (proposed Habitat Management Area)
  - Stewart Valley (proposed Habitat Management Area)
- Existing and proposed mesquite/acacia ACEC's (2):
  - Amargosa ACEC
  - Stewart Valley ACEC (proposed)
- Known sensitive species populations in FMU mesquite/acacia stands:
  - Phainopepla
  - Lucy's warbler
  - Pahrump Valley buckwheat
  - Parish's phacelia
- Unsurveyed sensitive bird species that use mesquite/acacia habitat (10)
- Spring source and riparian habitat (Stump Spring)
- Desert tortoise habitat (surrounding all portions of this FMU)
- Stump Springs cultural resources ACEC
- Wild horse and burro Johnnie Herd Management Area
- Wild horse and burro Ash Meadows Herd Management Area

A.3.4.15.1.11. FMU Fire Protection Responsibility

Wildland fire protection on all BLM public lands within this FMU is provided by the Las Vegas Field Office. Structural fire protection on private lands within this FMU is provided by the Clark County Fire Department, Pahrump Valley Fire Department, and the Amargosa Valley Volunteer Fire Department.

A.3.4.15.2. FMU Objectives & Strategies

A.3.4.15.2.1. FMU Fire Management Objectives Priority Statement

- Protect human life, safety of wildland firefighters, and protection of human safety and health *(National Fire Plan 2001).*
- Provide fire suppression efforts commensurate with resource and adjacent property values at risk *(LVFO RMP, 1998. Fire Mgt Direction FE-1-a).*
- Manage Mesquite and Acacia woodlands for their value as wildlife habitat in the following areas: Amargosa Valley, Pahrump Valley, Stewart Valley, Hiko Wash, Piute Wash, Crystal and Stump Springs, or any other areas identified as being of significant wildlife value *(LVFO RMP, 1998. Fish, Wildlife and Special Status Species Management, Management Direction FW-3-a).*
- Protect important resting/nesting habitats, such as riparian areas and mesquite/acacia woodlands *(LVFO RMP, 1998. Fish & Wildlife Mgt Direction FW-3-g).*
- Use integrated weed management techniques to control and eradicate tamarisk, such as burning, chemical, biological or mechanical treatments, where potential for treatment is good. Rehabilitate with native species to help reduce the potential for tamarisk re-establishment and improve ecosystem health (LVFO RMP, 1998. Riparian Mgt Objective RP-1-f).
- Manage habitat to further sustain the populations of federally listed species so they would no longer need protection of the Endangered Species Act. Manage habitats for non-listed special status species to support viable populations so that future listing would not be necessary *(LVFO RMP 1998. Special Status Species Mgt Objective SS-2).*
- Manage special status species habitat at the potential natural community or desired plant community, according to the need of the species (LVFO RMP 1998. Special Status Species Mgt Objective SS-1).
- Determine specific hazard reduction priorities, including any noxious or invasive species infestations, and implement according to the existing budget (LVFO RMP, 1998. Fire Mgt Direction FE-2-a).
- Restore plant productivity on disturbed areas of the public lands. Rehabilitate, reclaim, or revegetate areas subjected to surface-disturbing activities, where feasible. When rehabilitating, manage for optimum species diversity by seeding native species, except where non-native species are appropriate (LVFO RMP 1998. Vegetation Mgt Objective VG-2).

Wildfire Management Priorities:

- Employ aggressive Appropriate Management Response options to keep burned acreage in mesquite/acacia woodlands to an absolute minimum.
- Employ MIST, to the extent feasible while achieving the primary priority of minimum burned acreage.
- Reduce understory fuel loadings, construct stand perimeter fuel breaks, and perform other treatment activities to protect mesquite/acacia habitats.

A.3.4.15.2.2. FMU Wildland Fire Suppression Objectives & Strategies

Fire Suppression Objectives: Minimize burned acreage in mesquite/acacia woodlands, while insuring that firefighting activities cause the least possible impact to the resource.

Fire Suppression Strategies:

- Appropriate Management Response will be predicated on the primary resource objective to minimize wildfire size and impact intensity in mesquite/acacia stands, including impacts from the suppression effort.
- Unless firefighter safety, public safety, or property values are threatened, fires in this FMU will be fought using Minimum Impact Suppression Tactics.
- All wildfires in this FMU will require on-site coordination with an approved BLM Resource Advisor.

Suppression/Protection Priorities:

- City of Pahrump (adjacent to FMU)
- Farming community of Crystal/Amargosa Valley (adjacent to FMU)
- Unincorporated Sandy Valley community (adjacent to FMU)
- Private property, including residences
- Utility line ROW's and other dispersed infrastructure and developments
- Regionally threatened mesquite/acacia woodland (proposed HMA's)
- Amargosa Mesquite ACEC
- Stump Springs cultural ACEC
- Spring source and riparian habitat (Stump Spring)

FMU Target Individual Wildland Fire Size: 1 acre @ 90%

FMU Target Acres Burned Per Decade: 25 acres

A.3.4.15.2.3. FMU Wildland Fire Operational Constraints, Objectives & Strategies

Special Fire Management Consideration/Areas: This FMU is entirely comprised of special status habitat. In Southern Nevada, the mesquite/acacia vegetative community is in jeopardy

from urban expansion, water table depletion, illegal woodcutting and other human impacts. Distribution of mesquite/acacia woodlands under Mojave Desert climate conditions is limited to areas with perennial groundwater. Because of the regional scarcity of water, human activity and urban growth is likewise concentrated in these same areas. Many of the WUI FMU's in Southern Nevada contain stands of mesquite/acacia. All sizable stands of mesquite/acacia outside of these WUI FMU boundaries are contained in this FMU. These stands provide habitat to at least four sensitive species (2 birds; 2 understory plants) that are closely associated/dependent upon the mesquite/acacia community type.

- City of Pahrump (adjacent to FMU)
- Farming community of Crystal/Amargosa Valley (adjacent to FMU)
- Unincorporated Sandy Valley community (adjacent to FMU)
- Private property, including residences
- Utility line ROW's; other dispersed infrastructure and developments
- Regionally important mesquite/acacia woodlands (proposed HMA's):
  - Amargosa Flat (proposed Habitat Management Area)
  - Pahrump (proposed Habitat Management Area)
  - Stump Spring (proposed Habitat Management Area)
  - Sandy Valley (proposed Habitat Management Area)
  - Stewart Valley (proposed Habitat Management Area)
- Existing and proposed mesquite/acacia ACEC's (2):
  - Amargosa ACEC
  - Stewart Valley ACEC (proposed)
- Known sensitive species populations in FMU mesquite/acacia stands:
  - Phainopepla
  - Lucy's warbler
  - Pahrump Valley buckwheat
  - Parish's phacelia
- Unsurveyed sensitive bird species that use mesquite/acacia habitat (10)
- Spring source and riparian habitat (Stump Spring)
- Desert tortoise habitat (surrounding all portions of this FMU)
- Stump Springs cultural resources ACEC
- Wild horse and burro Johnnie Herd Management Area

- Wild horse and burro Ash Meadows Herd Management Area

A.3.4.15.2.3.1. Wildland Fire Operational Constraints Objectives & Strategies:

A.3.4.15.2.3.1.1. FMU-Wide Constraints:

- An approved Resource Advisor will be dispatched to all fires occurring within this FMU.
- All fire suppression activities will use Minimum Impact Suppression Techniques (MIST) at all times.
- Use of heavy equipment (bulldozers, etc.) will only be used in this FMU if fire is threatening human life or property. The Field Manager must approve the use of heavy equipment in all cases.
- Motorized vehicles used in fire suppression will remain on existing roads in this FMU.
- Helicopters and air tankers will be included in the WILDCAD system for fires in this FMU.
- Helibases, staging areas, and fire camps will be located outside of this FMU.
- Use of aerial applied water or retardant is authorized in this FMU, and should be considered a primary suppression option.
- Firefighting crews may use hand tools and chainsaws for fireline construction. Chainsaw use and line width should be kept to the minimum feasible extent. The use of existing natural barriers, minimum “scratch line”, and cold trailing tactics are encouraged.

A.3.4.15.2.3.1.2. Riparian Area Constraints:

- Apply M.I.S.T. within riparian habitat
- In riparian areas, prioritize suppression actions to minimize damage to native vegetation from wildfire or suppression operations
- Fire suppression in riparian habitat will be coordinated with the approved Resource Advisor
- In riparian areas, use natural barriers or openings in riparian vegetation where possible as the easiest, safest method to manage a riparian wildfire. Where possible and practical use wet firebreaks rather than constructing firelines by hand or with heavy equipment
- Avoid burning out unburned islands, whenever possible
- Utilize firing tactics only if necessary to protect firefighter or public safety
- Avoid surface disturbing suppression activities in riparian areas whenever possible
- Avoid dropping retardant within 300 feet of water sources, to the maximum extent feasible
- Use of containment systems for portable pumps to avoid fuel spills in riparian or aquatic systems will be required.

A.3.4.15.2.3.1.3. Noxious Weeds and Invasive Species Transport Control Procedures:

Las Vegas Field Office Noxious Weed Control and Fire Management Weed Transport Control:

- Off-district engines, crew carriers, overhead vehicles, and helitack/helicopter support vehicles will, upon check-in and prior to proceeding to the line, wash down at the, Logandale, Red Rock, Pahrump Fire Stations or a commercial truck washing station. This will be determined by the location of the units' last fire assignment and if they were cleaned at release from that assignment.
    - The washdown will concentrate on the undercarriage, with special emphasis on axles, frame, crossmembers, motor mounts, and on and underneath steps, running boards, and front bumper/brushguard assemblies. Vehicle cabs will be swept out with refuse disposed of in waste receptacles. In wilderness areas, all portable equipment used on an incident (pumps, hose, fittings, water storage items) will be washed off to rid them of any seed or spores that may be attached from previous fires in noxious weed infested sites.
    - During initial briefings, washdowns will be mentioned and facilities made available for oncoming crews.
- Las Vegas Field Office crews will follow the same procedures identified in Item 1 when returning from fieldwork or wildland fires, especially when vehicles are used in know noxious weed areas infested with known noxious or invasive species common to the Field Office area.
- Upon leaving the Field Office when released from an incident, all off-unit vehicles will follow aforementioned washdown procedures so that Las Vegas' noxious weed problems do not become someone else's problems.
- All equipment used off pavement will be cleaned of weed and grass seed stems, stalks, etc. prior to release from an incident. This includes, but is not limited to, tents, tarps, helicopter support equipment, foldatanks and free-standing tanks, mechanic's vehicles, and logistical support vehicles, trailers and equipment. These vehicles will be washed as in 1.a. above.

This Field Office policy will be followed by all equipment involved in fire suppression while on Las Vegas Field Office assignments. Vehicles will be cleared of washdown procedures during checkout and crew evaluations. In the event vehicles are released from fires away from the district office, the closest wash facility, (government or commercial) will be utilized.

A.3.4.15.2.4. FMU Wildland Fire Use Objectives & Strategies

Wildfire will not be used as a management tool within this FMU at this time.

A.3.4.15.2.5. Burned Acre Objective Review

IF the FMU decadal wildfire acre-burned target has been reached or exceeded PRIOR TO THE COMPLETION OF THE 10-YEAR PLANNING PERIOD, from either wildfire or prescribed fire, a review of fire management objectives and strategies will be initiated to develop new suppression criteria on wildland fire occurrence and prescribed fire acre goals.

A.3.4.15.2.6. FMU Prescribed Fire Objectives & Strategies

Prescribed Fire Objectives: Limited pile burning may be used to eliminate woody residue resulting from understory litter clearing treatments and/or perimeter fuel breaks.

Prescribed Fire Strategies: Pile burning will be conducted in conjunction with one or more of these three non-fire fuel treatments: removal of tamarisk infestations; removal of understory litter accumulations resulting from illegal wood-cutting activity; or the construction of fuel breaks along the perimeter of mesquite/acacia stands.

Rx Fire Annual & Decadal Acre Target:

- Annual: 10 acres
- Decade: 100 acres

T & E Species Strategies: No T&E species are presently known to occur in this FMU. Low density Desert tortoise habitat surrounds the Amargosa Valley portion of this FMU. Moderate density Desert tortoise habitat surrounds all other portions of this FMU. All fire management vehicular traffic egressing this FMU (for suppression, prescribed fire treatments or vegetative treatment purposes) will comply with the terms and conditions of the Las Vegas Field Office RMP programmatic Biological Opinion, file no. 1-5-97-F-251.

Air Quality Strategy: Burning operations will be conducted to minimize smoke impacts to private properties, road traffic, and T&E/sensitive species populations. Prescribed burn project plans will address appropriate smoke management and mitigation.

NEPA Compliance: Prior to implementation of any proposed projects, site-specific NEPA documentation will be completed, as applicable.

Rx Fire Monitoring Strategy: Prescribed fire use will support the objective of sensitive habitat protection and restoration. During all phases of this effort, the monitoring, documentation, and dissemination of treatment effectiveness data will be a priority action.

A.3.4.15.2.7. FMU Non-Fire Fuels Treatment Objectives & Strategies

Non-Fire Fuels Treatment Objectives: Hand crews will gather and pile understory fuels residue leftover from illegal woodcutting activities. Hand crews will construct perimeter fuels breaks along those mesquite/acacia stand boundaries that interface either with infestations of invasive tamarisk, or that interface with urbanized portions of the Pahrump and Amargosa Valleys.

Non-Fire Fuels Treatment Strategies: Small, localized tamarisk removal projects will entail integrated hand- cutting/piling and chemical treatment of resprouts. Fire prone understory litter accumulations will be hand gathered and piled off-site for burning or chipping disposal. Fuel breaks will be constructed along the perimeter of mesquite/acacia stands, where threatened by tamarisk fuels or where in contact with the wildland urban interface (particularly in Pahrump Valley).

Non-Fire Annual & Decadal Acre Target:

- Annual: 10 acres

- Decade: 100 acres

T & E Species Strategies: No T&E species are presently known to occur in this FMU. Low density Desert tortoise habitat surrounds the Amargosa Valley portion of this FMU. Moderate density Desert tortoise habitat surrounds all other portions of this FMU. All fire management vehicular traffic egressing this FMU (for suppression or vegetative treatment purposes) will comply with the terms and conditions of the Las Vegas Field Office RMP programmatic Biological Opinion, file no. 1-5-97-F-251.

Air Quality Strategies: Vegetative treatments will have a positive long-term effect on air quality, by reducing the potential for wildfire occurrence and spread. Pile burn plans will have an approved variance (Open Burn Permit) from the State of Nevada, Division of Environmental Protection; Smoke Management Program.

NEPA Compliance: The following procedures will be completed for all fuels treatment projects:

- Chemical applications:
  - Operational compliance with EPA label restrictions
  - File for and obtain BLM Pesticide Use Permits (PUP's)
  - Complete daily Pesticide Application Records (PAR's)
  - Submit annual Pesticide Use Reports to the Nevada Department of Agriculture
  - Obtain/Maintain Nevada Pesticide Applicator Certification training for designated Field Office personnel
  - Ensure that all contractors obtain/possess current Nevada Pesticide Applicators Commercial License
- NEPA compliance:
  - Ensure all projects comply with LUP direction
  - Prepare appropriate project level and/or programmatic NEPA documents (EA's, DNA's, ROD, etc.)
- ESA compliance:
  - Complete project level and/or programmatic Section 7 consultations for all fuels treatments, in early and close coordination with USFWS
  - If project conditions change, initiate re-consultation procedures as appropriate.

Treatment Monitoring Strategy:

- Treatment effectiveness monitoring may be conducted in partnership with interested parties, as identified
- Treatment sites will be monitored for re-infestation by noxious species

Photo monitoring may be used to track native plant recruitment and status of active re-vegetation treatments.

A.3.4.15.2.8. FMU Post Fire Rehab/Restoration Objectives & Strategies

Restore plant productivity on disturbed areas of the public lands. Rehabilitate, reclaim, or revegetate areas subjected to surface-disturbing activities, where feasible. When rehabilitating, manage for optimum species diversity by seeding native species, except where non-native species are appropriate.

- Treatments will comply with the Las Vegas Field Office Normal Year Fire Rehabilitation Plan (1990); Environmental Assessment no. NV-054-90-24.
- In the event that suppression efforts require off-road vehicle operations, replant and visually camouflage the first 200 feet of tire tracks in order to prevent further habitat impacts (due to public use of these track ways).
- Whenever feasible, utilize native species in seeding and/or re-planting treatments.
- Cultivate local supplies of live plant materials for use during riparian restoration efforts.
- Maintain a seed bank of locally collected native plant species for use in restoring both fire fuels treatments and fire-disturbed sites.
- Cultivate and develop varieties of locally grown native seed by means of plant material centers.

A.3.4.15.2.9. FMU Community Protection/Community Assistance Objectives & Strategies

Communities at Risk/WUI Areas: N/A

- City of Pahrump (adjacent to FMU)
- Agricultural community of Crystal/Amargosa Valley (adjacent to FMU)
- Unincorporated Sandy Valley (adjacent to FMU)
- Private property parcels, including homes and ranches
- Utility line ROW'S and other dispersed infrastructure and developments

Community Protection/Community Assistance Objectives:

- Collaborate with interested citizens in Pahrump, NV to perform education, outreach and/or volunteer fuels treatment work focused on the protection and stewardship of local mesquite/acacia woodlands.
- Promote collaborative efforts to mitigate fuel hazards with cooperators, such as Clark County Fire Department, Nye County Emergency Services, Pahrump Fire Department, Amargosa Valley VFD, and Sandy Valley VFD.

Community Protection/Community Assistance Strategy:

- Construct fuel breaks along the boundary with the urban Pahrump Valley, for both WUI protection and to protect the mesquite/acacia habitats from fires originating on private or municipal lands.

- Initiate fuels treatments to protect dispersed residences and developments
- Coordinate with the BLM Nevada State Office to implement Rural Fire Assistance and Community Assistance programs for the City of Pahrump, the Amargosa Valley VFD, and the Sandy Valley VFD; through the Clark County Fire Department or Nye County Emergency Services Department.
- Collaborate with interested Pahrump citizens group to perform education, outreach or treatment activities to protect mesquite/acacia woodlands.
- Promote collaborative efforts to mitigate fuel hazards with cooperators: Clark County FD, Nye County Emergency Services, Pahrump FD, Sandy Valley VFD, and Amargosa Valley VFD.

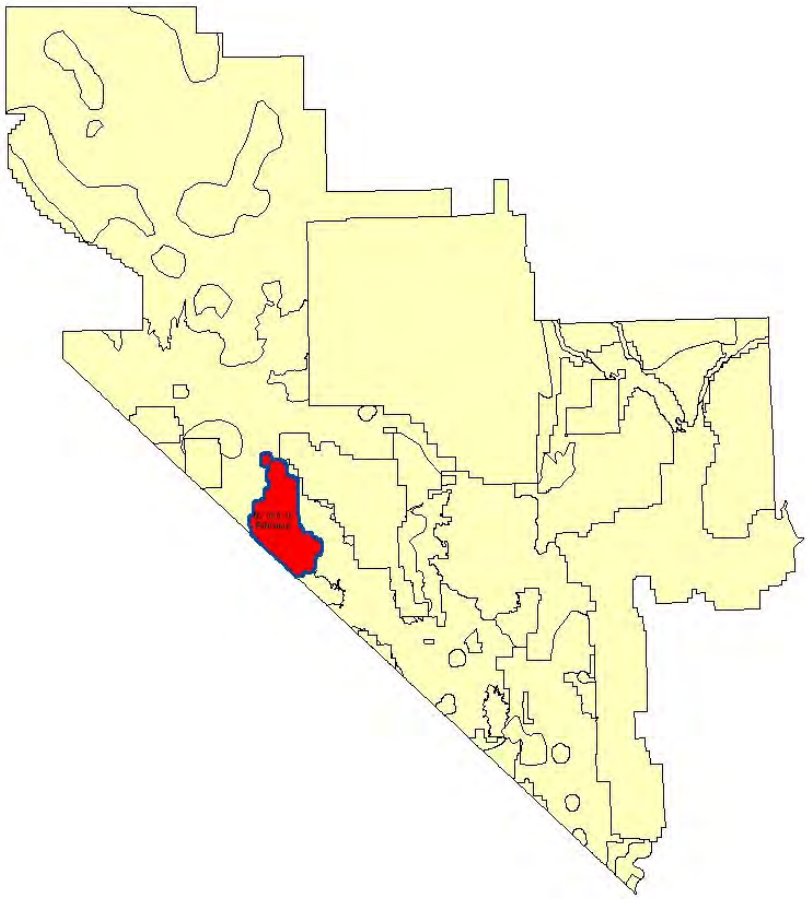
Community Wildfire Safety Education Strategy: Educate/work with private landowners on defensible space issues and wildfire hazards

A.3.4.15.3. FMU Fire Program Analysis - Quantifiable Objective Summary

Initial Attack Success	Decadal Wildfire Acres Burn Tolerance	WFU Decadal Target Acres	Rx Fire Acres Per Decade	Non-Fire Acres Per Decade
1 acres @ 90%	25	N/A	100	100

A.3.4.16. Pahrump

NV050-15



FMU Name & Unit No.: **Pahrump; NV050-15**

FMU Type/Category: **Wildland Urban Interface (WUI)**

A.3.4.16.1. FMU Description:

A.3.4.16.1.1. FMU Location Information

Geographic boundaries: FMU NV050-15 includes the greater Pahrump Valley urban area. This FMU consists of isolated pockets of BLM managed lands surrounded by a metropolitan area. Also included within this FMU is the 14,768-acre Pahrump disposal area.

A.3.4.16.1.2. FMU Acre Total

Ownership by Acres and Percent		
NV 050-15	**Pahrump**	
Ownership	**Acres**	**Percent**
Bureau of Land Management	62,430	42.6
Private	84,180	57.4
Total Acres	146,610	

A.3.4.16.1.3. Fire Occurrence and History

FMU Number	**Decadal (94-03)**	**24 Years (80-03)**	**Ignition Cause (80-03)**	
NV 050-15			Lightning	12
Number of Fires	35	53	Human/Other	41
Largest Fire (Acres)	15.0	15.0	**Multiple Fire Days (80-03)**	
Total Acres Burned	51.5	65.6	Total Multiple Fire Days (MFD)	11
Average Fire Size (Acres)	1.5	1.2	Number of MFD Fires	17
			Total Acres Burned by Multiple Fires	14.3

Narrative Description: This FMU is dominated by creosote bursage habitat, which in certain years is heavily infested with the invasive annual grass red brome. The Mesquite/Acacia woodlands are susceptible to frequent high intensity wildland fires. Wildland fire played a minor to limited role in this habitat prior to the present disturbed state. Fires generally occur in the late spring through September but can occur year round. Most wildfires in this FMU occur in the Mesquite/Acacia woodlands. Typically these fires are wind driven and are of moderate to high intensity. Small, low intensity wildfires are less common but do occur.

General Fire Protection Characteristics: This FMU consists of small enclaves of BLM managed lands within a large and dispersed metropolitan area. These BLM lands include some areas of medium and low density Desert tortoise habitat, and Mesquite/Acacia woodlands. This is a Creosote-Bursage habitat; however, most of these lands are no longer managed by the BLM due to disposal.

A.3.4.16.1.4. FMU Vegetation

FMU Vegetation/Fuel Types		
NV 050-15	**Pahrump**	
Veg/Fuel Type	Acres	Percent
Grassland	183	0.1
Mojave	99,254	67.5
No Significant Vegetation	46,060	31.3
Salt Desert Scrub/Shadscale	1,509	1.0
Grand Total	147,006	

Vegetation Narrative: The vast majority of this FMU consists of creosote bursage, with scattered pockets of mesquite/acacia Woodlands.

A.3.4.16.1.5. FMU Fuel Models & Live Fuel Moisture Characteristics

Surface Fuel Model & Canopy Cover:

- Wildland fires in the Creosote/Bursage portion are generally dependent upon ephemeral buildups of red brome and other fine fuels.

Live Fuel Moisture Averages:

LFM Site	May	June	July	Aug	Sept	Oct
N5C	189%	130%	93%	92%	99%	89%

Live Fuel Moisture Characteristics:

- At live fuel moisture levels of 181% and above fires typically will exhibit Very Low Fire Behavior characteristics
- At live fuel moisture levels of 151% to 180% fires typically will exhibit Low Fire Behavior characteristics
- At live fuel moisture levels of 126% to 150% fires typically will exhibit Moderate Fire Behavior characteristics
- At live fuel moisture levels of 101% to 125% fires typically will exhibit High Fire Behavior characteristics
- At live fuel moisture levels of 75% to 100% fires typically will exhibit Extreme Fire Behavior characteristics
- At live fuel moisture levels of 75% and below fires typically will exhibit Advanced Fire Behavior characteristics

A.3.4.16.1.6. Fire Weather & Climate Related Impacts

(Detailed weather station data for this FMU will be added to the FMP Appendix upon completion of the national fire weather data validation/correction project.)

- Wet lightning is common in this area. Fires generally remain small when starts occur under these common conditions.
- Dry Lightning is possible in this area. Larger fires can occur with these erratic and gusty thunderstorm events.
- Larger fires occur when human ignitions occur under typical warm and windy summer weather.
- Fire behavior can be extreme under these conditions in Mesquite/acacia woodlands or the open urban fields of Pahrump when there is an ephemeral buildup of the invasive annual grass Red brome.

A.3.4.16.1.7. Fire Regime

- Upland Vegetation: Fire Regime V; Condition Class II

FMU by Condition Class and Fire Regime			
NV 050-15		Pahrump	
CC	FR	Acres	Percent
2	II	2,842	2.8
	V	88,172	86.5

3	III	187	0.2
	IV	4,052	4.0
	V	6,709	6.6
Total		101,962	

A.3.4.16.1.8. FMU Physical Characteristics

Topography:

- Elevation Range:
- Slope:
  - Riparian: less than 10%
  - Upland: generally xx% but with steeper slopes on the mesa edges
- Aspect:
  - Riparian: flat
  - Upland: variable
- Major topographical features: This FMU is in the Pahrump Valley which is bounded on the north and east by the Spring Mountain Range (outside the FMU boundary) and on the west and south by the Last Chance Range (outside the FMU boundary) and Stewart Valley (outside the FMU boundary) respectively.

Access Information: Major access routes include Nevada State Routes 95,160, and 372. In addition, the FMU contains numerous paved arterial roads.

A.3.4.16.1.9. FMU Resource Values & Attributes

Wildland-Urban Interface/Intermix:

- The present Wildland Urban Interface zone of Pahrump extends into both the Creosote/Bursage and Mesquite /Acacia woodland habitats.
- Eventually, additional urban build-out will occur on the 14,768acre “Pahrump Disposal Area”. At present, this build-out is anticipated to occur over a 30-year period.

Resource Use:

- Human life and property values, primarily located in the PahrumpValley urban area.
- Mesquite/Acacia woodlands
- Johnnie Herd Management Area
- Public lands:
  - Utility line ROW’s
  - Grazing - Wheeler Wash allotment is open but inactive.

  - Sand and Gravel pits

- Non-federal lands: Extensive urban industrial and residential activity; utility line ROW's; commercial airports; and expansive infrastructure.

- Dispersed recreation; special use permit activities

Air Quality: There are no non-attainment airsheds in this FMU. Rx fire burn plans will have an approved variance (Open Burn Permit) from the State of Nevada, Division of Environmental Protection; Smoke Management Program.

Soils: Soils have formed under conditions of physical weathering (rather than chemical dissolution) because of the arid climate. Soils on lower portions of alluvial fans and valley floors contain very little organic material, are moderately to highly alkaline, and can contain high concentrations of gypsum and dissolved salts. A gravelly surface crust (called desert pavement) occurs throughout these areas. Desert pavement is very stable and protects underlying fine-grained soils from erosion. A cemented hardpan layer commonly occurs at shallow depths beneath surface soils throughout these areas. Mountain slopes tend to be covered by an unstable layer of large rocks, boulders, stones, and cobbles. Runoff from periodic rainstorms transports large amounts of material to lower elevations, forming alluvial fans of coarse material and depositing thick sequences of gravelly loams, sands, and finer grained sediments on valley floors.

Soils are susceptible to water and wind erosion. Water erosion occurs during periodic high-intensity, short duration summertime thunderstorms and less frequent, sustained wintertime rainstorms. Water erosion occurs by a combination of sheet flow, rill formation, splashing, and channelized flow in ephemeral washes and stream channels. Wind erosion occurs in areas where the desert pavement layer has been disturbed by human activities or heavy use by wild horses and burros, where large areas of vegetation have been burned by fire, sand dune areas, and as part of physical weathering processes.

Cultural and Paleontological Values: N/A

T&E and Sensitive Species: Desert tortoise (scattered, isolated populations)

Habitat Values: Moderate density Desert tortoise habitat scattered in isolated pockets throughout the area.

Hydrology and Water Quality: The Pahrump FMU lies within the Central Region hydrographic region, which is a topographically closed, internally drained basin. Ephemeral wash channels drain most areas and only convey flow after periodic high-intensity summer thunderstorms or sustained winter rainstorms. Ephemeral wash channels drain most of the Pahrump FMU and only convey flow after periodic high-intensity summer thunderstorms or sustained winter rainstorms. Rapid runoff to ephemeral wash channels can produce flash flooding and transport large quantities of sediment as water flows from mountainous areas and alluvial fans towards valley floors.

Wilderness or WSA: N/A

A.3.4.16.1.10. FMU Public Safety, Economic & Community Values at Risk

- City of Pahrump

- Dispersed properties and developments (homes, ranches, etc.)

- Mesquite/Acacia woodlands
- Desert tortoise habitat (low and moderate density)
- Utility line ROW's

A.3.4.16.1.11. FMU Fire Protection Responsibility

Wildland fire protection on all BLM public lands within this FMU is provided by the Las Vegas Field Office. Structural fire protection on private lands within this FMU is provided by Pahrump Valley Fire Department.

A.3.4.16.2. FMU Objectives & Strategies

A.3.4.16.2.1. FMU Fire Management Objectives Priority Statement

- Protect human life, safety of wildland firefighters, and protection of human safety and health *(National Fire Plan 2001).*
- Use approved fire suppression techniques in areas of critical environmental concern where there are concerns for habitat, threatened and endangered species, and urban/rural/wildland interface zones (LVFO RMP, 1998. Fire Management Direction FE-1-d).
- Provide fire suppression efforts commensurate with resource and adjacent property values at risk *(LVFO RMP, 1998. Fire Mgt Direction FE-1-a).*
- Determine specific hazard reduction priorities, including any noxious or invasive species infestations, and implement according to the existing budget (LVFO RMP, 1998. Fire Mgt Direction FE-2-a).
- Determine specific prescribed burn priorities annually, including any noxious or invasive species infestations, and implement where possible (LVFO RMP, 1998. Fire Mgt Direction FE-3-a).
- On watersheds that exhibit good potential for recovery, implement protective measures, including but not limited to fencing and removal of tamarisk (LVFO RMP, 1998. Soil Resource Mgt Objective SL-1).
- Use integrated weed management techniques to control and eradicate tamarisk, such as burning, chemical, biological or mechanical treatments, where potential for treatment is good. Rehabilitate with native species to help reduce the potential for tamarisk re-establishment and improve ecosystem health (LVFO RMP, 1998. Riparian Mgt Objective RP-1-f).
- Maintain or improve the condition of vegetation on public lands to a Desired Plant Community or to a Potential Natural Community (LVFO RMP, 1998. Vegetation Mgt Objective VG-1).
- Restore plant productivity on disturbed areas of the public lands (LVFO RMP, 1998. Vegetation Mgt Objective VG-2).
- Rehabilitate, reclaim, or revegetate areas subjected to surface-disturbing activities, where feasible. When rehabilitating, manage for optimum species diversity by seeding native species,

except where non-native species are appropriate (LVFO RMP, 1998. Vegetation Mgt Direction VG-2a).

- Protect important resting/nesting habitats, such as riparian areas and mesquite/acacia woodlands *(LVFO RMP, 1998. Fish & Wildlife Mgt Direction FW-3-g).*
- Improve disturbed non-game bird habitat, including the water table supporting these habitats, by emphasizing maintenance and enhancement of natural biodiversity (LVFO RMP, 1998. Fish & Wildlife Mgt Direction FW-3-h).
- Manage special status species habitat at the potential natural community or desired plant community, according to the need of the species (LVFO RMP, 1998. Special Status Species Objective SS-1).
- Manage habitat to further sustain the populations of federally listed species so they would no longer need protection of the Endangered Species Act. Manage habitats for non-listed special status species to support viable populations so that future listing would not be necessary *(LVFO RMP, 1998. Special Status Species Objective SS-2).*
- Manage Mesquite and Acacia woodlands for their value as wildlife habitat in the following areas: Amargosa Valley, Pahrump Valley, Stewart Valley, Hiko Wash, Piute Wash, Crystal and Stump Springs, or any other areas identified as being of significant wildlife value (LVFO RMP, 1998. Fish, Wildlife and Special Status Species Management, Management Direction FW-3-a).

Wildfire Management Priorities:

- Life safety (public and firefighters)
- Protection of human communities (including community infrastructure)
- Protection of other property and improvements
- Protection of Mesquite/Acacia woodlands
- Protection of Bighorn sheep winter range
- Protection of natural and cultural resources

A.3.4.16.2.2. FMU Wildland Fire Suppression Objectives & Strategies

Fire Suppression Objectives: Primary Wildland Fire Protection/Suppression Objective: Protect human life and property values while minimizing impacts to T&E Species populations and habitat.

Fire Suppression Strategies:

- Appropriate Management Response will be utilized as the primary fire suppression strategy to implement wildland fire suppression objectives as identified for this FMU.
- Wildland fires will be fought aggressively to minimize threats or impacts to human life, safety, and property values in the community of Pahrump, NV and adjacent areas of dispersed development.

Suppression/Protection Priorities:

- Apply M.I.S.T. when possible
- Fire suppression will be coordinated with the approved Resource Advisor
- Use natural barriers or openings where possible as the easiest, safest method to manage a wildfire. Where possible and practical use wet firebreaks rather than constructing firelines by hand or with heavy equipment
- Avoid burning out unburned islands, whenever possible
- Utilize firing tactics only if necessary to protect firefighter or public safety
- Avoid surface disturbing suppression activities whenever possible
- Avoid dropping retardant within 300 feet of water sources, to the maximum extent feasible
- Use of containment systems for portable pumps to avoid fuel spills will be required.
- City of Pahrump, NV
- Dispersed WUI values (ranches, homes, power lines, etc.)
- Federally listed T&E species populations and designated critical habitat
- Mesquite/Acacia woodlands

FMU Target Individual Wildland Fire Size: 1 acre @ 90%

FMU Target Acres Burned Per Decade: 50 acres

A.3.4.16.2.3. FMU Wildland Fire Operational Constraints, Objectives & Strategies

Special Fire Management Consideration/Areas: This FMU contains an upland urbanized area, and Mesquite/Acacia woodlands. WUI protection objectives and tactics must be weighed against T&E species and habitat concerns and constraints. All fires in Mesquite/Acacia woodlands will require on-site coordination with a BLM approved Resource Advisor.

A.3.4.16.2.3.1. Wildland Fire Operational Constraints Objectives & Strategies:

A.3.4.16.2.3.1.1. Desert Tortoise:

- Initiate full suppression activities with minimum surface disturbances to reduce loss of tortoise cover and to minimize the spread of exotic annual grasses.
- Require consultation with a qualified Resource Advisor for all wildfires within desert tortoise habitat, particularly within ACEC's and designated critical habitat units.
- Restrict OHV travel and the use of tracked vehicles to the minimum necessary to suppress wildfires within desert tortoise habitat, particularly within ACEC's and designated critical habitat units; obliterate all tracks to reduce possibility of future use.
- Use of aerial retardant is authorized; foam or fugitive retardant is preferable to iron oxide retardant.

- Do not authorize burning out of unburned fingers or islands of vegetation. The exception to this case would be the removal of fuels for safety concerns.
- Establish fire camps, staging areas, and helispots in previously disturbed areas outside of ACEC's and designated critical habitat units, where possible, in consultation with a qualified Resource Advisor.
- Provide all firefighters and support personnel with a briefing on desert tortoises and their habitat to minimize take, particularly those associated with vehicle use.

A.3.4.16.2.3.1.2. Noxious Weeds and Invasive Species Transport Control Procedures:

Las Vegas Field Office Noxious Weed Control and Fire Management Weed Transport Control:

- Off-district engines, crew carriers, overhead vehicles, and helitack/helicopter support vehicles will, upon check-in and prior to proceeding to the line, wash down at the, Logandale, Red Rock, Pahrump Fire Stations or a commercial truck washing station. This will be determined by the location of the units' last fire assignment and if they were cleaned at release from that assignment.
    - The washdown will concentrate on the undercarriage, with special emphasis on axles, frame, crossmembers, motor mounts, and on and underneath steps, running boards, and front bumper/brushguard assemblies. Vehicle cabs will be swept out with refuse disposed of in waste receptacles. In wilderness areas, all portable equipment used on an incident (pumps, hose, fittings, water storage items) will be washed off to rid them of any seed or spores that may be attached from previous fires in noxious weed infested sites.
    - During initial briefings, washdowns will be mentioned and facilities made available for oncoming crews.
- Las Vegas Field Office crews will follow the same procedures identified in Item 1 when returning from fieldwork or wildland fires, especially when vehicles are used in know noxious weed areas infested with known noxious or invasive species common to the Field Office area.
- Upon leaving the Field Office when released from an incident, all off-unit vehicles will follow aforementioned washdown procedures so that Las Vegas' noxious weed problems do not become someone else's problems.
- All equipment used off pavement will be cleaned of weed and grass seed stems, stalks, etc. prior to release from an incident. This includes, but is not limited to, tents, tarps, helicopter support equipment, foldatanks and free-standing tanks, mechanic's vehicles, and logistical support vehicles, trailers and equipment. These vehicles will be washed as in 1.a. above.

This Field Office policy will be followed by all equipment involved in fire suppression while on Las Vegas Field Office assignments. Vehicles will be cleared of washdown procedures during checkout and crew evaluations. In the event vehicles are released from fires away from the district office, the closest wash facility, (government or commercial) will be utilized.

A.3.4.16.2.4. FMU Wildland Fire Use Objectives & Strategies

Wildfire will not be used as a management tool within this FMU at this time.

A.3.4.16.2.5. Burned Acre Objective Review

IF the FMU decadal wildfire acre-burned target has been reached or exceeded PRIOR TO THE COMPLETION OF THE 10-YEAR PLANNING PERIOD, from either wildfire or prescribed fire, a review of fire management objectives and strategies will be initiated to develop new suppression criteria on wildland fire occurrence and prescribed fire acre goals.

A.3.4.16.2.6. FMU Prescribed Fire Objectives & Strategies

Prescribed Fire Objectives: Prescribed fire would be utilized to eliminate or reduce biomass piles created from cut material to clear fuel breaks around the scattered pockets of Mesquite/Acacia woodlands.

Prescribed Fire Strategies: *Note:* Cut and piled debris will be the only vegetation burned to reduce or eliminate hazard fuel concentrations.

Rx Fire Annual & Decadal Acre Target:

- Annual: Maximum of 5 acres
- Decadal: 50 acres

T & E Species Strategies: There are presently no prescribed fire fuels treatments planned or in operation in this FMU, but future fuels treatments are probable. Endangered Species Act Section 7 consultation procedures and Fish and Wildlife Service concurrence will be achieved, prior to the commencement of any future on-the-ground treatments. At the discretion of the Service, the fuels treatment consultation process will either entail a formal programmatic consultation for the entire Pahrump FMU or else individual project-level informal consultations. All terms and conditions, minimization measures, and other stipulations in those consultation agreements will be adhered to during the implementation of any BLM fuels treatments in this FMU.

Air Quality Strategy: Any burning operations will be conducted to minimize smoke impacts to urban communities, dispersed residences, and nearby highway traffic. Project level prescribed fire plans will address smoke management.

NEPA Compliance: Prior to implementation of any proposed projects, site-specific NEPA documentation will be completed, as applicable.

Rx Fire Monitoring Strategy: Monitoring, documentation, dissemination and sharing of treatment effectiveness data is a priority when applying prescribed fire.

A.3.4.16.2.7. FMU Non-Fire Fuels Treatment Objectives & Strategies

Non-Fire Fuels Treatment Objectives: Hazard fuel breaks would be cut around the scattered pockets of Mesquite/Acacia woodlands and the material piled to be eventually burned.

Non-Fire Fuels Treatment Strategies: *Note:* Cut and piled debris will be the only vegetation burned to reduce or eliminate hazard fuel concentrations.

Non-Fire Annual & Decadal Acre Target:

- Annual: Maximum of 50 acres

- Decadal: 500 acres

T & E Species Strategies: There are presently no non-fire fuels treatments planned or in operation in this FMU, but future fuels treatments are probable. Endangered Species Act Section 7 consultation procedures and Fish and Wildlife Service concurrence will be achieved, prior to the commencement of any future on-the-ground treatments. At the discretion of the Service, the fuels treatment consultation process will either entail a formal programmatic consultation for the entire Pahrump FMU or else individual project-level informal consultations. All terms and conditions, minimization measures, and other stipulations in those consultation agreements will be adhered to during the implementation of any BLM fuels treatments in this FMU.

Air Quality Strategies: Fire management activities in this FMU may include fire suppression; open burning, light and heavy equipment mobilization and fuels treatment activities, both chemical and biological.

The short-term use of small-mechanized equipment used for the project may cause some minor soil disturbances and potential increases in PM10 emissions, however it is anticipated that there will be no significant impact to air quality. Where applicable, water will be used as a dust control measure.

If dust emissions during mechanical treatment activities result in any complaints from the public, the operation will be re-evaluated to identify dust mitigation measures that can be implemented cost-effectively and without undue delays to the overall project schedule.

NEPA Compliance: The following procedures will be completed for all fuels treatment projects:

- Chemical applications:
  - Operational compliance with EPA label restrictions
  - File for and obtain BLM Pesticide Use Permits (PUP's)
  - Complete daily Pesticide Application Records (PAR's)
  - Submit annual Pesticide Use Reports to the Nevada Department of Agriculture
  - Obtain/Maintain Nevada Pesticide Applicator Certification training for designated Field Office personnel
  - Ensure that all contractors obtain/possess current Nevada Pesticide Applicators Commercial License
- NEPA compliance:
  - Ensure all projects comply with LUP direction
  - Prepare appropriate project level and/or programmatic NEPA documents (EA's, DNA's, ROD, etc.)
- ESA compliance:
  - Complete project level and/or programmatic Section 7 consultations for all fuels treatments, in early and close coordination with USFWS

- ○ If project conditions change, initiate re-consultation procedures as appropriate.

Treatment Monitoring Strategy: Treatment effectiveness monitoring will be conducted in partnership with USGS, UNR, UNLV, and other parties as identified

A.3.4.16.2.8. FMU Post Fire Rehab/Restoration Objectives & Strategies

- Treatments will comply with the LVFO Normal Fire Rehabilitation Plan and Environmental Assessment (E.A. No. NV-054-9-24).

A.3.4.16.2.9. FMU Community Protection/Community Assistance Objectives & Strategies

Communities at Risk/WUI Areas: City of Pahrump

Community Protection/Community Assistance Objectives:

- Educate/work with communities on defensible space issues and wildfire hazards
- Pursue establishment of local Fire Safe Council Chapter
- Promote collaborative efforts to mitigate fuel hazards with cooperators
- Continue dialogue with City of Pahrump officials, and Nye County officials toward implementation of the above-mentioned objectives.

Community Protection/Community Assistance Strategy:

- Complete and maintain the hazard fuel breaks around the scattered pockets of Mesquite/Acacia woodlands.
- Prepare risk assessments and hazard mitigation plans for the City of Pahrump urban area
- Educate/work with communities on defensible space issues and wildfire hazards
- Pursue establishment of local Fire Safe Council Chapter
- Promote collaborative efforts to mitigate fuel hazards with cooperators
- Continue dialogue with City of Pahrump and Nye County officials toward the implementation of the above mentioned objectives

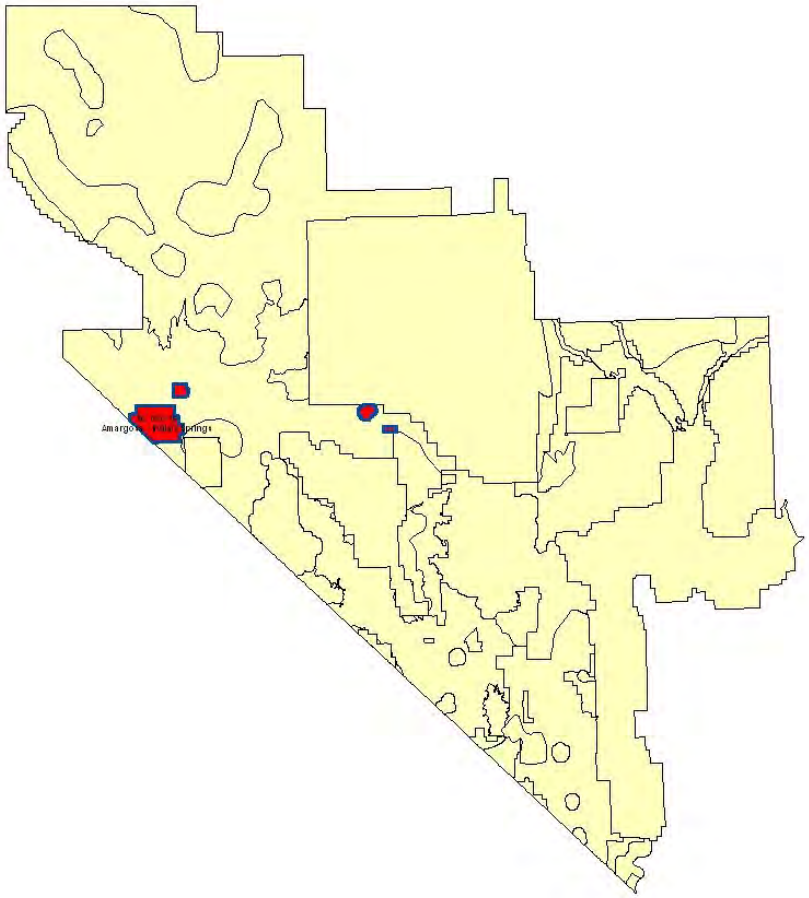
Community Wildfire Safety Education Strategy: Coordinate with Pahrump Valley Fire Department, and citizen groups (Friends of Mesquite) to provide public education and prevention programs in accordance with the National Fire Plan

A.3.4.16.3. FMU Fire Program Analysis - Quantifiable Objective Summary

Initial Attack Success	Decadal Wildfire Acres Burn Tolerance	WFU Decadal Target Acres	Rx Fire Acres Per Decade	Non-Fire Acres Per Decade
1 acre @ 90%	50	N/A	50	500

A.3.4.17. Amargosa-Indian Springs

NV050-16



FMU Name & Unit No.: **Amargosa-Indian Springs; NV050-16**

FMU Type/Category: **Wildland Urban Interface (WUI)**

A.3.4.17.1. FMU Description:

A.3.4.17.1.1. FMU Location Information

Geographic boundaries: This discontinuous FMU takes in the farming community of Amargosa, the City of Indian Springs, Indian Springs Air Force Base, and dispersed sites of commercial development on US Highway 95. This FMU also includes two public land disposal areas, in Amargosa Valley (27,904 acres) and at Indian Springs (1,302 acres).

A.3.4.17.1.2. FMU Acre Total

Ownership by Acres and Percent		
NV 050-16	**Amargosa - Indian Springs**	
Ownership	**Acres**	**Percent**
Bureau of Land Management	38,464	63.1
Department of Defense	2,329	3.8
Nevada State	684	1.1
Private	19,490	32.0
Total Acres	60,967	

A.3.4.17.1.3. Fire Occurrence and History

FMU Number	Decadal (94-03)	24 Years (80-03)	Ignition Cause (80-03)	
NV 050-16			Lightning	0
Number of Fires	1	3	Human/Other	3
Largest Fire (Acres)	0.1	0.1	**Multiple Fire Days (80-03)**	
Total Acres Burned	0.1	0.2	Total Multiple Fire Days (MFD)	2
Average Fire Size (Acres)	0.1	0.1	Number of MFD Fires	2
			Total Acres Burned by Multiple Fires	0.1

Narrative Description: Most wildfires in this FMU are single tree yucca fires.

This FMU mainly consists of creosote bursage habitat, which in certain years is heavily infested with the invasive annual grass, red brome. Although mesquites and acacias resprout following fire disturbance, these woodland stands need to be protected from high intensity wildfire in order to preserve the canopy structural character (for sensitive bird species habitat suitability, mainly for Phainopepla).

General Fire Protection Characteristics: This FMU consists of parcels of BLM lands located within rural and urban WUI zones. BLM lands include areas of medium and low density Desert tortoise habitat, and stands of mesquite/acacia woodland. Of the upland shrub habitat portion of this FMU, a sizable portion will eventually convey to non-federal ownership.

A.3.4.17.1.4. FMU Vegetation

FMU Vegetation/Fuel Types		
NV 050-16	**Amargosa - Indian Springs**	
Veg/Fuel Type	Acres	Percent
Mojave	45,342	74.0
No Significant Vegetation	9,700	15.8
Salt Desert Scrub/Shadscale	6,236	10.2
Grand Total	61,278	

Vegetation Narrative: The wildland portion of this FMU mainly consists of creosote bursage and Mojave scrub vegetation, with scattered stands of mesquite/acacia woodland.

A.3.4.17.1.5. FMU Fuel Models & Live Fuel Moisture Characteristics

Surface Fuel Model & Canopy Cover: Wildfires in the desert shrub vegetative types are generally dependent upon ephemeral buildups of red brome and other introduced species.

Live Fuel Moisture Averages:

LFM Site	May	June	July	Aug	Sept	Oct
N5C	189%	130%	93%	92%	99%	89%

Live Fuel Moisture Characteristics:

- At live fuel moisture levels of 181% and above fires typically will exhibit Very Low Fire Behavior characteristics
- At live fuel moisture levels of 151% to 180% fires typically will exhibit Low Fire Behavior characteristics
- At live fuel moisture levels of 126% to 150% fires typically will exhibit Moderate Fire Behavior characteristics
- At live fuel moisture levels of 101% to 125% fires typically will exhibit High Fire Behavior characteristics
- At live fuel moisture levels of 75% to 100% fires typically will exhibit Extreme Fire Behavior characteristics
- At live fuel moisture levels of 75% and below fires typically will exhibit Advanced Fire Behavior characteristics

A.3.4.17.1.6. Fire Weather & Climate Related Impacts

(Detailed weather station data for this FMU will be added to the FMP Appendix upon completion of the national fire weather data validation/correction project.)

- Wet lightning is common in this area. Fires generally remain small when starts occur under these common conditions.
- Dry Lightning is possible in this area. Larger fires can occur with these erratic and gusty thunderstorm events.
- Larger fires occur when human ignitions occur under typical warm and windy summer weather.
- Fire behavior can be extreme under these conditions in Mesquite/acacia woodlands or heavily infested Tamarisk riparian areas when there is an ephemeral buildup of the invasive annual grass Red brome.

A.3.4.17.1.7. Fire Regime

- Fire Regime IV and V; Condition Class II

FMU by Condition Class and Fire Regime			
NV 050-16		Amargosa - Indian Springs	
CC	FR	Acres	Percent
2	V	41,621	81.7
3	IV	9,293	18.3
Total		50,913	

A.3.4.17.1.8. FMU Physical Characteristics

Topography:

- Elevation Range: 3,199 to 3,998 feet
- Slope: less than 10%
- Aspect: flat
- Major topographical features: This FMU consists of four discontinuous WUI zones located northwest of Las Vegas, and including:
  - The Amargosa Valley, bounded to the north and east by the Amargosa Desert, to the west and south by California, and to the southeast by Ash Meadows National Wildlife Refuge.
  - City of Indian Springs/Indian Springs Air Force Base: 42 miles from Las Vegas on US Highway 95.

Access Information: Major access routes include US 95; State Routes 160, and 373, and other paved and unpaved roads.

A.3.4.17.1.9. FMU Resource Values & Attributes

Wildland-Urban Interface/Intermix:

- Rural farming community of Amargosa, including future build-out on the 27,904-acre public land disposal area.
- City of Indian Springs, including future build-out on the 1,302-acre public land disposal area.
- Indian Springs Air Force Base.
- Nevada State Correctional Facilities at Indian Springs.
- Gas station properties on US Highway 95, above Amargosa Valley.

Resource Use:

- Human life and property values
- Community of Amargosa
- City of Indian Springs
- Indian Springs Air Force Base
- Mesquite/acacia woodlands, including the restoration project and enclosure at Cactus Springs.
- Dispersed recreation; special use permit activities

  Public lands:

  - Utility line ROW's

  - Sand and gravel pits

- Non-federal lands:
  - Commercial and residential urban activities and infrastructure
  - Utility line ROW's
  - Farms and ranches

Air Quality: There are no non-attainment airsheds in this FMU. Rx fire burn plans will have an approved variance (Open Burn Permit) from the State of Nevada, Division of Environmental Protection; Smoke Management Program.

Soils: Soils have formed under conditions of physical weathering (rather than chemical dissolution) because of the arid climate. Soils on lower portions of alluvial fans and valley floors contain very little organic material, are moderately to highly alkaline, and can contain high concentrations of gypsum and dissolved salts. A gravelly surface crust (called desert pavement) occurs throughout these areas. Desert pavement is very stable and protects underlying fine-grained soils from erosion. A cemented hardpan layer commonly occurs at shallow depths beneath surface soils throughout these areas. Mountain slopes tend to be covered by an unstable layer of large rocks, boulders, stones, and cobbles. Runoff from periodic rainstorms transports large amounts of material to lower elevations, forming alluvial fans of coarse material and depositing thick sequences of gravelly loams, sands, and finer grained sediments on valley floors.

Soils are susceptible to water and wind erosion. Water erosion occurs during periodic high-intensity, short duration summertime thunderstorms and less frequent, sustained wintertime rainstorms. Water erosion occurs by a combination of sheet flow, rill formation, splashing, and channelized flow in ephemeral washes and stream channels. Wind erosion occurs in areas where the desert pavement layer has been disturbed by human activities or heavy use by wild horses and burros, where large areas of vegetation have been burned by fire, sand dune areas, and as part of physical weathering processes.

Cultural and Paleontological Values: N/A

T&E and Sensitive Species: Desert tortoise

Habitat Values:

- Low density Desert tortoise habitat
- Mesquite/acacia woodlands: sensitive species habitat
- Wild horse and burro Amargosa Herd Management Area
- Wild horse and burro Wheeler Pass Herd Management Area

Hydrology and Water Quality: The Amargosa-Indian Springs FMU lies within both the Death Valley and the Central Region hydrographic regions which are topographically closed internally drained basins. Ephemeral wash channels drain most of the Amargosa-Indian Springs FMU and only convey flow after periodic high-intensity summer thunderstorms or sustained winter rainstorms. Rapid runoff to ephemeral wash channels can produce flash flooding and transport

large quantities of sediment as water flows from mountainous areas and alluvial fans towards valley floors.

Wilderness or WSA: N/A

A.3.4.17.1.10. FMU Public Safety, Economic & Community Values at Risk

- Human life and property values
- Community of Amargosa
- City of Indian Springs
- Dispersed properties and developments (homes, ranches, etc.)
- Mesquite/acacia woodlands
- Desert tortoise habitat (low density)
- Utility line ROW's

A.3.4.17.1.11. FMU Fire Protection Responsibility

Wildland fire protection on all BLM public lands within this FMU is provided by the Las Vegas Field Office. Structural fire protection on private lands within this FMU is provided by the Clark County Fire Department, Department of Defense (USAF Indian Springs Auxiliary Airfield), and Amargosa Valley Volunteer Fire Department.

A.3.4.17.2. FMU Objectives & Strategies

A.3.4.17.2.1. FMU Fire Management Objectives Priority Statement

- Protect human life, safety of wildland firefighters, and protection of human safety and health *(National Fire Plan 2001).*
- Use approved fire suppression techniques in areas of critical environmental concern where there are concerns for habitat, threatened and endangered species, and urban/rural/wildland interface zones (LVFO RMP, 1998. Fire Management Direction FE-1-d).
- Provide fire suppression efforts commensurate with resource and adjacent property values at risk *(LVFO RMP, 1998. Fire Mgt Direction FE-1-a).*
- Determine specific hazard reduction priorities, including any noxious or invasive species infestations, and implement according to the existing budget (LVFO RMP, 1998. Fire Mgt Direction FE-2-a).
- Manage Mesquite and Acacia woodlands for their value as wildlife habitat in the following areas: Amargosa Valley, Pahrump Valley, Stewart Valley, Hiko Wash, Piute Wash, Crystal and Stump Springs, or any other areas identified as being of significant wildlife value *(LVFO RMP, 1998. Fish, Wildlife and Special Status Species Management, Management Direction FW-3-a).*

- Determine specific prescribed burn priorities annually, including any noxious or invasive species infestations, and implement where possible (LVFO RMP, 1998. Fire Mgt Direction FE-3-a).
- On watersheds that exhibit good potential for recovery, implement protective measures, including but not limited to fencing and removal of tamarisk (LVFO RMP, 1998. Soil Resource Mgt Objective SL-1).
- Use integrated weed management techniques to control and eradicate tamarisk, such as burning, chemical, biological or mechanical treatments, where potential for treatment is good. Rehabilitate with native species to help reduce the potential for tamarisk re-establishment and improve ecosystem health (LVFO RMP, 1998. Riparian Mgt Objective RP-1-f).
- Maintain or improve the condition of vegetation on public lands to a Desired Plant Community or to a Potential Natural Community (LVFO RMP, 1998. Vegetation Mgt Objective VG-1).
- Restore plant productivity on disturbed areas of the public lands (LVFO RMP, 1998. Vegetation Mgt Objective VG-2).
- Rehabilitate, reclaim, or revegetate areas subjected to surface-disturbing activities, where feasible. When rehabilitating, manage for optimum species diversity by seeding native species, except where non-native species are appropriate (LVFO RMP, 1998. Vegetation Mgt Direction VG-2a).
- Protect important resting/nesting habitats, such as riparian areas and mesquite/acacia woodlands *(LVFO RMP, 1998. Fish & Wildlife Mgt Direction FW-3-g).*
- Improve disturbed non-game bird habitat, including the water table supporting these habitats, by emphasizing maintenance and enhancement of natural biodiversity (LVFO RMP, 1998. Fish & Wildlife Mgt Direction FW-3-h).
- Manage special status species habitat at the potential natural community or desired plant community, according to the need of the species (LVFO RMP, 1998. Special Status Species Objective SS-1).
- Manage habitat to further sustain the populations of federally listed species so they would no longer need protection of the Endangered Species Act. Manage habitats for non-listed special status species to support viable populations so that future listing would not be necessary *(LVFO RMP, 1998. Special Status Species Objective SS-2).*

Wildfire Management Priorities:

- Life safety (public and firefighters)
- Protection of human communities (including community infrastructure)
- Protection of other property and improvements
- Protection of mesquite/acacia woodlands
- Protection of other natural resources
- Protection of cultural resources

A.3.4.17.2.2. FMU Wildland Fire Suppression Objectives & Strategies

Fire Suppression Objectives: Primary Wildland Fire Protection/Suppression Objective: Protect human life and property values while minimizing impacts to T&E or Sensitive Species populations and habitats.

Fire Suppression Strategies:

- Appropriate Management Response will be utilized as the primary fire suppression strategy to implement wildland fire suppression objectives as identified for this FMU.
- Wildland fires will be fought aggressively to minimize threats or impacts to human life, safety, and property values in the communities of Amargosa and Indian Springs, NV, as well as areas of dispersed development along US Highway 95.
- Although WUI protection is the clear number one priority in this FMU, there is the secondary priority to protect mesquite/acacia woodland habitats.

Suppression/Protection Priorities:

- Rural community of Amargosa, NV
- City of Indian Springs, NV; adjacent Indian Springs Air Force Base
- Dispersed WUI values (ranches, homes, power lines, etc.)
- Federally listed T&E species: Desert tortoise
- Mesquite/acacia woodlands

FMU Target Individual Wildland Fire Size: 1 acre @ 90%

FMU Target Acres Burned Per Decade: 50 acres

A.3.4.17.2.3. FMU Wildland Fire Operational Constraints, Objectives & Strategies

Special Fire Management Consideration/Areas: This discontinuous FMU takes in the WUI zones of the City of Indian Springs, Indian Springs Air Force Base, the Amargosa Valley farming community, and dispersed commercial developments along Highway 95. The FMU includes Desert tortoise habitat and some stands of mesquite/acacia woodland. Fires in mesquite/acacia habitat will require on-site coordination with an approved Resource Advisor.

This FMU contains isolated rural and small urban WUI zones, along with upland shrub habitats and mesquite/acacia woodland stands. WUI protection tactics should be weighed against T&E species concerns and constraints. Wildfires in mesquite/acacia woodlands will require on-site coordination with an approved Resource Advisor.

A.3.4.17.2.3.1. Wildland Fire Operational Constraints Objectives & Strategies:

A.3.4.17.2.3.1.1. General Wildlife and Mesquite/Acacia Constraints:

- Apply M.I.S.T. when possible

- Fire suppression will be coordinated with the approved Resource Advisor
- Use natural barriers or openings where possible as the easiest, safest method to manage a wildfire. Where possible and practical use wet firebreaks rather than constructing firelines by hand or with heavy equipment
- Avoid burning out unburned islands, whenever possible
- Utilize firing tactics only if necessary to protect firefighter or public safety
- Avoid surface disturbing suppression activities whenever possible
- Avoid dropping retardant within 300 feet of water sources, to the maximum extent feasible
- Use of containment systems for portable pumps to avoid fuel spills will be required.

A.3.4.17.2.3.1.2. Desert Tortoise:

- Initiate full suppression activities with minimum surface disturbances to reduce loss of tortoise cover and to minimize the spread of exotic annual grasses.
- Require consultation with a qualified Resource Advisor for all wildfires within desert tortoise habitat, particularly within ACEC's and designated critical habitat units.
- Restrict OHV travel and the use of tracked vehicles to the minimum necessary to suppress wildfires within desert tortoise habitat, particularly within ACEC's and designated critical habitat units; obliterate all tracks to reduce possibility of future use.
- Use of aerial retardant is authorized; foam or fugitive retardant is preferable to iron oxide retardant.
- Do not authorize burning out of unburned fingers or islands of vegetation. The exception to this case would be the removal of fuels for safety concerns.
- Establish fire camps, staging areas, and helispots in previously disturbed areas outside of ACEC's and designated critical habitat units, where possible, in consultation with a qualified Resource Advisor.
- Provide all firefighters and support personnel with a briefing on desert tortoises and their habitat to minimize take, particularly those associated with vehicle use.

A.3.4.17.2.3.1.3. Noxious Weeds and Invasive Species Transport Control Procedures:

Las Vegas Field Office Noxious Weed Control and Fire Management Weed Transport Control:

- Off-district engines, crew carriers, overhead vehicles, and helitack/helicopter support vehicles will, upon check-in and prior to proceeding to the line, wash down at the, Logandale, Red Rock, Pahrump Fire Stations or a commercial truck washing station. This will be determined by the location of the units' last fire assignment and if they were cleaned at release from that assignment.
    - The washdown will concentrate on the undercarriage, with special emphasis on axles, frame, crossmembers, motor mounts, and on and underneath steps, running boards, and front

bumper/brushguard assemblies. Vehicle cabs will be swept out with refuse disposed of in waste receptacles. In wilderness areas, all portable equipment used on an incident (pumps, hose, fittings, water storage items) will be washed off to rid them of any seed or spores that may be attached from previous fires in noxious weed infested sites.

  - During initial briefings, washdowns will be mentioned and facilities made available for oncoming crews.

- Las Vegas Field Office crews will follow the same procedures identified in Item 1 when returning from fieldwork or wildland fires, especially when vehicles are used in know noxious weed areas infested with known noxious or invasive species common to the Field Office area.

- Upon leaving the Field Office when released from an incident, all off-unit vehicles will follow aforementioned washdown procedures so that Las Vegas' noxious weed problems do not become someone else's problems.

- All equipment used off pavement will be cleaned of weed and grass seed stems, stalks, etc. prior to release from an incident. This includes, but is not limited to, tents, tarps, helicopter support equipment, foldatanks and free-standing tanks, mechanic's vehicles, and logistical support vehicles, trailers and equipment. These vehicles will be washed as in 1.a. above.

This Field Office policy will be followed by all equipment involved in fire suppression while on Las Vegas Field Office assignments. Vehicles will be cleared of washdown procedures during checkout and crew evaluations. In the event vehicles are released from fires away from the district office, the closest wash facility, (government or commercial) will be utilized.

A.3.4.17.2.4. FMU Wildland Fire Use Objectives & Strategies

Wildfire will not be used as a management tool within this FMU at this time.

A.3.4.17.2.5. Burned Acre Objective Review

IF the FMU decadal wildfire acre-burned target has been reached or exceeded PRIOR TO THE COMPLETION OF THE 10-YEAR PLANNING PERIOD, from either wildfire or prescribed fire, a review of fire management objectives and strategies will be initiated to develop new suppression criteria on wildland fire occurrence and prescribed fire acre goals.

A.3.4.17.2.6. FMU Prescribed Fire Objectives & Strategies

Prescribed Fire Objectives: Prescribed fire would be utilized to eliminate or reduce piles resulting from fuel break treatments to protect stands of mesquite/acacia.

Prescribed Fire Strategies: Prescribed fire would only be utilized to eliminate or reduce piles resulting from fuel break treatments to protect stands of mesquite/acacia.

Rx Fire Annual & Decadal Acre Target:

- Annual: Maximum of 5 acres

- Decadal: 50 acres

T & E Species Strategies: There are presently no prescribed fire fuels treatments planned or in operation in this FMU, but future fuels treatments are probable. Endangered Species Act Section 7 consultation procedures and Fish and Wildlife Service concurrence will be achieved, prior to the commencement of any future on-the-ground treatments. At the discretion of the Service, the fuels treatment consultation process will either entail a formal programmatic consultation for the entire Amargosa-Indian Springs FMU or else individual project-level informal consultations. All terms and conditions, minimization measures, and other stipulations in those consultation agreements will be adhered to during the implementation of any BLM fuels treatments in this FMU.

Air Quality Strategy: Any burning operations will be conducted to minimize smoke impacts to urban communities, dispersed residences, and nearby highway traffic.

Any prescribed fire would be done in accordance with an approved burn plan containing a smoke management plan.

NEPA Compliance: Prior to implementation of any proposed projects, site-specific NEPA documentation will be completed, as applicable.

Rx Fire Monitoring Strategy: Monitoring will be conducted to identify: treatment effectiveness, site recruitment by invasive species, and presence of cultural resources.

A.3.4.17.2.7. FMU Non-Fire Fuels Treatment Objectives & Strategies

Non-Fire Fuels Treatment Objectives: Non-fire treatments would entail cutting, limbing, piling and or lop/scatter to create fuel breaks on the perimeter of mesquite/acacia stands, for the purpose of protecting sensitive species habitat values.

Non-Fire Fuels Treatment Strategies: Note: Vegetation will be removed to create a fuel break around the scattered pockets of Mesquite/Acacia woodlands.

Non-Fire Annual & Decadal Acre Target:

- Annual: Maximum of 5 acres
- Decadal: 50 acres

T & E Species Strategies: There are presently no non-fire fuels treatments planned or in operation in this FMU, but future fuels treatments are probable. Endangered Species Act Section 7 consultation procedures and Fish and Wildlife Service concurrence will be achieved, prior to the commencement of any future on-the-ground treatments. At the discretion of the Service, the fuels treatment consultation process will either entail a formal programmatic consultation for the entire Amargosa-Indian Springs FMU or else individual project-level informal consultations. All terms and conditions, minimization measures, and other stipulations in those consultation agreements will be adhered to during the implementation of any BLM fuels treatments in this FMU.

Air Quality Strategies: Fire management activities in this FMU may include fire suppression, open burning, light and heavy equipment mobilization and fuels treatment activities, both chemical and biological.

The short-term use of small mechanized equipment used for the project may cause some minor soil disturbances and potential increases in PM10 emissions, however it is anticipated that there

will be no significant impact to air quality. Where applicable, water will be used as a dust control measure.

If dust emissions during mechanical treatment activities result in any complaints from the public, the operation will be re-evaluated to identify dust mitigation measures that can be implemented cost-effectively and without undue delays to the overall project schedule.

NEPA Compliance: The following procedures will be completed for all fuels treatment projects:

- NEPA compliance:
  - Ensure all projects comply with LUP direction
  - Prepare appropriate project level and/or programmatic NEPA documents (EA's, DNA's, ROD, etc.)
- ESA compliance:
  - Complete project level and/or programmatic Section 7 consultations for all fuels treatments, in early and close coordination with USFWS
  - If work conditions change, initiate appropriate re-consultation procedures.

Treatment Monitoring Strategy: Monitoring will be conducted to identify: treatment effectiveness, site recruitment by invasive species, and presence of cultural resources.

A.3.4.17.2.8. FMU Post Fire Rehab/Restoration Objectives & Strategies

Restore plant productivity on disturbed areas of the public lands. Rehabilitate, reclaim, or revegetate areas subjected to surface-disturbing activities, where feasible. When rehabilitating, manage for optimum species diversity by seeding native species, except where non-native species are appropriate.

- Conduct all treatment activities in accordance with the Las Vegas Field Office Normal Year Fire Rehabilitation Plan (1990); Environmental Assessment no. NV-054-90-24.
- In the event that suppression efforts require off-road vehicle operations, replant and visually camouflage the first 200 feet of tire tracks in order to prevent further habitat impacts (due to public use of these track ways).
- Whenever feasible, utilize native species in seeding and/or re-planting treatments.
- Cultivate local supplies of live plant materials for use during riparian restoration efforts.
- Maintain a seed bank of locally collected native plant species for use in restoring both fire fuels treatments and fire-disturbed sites.
- Cultivate and develop varieties of locally grown native seed by means of plant material centers.

A.3.4.17.2.9. FMU Community Protection/Community Assistance Objectives & Strategies

Communities at Risk/WUI Areas:

- Rural community of Amargosa, NV, including public land disposal area
- City of Indian Springs, NV
- Indian Springs Air Force Base

Community Protection/Community Assistance Objectives:

- Educate/work with the City of Indian Springs and the rural community of Amargosa on defensible space issues and wildfire hazards.
- Pursue establishment of local Fire Safe Council Chapter(s).
- Promote collaborative efforts to mitigate fuel hazards with cooperators, including Indian Springs Air Force Base.
- Continue dialogue with City of Indian Springs and Amargosa officials, and Clark and Nye County officials toward implementation of the above-mentioned objectives.

Community Protection/Community Assistance Strategy:

- Implement fuel break treatments around stands of mesquite/acacia.
- Prepare risk assessments and hazard mitigation plans for the Amargosa and Indian Springs WUI zones.
- Educate/work with the communities of Amargosa, Indian Springs, and Indian Springs Air Force Base on defensible space issues and wildfire hazards.
- Pursue establishment of local Fire Safe Council Chapter(s).
- Promote collaborative efforts to mitigate fuel hazards with cooperators.
- Continue dialogue with Amargosa, Indian Springs, Air Force, and Clark and Nye County officials toward implementation of the above-mentioned objectives, including through Reciprocal Agreements.

Community Wildfire Safety Education Strategy: Coordinate with Amargosa and Indian Springs VFD's, and citizen groups to provide public education and prevention programs in accordance with the National Fire Plan.

A.3.4.17.3. FMU Fire Program Analysis - Quantifiable Objective Summary

Initial Attack Success	Decadal Wildfire Acres Burn Tolerance	WFU Decadal Target Acres	Rx Fire Acres Per Decade	Non-Fire Acres Per Decade
1 acre @ 90%	50	N/A	50	50

A.3.4.18. Laughlin-Nelson

FMU Name & Unit No.: **Laughlin-Nelson; NV050-17**

FMU Type/Category: **Wildland Urban Interface (WUI)**

A.3.4.18.1. FMU Description:

A.3.4.18.1.1. FMU Location Information

Geographic boundaries: This discontinuous FMU takes in the large urbanized city of Laughlin and the rural communities of Searchlight, Nelson, Cal-Nev-Ari and a small community subdivision (unnamed) at the intersection of US 95 and State route 163. This FMU also includes three public land disposal areas, in Laughlin (4,720 acres) at Searchlight (1,944 acres), and at Nelson (1,259 acres).

A.3.4.18.1.2. FMU Acre Total

Ownership by Acres and Percent		
NV 050-17	**Laughlin - Nelson**	
Ownership	**Acres**	**Percent**
Bureau of Land Management	25,351	51.0
Bureau of Reclamation	2,980	6.0
Nevada State	450	0.9
Private	20,537	41.3
Water	380	0.8
Total Acres	49,698	

A.3.4.18.1.3. Fire Occurrence and History

FMU Number	**Decadal (94-03)**	**24 Years (80-03)**	**Ignition Cause (80-03)**	
NV 050-17			Lightning	2
Number of Fires	2	7	Human/Other	4
Largest Fire (Acres)	0.1	300.0	**Multiple Fire Days (80-03)**	
Total Acres Burned	0.2	350.2	Total Multiple Fire Days (MFD)	4
Average Fire Size (Acres)	0.1	50.0	Number of MFD Fires	5
			Total Acres Burned by Multiple Fires	30.2

Narrative Description: This FMU mainly consists of creosote bursage habitat, which in certain years is heavily infested with the invasive annual grass, red brome. Wildland fire played a minor to limited role in this habitat prior to their present disturbed state. Fires generally occur in the late spring through September but can occur year round. Most wildfires occur in tamarisk-infested areas. Typically, these fires are wind driven and are of moderate to high intensity. Small, low intensity wildfires in tamarisk are less common but do occur.

General Fire Protection Characteristics: The Laughlin portion of this FMU consists of two small parcels of BLM lands located within the urban WUI zone. The Searchlight, Nelson, Cal-Nev-Ari, and small community subdivision (unnamed) WUI zones are surrounded by BLM lands. All portions include upland shrub habitats and will eventually convey to non-federal ownership.

A.3.4.18.1.4. FMU Vegetation

FMU Vegetation/Fuel Types		
NV 050-17	**Laughlin - Nelson**	
Veg/Fuel Type	Acres	Percent
Grassland	2,536	5.1
Mojave	41,936	84.3
No Significant Vegetation	5,092	10.2
Salt Desert Scrub/Shadscale	159	0.3
Grand Total	49,723	

Vegetation Narrative: The wildland portion of this FMU mainly consists of creosote bursage and Mojave scrub vegetation, with scattered stands of tamarisk.

A.3.4.18.1.5. FMU Fuel Models & Live Fuel Moisture Characteristics

Surface Fuel Model & Canopy Cover: The desert shrub vegetative types are generally dependent upon ephemeral buildups of red brome and other introduced species.

Live Fuel Moisture Averages:

LFM Site	May	June	July	Aug	Sept	Oct
N5F	154%	94%	81%	76%	74%	82%

Live Fuel Moisture Characteristics:

- At live fuel moisture levels of 181% and above fires typically will exhibit Very Low Fire Behavior characteristics
- At live fuel moisture levels of 151% to 180% fires typically will exhibit Low Fire Behavior characteristics
- At live fuel moisture levels of 126% to 150% fires typically will exhibit Moderate Fire Behavior characteristics
- At live fuel moisture levels of 101% to 125% fires typically will exhibit High Fire Behavior characteristics
- At live fuel moisture levels of 75% to 100% fires typically will exhibit Extreme Fire Behavior characteristics
- At live fuel moisture levels of 75% and below fires typically will exhibit Advanced Fire Behavior characteristics

A.3.4.18.1.6. Fire Weather & Climate Related Impacts

(Detailed weather station data for this FMU will be added to the FMP Appendix upon completion of the national fire weather data validation/correction project.)

- Wet lightning is common in this area. Fires generally remain small when starts occur under these common conditions.
- Dry Lightning is possible in this area. Larger fires can occur with these erratic and gusty thunderstorm events.
- Larger fires occur when human ignitions occur under typical warm and windy summer weather.
- Fire behavior can be extreme under these conditions when there are heavy buildups of ephemeral light flashy fuels.
- Fire behavior can be extreme under these conditions in heavily infested tamarisk riparian areas.

A.3.4.18.1.7. Fire Regime

- Fire Regime V; Condition Class II

FMU by Condition Class and Fire Regime	
NV 050-17	**Laughlin - Nelson**

CC	FR	Acres	Percent
2	II	596	1.3
	V	40,119	89.2
3	III	3,115	6.9
	IV	1,148	2.6
Total		44,978	

A.3.4.18.1.8. FMU Physical Characteristics

Topography:

- Elevation Range: 599 to 4,199 feet
- Slope: less than 10%
- Aspect: flat

  Major topographical features: This FMU consists of five discontinuous WUI zones located southeast of Las Vegas, and including:

  - The City of Laughlin in the Mohave Valley formed by the Colorado River and bounded to the east by the Colorado River and to the south by the Fort Mohave Indian Reservation and to the northwest by the Newberry Mountains.
  - The City of Searchlight in the Piute Valley on US 95 and bounded to the north by Eldorado Valley and to the southeast by the Newberry Mountains.
  - The Town of Nelson in Copper Canyon on State Route 165 and bounded to the east by the Eldorado Mountains.
  - The Town of Cal-Nev-Ari in Piute Valley approximately ten miles south of Searchlight on US 95.
  - The small community subdivision (unnamed) in Piute Valley at the intersection of US 95 and State route 163.

Access Information: Major access routes include US 95; Nevada State Routes 163, and 165, Arizona State Route 68 and other paved and unpaved roads.

A.3.4.18.1.9. FMU Resource Values & Attributes

Wildland-Urban Interface/Intermix:

- Large Urbanized City of Laughlin, including future build-out on the 4,720-acre public land disposal area.
- Rural town of Searchlight, including future build-out on the 1,944-acre public land disposal area.
- Rural mining town of Nelson, including future build-out on the 1,259-acre public land disposal area.
- Rural town of Cal-Nev-Ari.

- Rural small community subdivision (unnamed).
- Public lands:
  - Utility line ROW's
  - Sand and gravel pits
- Non-federal lands:
  - Commercial and residential urban activities and infrastructure
  - Utility line ROW's
  - Farms and ranches
- Dispersed recreation; special use permit activities

Resource Use:

- Human life and property values
- City of Laughlin
- Town of Searchlight
- Town of Nelson
- Town of Cal-Nev-Ari
- Small community subdivision (unnamed)

Air Quality: There are no non-attainment airsheds in this FMU. Fire management activities in this FMU may include fire suppression, open burning, and light and heavy equipment mobilization. Fire Management Open burning (RX FIRE) is permitted in Clark County with a courtesy call to the Department of Health. Open burning is defined here "where fire is set either by OFFICERS of governmental agencies, in performance of their official duties or the purposes of training and instruction of firefighting and fire-rescue personnel". (*Section 42-Open Burning, Clark County Air Quality Regulations*).

Soils: Soils have formed under conditions of physical weathering (rather than chemical dissolution) because of the arid climate. Soils on lower portions of alluvial fans and valley floors contain very little organic material, are moderately to highly alkaline, and can contain high concentrations of gypsum and dissolved salts. A gravelly surface crust (called desert pavement) occurs throughout these areas. Desert pavement is very stable and protects underlying fine-grained soils from erosion. A cemented hardpan layer commonly occurs at shallow depths beneath surface soils throughout these areas. Mountain slopes tend to be covered by an unstable layer of large rocks, boulders, stones, and cobbles. Runoff from periodic rainstorms transports large amounts of material to lower elevations, forming alluvial fans of coarse material and depositing thick sequences of gravelly loams, sands, and finer grained sediments on valley floors.

Soils are susceptible to water and wind erosion. Water erosion occurs during periodic high-intensity, short duration summertime thunderstorms and less frequent, sustained wintertime rainstorms. Water erosion occurs by a combination of sheet flow, rill formation, splashing, and

channelized flow in ephemeral washes and stream channels. Wind erosion occurs in areas where the desert pavement layer has been disturbed by human activities or heavy use by wild horses and burros, where large areas of vegetation have been burned by fire, sand dune areas, and as part of physical weathering processes.

Cultural and Paleontological Values: N/A

T&E and Sensitive Species: Desert tortoise

Habitat Values:

- Desert tortoise critical habitat
- Piute/Eldorado ACEC
- Bighorn sheep crucial and winter range habitat.
- Rosy two-toned penstemon habitat
- Sensitive species populations in creosote bursage habitat (Gila monster)
- Wild horse and burro Eldorado Herd Management Area

Hydrology and Water Quality: The Laughlin-Nelson FMU lies within the Colorado River Basin hydrographic region, which is part of a regional flow system that drains portions of seven southwestern states. The Colorado River and its mainstem reservoirs (Lake Mead and Lake Mohave) are an important source of water for the Las Vegas Valley and millions of downstream users. Ephemeral wash channels drain most areas and only convey flow after periodic high-intensity summer thunderstorms or sustained winter rainstorms. The only perennial streams occur in the eastern and south-central portions of Clark County, within the Colorado River hydrographic region. Within the Laughlin-Nelson FMU the Colorado River is a perennial river.

Wilderness or WSA: N/A

A.3.4.18.1.10. FMU Public Safety, Economic & Community Values at Risk

- Human life and property values
- City of Laughlin
- Town of Searchlight
- Town of Nelson
- Town of Cal-Nev-Ari
- Small community subdivision (unnamed)
- Dispersed properties and developments (homes, ranches, etc.)
- Critical Desert tortoise habitat
- Piute/Eldorado ACEC

- Bighorn sheep crucial and winter range habitat
- Rosy two-toned penstemon habitat
- Utility line ROW's

A.3.4.18.1.11. FMU Fire Protection Responsibility

Wildland fire protection on all BLM public lands within this FMU is provided by the Las Vegas Field Office. Structural fire protection on private lands within this FMU is provided by the Clark County Fire Department.

A.3.4.18.2. FMU Objectives & Strategies

A.3.4.18.2.1. FMU Fire Management Objectives Priority Statement

- Protect human life, safety of wildland firefighters, and protection of human safety and health *(National Fire Plan 2001).*
- Use approved fire suppression techniques in areas of critical environmental concern where there are concerns for habitat, threatened and endangered species, and urban/rural/wildland interface zones (LVFO RMP, 1998. Fire Management Direction FE-1-d).
- Provide fire suppression efforts commensurate with resource and adjacent property values at risk *(LVFO RMP, 1998. Fire Mgt Direction FE-1-a).*
- Determine specific hazard reduction priorities, including any noxious or invasive species infestations, and implement according to the existing budget (LVFO RMP, 1998. Fire Mgt Direction FE-2-a).
- Determine specific prescribed burn priorities annually, including any noxious or invasive species infestations, and implement where possible (LVFO RMP, 1998. Fire Mgt Direction FE-3-a).
- On watersheds that exhibit good potential for recovery, implement protective measures, including but not limited to fencing and removal of tamarisk (LVFO RMP, 1998. Soil Resource Mgt Objective SL-1).
- Maintain or reduce salt yields originating from public lands to meet state-adopted and EPA approved water quality standards for the Colorado River (LVFO RMP, 1998. Water Resource Objective WT-2).
- Use integrated weed management techniques to control and eradicate tamarisk, such as burning, chemical, biological or mechanical treatments, where potential for treatment is good. Rehabilitate with native species to help reduce the potential for tamarisk re-establishment and improve ecosystem health (LVFO RMP, 1998. Riparian Mgt Objective RP-1-f).
- Maintain or improve the condition of vegetation on public lands to a Desired Plant Community or to a Potential Natural Community (LVFO RMP, 1998. Vegetation Mgt Objective VG-1).
- Restore plant productivity on disturbed areas of the public lands (LVFO RMP, 1998. Vegetation Mgt Objective VG-2).

- Rehabilitate, reclaim, or revegetate areas subjected to surface-disturbing activities, where feasible. When rehabilitating, manage for optimum species diversity by seeding native species, except where non-native species are appropriate (LVFO RMP, 1998. Vegetation Mgt Direction VG-2a).

- Improve disturbed non-game bird habitat, including the water table supporting these habitats, by emphasizing maintenance and enhancement of natural biodiversity (LVFO RMP, 1998. Fish & Wildlife Mgt Direction FW-3-h).

- Manage special status species habitat at the potential natural community or desired plant community, according to the need of the species (LVFO RMP, 1998. Special Status Species Objective SS-1).

- Manage habitat to further sustain the populations of federally listed species so they would no longer need protection of the Endangered Species Act. Manage habitats for non-listed special status species to support viable populations so that future listing would not be necessary (LVFO RMP, 1998. Special Status Species Objective SS-2).

- Manage 743,209 acres of the four desert tortoise areas of critical environmental concern specifically for tortoise recovery. Implement the management actions listed below:

- …Minimize impacts to tortoise habitat during fire suppression by minimizing the use of mechanized equipment and, where possible, staying on existing roads and trails. Give priority to keeping the wildfire to an absolute minimum size (LVFO RMP, 1998. Special Status Species Mgt Direction SS-3-a).

Wildfire Management Priorities:

- Life safety (public and firefighters)

- Protection of human communities (including community infrastructure)

- Protection of other property and improvements

- Protection of crucial and winter range Bighorn sheep habitat

- Protection of sensitive plant species

- Protection of other natural resources

- Protection of cultural resources

A.3.4.18.2.2. FMU Wildland Fire Suppression Objectives & Strategies

Fire Suppression Objectives: Primary Wildland Fire Protection/Suppression Objective: Protect human life and property values while minimizing impacts to T&E or Sensitive Species populations and habitats.

Fire Suppression Strategies:

- Appropriate Management Response will be utilized as the primary fire suppression strategy to implement wildland fire suppression objectives as identified for this FMU.

- Wildland fires will be fought aggressively to minimize threats or impacts to human life, safety, and property values in the communities of Laughlin, Searchlight, Nelson and a small community subdivision at the intersection of US 95 and State Route 163.

Suppression/Protection Priorities:

- Appropriate Management Response will be utilized as the primary fire suppression strategy to implement wildland fire suppression objectives as identified for this FMU.
- Wildland fires will be fought aggressively to minimize threats or impacts to human life, safety, and property values in the communities of Laughlin, Searchlight, Nelson and a small community subdivision at the intersection of US 95 and State Route 163.

FMU Target Individual Wildland Fire Size: 1 acre @ 90%

FMU Target Acres Burned Per Decade: 50 acres

A.3.4.18.2.3. FMU Wildland Fire Operational Constraints, Objectives & Strategies

Special Fire Management Consideration/Areas: This discontinuous FMU takes in the WUI zones of the City of Laughlin, City of Searchlight, Town of Cal-Nev-Ari, Town of Nelson, and a small community subdivision (unnamed) of houses at the intersection of US 95 and State Route 163. The FMU includes Desert tortoise habitat, Bighorn sheep crucial and winter range, and the sensitive plant species Rosy two-toned penstemon. Fires will require on-site coordination with an approved Resource Advisor.

This FMU contains large urban and isolated rural WUI zones, upland shrub habitats, and Bighorn sheep crucial and winter range habitat. WUI protection tactics should be weighed against T&E species concerns and constraints. Wildfires will require on-site coordination with an approved Resource Advisor.

A.3.4.18.2.3.1. Wildland Fire Operational Constraints Objectives & Strategies:

A.3.4.18.2.3.1.1. General Wildlife and Mesquite/Acacia Constraints:

- Apply M.I.S.T. when possible
- Fire suppression will be coordinated with the approved Resource Advisor
- Use natural barriers or openings where possible as the easiest, safest method to manage a wildfire. Where possible and practical use wet firebreaks rather than constructing firelines by hand or with heavy equipment
- Avoid burning out unburned islands, whenever possible
- Utilize firing tactics only if necessary to protect firefighter or public safety
- Avoid surface disturbing suppression activities whenever possible
- Avoid dropping retardant within 300 feet of water sources, to the maximum extent feasible
- Use of containment systems for portable pumps to avoid fuel spills will be required.

A.3.4.18.2.3.1.2. Desert Tortoise:

- Initiate full suppression activities with minimum surface disturbances to reduce loss of tortoise cover and to minimize the spread of exotic annual grasses.
- Require consultation with a qualified Resource Advisor for all wildfires within desert tortoise habitat, particularly within ACEC's and designated critical habitat units.
- Restrict OHV travel and the use of tracked vehicles to the minimum necessary to suppress wildfires within desert tortoise habitat, particularly within ACEC's and designated critical habitat units; obliterate all tracks to reduce possibility of future use.
- Use of aerial retardant is authorized; foam or fugitive retardant is preferable to iron oxide retardant.
- Do not authorize burning out of unburned fingers or islands of vegetation. The exception to this case would be the removal of fuels for safety concerns.
- Establish fire camps, staging areas, and helispots in previously disturbed areas outside of ACEC's and designated critical habitat units, where possible, in consultation with a qualified Resource Advisor.
- Provide all firefighters and support personnel with a briefing on desert tortoises and their habitat to minimize take, particularly those associated with vehicle use.

A.3.4.18.2.3.1.3. Noxious Weeds and Invasive Species Transport Control Procedures:

Las Vegas Field Office Noxious Weed Control and Fire Management Weed Transport Control:

- Off-district engines, crew carriers, overhead vehicles, and helitack/helicopter support vehicles will, upon check-in and prior to proceeding to the line, wash down at the, Logandale, Red Rock, Pahrump Fire Stations or a commercial truck washing station. This will be determined by the location of the units' last fire assignment and if they were cleaned at release from that assignment.
    - The washdown will concentrate on the undercarriage, with special emphasis on axles, frame, crossmembers, motor mounts, and on and underneath steps, running boards, and front bumper/brushguard assemblies. Vehicle cabs will be swept out with refuse disposed of in waste receptacles. In wilderness areas, all portable equipment used on an incident (pumps, hose, fittings, water storage items) will be washed off to rid them of any seed or spores that may be attached from previous fires in noxious weed infested sites.
    - During initial briefings, washdowns will be mentioned and facilities made available for oncoming crews.
- Las Vegas Field Office crews will follow the same procedures identified in Item 1 when returning from fieldwork or wildland fires, especially when vehicles are used in know noxious weed areas infested with known noxious or invasive species common to the Field Office area.
- Upon leaving the Field Office when released from an incident, all off-unit vehicles will follow aforementioned washdown procedures so that Las Vegas' noxious weed problems do not become someone else's problems.

- All equipment used off pavement will be cleaned of weed and grass seed stems, stalks, etc. prior to release from an incident. This includes, but is not limited to, tents, tarps, helicopter support equipment, foldatanks and free-standing tanks, mechanic's vehicles, and logistical support vehicles, trailers and equipment. These vehicles will be washed as in 1.a. above.

This Field Office policy will be followed by all equipment involved in fire suppression while on Las Vegas Field Office assignments. Vehicles will be cleared of washdown procedures during checkout and crew evaluations. In the event vehicles are released from fires away from the district office, the closest wash facility, (government or commercial) will be utilized.

A.3.4.18.2.4. FMU Wildland Fire Use Objectives & Strategies

Wildfire will not be used as a management tool within this FMU at this time.

A.3.4.18.2.5. Burned Acre Objective Review

IF the FMU decadal wildfire acre-burned target has been reached or exceeded PRIOR TO THE COMPLETION OF THE 10-YEAR PLANNING PERIOD, from either wildfire or prescribed fire, a review of fire management objectives and strategies will be initiated to develop new suppression criteria on wildland fire occurrence and prescribed fire acre goals.

A.3.4.18.2.6. FMU Prescribed Fire Objectives & Strategies

Prescribed Fire Objectives & Strategies: Use integrated weed management techniques to control and eradicate tamarisk, such as *burning*, chemical, biological or mechanical treatments, where potential for treatment is good. Rehabilitate with native species to help reduce the potential for tamarisk re-establishment and improve ecosystem health (RMP, RP-1-f).

Rx Fire Annual & Decadal Acre Target:

- Annual: Maximum of 5 acres
- Decadal: 50 acres

T & E Species Strategies: There are presently no prescribed fire fuels treatments planned or in operation in this FMU, but future fuels treatments are probable. Endangered Species Act Section 7 consultation procedures and Fish and Wildlife Service concurrence will be achieved, prior to the commencement of any future on-the-ground treatments. At the discretion of the Service, the fuels treatment consultation process will either entail a formal programmatic consultation for the entire Laughlin-Nelson FMU or else individual project-level informal consultations. All terms and conditions, minimization measures, and other stipulations in those consultation agreements will be adhered to during the implementation of any BLM fuels treatments in this FMU.

Air Quality Strategy: Fire management activities in this FMU may include fire suppression, open burning, light and heavy equipment mobilization and fuels treatment activities, both chemical and biological. Fire Management Open burning (RX FIRE) is permitted in Clark County with a courtesy call to the Department of Health. Open burning is defined here "where fire is set either by OFFICERS of governmental agencies, in performance of their official duties or the purposes of training and instruction of firefighting and fire-rescue personnel". (*Section 42-Open Burning, Clark County Air Quality Regulations*).

The short-term use of small-mechanized equipment used for the project may cause some minor soil disturbances and potential increases in PM10 emissions, however it is anticipated that there will be no significant impact to air quality. Where applicable, water will be used as a dust control measure.

If dust emissions during mechanical treatment activities result in any complaints from the public, the operation will be re-evaluated to identify dust mitigation measures that can be implemented cost-effectively and without undue delays to the overall project schedule.

NEPA Compliance: Prior to implementation of any proposed projects, site-specific NEPA documentation will be completed, as applicable.

Rx Fire Monitoring Strategy: Monitoring will be conducted to identify: treatment effectiveness, site recruitment by invasive species, and presence of cultural resources.

A.3.4.18.2.7. FMU Non-Fire Fuels Treatment Objectives & Strategies

Non-Fire Fuels Treatment Objectives & Strategies: Use integrated weed management techniques to control and eradicate tamarisk, such as *burning*, chemical, biological or mechanical treatments, where potential for treatment is good. Rehabilitate with native species to help reduce the potential for tamarisk re-establishment and improve ecosystem health (RMP, RP-1-f).

Note: The Laughlin-Nelson tamarisk treatments are intended to achieve WUI hazardous fuels abatement objectives, and noxious weed control objectives. These are multi-phased, multi-year treatments, some of which may entail pile and or broadcast burning in conjunction/combination with mechanical and chemical applications.

Non-Fire Annual & Decadal Acre Target:

- Annual: Maximum of 5 acres
- Decadal: 50 acres

T & E Species Strategies: There are presently no non-fire fuels treatments planned or in operation in this FMU, but future fuels treatments are probable. Endangered Species Act Section 7 consultation procedures and Fish and Wildlife Service concurrence will be achieved, prior to the commencement of any future on-the-ground treatments. At the discretion of the Service, the fuels treatment consultation process will either entail a formal programmatic consultation for the entire Laughlin-Nelson FMU or else individual project-level informal consultations. All terms and conditions, minimization measures, and other stipulations in those consultation agreements will be adhered to during the implementation of any BLM fuels treatments in this FMU.

Air Quality Strategies: Fire management activities in this FMU may include fire suppression, open burning, light and heavy equipment mobilization and fuels treatment activities, both chemical and biological. Open burning is defined here "where fire is set either by OFFICERS of governmental agencies, in performance of their official duties or the purposes of training and instruction of firefighting and fire-rescue personnel". (*Section 42-Open Burning, Clark County Air Quality Regulations*).

The short-term use of small mechanized equipment used for the project may cause some minor soil disturbances and potential increases in PM10 emissions, however it is anticipated that there

will be no significant impact to air quality. Where applicable, water will be used as a dust control measure.

If dust emissions during mechanical treatment activities result in any complaints from the public, the operation will be re-evaluated to identify dust mitigation measures that can be implemented cost-effectively and without undue delays to the overall project schedule.

NEPA Compliance: The following procedures will be completed for all fuels treatment projects:

- NEPA compliance:
  - Ensure all projects comply with LUP direction
  - Prepare appropriate project level and/or programmatic NEPA documents (EA's, DNA's, ROD, etc.)
- ESA compliance:
  - Complete project level and/or programmatic Section 7 consultations for all fuels treatments, in early and close coordination with USFWS
  - If work conditions change, initiate appropriate re-consultation procedures.

Treatment Monitoring Strategy: Monitoring will be conducted to identify: treatment effectiveness, site recruitment by invasive species, and presence of cultural resources.

A.3.4.18.2.8. FMU Post Fire Rehab/Restoration Objectives & Strategies

Restore plant productivity on disturbed areas of the public lands. Rehabilitate, reclaim, or revegetate areas subjected to surface-disturbing activities, where feasible. When rehabilitating, manage for optimum species diversity by seeding native species, except where non-native species are appropriate.

- Conduct all treatment activities in accordance with the Las Vegas Field Office Normal Year Fire Rehabilitation Plan (1990); Environmental Assessment no. NV-054-90-24.
- In the event that suppression efforts require off-road vehicle operations, replant and visually camouflage the first 200 feet of tire tracks in order to prevent further habitat impacts (due to public use of these track ways).
- Whenever feasible, utilize native species in seeding and/or re-planting treatments.
- Cultivate local supplies of live plant materials for use during riparian restoration efforts.
- Maintain a seed bank of locally collected native plant species for use in restoring both fire fuels treatments and fire-disturbed sites.
- Cultivate and develop varieties of locally grown native seed by means of plant material centers.

A.3.4.18.2.9. FMU Community Protection/Community Assistance Objectives & Strategies

Communities at Risk/WUI Areas:

- City of Laughlin, NV, NV, including public land disposal area
- Communities of Searchlight, Nelson, Cal-Nev-Ari and the small community subdivision (unnamed)

Community Protection/Community Assistance Objectives:

- Educate/work with the City of Laughlin and the rural communities of Searchlight, Nelson, Cal-Nev-Ari, and the small community subdivision (unnamed) on defensible space issues and wildfire hazards.
- Pursue establishment of local Fire Safe Council Chapter(s).
- Promote collaborative efforts to mitigate fuel hazards with cooperators, including the community subdivision.
- Continue dialogue with City of Laughlin and the rural communities of Searchlight, Nelson, and the small community subdivision (unnamed) officials, and Clark County officials toward implementation of the above-mentioned objectives.

Community Protection/Community Assistance Strategy:

- Implement tamarisk treatments in this FMU to protect urban areas, rural communities, dispersed residences, and developed properties.
- Prepare risk assessments and hazard mitigation plans for the Laughlin, Searchlight, Nelson, Cal-Nev-Ari and small community subdivision (unnamed) WUI zones.
- Educate/work with the communities of Laughlin, Searchlight, Nelson, Cal-Nev-Ari, and small community subdivision (unnamed) on defensible space issues and wildfire hazards.
- Pursue establishment of local Fire Safe Council Chapter(s).
- Promote collaborative efforts to mitigate fuel hazards with cooperators.
- Continue dialogue with Laughlin, Searchlight, Nelson, Cal-Nev-Ari, small community subdivision (unnamed) officials and Clark County officials toward implementation of the above-mentioned objectives, including through Reciprocal Agreements.

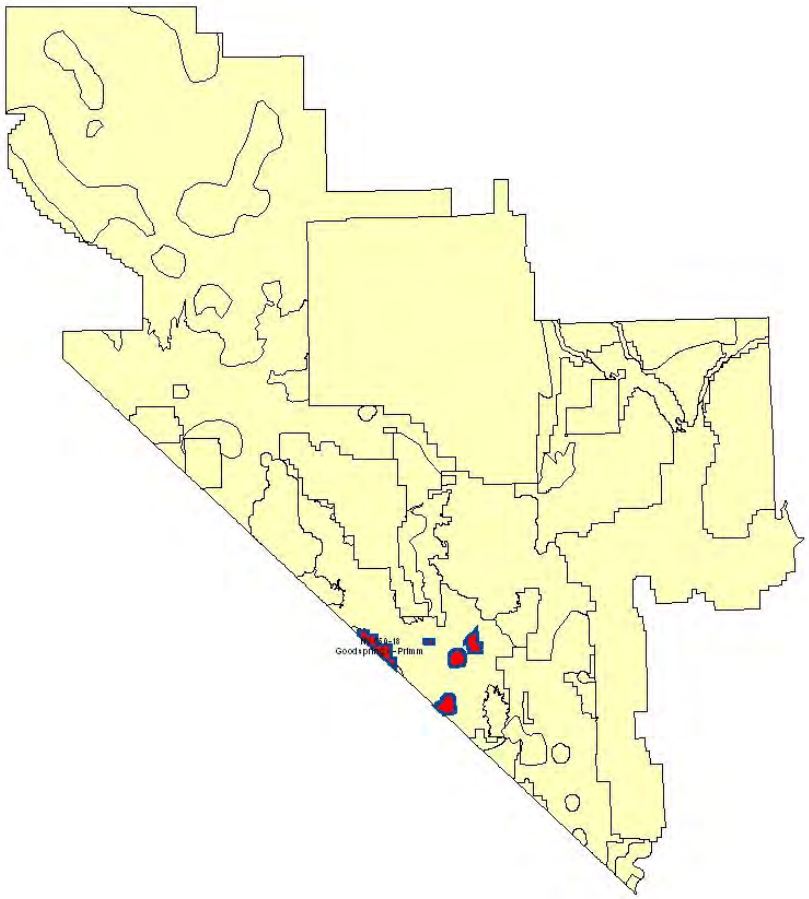
Community Wildfire Safety Education Strategy: Coordinate with Clark County Fire Department (Laughlin), and Searchlight, Nelson, and Cal-Nev-Ari VFD's, and citizen groups to provide public education and prevention programs in accordance with the National Fire Plan

A.3.4.18.3. FMU Fire Program Analysis - Quantifiable Objective Summary

Initial Attack Success	Decadal Wildfire Acres Burn Tolerance	WFU Decadal Target Acres	Rx Fire Acres Per Decade	Non-Fire Acres Per Decade
1 acre @ 90%	50	N/A	50	50

A.3.4.19. Goodsprings-Primm

NV050-18



FMU Name & Unit No.: **Goodsprings-Primm; NV050-18**

FMU Type/Category: **Wildland Urban Interface (WUI)**

A.3.4.19.1. FMU Description:

A.3.4.19.1.1. FMU Location Information

Geographic boundaries: This discontinuous FMU takes in the rural towns of Goodsprings, Primm, Sandy Valley, Jean, and the Jean Lake disposal area. This FMU includes five public land disposal areas, Goodsprings (915 acres), Primm (1,181 acres), Sandy Valley (6,268 acres), Jean (2,445 acres), and Jean Lake (7,326 acres). The Jean Lake disposal area WUI zone is included in anticipation of near future build-out around the proposed airport at Jean, NV.

A.3.4.19.1.2. FMU Acre Total

Ownership by Acres and Percent		
NV 050-18	**Goodsprings - Primm**	
Ownership	**Acres**	**Percent**
Bureau of Land Management	27,687	72.3
Private	10,592	27.7
Total Acres	38,279	

A.3.4.19.1.3. Fire Occurrence and History

FMU Number	Decadal (94-03)	24 Years (80-03)	Ignition Cause (80-03)	
NV 050-18			Lightning	0
Number of Fires	0	9	Human/Other	9
Largest Fire (Acres)	0.0	1.0	**Multiple Fire Days (80-03)**	
Total Acres Burned	0.0	2.0	Total Multiple Fire Days (MFD)	1
Average Fire Size (Acres)	0.0	0.2	Number of MFD Fires	1
			Total Acres Burned by Multiple Fires	.5

Narrative Description: This FMU mainly consists of creosote bursage habitat, which in certain years is heavily infested with the invasive annual grass, red brome. Although mesquites and acacias resprout following fire disturbance, these woodland stands need to be protected from high intensity wildfire in order to preserve the canopy structural character (for sensitive bird species habitat suitability, mainly for Phainopepla). Most wildfires occur in tamarisk-infested areas. Typically, these fires are wind driven and are of moderate to high intensity. Small, low intensity wildfires in tamarisk are less common but do occur.

General Fire Protection Characteristics: The Sandy Valley portion of this FMU consists of small parcels of BLM lands located within the WUI zone. The Goodsprings, Primm, Jean, and Jean Lake disposal area WUI zones are surrounded by BLM lands. BLM lands include upland shrub habitats, areas of medium and low density Desert tortoise habitat, and stands of mesquite/acacia woodlands. Of the upland shrub habitat portion of this FMU, a sizable portion will eventually convey to non-federal ownership.

A.3.4.19.1.4. FMU Vegetation

FMU Vegetation/Fuel Types		
NV 050-18	**Goodsprings - Primm**	
Veg/Fuel Type	Acres	Percent
Mojave	31,915	82.9
No Significant Vegetation	4,406	11.5
Salt Desert Scrub/Shadscale	2,156	5.6
Grand Total	38,477	

Vegetation Narrative: The wildland portion of this FMU mainly consists of creosote bursage and Mojave scrub vegetation, with scattered stands of mesquite/acacia and tamarisk.

A.3.4.19.1.5. FMU Fuel Models & Live Fuel Moisture Characteristics

Surface Fuel Model & Canopy Cover: The desert shrub vegetative types are generally dependent upon ephemeral buildups of red brome and other introduced species.

Live Fuel Moisture Averages:

LFM Site	May	June	July	Aug	Sept	Oct
N5D	198%	178%	134%	107%	112%	110%

Live Fuel Moisture Characteristics:

- At live fuel moisture levels of 181% and above fires typically will exhibit Very Low Fire Behavior characteristics
- At live fuel moisture levels of 151% to 180% fires typically will exhibit Low Fire Behavior characteristics
- At live fuel moisture levels of 126% to 150% fires typically will exhibit Moderate Fire Behavior characteristics
- At live fuel moisture levels of 101% to 125% fires typically will exhibit High Fire Behavior characteristics
- At live fuel moisture levels of 75% to 100% fires typically will exhibit Extreme Fire Behavior characteristics
- At live fuel moisture levels of 75% and below fires typically will exhibit Advanced Fire Behavior characteristics

A.3.4.19.1.6. Fire Weather & Climate Related Impacts

(Detailed weather station data for this FMU will be added to the FMP Appendix upon completion of the national fire weather data validation/correction project.)

- Wet lightning is common in this area. Fires generally remain small when starts occur under these common conditions.
- Dry Lightning is possible in this area. Larger fires can occur with these erratic and gusty thunderstorm events.
- Larger fires occur when human ignitions occur under typical warm and windy summer weather.
- Fire behavior can be extreme under these conditions in Mesquite/acacia woodlands or heavily infested Tamarisk riparian areas when there is an ephemeral buildup of the invasive annual grass Red brome.

A.3.4.19.1.7. Fire Regime

- Fire Regime IV & V; Condition Class III

FMU by Condition Class and Fire Regime			
NV 050-18		Goodsprings - Primm	
CC	FR	Acres	Percent

2	II	121	0.4
	V	29,949	89.2
3	IV	2,626	7.8
	V	868	2.6
Total		33,564	

A.3.4.19.1.8. FMU Physical Characteristics

Topography:

- Elevation Range: 2599 to 3,999 feet
- Slope: less than 10%
- Aspect: flat
- Major topographical features: This FMU consists of five discontinuous WUI zones located south of Las Vegas, including:
  - The Town of Goodsprings on State Route 161 in the Goodsprings Valley approximately 15 miles south of Las Vegas and bounded to the north, west and south by the Spring Mountain Range and to the east by the Bird Spring Range.
  - The Town of Primm on Interstate 15 in the Ivanpah Valley approximately 30 miles south of Las Vegas and bounded to the west by the Clark Mountains, to the north by Roach Lake, to the south by Stateline, and to the east by the Lucky Gray Mountains.
  - The Town of Sandy Valley in the Mesquite Valley approximately 20 miles southwest of Las Vegas and bounded to the north by the Spring Mountain Range and to the south by the Mesquite Mountains.
  - The Town of Jean on Interstate 15 approximately 15 miles south of Las Vegas in Ivanpah Valley bounded to the east by Sheep Mountain.
  - The Jean Lake disposal area on Interstate 15 in Ivanpah Valley approximately 10 miles south of Las Vegas.

Access Information: Major access routes include Interstate 15, State Route 161, and other paved and unpaved roads.

A.3.4.19.1.9. FMU Resource Values & Attributes

Wildland-Urban Interface/Intermix:

- The Town of Goodsprings, including future build-out on the 915-acre public land disposal area.
- Town of Primm, including future build-out on the 1,181-acre public land disposal area.
- Town of Sandy Valley, including future build-out on the 6,268-acre public land disposal area.
- Town of Jean, including future build-out on the 2,445-acre public land disposal area.
- Jean Lake disposal area (7,326 acres)

Resource Use:

- Human life and property values
- Town of Goodsprings
- Town of Primm
- Town of Sandy Valley
- Town of Jean
- Dispersed recreation; special use permit activities
- Public lands:
  - Utility line ROW's
  - Sand and gravel pits
  - Jean Lake grazing allotment
- Non-federal lands:
  - Commercial and residential urban activities and infrastructure
  - Utility line ROW's
  - Farms and ranches

Air Quality: There are no non-attainment airsheds in this FMU. Fire management activities in this FMU may include fire suppression, open burning, and light and heavy equipment mobilization. Fire Management Open burning (RX FIRE) is permitted in Clark County with a courtesy call to the Department of Health. Open burning is defined here "where fire is set either by OFFICERS of governmental agencies, in performance of their official duties or the purposes of training and instruction of firefighting and fire-rescue personnel". (*Section 42-Open Burning, Clark County Air Quality Regulations*).

Soils: Soils have formed under conditions of physical weathering (rather than chemical dissolution) because of the arid climate. Soils on lower portions of alluvial fans and valley floors contain very little organic material, are moderately to highly alkaline, and can contain high concentrations of gypsum and dissolved salts. A gravelly surface crust (called desert pavement) occurs throughout these areas. Desert pavement is very stable and protects underlying fine-grained soils from erosion. A cemented hardpan layer commonly occurs at shallow depths beneath surface soils throughout these areas. Mountain slopes tend to be covered by an unstable layer of large rocks, boulders, stones, and cobbles. Runoff from periodic rainstorms transports large amounts of material to lower elevations, forming alluvial fans of coarse material and depositing thick sequences of gravelly loams, sands, and finer grained sediments on valley floors.

Soils are susceptible to water and wind erosion. Water erosion occurs during periodic high-intensity, short duration summertime thunderstorms and less frequent, sustained wintertime rainstorms. Water erosion occurs by a combination of sheet flow, rill formation, splashing, and channelized flow in ephemeral washes and stream channels. Wind erosion occurs in areas where the desert pavement layer has been disturbed by human activities or heavy use by wild horses and

burros, where large areas of vegetation have been burned by fire, sand dune areas, and as part of physical weathering processes.

Cultural and Paleontological Values: N/A

T&E and Sensitive Species: Desert tortoise

Habitat Values:

- Mesquite/Acacia woodland habitat.
- Moderate density Desert tortoise habitat
- Sensitive plant species habitat
- Wild horse and burro Red Rocks Herd Management Area

Hydrology and Water Quality: The Goodspring-Primm FMU lies within the Central Region hydrographic region, which is a topographically closed, internally drained basin. Ephemeral wash channels drain most of the Goodsprings-Primm FMU and only convey flow after periodic high-intensity summer thunderstorms or sustained winter rainstorms. Rapid runoff to ephemeral wash channels can produce flash flooding and transport large quantities of sediment as water flows from mountainous areas and alluvial fans towards valley floors.

Wilderness or WSA: N/A

A.3.4.19.1.10. FMU Public Safety, Economic & Community Values at Risk

- Human life and property values
- Town of Goodsprings
- Town of Primm
- Town of Sandy Valley
- Town of Jean
- Dispersed properties and developments (homes, ranches, etc.)
- Mesquite/acacia woodland habitat
- Desert tortoise habitat (moderate density)
- Sensitive plant species habitat
- Utility line ROW's

A.3.4.19.1.11. FMU Fire Protection Responsibility

Wildland fire protection on all BLM public lands within this FMU is provided by the Las Vegas Field Office. Structural fire protection on private lands within this FMU is provided by the Clark County Fire Department.

A.3.4.19.2. FMU Objectives & Strategies

A.3.4.19.2.1. FMU Fire Management Objectives Priority Statement

- Protect human life, safety of wildland firefighters, and protection of human safety and health *(National Fire Plan 2001).*

- Use approved fire suppression techniques in areas of critical environmental concern where there are concerns for habitat, threatened and endangered species, and urban/rural/wildland interface zones (LVFO RMP, 1998. Fire Management Direction FE-1-d).

- Provide fire suppression efforts commensurate with resource and adjacent property values at risk *(LVFO RMP, 1998. Fire Mgt Direction FE-1-a).*

- Determine specific hazard reduction priorities, including any noxious or invasive species infestations, and implement according to the existing budget (LVFO RMP, 1998. Fire Mgt Direction FE-2-a).

- Manage Mesquite and Acacia woodlands for their value as wildlife habitat in the following areas: Amargosa Valley, Pahrump Valley, Stewart Valley, Hiko Wash, Piute Wash, Crystal and Stump Springs, or any other areas identified as being of significant wildlife value (LVFO RMP, 1998. Fish, Wildlife and Special Status Species Management, Management Direction FW-3-a).

- Determine specific prescribed burn priorities annually, including any noxious or invasive species infestations, and implement where possible (LVFO RMP, 1998. Fire Mgt Direction FE-3-a).

- On watersheds that exhibit good potential for recovery, implement protective measures, including but not limited to fencing and removal of tamarisk (LVFO RMP, 1998. Soil Resource Mgt Objective SL-1).

- Use integrated weed management techniques to control and eradicate tamarisk, such as burning, chemical, biological or mechanical treatments, where potential for treatment is good. Rehabilitate with native species to help reduce the potential for tamarisk re-establishment and improve ecosystem health (LVFO RMP, 1998. Riparian Mgt Objective RP-1-f).

- Maintain or improve the condition of vegetation on public lands to a Desired Plant Community or to a Potential Natural Community (LVFO RMP, 1998. Vegetation Mgt Objective VG-1).

- Restore plant productivity on disturbed areas of the public lands (LVFO RMP, 1998. Vegetation Mgt Objective VG-2).

- Rehabilitate, reclaim, or revegetate areas subjected to surface-disturbing activities, where feasible. When rehabilitating, manage for optimum species diversity by seeding native species, except where non-native species are appropriate (LVFO RMP, 1998. Vegetation Mgt Direction VG-2a).

- Protect important resting/nesting habitats, such as riparian areas and mesquite/acacia woodlands (*LVFO RMP, 1998. Fish & Wildlife Mgt Direction FW-3-g)*.

- Improve disturbed non-game bird habitat, including the water table supporting these habitats, by emphasizing maintenance and enhancement of natural biodiversity (LVFO RMP, 1998. Fish & Wildlife Mgt Direction FW-3-h).
- Manage special status species habitat at the potential natural community or desired plant community, according to the need of the species (LVFO RMP, 1998. Special Status Species Objective SS-1).
- Manage habitat to further sustain the populations of federally listed species so they would no longer need protection of the Endangered Species Act. Manage habitats for non-listed special status species to support viable populations so that future listing would not be necessary *(LVFO RMP, 1998. Special Status Species Objective SS-2).*

Wildfire Management Priorities:

- Life safety (public and firefighters)
- Protection of human communities (including community infrastructure)
- Protection of other property and improvements
- Protection of mesquite/acacia woodlands
- Protection of moderate density Desert tortoise habitat
- Protection of sensitive plant species
- Protection of other natural resources
- Protection of cultural resources

A.3.4.19.2.2. FMU Wildland Fire Suppression Objectives & Strategies

Fire Suppression Objectives: Primary Wildland Fire Protection/Suppression Objective: Protect human life and property values while minimizing impacts to T&E or Sensitive Species populations and habitats.

Fire Suppression Strategies:

- Appropriate Management Response will be utilized as the primary fire suppression strategy to implement wildland fire suppression objectives as identified for this FMU.
- Wildland fires will be fought aggressively to minimize threats or impacts to human life, safety, and property values in the communities of Goodsprings, Primm, Sandy Valley, and Jean.

Suppression/Protection Priorities:

- Town of Goodsprings, NV
- Town of Primm, NV
- Town of Sandy Valley, NV
- Town of Jean, NV

- Dispersed WUI values (ranches, homes, power lines, etc.)
- Federally listed T&E species: Desert tortoise
- Mesquite/acacia woodlands (Sandy Valley)
- Rosy two-toned penstemon, White-margined penstemon, and Yellow two-toned penstemon sensitive plant species habitat

FMU Target Individual Wildland Fire Size: 1 acre @ 90%

FMU Target Acres Burned Per Decade: 50 acres

A.3.4.19.2.3. FMU Wildland Fire Operational Constraints, Objectives & Strategies

Special Fire Management Consideration/Areas: This discontinuous FMU takes in the WUI zones of the Towns of Goodsprings, Primm, Sandy Valley, and Jean. The FMU includes moderate Desert tortoise habitat, and some stands of mesquite/Acacia woodlands. Fires in mesquite/Acacia woodlands will require on-site coordination with an approved Resource Advisor.

A.3.4.19.2.3.1. Wildland Fire Operational Constraints Objectives & Strategies:

A.3.4.19.2.3.1.1. General Wildlife and Mesquite/Acacia Constraints:

- Apply M.I.S.T. when possible
- Fire suppression will be coordinated with the approved Resource Advisor
- Use natural barriers or openings where possible as the easiest, safest method to manage a wildfire. Where possible and practical use wet firebreaks rather than constructing firelines by hand or with heavy equipment
- Avoid burning out unburned islands, whenever possible
- Utilize firing tactics only if necessary to protect firefighter or public safety
- Avoid surface disturbing suppression activities whenever possible
- Avoid dropping retardant within 300 feet of water sources, to the maximum extent feasible
- Use of containment systems for portable pumps to avoid fuel spills will be required.

A.3.4.19.2.3.1.2. Desert Tortoise:

- Initiate full suppression activities with minimum surface disturbances to reduce loss of tortoise cover and to minimize the spread of exotic annual grasses.
- Require consultation with a qualified Resource Advisor for all wildfires within desert tortoise habitat, particularly within ACEC's and designated critical habitat units.
- Restrict OHV travel and the use of tracked vehicles to the minimum necessary to suppress wildfires within desert tortoise habitat, particularly within ACEC's and designated critical habitat units; obliterate all tracks to reduce possibility of future use.

- Use of aerial retardant is authorized; foam or fugitive retardant is preferable to iron oxide retardant.
- Do not authorize burning out of unburned fingers or islands of vegetation. The exception to this case would be the removal of fuels for safety concerns.
- Establish fire camps, staging areas, and helispots in previously disturbed areas outside of ACEC's and designated critical habitat units, where possible, in consultation with a qualified Resource Advisor.
- Provide all firefighters and support personnel with a briefing on desert tortoises and their habitat to minimize take, particularly those associated with vehicle use.

A.3.4.19.2.3.1.3. Noxious Weeds and Invasive Species Transport Control Procedures:

Las Vegas Field Office Noxious Weed Control and Fire Management Weed Transport Control:

- Off-district engines, crew carriers, overhead vehicles, and helitack/helicopter support vehicles will, upon check-in and prior to proceeding to the line, wash down at the, Logandale, Red Rock, Pahrump Fire Stations or a commercial truck washing station. This will be determined by the location of the units' last fire assignment and if they were cleaned at release from that assignment.
    - The washdown will concentrate on the undercarriage, with special emphasis on axles, frame, crossmembers, motor mounts, and on and underneath steps, running boards, and front bumper/brushguard assemblies. Vehicle cabs will be swept out with refuse disposed of in waste receptacles. In wilderness areas, all portable equipment used on an incident (pumps, hose, fittings, water storage items) will be washed off to rid them of any seed or spores that may be attached from previous fires in noxious weed infested sites.
    - During initial briefings, washdowns will be mentioned and facilities made available for oncoming crews.
- Las Vegas Field Office crews will follow the same procedures identified in Item 1 when returning from fieldwork or wildland fires, especially when vehicles are used in know noxious weed areas infested with known noxious or invasive species common to the Field Office area.
- Upon leaving the Field Office when released from an incident, all off-unit vehicles will follow aforementioned washdown procedures so that Las Vegas' noxious weed problems do not become someone else's problems.
- All equipment used off pavement will be cleaned of weed and grass seed stems, stalks, etc. prior to release from an incident. This includes, but is not limited to, tents, tarps, helicopter support equipment, foldatanks and free-standing tanks, mechanic's vehicles, and logistical support vehicles, trailers and equipment. These vehicles will be washed as in 1.a. above.

This Field Office policy will be followed by all equipment involved in fire suppression while on Las Vegas Field Office assignments. Vehicles will be cleared of washdown procedures during checkout and crew evaluations. In the event vehicles are released from fires away from the district office, the closest wash facility, (government or commercial) will be utilized.

A.3.4.19.2.4. FMU Wildland Fire Use Objectives & Strategies

Wildfire will not be used as a management tool within this FMU at this time.

A.3.4.19.2.5. Burned Acre Objective Review

IF the FMU decadal wildfire acre-burned target has been reached or exceeded PRIOR TO THE COMPLETION OF THE 10-YEAR PLANNING PERIOD, from either wildfire or prescribed fire, a review of fire management objectives and strategies will be initiated to develop new suppression criteria on wildland fire occurrence and prescribed fire acre goals.

A.3.4.19.2.6. FMU Prescribed Fire Objectives & Strategies

Prescribed Fire Objectives & Strategies: Use integrated weed management techniques to control and eradicate tamarisk, such as *burning*, chemical, biological or mechanical treatments, where potential for treatment is good. Rehabilitate with native species to help reduce the potential for tamarisk re-establishment and improve ecosystem health (RMP, RP-1-f).

Rx Fire Annual & Decadal Acre Target:

- Annual: Maximum of 5 acres
- Decadal: 50 acres

T & E Species Strategies: There are presently no prescribed fire fuels treatments planned or in operation in this FMU, but future fuels treatments are probable. Endangered Species Act Section 7 consultation procedures and Fish and Wildlife Service concurrence will be achieved, prior to the commencement of any future on-the-ground treatments. At the discretion of the Service, the fuels treatment consultation process will either entail a formal programmatic consultation for the entire Goodspring-Primm FMU or else individual project-level informal consultations. All terms and conditions, minimization measures, and other stipulations in those consultation agreements will be adhered to during the implementation of any BLM fuels treatments in this FMU.

Air Quality Strategy: Burning operations will be conducted to minimize smoke impacts to private properties, road traffic, and T&E/sensitive species populations. Prescribed burn project plans will address appropriate smoke management and mitigation.

NEPA Compliance: Prior to implementation of any proposed projects, site-specific NEPA documentation will be completed, as applicable.

Rx Fire Monitoring Strategy: Monitoring will be conducted to identify: treatment effectiveness, site recruitment by invasive species, and presence of cultural resources.

A.3.4.19.2.7. FMU Non-Fire Fuels Treatment Objectives & Strategies

Non-Fire Fuels Treatment Objectives & Strategies: Use integrated weed management techniques to control and eradicate tamarisk, such as *burning*, chemical, biological or mechanical treatments, where potential for treatment is good. Rehabilitate with native species to help reduce the potential for tamarisk re-establishment and improve ecosystem health (RMP, RP-1-f).

Note: The Goodsprings-Primm tamarisk treatments are intended to achieve WUI hazardous fuels abatement objectives, and noxious weed control objectives. These are multi-phased, multi-year treatments, some of which may entail pile and or broadcast burning in conjunction/combination with mechanical and chemical applications.

Non-Fire Annual & Decadal Acre Target:

- Annual: maximum of 5 acres
- Decadal: 50 acres

T & E Species Strategies: There are presently no non-fire fuels treatments planned or in operation in this FMU, but future fuels treatments are probable. Endangered Species Act Section 7 consultation procedures and Fish and Wildlife Service concurrence will be achieved, prior to the commencement of any future on-the-ground treatments. At the discretion of the Service, the fuels treatment consultation process will either entail a formal programmatic consultation for the entire Goodspring-Primm FMU or else individual project-level informal consultations. All terms and conditions, minimization measures, and other stipulations in those consultation agreements will be adhered to during the implementation of any BLM fuels treatments in this FMU.

Air Quality Strategies: Fire management activities in this FMU may include fire suppression; open burning, light and heavy equipment mobilization and fuels treatment activities, both chemical and biological. Open burning is defined here "where fire is set either by OFFICERS of governmental agencies, in performance of their official duties or the purposes of training and instruction of firefighting and fire-rescue personnel". (*Section 42-Open Burning, Clark County Air Quality Regulations*).

The short-term use of small-mechanized equipment used for the project may cause some minor soil disturbances and potential increases in PM10 emissions, however it is anticipated that there will be no significant impact to air quality. Where applicable, water will be used as a dust control measure.

If dust emissions during mechanical treatment activities result in any complaints from the public, the operation will be re-evaluated to identify dust mitigation measures that can be implemented cost-effectively and without undue delays to the overall project schedule.

NEPA Compliance: The following procedures will be completed for all fuels treatment projects:

- NEPA compliance:
  - Ensure all projects comply with LUP direction
  - Prepare appropriate project level and/or programmatic NEPA documents (EA's, DNA's, ROD, etc.)
- ESA compliance:
  - Complete project level and/or programmatic Section 7 consultations for all fuels treatments, in early and close coordination with USFWS
  - If work conditions change, initiate appropriate re-consultation procedures.

Treatment Monitoring Strategy: Monitoring will be conducted to identify: treatment effectiveness, site recruitment by invasive species, and presence of cultural resources.

A.3.4.19.2.8. FMU Post Fire Rehab/Restoration Objectives & Strategies

Restore plant productivity on disturbed areas of the public lands. Rehabilitate, reclaim, or revegetate areas subjected to surface-disturbing activities, where feasible. When rehabilitating, manage for optimum species diversity by seeding native species, except where non-native species are appropriate.

- Conduct all treatment activities in accordance with the Las Vegas Field Office Normal Year Fire Rehabilitation Plan (1990); Environmental Assessment no. NV-054-90-24.
- In the event that suppression efforts require off-road vehicle operations, replant and visually camouflage the first 200 feet of tire tracks in order to prevent further habitat impacts (due to public use of these track ways).
- Whenever feasible, utilize native species in seeding and/or re-planting treatments.
- Cultivate local supplies of live plant materials for use during riparian restoration efforts.
- Maintain a seed bank of locally collected native plant species for use in restoring both fire fuels treatments and fire-disturbed sites.
- Cultivate and develop varieties of locally grown native seed by means of plant material centers.

A.3.4.19.2.9. FMU Community Protection/Community Assistance Objectives & Strategies

Communities at Risk/WUI Areas:

- Town of Goodsprings, NV including public land disposal area
- Town of Primm, NV including public land disposal area
- Town of Sandy Valley, NV including public land disposal area
- Town of Jean, NV including public land disposal area

Community Protection/Community Assistance Objectives:

- Educate/work with the Towns of Goodsprings, Primm, Sandy Valley, and Jean on defensible space issues and wildfire hazards.
- Pursue establishment of local Fire Safe Council Chapter(s).
- Promote collaborative efforts to mitigate fuel hazards with cooperators.
- Continue dialogue with Towns of Goodsprings, Primm, Sandy Valley, and Jean officials, and Clark County officials toward implementation of the above-mentioned objectives.

Community Protection/Community Assistance Strategy:

- Implement tamarisk treatments in this FMU to protect urban areas, rural communities, dispersed residences, and developed properties.
- Prepare risk assessments and hazard mitigation plans for the Goodsprings, Primm, Sandy Valley, and Jean WUI zones.
- Educate/work with the communities of Goodsprings, Primm, Sandy Valley, and Jean on defensible space issues and wildfire hazards.
- Pursue establishment of local Fire Safe Council Chapter(s).
- Promote collaborative efforts to mitigate fuel hazards with cooperators.
- Continue dialogue with Goodsprings, Primm, Sandy Valley, and Jean officials and Clark County officials toward implementation of the above-mentioned objectives, including through Reciprocal Agreements.

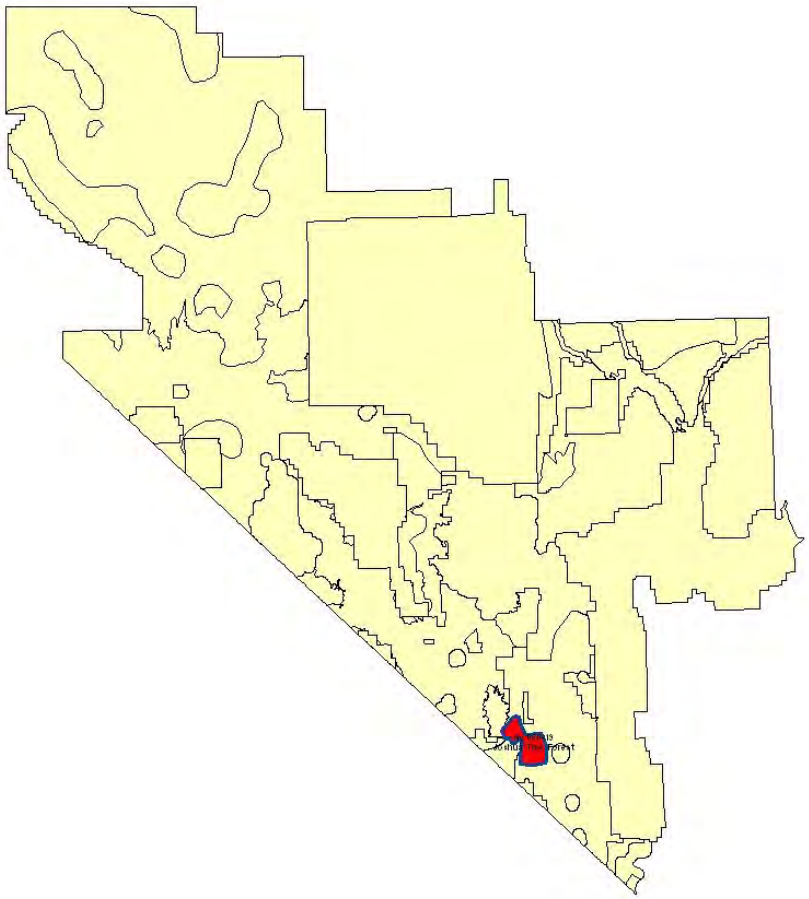
Community Wildfire Safety Education Strategy: Coordinate with Goodsprings and Sandy Valley VFD's, Primm and Jean (Clark County Fire department), and citizen groups to provide public education and prevention programs in accordance with the National Fire Plan.

A.3.4.19.3. FMU Fire Program Analysis - Quantifiable Objective Summary

Initial Attack Success	Decadal Wildfire Acres Burn Tolerance	WFU Decadal Target Acres	Rx Fire Acres Per Decade	Non-Fire Acres Per Decade
1 acres @ 90%	50	N/A	50	50

A.3.4.20. Joshua Tree Forest

NV050-19



FMU Name & Unit No.: **Joshua Tree Forest; NV050-19**

FMU Type/Category: **Special Management Area (SMA)**

A.3.4.20.1. FMU Description:

A.3.4.20.1.1. FMU Location Information

Geographic boundaries: This FMU consists of the Joshua tree forest vegetative community in Piute Valley at the southeast edge of the McCullough Mountains. The FMU takes in the entire Joshua Tree Wee Thump Wilderness and a portion of the Piute/Eldorado Valley critical desert tortoise unit and desert tortoise ACEC.

A.3.4.20.1.2. FMU Acre Total

Ownership by Acres and Percent		
NV 050-19	**Joshua Tree Forest**	
Ownership	**Acres**	**Percent**
Bureau of Land Management	35,359	99.5
Private	170	0.5
Total Acres	35,529	

A.3.4.20.1.3. Fire Occurrence and History

FMU Number	**Decadal (94-03)**	**24 Years (80-03)**	**Ignition Cause (80-03)**	
NV 050-19			Lightning	2
Number of Fires	2	3	Human/Other	1
Largest Fire (Acres)	20.0	20.0	**Multiple Fire Days (80-03)**	
Total Acres Burned	20.1	25.1	Total Multiple Fire Days (MFD)	2
Average Fire Size (Acres)	10.1	8.4	Number of MFD Fires	2
			Total Acres Burned by Multiple Fires	5.1

Narrative Description: Wildfires within this FMU are almost entirely dependent upon ephemeral buildups of invasive annual grasses, primarily red brome. Fire behavior and spread is most typically wind-driven. The few fires that do occur in this FMU are typically associated with "wet cell" lightning storms, which account for their diminutive size and low rate of spread.

General Fire Protection Characteristics: The dominant vegetation consists of Mojave Desert scrub, with a Joshua tree component that is of unique stature and density. The Joshua tree type under southern Nevada climatic conditions does not display vigorous post-fire disturbance recovery. Fires are to be fought aggressively in this FMU but with the simultaneous objective of minimizing suppression-related impacts to desert tortoise habitat.

A.3.4.20.1.4. FMU Vegetation

FMU Vegetation/Fuel Types		
NV 050-19	**Joshua Tree Forest**	
Veg/Fuel Type	Acres	Percent
Grassland	2,210	6.2
Mojave	33,241	93.6
Mountain Shrub	79	0.2
Grand Total	35,529	

Vegetation Narrative: This FMU mostly consists of Mojave Desert scrub vegetation, but which is characterized by the unique height and crown density of its Joshua tree component.

A.3.4.20.1.5. FMU Fuel Models & Live Fuel Moisture Characteristics

Surface Fuel Model & Canopy Cover: With few exceptions, fine fuels drive the characteristics of wildland fires occurring in this FMU. These fine fuels are ephemeral and primarily consist of red brome and other non-native annual grasses.

Live Fuel Moisture Averages:

LFM Site	May	June	July	Aug	Sept	Oct
N5G	167%	121%	96%	98%	88%	75%

Live Fuel Moisture Characteristics:

- At live fuel moisture levels of 181% and above fires typically will exhibit Very Low Fire Behavior characteristics
- At live fuel moisture levels of 151% to 180% fires typically will exhibit Low Fire Behavior characteristics
- At live fuel moisture levels of 126% to 150% fires typically will exhibit Moderate Fire Behavior characteristics
- At live fuel moisture levels of 101% to 125% fires typically will exhibit High Fire Behavior characteristics
- At live fuel moisture levels of 75% to 100% fires typically will exhibit Extreme Fire Behavior characteristics
- At live fuel moisture levels of 75% and below fires typically will exhibit Advanced Fire Behavior characteristics

A.3.4.20.1.6. Fire Weather & Climate Related Impacts

(Detailed weather station data for this FMU will be added to the FMP Appendix upon completion of the national fire weather data validation/correction project.)

- Wet lightning is common in this area. Fires generally remain small when starts occur under these common conditions.
- Dry Lightning is possible in this area. Larger fires can occur with these erratic and gusty thunderstorm events.
- Larger fires occur when human ignitions occur under typical warm and windy summer weather.
- Fire behavior can be extreme under these conditions when there are heavy buildups of ephemeral light flashy fuels.
- Fire behavior can be extreme under these conditions in heavy brush and/or Pinyon-Juniper fuels.

A.3.4.20.1.7. Fire Regime

FMU by Condition Class and Fire Regime			
NV 050-19		Joshua Tree Forest	
CC	FR	Acres	Percent
2	II	21,070	59.4
	V	10,576	29.8
3	I	3,717	10.5
	II	123	0.3
Total		35,485	

A.3.4.20.1.8. FMU Physical Characteristics

Topography:

- Elevation Range: 3,399feet to 5,398 feet
- Slope: Primarily flat valley bottoms with some bajada slopes up to 30%
- Aspect: Various
- Major topographical features: Piute Valley

Access Information: Access primarily consists of Nevada State Route 164 and unpaved roads. Most of the FMU is roadless.

A.3.4.20.1.9. FMU Resource Values & Attributes

Wildland-Urban Interface/Intermix: One power line ROW on the northwest boundary of the FMU

Resource Use:

- Critical desert tortoise habitat
- Joshua Tree Wee Thump Wilderness
- Joshua tree forest
  - Dispersed recreation; hunting; special use permit activities
  - Commercial reptile collection

Air Quality: This FMU does not contain any non-attainment airsheds. Fire management activities in this FMU may include fire suppression, open burning, and light and heavy equipment mobilization. Fire Management Open burning (RX FIRE) is permitted in Clark County with a courtesy call to the Department of Health. Open burning is defined here "where fire is set either by OFFICERS of governmental agencies, in performance of their official duties or the purposes of training and instruction of firefighting and fire-rescue personnel". (*Section 42-Open Burning, Clark County Air Quality Regulations*).

Soils: Soils have formed under conditions of physical weathering (rather than chemical dissolution) because of the arid climate. Soils on lower portions of alluvial fans and valley floors contain very little organic material, are moderately to highly alkaline, and can contain high concentrations of gypsum and dissolved salts. A gravelly surface crust (called desert pavement) occurs throughout these areas. Desert pavement is very stable and protects underlying fine-grained soils from erosion. A cemented hardpan layer commonly occurs at shallow depths beneath surface soils throughout these areas. Mountain slopes tend to be covered by an unstable layer of large rocks, boulders, stones, and cobbles. Runoff from periodic rainstorms transports large amounts of material to lower elevations, forming alluvial fans of coarse material and depositing thick sequences of gravelly loams, sands, and finer grained sediments on valley floors.

Soils are susceptible to water and wind erosion. Water erosion occurs during periodic high-intensity, short duration summertime thunderstorms and less frequent, sustained wintertime

rainstorms. Water erosion occurs by a combination of sheet flow, rill formation, splashing, and channelized flow in ephemeral washes and stream channels. Wind erosion occurs in areas where the desert pavement layer has been disturbed by human activities or heavy use by wild horses and burros, where large areas of vegetation have been burned by fire, sand dune areas, and as part of physical weathering processes.

Cultural and Paleontological Values: N/A

T&E and Sensitive Species: Desert tortoise

Habitat Values: Critical desert tortoise habitat

Hydrology and Water Quality: The Joshua Tree Forest FMU lies primarily within The Death Valley Basin hydrographic region, and is a topographically-closed, internally-drained basin. Ephemeral wash channels drain most of the Joshua Tree Forest FMU and only convey flow after periodic high-intensity summer thunderstorms or sustained winter rainstorms. Rapid runoff to ephemeral wash channels can produce flash flooding and transport large quantities of sediment as water flows from mountainous areas and alluvial fans towards valley floors.

Wilderness or WSA: Joshua Tree Wee Thump Wilderness

A.3.4.20.1.10. FMU Public Safety, Economic & Community Values at Risk

- Power line ROW (adjacent to the FMU)
- State Route 164

A.3.4.20.1.11. FMU Fire Protection Responsibility

Wildland fire protection on all BLM public lands within this FMU is provided by the Las Vegas Field Office. Structural fire protection on private lands within this FMU is provided by the Clark County Fire Department.

A.3.4.20.2. FMU Objectives & Strategies

A.3.4.20.2.1. FMU Fire Management Objectives Priority Statement

- Protect human life, safety of wildland firefighters, and protection of human safety and health *(National Fire Plan 2001).*
- Use approved fire suppression techniques in areas of critical environmental concern where there are concerns for habitat, threatened and endangered species, and urban/rural/wildland interface zones (LVFO RMP, 1998. Fire Management Direction FE-1-d).
- Provide fire suppression efforts commensurate with resource and adjacent property values at risk *(LVFO RMP, 1998. Fire Mgt Direction FE-1-a).*
- Determine specific hazard reduction priorities, including any noxious or invasive species infestations, and implement according to the existing budget (LVFO RMP, 1998. Fire Mgt Direction FE-2-a).

- Manage 743,209 acres of the four desert tortoise areas of critical environmental concern specifically for tortoise recovery. Minimize impacts to tortoise habitat during fire suppression by minimizing the use of mechanized equipment and, where possible, staying on existing roads and trails. Give priority to keeping the wildfire to an absolute minimum (size). Require reclamation of disturbed lands so that predisturbed condition can be reached within a reasonable time frame (LVFO RMP 1998. Special Status Species Mgt Direction SS-3-a).

- Manage habitat to further sustain the populations of federally listed species so they would no longer need protection of the Endangered Species Act. Manage habitats for non-listed special status species to support viable populations so that future listing would not be necessary *(LVFO RMP 1998. Special Status Species Mgt Objective SS-2).*

- Manage special status species habitat at the potential natural community or desired plant community, according to the need of the species (LVFO RMP 1998. Special Status Species Mgt Objective SS-1).

- Maintain or improve the condition of vegetation on public lands to a Desired Plant Community or to a Potential Natural Community (LVFO RMP 1998. Vegetation Mgt Objective VG-1).

- Restore plant productivity on disturbed areas of the public lands. Rehabilitate, reclaim, or revegetate areas subjected to surface-disturbing activities, where feasible. When rehabilitating, manage for optimum species diversity by seeding native species, except where non-native species are appropriate (LVFO RMP 1998. Vegetation Mgt Objective VG-2).

- Wilderness areas are to be managed to provide for the protection, the preservation of their natural conditions, and the preservation of their wilderness character [Wilderness Act, Section 4(b), BLM Manual 8560 (.08A1)]. Specific objectives and management direction for the Wee Thump Joshua Tree Wilderness will be identified in the South McCullough/Wee Thump Joshua Tree Wilderness Management Plan, which is in preparation (LVFO RMP 1998. Wilderness Mgt Objective WS-2) and (BLM Manual 8560 (.21A)).

Wildfire Management Priorities:

- Protect the Joshua tree forest from high intensity, stand-removing wildfires.

- Maintain wilderness characteristics of the Wee Thump Joshua Tree WSA

A.3.4.20.2.2. FMU Wildland Fire Suppression Objectives & Strategies

Fire Suppression Objectives:

- Minimize impacts to desert tortoise habitat during fire suppression by minimizing the use of mechanized equipment and, where possible, staying on existing roads and trails.

- Give priority to keeping the wildfire to an absolute minimum (size), in order to prevent loss of Joshua tree vegetation to brome grass type conversion.

- Require reclamation of disturbed lands so that predisturbed condition can be reached within a reasonable time frame.

Fire Suppression Strategies:

- Wildland fires will be fought aggressively in order to minimize burned acreage in critical desert tortoise habitat, the tortoise ACEC, the Joshua Tree Wee Thump Wilderness, and the Joshua tree forest. Actions will be dictated by Appropriate Management Response guidelines.
- Wildland fires in all wilderness areas will be fought using Minimum Impact Suppression Tactics (MIST)

Suppression/Protection Priorities:

- Piute/Eldorado desert tortoise critical habitat unit
- Piute/Eldorado desert tortoise ACEC
- Joshua Tree Wee Thump Wilderness
- Joshua tree forest (outside the wilderness unit)

FMU Target Individual Wildland Fire Size: 1 acre @ 90 %

FMU Target Acres Burned Per Decade: 50 acres

A.3.4.20.2.3. FMU Wildland Fire Operational Constraints, Objectives & Strategies

Special Fire Management Consideration/Areas:

- Piute/Eldorado Valley desert tortoise critical habitat unit
- Piute/Eldorado Valley ACEC
- Joshua Tree Wee Thump Wilderness
- Joshua Tree Forest (outside the wilderness unit)

A.3.4.20.2.3.1. Wildland Fire Operational Constraints Objectives & Strategies:

A.3.4.20.2.3.1.1. Desert Tortoise:

- Initiate full suppression activities with minimum surface disturbances to reduce loss of tortoise cover and to minimize the spread of exotic annual grasses.
- Require consultation with a qualified Resource Advisor for all wildfires within desert tortoise habitat, particularly within ACEC's and designated critical habitat units.
- Restrict OHV travel and the use of tracked vehicles to the minimum necessary to suppress wildfires within desert tortoise habitat, particularly within ACEC's and designated critical habitat units; obliterate all tracks to reduce possibility of future use.
- Use of aerial retardant is authorized; foam or fugitive retardant is preferable to iron oxide retardant.
- Do not authorize burning out of unburned fingers or islands of vegetation. The exception to this case would be the removal of fuels for safety concerns.

- Establish fire camps, staging areas, and helispots in previously disturbed areas outside of ACEC's and designated critical habitat units, where possible, in consultation with a qualified Resource Advisor.
- Provide all firefighters and support personnel with a briefing on desert tortoises and their habitat to minimize take, particularly those associated with vehicle use.

A.3.4.20.2.3.1.2. Wilderness:

- A Resource Advisor will be dispatched to all fires occurring in or threatening a wilderness area.
- Use of Heavy equipment (bulldozers, etc.) will only be used in Wilderness if the fire is threatening human life or property. The Field Manager must approve the use of heavy equipment in all cases.
- Motorized vehicles used in fire suppression efforts will remain on "cherrystem" roads or predetermined existing ways inside Wilderness.
- Air resources including helicopters and SEAT's will be included in the WILDCAD system for all wilderness fire suppression activities.
- Helibases, staging areas, and fire camps will be located outside of wilderness areas, unless authorized by the Field Manager.
- Use of retardant must be approved by the Field Manager.
- If retardant is not approved, water may be dropped from aircraft.
- Landing of helicopters will be kept to a minimum and will only occur in existing openings.
- All fire suppression activities will use Minimum Impact Suppression Techniques (MIST) at all times. See attached MIST Guidelines.
- Hand crews may use conventional hand tools and, with approval from the Resource Advisor, may conservatively use chainsaws for fire line construction. Chainsaw use and line width should be kept to a minimum. Utilization of existing natural barriers, minimum "scratch line", and cold trailing is encouraged where feasible. Handline construction will be rehabilitated back to the natural contour.
- A "Leave No Trace" policy will be used in the wilderness area. All evidence of human activity must be removed, to the maximum extent possible.
- Noxious weeds will be controlled in conformance with the attached "Las Vegas Field Office Noxious Weed Control, Fire Management Weed Transport Control" guidelines.

A.3.4.20.2.3.1.3. Noxious Weeds and Invasive Species Transport Control Procedures:

Las Vegas Field Office Noxious Weed Control and Fire Management Weed Transport Control:

- Off-district engines, crew carriers, overhead vehicles, and helitack/helicopter support vehicles will, upon check-in and prior to proceeding to the line, wash down at the, Logandale, Red Rock, Pahrump Fire Stations or a commercial truck washing station. This will be determined

by the location of the units' last fire assignment and if they were cleaned at release from that assignment.

  - The washdown will concentrate on the undercarriage, with special emphasis on axles, frame, crossmembers, motor mounts, and on and underneath steps, running boards, and front bumper/brushguard assemblies. Vehicle cabs will be swept out with refuse disposed of in waste receptacles. In wilderness areas, all portable equipment used on an incident (pumps, hose, fittings, water storage items) will be washed off to rid them of any seed or spores that may be attached from previous fires in noxious weed infested sites.

  - During initial briefings, washdowns will be mentioned and facilities made available for oncoming crews.

- Las Vegas Field Office crews will follow the same procedures identified in Item 1 when returning from fieldwork or wildland fires, especially when vehicles are used in know noxious weed areas infested with known noxious or invasive species common to the Field Office area.

- Upon leaving the Field Office when released from an incident, all off-unit vehicles will follow aforementioned washdown procedures so that Las Vegas' noxious weed problems do not become someone else's problems.

- All equipment used off pavement will be cleaned of weed and grass seed stems, stalks, etc. prior to release from an incident. This includes, but is not limited to, tents, tarps, helicopter support equipment, foldatanks and free-standing tanks, mechanic's vehicles, and logistical support vehicles, trailers and equipment. These vehicles will be washed as in 1.a. above.

This Field Office policy will be followed by all equipment involved in fire suppression while on Las Vegas Field Office assignments. Vehicles will be cleared of washdown procedures during checkout and crew evaluations. In the event vehicles are released from fires away from the district office, the closest wash facility, (government or commercial) will be utilized.

A.3.4.20.2.4. FMU Wildland Fire Use Objectives & Strategies

Wildfire will not be used as a management tool within this FMU at this time.

A.3.4.20.2.5. Burned Acre Objective Review

IF the FMU decadal wildfire acre-burned target has been reached or exceeded PRIOR TO THE COMPLETION OF THE 10-YEAR PLANNING PERIOD, from either wildfire or prescribed fire, a review of fire management objectives and strategies will be initiated to develop new suppression criteria on wildland fire occurrence and prescribed fire acre goals.

A.3.4.20.2.6. FMU Prescribed Fire Objectives & Strategies

Prescribed Fire Objectives & Strategies: Prescribed fire will not be used as a management tool within this FMU at this time.

Rx Fire Annual & Decadal Acre Target: N/A

T & E Species Strategies: N/A

Air Quality Strategy: N/A

NEPA Compliance: Prior to implementation of any proposed projects, site-specific NEPA documentation will be completed, as applicable.

Rx Fire Monitoring Strategy: Monitoring will be completed for attainment/non-attainment of project specific resource management objectives, as applicable.

A.3.4.20.2.7. FMU Non-Fire Fuels Treatment Objectives & Strategies

Non-Fire Fuels Treatment Objectives & Strategies: Non-fire fuels treatments will not be used as a management tool within this FMU at this time.

Non-Fire Annual & Decadal Acre Target: N/A

T & E Species Strategies: N/A

Air Quality Strategies: N/A

NEPA Compliance: Prior to implementation of any proposed projects, site-specific NEPA documentation will be completed, as applicable.

Treatment Monitoring Strategy: Monitoring will be completed for attainment/non-attainment of project specific resource management objectives, as applicable.

A.3.4.20.2.8. FMU Post Fire Rehab/Restoration Objectives & Strategies

Restore plant productivity on disturbed areas of the public lands. Rehabilitate, reclaim, or revegetate areas subjected to surface-disturbing activities, where feasible. When rehabilitating, manage for optimum species diversity by seeding native species, except where non-native species are appropriate.

- In desert tortoise habitat, conduct all activities in accordance with the Reclamation Plan For Critical Tortoise Habitat In The Las Vegas Field Office (1998); Environmental Assessment no. NV-052-98-077.
- Within wilderness, rehabilitation and restoration will be conducted in accordance with the appropriate wilderness management plan(s).
- In the event that suppression efforts require off-road vehicle operations, replant and visually camouflage the first 200 feet of tire tracks in order to prevent further habitat impacts (due to public use of these track ways).
- Whenever feasible, utilize native species in seeding and/or re-planting treatments.
- Cultivate local supplies of live plant materials for use during riparian restoration efforts.
- Maintain a seed bank of locally collected native plant species for use in restoring both fire fuels treatments and fire-disturbed sites.
- Cultivate and develop varieties of locally grown native seed by means of plant material centers.

A.3.4.20.2.9. FMU Community Protection/Community Assistance Objectives & Strategies

Communities at Risk/WUI Areas: N/A. Communities-at-risk, community protection/assistance and public education strategies and objectives will be further defined through the LVFO RAMS Fire Plan update, which is scheduled for 2005.

Community Protection/Community Assistance Objectives: N/A

Community Protection/Community Assistance Strategy: N/A

Community Wildfire Safety Education Strategy: N/A

A.3.4.20.3. FMU Fire Program Analysis - Quantifiable Objective Summary

Initial Attack Success	Decadal Wildfire Acres Burn Tolerance	WFU Decadal Target Acres	Rx Fire Acres Per Decade	Non-Fire Acres Per Decade
1 acre @ 90%	50	N/A	N/A	N/A

A.3.4.21. Nellis-Sagegrouse

NV050-20

FMU Name & Unit No.: **Nellis-Sagegrouse; NV050-20**

FMU Type/Category: **High Value Habitat (HVH)**

A.3.4.21.1. FMU Description:

A.3.4.21.1.1. FMU Location Information

Geographic boundaries: This is an FMU comprised of: critical late summer, winter, and breeding Sage grouse habitat; Pronghorn habitat; and Mule deer habitat. Geographically, this FMU lies on the northern boundary of the Nellis Test and Training Range (NTTR) at the southern end of the Kawich Range near Silverbow (Breen) Creek.

A.3.4.21.1.2. FMU Acre Total

Ownership by Acres and Percent		
NV 050-20	**Nellis - Sagegrouse**	
Ownership	**Acres**	**Percent**
Bureau of Land Management	2,841	3.3
Department of Defense	82,608	96.7
Total Acres	85,450	

A.3.4.21.1.3. Fire Occurrence and History

FMU Number	Decadal (94-03)	24 Years (80-03)	Ignition Cause (80-03)	
NV 050-20			Lightning	1
Number of Fires	0	3	Human/Other	2
Largest Fire (Acres)	0.0	4.0	**Multiple Fire Days (80-03)**	
Total Acres Burned	0.0	4.3	Total Multiple Fire Days (MFD)	0
Average Fire Size (Acres)	0.0	1.4	Number of MFD Fires	0
			Total Acres Burned by Multiple Fires	0.0

Narrative Description: This FMU has exhibits very low fire occurrence.

General Fire Protection Characteristics: The sagebrush portion of this FMU comprises high suppression priority Sage grouse habitat and Pronghorn and Mule deer habitats.

A.3.4.21.1.4. FMU Vegetation

FMU Vegetation/Fuel Types		
NV 050-20	**Nellis - Sagegrouse**	
Veg/Fuel Type	Acres	Percent
Grassland	600	0.7
Mountain Shrub	998	1.2
Pinyon/Juniper Woodlands	36,642	43.7
Sagebrush	44,142	52.6
Salt Desert Scrub/Shadscale	1,497	1.8
Grand Total	83,879	

Vegetation Narrative: Mountain big sagebrush with pinyon-juniper along the ridge tops. Cheatgrass is widely distributed throughout the FMU. Red brome is mainly restricted to valley bottoms and alluvial fans.

A.3.4.21.1.5. FMU Fuel Models & Live Fuel Moisture Characteristics

Surface Fuel Model & Canopy Cover: Cheatgrass and red brome is widely distributed throughout the FMU. Both of these invasive species are strongly associated with prior disturbance/fire occurrence, but also occur at lesser densities in undisturbed habitats. Both of these invasive species contribute to fire fuel loadings and behavior.

Live Fuel Moisture Averages:

LFM Site	May	June	July	Aug	Sept	Oct
N5C	189%	130%	93%	92%	99%	89%

Live Fuel Moisture Characteristics:

- At live fuel moisture levels of 181% and above fires typically will exhibit Very Low Fire Behavior characteristics
- At live fuel moisture levels of 151% to 180% fires typically will exhibit Low Fire Behavior characteristics
- At live fuel moisture levels of 126% to 150% fires typically will exhibit Moderate Fire Behavior characteristics
- At live fuel moisture levels of 101% to 125% fires typically will exhibit High Fire Behavior characteristics
- At live fuel moisture levels of 75% to 100% fires typically will exhibit Extreme Fire Behavior characteristics
- At live fuel moisture levels of 75% and below fires typically will exhibit Advanced Fire Behavior characteristics

A.3.4.21.1.6. Fire Weather & Climate Related Impacts

(Detailed weather station data for this FMU will be added to the FMP Appendix upon completion of the national fire weather data validation/correction project.)

- Wet lightning is common in this area. Fires generally remain small when starts occur under these common conditions.
- Dry Lightning is possible in this area. Larger fires can occur with these erratic and gusty thunderstorm events.
- Larger fires occur when human ignitions occur under typical warm and windy summer weather.
- Fire behavior can be extreme under these conditions when there are heavy buildups of ephemeral light flashy fuels.
- Fire behavior can be extreme under these conditions in heavy brush and/or Pinyon-Juniper fuels.

A.3.4.21.1.7. Fire Regime

- Fire Regime II; Condition Class II

FMU by Condition Class and Fire Regime			
NV 050-20		**Nellis - Sagegrouse**	
CC	FR	Acres	Percent
1	IV	2,873	3.4
2	II	25,455	30.5
3	I	2,329	2.8
	II	50,512	60.6
	IV	2,219	2.7
Total		83,388	

A.3.4.21.1.8. FMU Physical Characteristics

Topography:

- Elevation Range: 6,232 feet to 8,423 feet
- Slope: 10 to 60%
- Aspect: Mainly west
- Major topographical features:
  - Kawich Range
  - Cedar Pass

Access Information: Access consists only of unpaved roads and a large portion of this FMU is road-less. Permission to enter the NTTR must be coordinated with Range Operations.

A.3.4.21.1.9. FMU Resource Values & Attributes

Wildland-Urban Interface/Intermix: DOD communication sites and other developments

Resource Use:

- Defense activities by the Nellis Air Force Base and NTTR
- Critical late summer, winter, and breeding Sage grouse habitat
- Pronghorn habitat
- Mule deer habitat
- Wild horse and burro NTTR Herd Management Area
- Grazing (incidental trespass use from unfenced Naquinta allotment)

Air Quality: There are no non-attainment airsheds in this FMU. Fire management activities in this FMU may include fire suppression, open burning, and light and heavy equipment mobilization. Rx fire burn plans will have an approved variance (Open Burn Permit) from the State of Nevada, Division of Environmental Protection; Smoke Management Program.

Soils: Soils have formed under conditions of physical weathering (rather than chemical dissolution) because of the arid climate. Soils on lower portions of alluvial fans and valley floors contain very little organic material, are moderately to highly alkaline, and can contain high concentrations of gypsum and dissolved salts. A gravelly surface crust (called desert pavement) occurs throughout these areas. Desert pavement is very stable and protects underlying fine-grained soils from erosion. A cemented hardpan layer commonly occurs at shallow depths beneath surface soils throughout these areas. Mountain slopes tend to be covered by an unstable layer of large rocks, boulders, stones, and cobbles. Runoff from periodic rainstorms transports large amounts of material to lower elevations, forming alluvial fans of coarse material and depositing thick sequences of gravelly loams, sands, and finer grained sediments on valley floors.

Soils are susceptible to water and wind erosion. Water erosion occurs during periodic high-intensity, short duration summertime thunderstorms and less frequent, sustained wintertime rainstorms. Water erosion occurs by a combination of sheet flow, rill formation, splashing, and channelized flow in ephemeral washes and stream channels. Wind erosion occurs in areas where

the desert pavement layer has been disturbed by human activities or heavy use by wild horses and burros, where large areas of vegetation have been burned by fire, sand dune areas, and as part of physical weathering processes.

Cultural and Paleontological Values: To be identified by DOD personnel

T&E and Sensitive Species: The Greater Sage grouse resides in this FMU, and is managed as a sensitive species.

Habitat Values: This FMU is located within a designated Greater Sage grouse Population Management Unit (PMU).

Hydrology and Water Quality: The Nellis Sagegrouse FMU lies within the Central Region hydrographic region which is a topographically closed, internally drained basin. Ephemeral wash channels drain most of the Nellis Sagegrouse FMU and only convey flow after periodic high-intensity summer thunderstorms or sustained winter rainstorms. Rapid runoff to ephemeral wash channels can produce flash flooding and transport large quantities of sediment as water flows from mountainous areas and alluvial fans towards valley floors.

Wilderness or WSA: N/A

A.3.4.21.1.10. FMU Public Safety, Economic & Community Values at Risk

- NTTR communication tower and other infrastructure
- Critical late summer, winter, and breeding Sage grouse habitat
- Pronghorn habitat
- Mule deer habitat
- Wild horse and burro NTTR Herd Management Area

A.3.4.21.1.11. FMU Fire Protection Responsibility

Wildland fire protection on all BLM public lands within this FMU is provided by the Las Vegas Field Office. Structural fire protection on private lands within this FMU is provided by the Department of Defense.

A.3.4.21.2. FMU Objectives & Strategies

A.3.4.21.2.1. FMU Fire Management Objectives Priority Statement

- Manage habitat to further sustain the populations of federally listed species so they would no longer need protection of the Endangered Species Act. Manage habitats for non-listed special status species to support viable populations so that future listing would not be necessary. (Planning Document Reference: LVFO RMP Objective SS-2)(NTTR RMP 2.6.8 Objective 1)
- Support viable wildlife populations by providing and maintaining sufficient quality and quantity of food, water, cover, and space to satisfy needs of wildlife species using habitats on withdrawn public land. (Planning Document Reference: NTTR RMP 2.6.7 Objective 1)

- Evaluate wildlife habitat quality and quantity on the NTTR and where appropriate re-establish appropriate native fauna (including naturalized species) to historic use areas, and/or increase population numbers in current use areas. (Planning Document Reference: NTTR RMP 2.6.7 Objective 2)

- Manage special status species habitat at the potential natural community or desired plant community, according to the need of the species. (Planning Document Reference: LVFO RMP Objective SS-1)(NTTR RMP 2.6.8 Objective 1)

- Protect important resting/nesting habitats, such as riparian areas and mesquite/acacia woodlands. *(Planning Document Reference: LVFO RMP, 1998. Mgt Direction FW-3-g.)*

- Improve disturbed non-game bird habitat, including the water table supporting these habitats, by emphasizing maintenance and enhancement of natural biodiversity. (Planning Document Reference: LVFO RMP, 1998. Mgt Direction FW-3-h.)

- Maintain or improve the condition of vegetation on public lands to a Desired Plant Community or to a Potential Natural Community (see Appendix N: desert tortoise habitat guidelines for Desired Plant Community). (Planning Document Reference: LVFO RMP Objective VG-1)

- Restore plant productivity on disturbed areas of the public lands. Rehabilitate, reclaim, or revegetate areas subjected to surface-disturbing activities, where feasible. When rehabilitating, manage for optimum species diversity by seeding native species, except where non-native species are appropriate. (Planning Document Reference: LVFO RMP Objective VG-2)

- Protect human life, safety of wildland firefighters, and protection of human safety and health. *(Planning Document Reference: National Fire Plan, 2001.)*

- Provide fire suppression efforts commensurate with resource and adjacent property values at risk. *(Planning Document Reference: LVFO RMP, 1998. Mgt Direction FE-1-a)(Planning Document Reference: NTTR RMP 2.6.19 Objective 1, Mgt Direction 1)*

- Determine specific hazard reduction priorities, including any noxious or invasive species infestations, and implement according to the existing budget. (Planning Document Reference: LVFO RMP, 1998. Mgt Direction FE-2-a)

- Determine specific prescribed burn priorities annually, including any noxious or invasive species infestations, and implement where possible. (Planning Document Reference: LVFO RMP, 1998. Mgt Direction FE-3-a)

- Determine site-specific potentials and prescribed fire priorities, based on survey data of expansion rates of pinyon-juniper forests and understory fuel loads. (Planning Document Reference: NTTR RMP 2.6.19 Objective 1, Mgt Direction 6)

- Maintain woodland and conifer forest where possible for all-aged stands, with understory vegetation forage value rating at moderate or better (LVFO RMP 1998. Forestry Mgt Objective FR-1).

- Use integrated weed management techniques to control and eradicate tamarisk, such as *burning*, chemical, biological or mechanical treatments, where potential for treatment is good. Rehabilitate with native species to help reduce the potential for tamarisk re-establishment and improve ecosystem health *(LVFO RMP, 1998. Riparian Mgt Objective RP-1-f).*

Wildfire Management Priorities:

- Protection of DOD infrastructure and developments
- Protection of property and improvements (adjacent to FMU)
- Protect Sage grouse habitat from ground disturbing activities. Permit no net loss of Sage grouse habitat as a result of new actions authorized by BLM; minimize habitat losses resulting from natural disturbances, including wildfire.

A.3.4.21.2.2. FMU Wildland Fire Suppression Objectives & Strategies

Fire Suppression Objectives: Ensure that actions authorized on BLM-administered lands do not contribute to the need to list Sage grouse under the provisions of the *Endangered Species Act*.

Fire Suppression Strategies: Wildland fires will be fought aggressively in order to minimize burned acreage in Sage grouse habitat. Actions will be dictated by Appropriate Management Response guidelines.

Suppression/Protection Priorities:

- Critical late summer, winter, and breeding Sage grouse habitat
- Pronghorn habitat
- Mule deer habitat
- Facilities or infrastructure (to be identified by DOD)
- Cultural resource sites (to be identified by DOD)

FMU Target Individual Wildland Fire Size: 5 acres @ 90%

FMU Target Acres Burned Per Decade: 50 acres

A.3.4.21.2.3. FMU Wildland Fire Operational Constraints, Objectives & Strategies

Special Fire Management Consideration/Areas:

- Critical late summer, winter, and breeding Sage grouse habitat
- Pronghorn habitat, winter use area and year-round use area
- Mule deer habitat, year-round use area
- Wild horse and Burro NTTR Herd Management Area
- Breeding Sage grouse habitat
- Critical late summer Sage grouse habitat
- Winter Sage grouse habitat

A.3.4.21.2.3.1. Wildland Fire Operational Constraints Objectives & Strategies:

A.3.4.21.2.3.1.1. Sagegrouse:

- Give wildlife suppression priority to known Sage grouse habitat within the framework of the federal Wildland Fire Policy (human life and safety as the first priority, with property and natural resources as second priorities) (USDI and UDA 1995)
- Use direct attack tactics when it is safe and effective at reducing amount of burned habitat.
- Retain unburned areas (including interior islands and patches between roads and the fire perimeter) of Sage grouse habitat unless there are compelling safety, resource protection, or control objectives at risk.
- The habitat character of the lek and surrounding sagebrush cover within 300 meters (985 ft.), as well as identified winter range, should be given top priority in fire suppression. Ground disturbing fire suppression actions, such as the use of heavy equipment and excessive brush removal should be judiciously applied to protect Sage grouse habitat.
- All areas where wildfires burn more than 10 acres in sites known to be prone to cheatgrass or other exotic plants will be seeded with an appropriate seed mixture to reduce the probability of cheatgrass establishment on that site. Potential benefits to Sage grouse populations should be considered in prioritizing sites for seeding.

A.3.4.21.2.3.1.2. Riparian Areas:

- Apply M.I.S.T. within riparian habitat
- In riparian areas, prioritize suppression actions to minimize damage to native vegetation from wildfire or suppression operations
- Fire suppression in riparian habitat will be coordinated with the approved Resource Advisor
- In riparian areas, use natural barriers or openings in riparian vegetation where possible as the easiest, safest method to manage a riparian wildfire. Where possible and practical use wet firebreaks rather than constructing firelines by hand or with heavy equipment
- Avoid burning out unburned islands, whenever possible
- Utilize firing tactics only if necessary to protect firefighter or public safety
- Avoid surface disturbing suppression activities in riparian areas whenever possible
- Avoid dropping retardant within 300 feet of water sources, to the maximum extent feasible
- Use of containment systems for portable pumps to avoid fuel spills in riparian or aquatic systems will be required.

A.3.4.21.2.3.1.3. Noxious Weeds and Invasive Species Transport Control Procedures:

Las Vegas Field Office Noxious Weed Control and Fire Management Weed Transport Control:

- Off-district engines, crew carriers, overhead vehicles, and helitack/helicopter support vehicles will, upon check-in and prior to proceeding to the line, wash down at the, Logandale, Red Rock, Pahrump Fire Stations or a commercial truck washing station. This will be determined by the location of the units' last fire assignment and if they were cleaned at release from that assignment.
  - The washdown will concentrate on the undercarriage, with special emphasis on axles, frame, crossmembers, motor mounts, and on and underneath steps, running boards, and front bumper/brushguard assemblies. Vehicle cabs will be swept out with refuse disposed of in waste receptacles. In wilderness areas, all portable equipment used on an incident (pumps, hose, fittings, water storage items) will be washed off to rid them of any seed or spores that may be attached from previous fires in noxious weed infested sites.
  - During initial briefings, washdowns will be mentioned and facilities made available for oncoming crews.
- Las Vegas Field Office crews will follow the same procedures identified in Item 1 when returning from fieldwork or wildland fires, especially when vehicles are used in know noxious weed areas infested with known noxious or invasive species common to the Field Office area.
- Upon leaving the Field Office when released from an incident, all off-unit vehicles will follow aforementioned washdown procedures so that Las Vegas' noxious weed problems do not become someone else's problems.
- All equipment used off pavement will be cleaned of weed and grass seed stems, stalks, etc. prior to release from an incident. This includes, but is not limited to, tents, tarps, helicopter support equipment, foldatanks and free-standing tanks, mechanic's vehicles, and logistical support vehicles, trailers and equipment. These vehicles will be washed as in 1.a. above.

This Field Office policy will be followed by all equipment involved in fire suppression while on Las Vegas Field Office assignments. Vehicles will be cleared of washdown procedures during checkout and crew evaluations. In the event vehicles are released from fires away from the district office, the closest wash facility, (government or commercial) will be utilized.

A.3.4.21.2.4. FMU Wildland Fire Use Objectives & Strategies

Wildfire will not be used as a management tool within this FMU at this time.

A.3.4.21.2.5. Burned Acre Objective Review

IF the FMU decadal wildfire acre-burned target has been reached or exceeded PRIOR TO THE COMPLETION OF THE 10-YEAR PLANNING PERIOD, from either wildfire or prescribed fire, a review of fire management objectives and strategies will be initiated to develop new suppression criteria on wildland fire occurrence and prescribed fire acre goals.

A.3.4.21.2.6. FMU Prescribed Fire Objectives & Strategies

Prescribed Fire Objectives & Strategies: Prescribed fire will not be used as a management tool within this FMU at this time.

Rx Fire Annual & Decadal Acre Target: N/A

T & E Species Strategies: N/A

Air Quality Strategy: N/A

NEPA Compliance: Prior to implementation of any proposed projects, site-specific NEPA documentation will be completed, as applicable.

Rx Fire Monitoring Strategy: Monitoring will be completed for attainment/non-attainment of project specific resource management objectives, as applicable.

A.3.4.21.2.7. FMU Non-Fire Fuels Treatment Objectives & Strategies

Non-Fire Fuels Treatment Objectives: Manage for native sagebrush vegetation within Sage grouse habitat. Treatments should focus on removal of cheatgrass and other exotic and encroaching species.

Non-Fire Fuels Treatment Strategies: Manage for native sagebrush vegetation within Sage grouse habitat. Treatments should focus on removal of cheatgrass and other exotic and encroaching species.

Non-Fire Annual & Decadal Acre Target:

- Annual: 25 acres
- Decadal: 250 acres

T & E Species Strategies: N/A

Air Quality Strategies: N/A

NEPA Compliance: Prior to implementation of any proposed projects, site-specific NEPA documentation will be completed, as applicable.

Treatment Monitoring Strategy: Monitoring will be completed for attainment/non-attainment of project specific resource management objectives, as applicable.

A.3.4.21.2.8. FMU Post Fire Rehab/Restoration Objectives & Strategies

Post Fire Rehab & Restoration Objectives: (refer to LVFO normal fire rehab document):

- Evaluate all wildfires burning more than 100 acres of Sage grouse habitat to determine if seeding is necessary to recover ecological processes and achieve habitat objectives. If seeding is necessary, use appropriate mixtures of sagebrush, native grasses, forbs, and appropriate nonnative perennials that will increase the probability of recovering ecological processes and habitat features of the site. Potential benefits to Sage grouse populations should be considered in prioritizing sites for restoration.
- All areas where wildfires burn more than 10 acres in sites known to be prone to cheatgrass or other exotic plants will be seeded with an appropriate seed mixture to reduce the probability of cheatgrass establishment on that site. Potential benefits to Sage grouse populations should be considered in prioritizing sites for seeding.

A.3.4.21.2.9. FMU Community Protection/Community Assistance Objectives & Strategies

Communities at Risk/WUI Areas: N/A. Communities-at-risk, community protection/assistance and public education strategies and objectives will be further defined, in collaboration with Nellis Air Force Base and Nellis Test and Training Range, through the LVFO RAMS Fire Plan update, which is scheduled for 2005.

Community Protection/Community Assistance Objectives:

- Collaborate with Nellis Air Force Base and Nellis Test and Training Range to identify and mitigate fuels hazards near DOD facilities or developments.
- Prioritize suppression efforts within Sage grouse habitat abutting Air Force facilities.

Community Protection/Community Assistance Strategy: Collaborate with Nellis Air Force Base and Nellis Test and Training Range to identify and mitigate fuels hazards near DOD facilities or developments. Prioritize suppression efforts within Sage grouse habitat abutting Air Force facilities.

Community Wildfire Safety Education Strategy: Coordinate with Nellis Air Force Base and Nellis Test and Training Range

A.3.4.21.3. FMU Fire Program Analysis - Quantifiable Objective Summary

Initial Attack Success	Decadal Wildfire Acres Burn Tolerance	WFU Decadal Target Acres	Rx Fire Acres Per Decade	Non-Fire Acres Per Decade
5 acres @ 90%	50	N/A	N/A	250

A.3.4.22. Nellis Bighorn

NV050 - 21

FMU Name & Unit No.: **Nellis Bighorn; NV050 - 21**

FMU Type/Category: **High Value Habitat (HVH)**

A.3.4.22.1. FMU Description:

A.3.4.22.1.1. FMU Location Information

Geographic boundaries: This is a discontinuous FMU comprised of: Winter and year round bighorn sheep habitat; antelope habitat; Mule deer habitat, and raptor nesting and foraging habitat. Geographically, this FMU consists of pinyon-juniper vegetated mountain ranges and uplands on the Nellis Test and Training Range (NTTR).

A.3.4.22.1.2. FMU Acre Total

Ownership by Acres and Percent		
NV 050-21	**Nellis Bighorn**	
Ownership	**Acres**	**Percent**
Bureau of Land Management	1,354	0.5
Department of Defense	278,857	99.5
Total Acres	280,211	

A.3.4.22.1.3. Fire Occurrence and History

FMU Number	Decadal (94-03)	24 Years (80-03)	Ignition Cause (80-03)	
NV 050-21			Lightning	1
Number of Fires	1	6	Human/Other	5
Largest Fire (Acres)	3.0	12,050.0	**Multiple Fire Days (80-03)**	
Total Acres Burned	3.0	13,007.5	Total Multiple Fire Days (MFD)	0
Average Fire Size (Acres)	3.0	2,167.9	Number of MFD Fires	0
			Total Acres Burned by Multiple Fires	0.0

Narrative Description: This FMU has a history of infrequent but large fires, primarily wind-driven and occurring in years with buildups of non-native annual grasses (cheatgrass/red brome). This fire behavior has included running crown fires in closed canopy pinyon-juniper stands.

Historically, wildfires in this FMU predominately resulted from the use of incendiary flares and other ordnance during military training exercises. These fires could occur at any time of the year but were most common in the summer. In recent years, the fire occurrence in this FMU has been minimal, possibly due to the Air Force's use of shorter-timed fuses on the training ordnance.

General Fire Protection Characteristics: The vegetation in this FMU is comprised of fire disturbance tolerant plant communities, including pinyon pine-Utah juniper and mountain chaparral. Until such time as fire use plans and prescriptions can be put in place, it would be desirable from a resource standpoint to allow non-human caused wildfires to burn small (under 25-acres), mosaic openings in the closed canopy pinyon-juniper stands. This resource objective must be balanced against the need to prevent fire of catastrophic size and intensity.

A.3.4.22.1.4. FMU Vegetation

FMU Vegetation/Fuel Types		
NV 050-21	**Nellis Bighorn**	
Veg/Fuel Type	Acres	Percent
Grassland	1,430	0.5
Mojave	1,047	0.4
No Significant Vegetation	844	0.3
Pinyon/Juniper Woodlands	9,499	3.4
Sagebrush	163,962	58.6
Salt Desert Scrub/Shadscale	103,135	36.8
Grand Total	279,916	

Vegetation Narrative: Mountain big sagebrush, blackbrush, Mojave Desert scrub, mountain chaparral, and pinyon-juniper in the upper elevations.

A.3.4.22.1.5. FMU Fuel Models & Live Fuel Moisture Characteristics

Surface Fuel Model & Canopy Cover: Cheatgrass is widely distributed throughout the FMU. Red brome is mainly restricted to valley bottoms and alluvial fans. Halogeton is widespread in salt shrub communities along the margins of playas. All three of these invasive species are strongly associated with prior disturbance, but also occur at lesser densities in undisturbed habitats. All three of these invasive species contribute to fire fuel loadings and behavior.

Live Fuel Moisture Averages:

LFM Site	May	June	July	Aug	Sept	Oct
N5C	189%	130%	93%	92%	99%	89%

Live Fuel Moisture Characteristics:

- At live fuel moisture levels of 181% and above fires typically will exhibit Very Low Fire Behavior characteristics
- At live fuel moisture levels of 151% to 180% fires typically will exhibit Low Fire Behavior characteristics
- At live fuel moisture levels of 126% to 150% fires typically will exhibit Moderate Fire Behavior characteristics
- At live fuel moisture levels of 101% to 125% fires typically will exhibit High Fire Behavior characteristics
- At live fuel moisture levels of 75% to 100% fires typically will exhibit Extreme Fire Behavior characteristics
- At live fuel moisture levels of 75% and below fires typically will exhibit Advanced Fire Behavior characteristics

A.3.4.22.1.6. Fire Weather & Climate Related Impacts

(Detailed weather station data for this FMU will be added to the FMP Appendix upon completion of the national fire weather data validation/correction project.)

- Wet lightning is common in this area. Fires generally remain small when starts occur under these common conditions.
- Dry Lightning is possible in this area. Larger fires can occur with these erratic and gusty thunderstorm events.
- Larger fires occur when human ignitions occur under typical warm and windy summer weather.
- Fire behavior can be extreme under these conditions when there are heavy buildups of ephemeral light flashy fuels.
- Fire behavior can be extreme under these conditions in heavy brush and/or Pinyon-Juniper fuels.

A.3.4.22.1.7. Fire Regime

- Lower elevation: Fire Regime IV; Condition Class III
- Higher elevation: Fire Regime II; Condition Class III

FMU by Condition Class and Fire Regime			
NV 050-21		**Nellis Bighorn**	
CC	FR	Acres	Percent
2	II	8,899	3.2
	V	4,932	1.8
3	I	4,438	1.6
	II	163,815	59.0
	IV	95,686	34.4
Total		277,769	

A.3.4.22.1.8. FMU Physical Characteristics

Topography:

- Elevation Range: 4,264 feet to 8,200 feet
- Slope:
  - Valley bottoms and playas: less than 2%
  - Fan piedmonts and bajadas: 2 to 30%
- Ridge tops: 30+%
- Aspect: Variable
- Major topographical features:
  - Tolicha Peak
  - Pahute Mesa
  - Thirsty Canyon
  - Stonewall Mountain

Access Information: Access consists only of unpaved roads and a large portion of this FMU is road-less. Permission to enter the NTTR must be coordinated with Range Operations.

A.3.4.22.1.9. FMU Resource Values & Attributes

Wildland-Urban Interface/Intermix:

- Tolicha Peak radar installation
- DOD communication sites and other developments

Resource Use:

- Defense activities by the Nellis Air Force Base and NTTR
- Pronghorn habitat
- Mule deer habitat
- Wild horse and burro NTTR Herd Management Area

Air Quality: There are no non-attainment airsheds in this FMU. Rx fire burn plans will have an approved variance (Open Burn Permit) from the State of Nevada, Division of Environmental Protection; Smoke Management Program.

Soils: Soils have formed under conditions of physical weathering (rather than chemical dissolution) because of the arid climate. Soils on lower portions of alluvial fans and valley floors contain very little organic material, are moderately to highly alkaline, and can contain high concentrations of gypsum and dissolved salts. A gravelly surface crust (called desert pavement) occurs throughout these areas. Desert pavement is very stable and protects underlying fine-grained soils from erosion. A cemented hardpan layer commonly occurs at shallow depths beneath surface soils throughout these areas. Mountain slopes tend to be covered by an unstable layer of large rocks, boulders, stones, and cobbles. Runoff from periodic rainstorms transports large amounts of material to lower elevations, forming alluvial fans of coarse material and depositing thick sequences of gravelly loams, sands, and finer grained sediments on valley floors.

Soils are susceptible to water and wind erosion. Water erosion occurs during periodic high-intensity, short duration summertime thunderstorms and less frequent, sustained wintertime rainstorms. Water erosion occurs by a combination of sheet flow, rill formation, splashing, and channelized flow in ephemeral washes and stream channels. Wind erosion occurs in areas where the desert pavement layer has been disturbed by human activities or heavy use by wild horses and burros, where large areas of vegetation have been burned by fire, sand dune areas, and as part of physical weathering processes. Soils in very high elevation areas have formed under conditions of greater rainfall. Resulting soils reflect a combination of physical weathering of rocks, chemical dissolution of rocks, and the decomposition of organic materials. Relative shallow soil layers occur on bedrock surfaces in these areas. Soils in these areas contain low to moderate amounts of organic material, are slightly to highly alkaline, and contain lower concentrations of dissolved salts than soils at lower elevations.

Cultural and Paleontological Values: To be identified by DOD personnel

T&E and Sensitive Species: None

Habitat Values:

- Antelope habitat
- Mule deer habitat
- Raptor nesting and forage habitat
- Wild horse and burro range

Hydrology and Water Quality: The Nellis Bighorn FMU lies within the Central Region hydrographic region which is a topographically closed, internally drained basin. Ephemeral wash channels drain most of the Nellis Bighorn FMU and only convey flow after periodic high-intensity summer thunderstorms or sustained winter rainstorms. Rapid runoff to ephemeral wash channels can produce flash flooding and transport large quantities of sediment as water flows from mountainous areas and alluvial fans towards valley floors.

Wilderness or WSA: N/A

A.3.4.22.1.10. FMU Public Safety, Economic & Community Values at Risk

- Tolicha Peak radar installation and other NTTR infrastructure
- Antelope habitat
- Mule deer habitat
- Wild horse and burro range
- Raptor nesting and forage habitat

A.3.4.22.1.11. FMU Fire Protection Responsibility

Wildland fire protection on all BLM public lands and DOD lands within this FMU is provided by the Las Vegas Field Office. Structural fire protection on private lands within this FMU is provided by the Department of Defense and/or the respective fire protection district(s).

A.3.4.22.2. FMU Objectives & Strategies

A.3.4.22.2.1. FMU Fire Management Objectives Priority Statement

- Manage habitat to further sustain the populations of federally listed species so they would no longer need protection of the Endangered Species Act. Manage habitats for non-listed special status species to support viable populations so that future listing would not be necessary. (Planning Document Reference: LVFO RMP Objective SS-2)(NTTR RMP 2.6.8 Objective 1)
- Support viable wildlife populations by providing and maintaining sufficient quality and quantity of food, water, cover, and space to satisfy needs of wildlife species using habitats on withdrawn public land. (Planning Document Reference: NTTR RMP 2.6.7 Objective 1)
- Evaluate wildlife habitat quality and quantity on the NTTR and where appropriate re-establish appropriate native fauna (including naturalized species) to historic use areas, and/or increase population numbers in current use areas. Planning Document Reference: NTTR RMP 2.6.7 Objective 2)
- Manage special status species habitat at the potential natural community or desired plant community, according to the need of the species. (Planning Document Reference: LVFO RMP Objective SS-1) (NTTR RMP 2.6.8 Objective 1)
- Protect important resting/nesting habitats, such as riparian areas and mesquite/acacia woodlands. (Planning Document Reference: LVFO RMP, 1998. Mgt Direction FW-3-g.)

- Protect and improve key nesting areas, migration routes, important prey base areas, and concentration areas for birds of prey. (Planning Document Reference: NTTR RMP 2.6.7 Objective 1, Mgt Direction 5)
- Protect and improve important non-game resting/nesting habitat in riparian areas and other important habitat types. (NTTR RMP)(Planning Document Reference: NTTR RMP 2.6.7 Objective 1, Mgt Direction 6)
- Improve disturbed non-game bird habitat, including the water table supporting these habitats, by emphasizing maintenance and enhancement of natural biodiversity. (Planning Document Reference: LVFO RMP, 1998. Mgt Direction FW-3-h.)
- Maintain and improve Mule deer and antelope habitat based on the forage and water needs of each species. (Planning Document Reference: NTTR RMP 2.6.7 Objective 1, Mgt Direction 1)
- Maintain or improve the condition of vegetation on public lands to a Desired Plant Community or to a Potential Natural Community (see Appendix N: desert tortoise habitat guidelines for Desired Plant Community). (Planning Document Reference: LVFO RMP Objective VG-1
- Restore plant productivity on disturbed areas of the public lands. Rehabilitate, reclaim, or revegetate areas subjected to surface-disturbing activities, where feasible. When rehabilitating, manage for optimum species diversity by seeding native species, except where non-native species are appropriate. (Planning Document Reference: LVFO RMP Objective VG-2)
- Protect human life, safety of wildland firefighters, and protection of human safety and health. *(Planning Document Reference: National Fire Plan, 2001.)*
- Provide fire suppression efforts commensurate with resource and adjacent property values at risk. (Planning Document Reference: LVFO RMP, 1998. Mgt Direction FE-1-a) (Planning Document Reference: NTTR RMP 2.6.19 Objective 1, Mgt Direction 1)
- Determine specific hazard reduction priorities, including any noxious or invasive species infestations, and implement according to the existing budget. (Planning Document Reference: LVFO RMP, 1998. Mgt Direction FE-2-a)
- Determine specific prescribed burn priorities annually, including any noxious or invasive species infestations, and implement where possible. (Planning Document Reference: LVFO RMP, 1998. Mgt Direction FE-3-a)
- Determine site-specific potentials and prescribed fire priorities, based on survey data of expansion rates of pinyon-juniper forests and understory fuel loads. (Planning Document Reference: NTTR RMP 2.6.19 Objective 1, Mgt Direction 6)
- Maintain woodland and conifer forest where possible for all-aged stands, with understory vegetation forage value rating at moderate or better (LVFO RMP 1998. Forestry Mgt Objective FR-1).
- Use integrated weed management techniques to control and eradicate tamarisk, such as burning, chemical, biological or mechanical treatments, where potential for treatment is good. Rehabilitate with native species to help reduce the potential for tamarisk re-establishment and improve ecosystem health (LVFO RMP, 1998. Riparian Mgt Objective RP-1-f).

Wildfire Management Priorities:

- Protection of DOD infrastructure and developments
- Protection of property and improvements (adjacent to FMU)
- Protect bighorn sheep habitat from ground disturbing activities.

A.3.4.22.2.2. FMU Wildland Fire Suppression Objectives & Strategies

Fire Suppression Objectives: Employ Appropriate Management Response practices in order to allow lightning caused wildfires to create openings in the closed canopy pinyon-juniper woodlands, to improve Bighorn sheep browse and forage habitat. This objective is consistent with the Rangewide Plan for Managing Habitat of Desert Bighorn Sheep on Public Lands (1989): *Spread of junipers... tamarisk... or other similar trees and shrubs into "open" habitats through plant succession, regression, or exotic plant introduction will be controlled to preserve open habitats.*

Fire Suppression Strategies:

- Prevent catastrophic wildfire in bighorn sheep use areas
- When no threat to fire fighter or public safety is present, use Appropriate Management Response tactics to allow low intensity fires to open the closed pinyon-juniper canopy in a mosaic pattern, in order to improve bighorn sheep browse and forage habitat.
- Protect DOD facilities and infrastructure

Suppression/Protection Priorities:

- Life safety (public and firefighters)
- Tolicha Peak radar installation
- Other DOD infrastructure and developments
- Property and improvements outside but adjacent to FMU
- Cultural resource sites (to be identified by DOD personnel)
- Winter and year-round bighorn sheep habitat
- Mule deer habitat
- Antelope habitat
- Wild horse and burro range

FMU Target Individual Wildland Fire Size: 25 acres @ 90%

FMU Target Acres Burned Per Decade: 20,000 acres

A.3.4.22.2.3. FMU Wildland Fire Operational Constraints, Objectives & Strategies

Special Fire Management Consideration/Areas:

- Timber Mountain Caldera ACEC
- Stonewall Mountain public access hunting area
- Tolicha Peak radar installation
- Other DOD infrastructure and developments
- Property and improvements outside but adjacent to FMU
- Cultural resource sites (to be identified by DOD personnel)
- Winter and year-round bighorn sheep habitat
- Mule deer habitat
- Antelope habitat
- Raptor nests
- Wild horse and burro range

A.3.4.22.2.3.1. Wildland Fire Operational Constraints Objectives & Strategies:

A.3.4.22.2.3.1.1. Bighorn Sheep and General Wildlife:

- *Crucial areas, such as lambing grounds, migration routes, mineral licks, and areas within 1 mile of permanent water sources will receive maximum habitat protection.* (Rangewide Plan for Managing Habitat of Desert Bighorn Sheep on Public Lands (1989).

A.3.4.22.2.3.1.2. Riparian Areas:

- Apply M.I.S.T. within riparian habitat
- In riparian areas, prioritize suppression actions to minimize damage to native vegetation from wildfire or suppression operations
- Fire suppression in riparian habitat will be coordinated with the approved Resource Advisor
- In riparian areas, use natural barriers or openings in riparian vegetation where possible as the easiest, safest method to manage a riparian wildfire. Where possible and practical use wet firebreaks rather than constructing firelines by hand or with heavy equipment
- Avoid burning out unburned islands, whenever possible
- Utilize firing tactics only if necessary to protect firefighter or public safety
- Avoid surface disturbing suppression activities in riparian areas whenever possible
- Avoid dropping retardant within 300 feet of water sources, to the maximum extent feasible
- Use of containment systems for portable pumps to avoid fuel spills in riparian or aquatic systems will be required.

A.3.4.22.2.3.1.3. Noxious Weeds and Invasive Species Transport Control Procedures:

Las Vegas Field Office Noxious Weed Control and Fire Management Weed Transport Control:

- Off-district engines, crew carriers, overhead vehicles, and helitack/helicopter support vehicles will, upon check-in and prior to proceeding to the line, wash down at the, Logandale, Red Rock, Pahrump Fire Stations or a commercial truck washing station. This will be determined by the location of the units' last fire assignment and if they were cleaned at release from that assignment.
    - The washdown will concentrate on the undercarriage, with special emphasis on axles, frame, crossmembers, motor mounts, and on and underneath steps, running boards, and front bumper/brushguard assemblies. Vehicle cabs will be swept out with refuse disposed of in waste receptacles. In wilderness areas, all portable equipment used on an incident (pumps, hose, fittings, water storage items) will be washed off to rid them of any seed or spores that may be attached from previous fires in noxious weed infested sites.
    - During initial briefings, washdowns will be mentioned and facilities made available for oncoming crews.
- Las Vegas Field Office crews will follow the same procedures identified in Item 1 when returning from fieldwork or wildland fires, especially when vehicles are used in know noxious weed areas infested with known noxious or invasive species common to the Field Office area.
- Upon leaving the Field Office when released from an incident, all off-unit vehicles will follow aforementioned washdown procedures so that Las Vegas' noxious weed problems do not become someone else's problems.
- All equipment used off pavement will be cleaned of weed and grass seed stems, stalks, etc. prior to release from an incident. This includes, but is not limited to, tents, tarps, helicopter support equipment, foldatanks and free-standing tanks, mechanic's vehicles, and logistical support vehicles, trailers and equipment. These vehicles will be washed as in 1.a. above.

This Field Office policy will be followed by all equipment involved in fire suppression while on Las Vegas Field Office assignments. Vehicles will be cleared of washdown procedures during checkout and crew evaluations. In the event vehicles are released from fires away from the district office, the closest wash facility, (government or commercial) will be utilized.

A.3.4.22.2.4. FMU Wildland Fire Use Objectives & Strategies

Wildfire will not be used as a management tool within this FMU at this time.

A.3.4.22.2.5. Burned Acre Objective Review

IF the FMU decadal wildfire acre-burned target has been reached or exceeded PRIOR TO THE COMPLETION OF THE 10-YEAR PLANNING PERIOD, from either wildfire or prescribed fire, a review of fire management objectives and strategies will be initiated to develop new suppression criteria on wildland fire occurrence and prescribed fire acre goals.

A.3.4.22.2.6. FMU Prescribed Fire Objectives & Strategies

Prescribed Fire Objectives & Strategies: Prescribed fire will be used as a management tool within this FMU. Prescribed fire treatment strategies and project information will be further defined through the LVFO RAMS Fire Plan update, which is scheduled for 2005.

Rx Fire Annual & Decadal Acre Target:

- Annual: 50 acres
- Decadal: 500 acres

T & E Species Strategies: N/A

Air Quality Strategy: Any burning operations will be conducted to minimize smoke impacts to urban communities, dispersed residences, and nearby highway traffic. Project level prescribed fire plans will address smoke management.

NEPA Compliance: Prior to implementation of any proposed projects, site-specific NEPA documentation will be completed, as applicable.

Rx Fire Monitoring Strategy: Monitoring will be completed for attainment/non-attainment of project specific resource management objectives, as applicable.

A.3.4.22.2.7. FMU Non-Fire Fuels Treatment Objectives & Strategies

Non-Fire Fuels Treatment Objectives: Manage for native sagebrush vegetation within Sage grouse habitat. Treatments should focus on removal of cheatgrass and other exotic and encroaching species.

Non-Fire Fuels Treatment Strategies: Spread of junipers, tamarix, or other similar trees and shrubs into "open" habitats through plant succession, regression, or exotic plant introduction will be controlled to preserve open habitats. *Note:* No non-fire fuels treatments are planned at this time. Non-fire fuel treatment strategies and project information will be further defined through the LVFO RAMS Fire Plan update, which is scheduled for 2005.

Non-Fire Annual & Decadal Acre Target:

- Annual: 5 acres
- Decadal: 50 acres

T & E Species Strategies: N/A

Air Quality Strategies: N/A

NEPA Compliance: Prior to implementation of any proposed projects, site-specific NEPA documentation will be completed, as applicable.

Treatment Monitoring Strategy: Monitoring will be completed for attainment/non-attainment of project specific resource management objectives, as applicable.

A.3.4.22.2.8. FMU Post Fire Rehab/Restoration Objectives & Strategies

Restore plant productivity on disturbed areas of the public lands. Rehabilitate, reclaim, or revegetate areas subjected to surface-disturbing activities, where feasible. When rehabilitating, manage for optimum species diversity by seeding native species, except where non-native species are appropriate.

- Conduct all treatment activities in accordance with the Las Vegas Field Office Normal Year Fire Rehabilitation Plan (1990); Environmental Assessment no. NV-054-90-24.
- In the event that suppression efforts require off-road vehicle operations, replant and visually camouflage the first 200 feet of tire tracks in order to prevent further habitat impacts (due to public use of these track ways).
- Whenever feasible, utilize native species in seeding and/or re-planting treatments.
- Cultivate local supplies of live plant materials for use during riparian restoration efforts.
- Maintain a seed bank of locally collected native plant species for use in restoring both fire fuels treatments and fire-disturbed sites.
- Cultivate and develop varieties of locally grown native seed by means of plant material centers.

A.3.4.22.2.9. FMU Community Protection/Community Assistance Objectives & Strategies

Communities at Risk/WUI Areas: N/A. Communities-at-risk, community protection/assistance and public education strategies and objectives will be further defined, in collaboration with Nellis Air Force Base and Nellis Test and Training Range, through the LVFO RAMS Fire Plan update, which is scheduled for 2005.

Community Protection/Community Assistance Objectives: Collaborate with Nellis Air Force Base and Nellis Test and Training Range to identify and mitigate fuels hazards near DOD facilities or developments.

Community Protection/Community Assistance Strategy: Collaborate with Nellis Air Force Base and Nellis Test and Training Range to identify and mitigate fuels hazards near DOD facilities or developments.

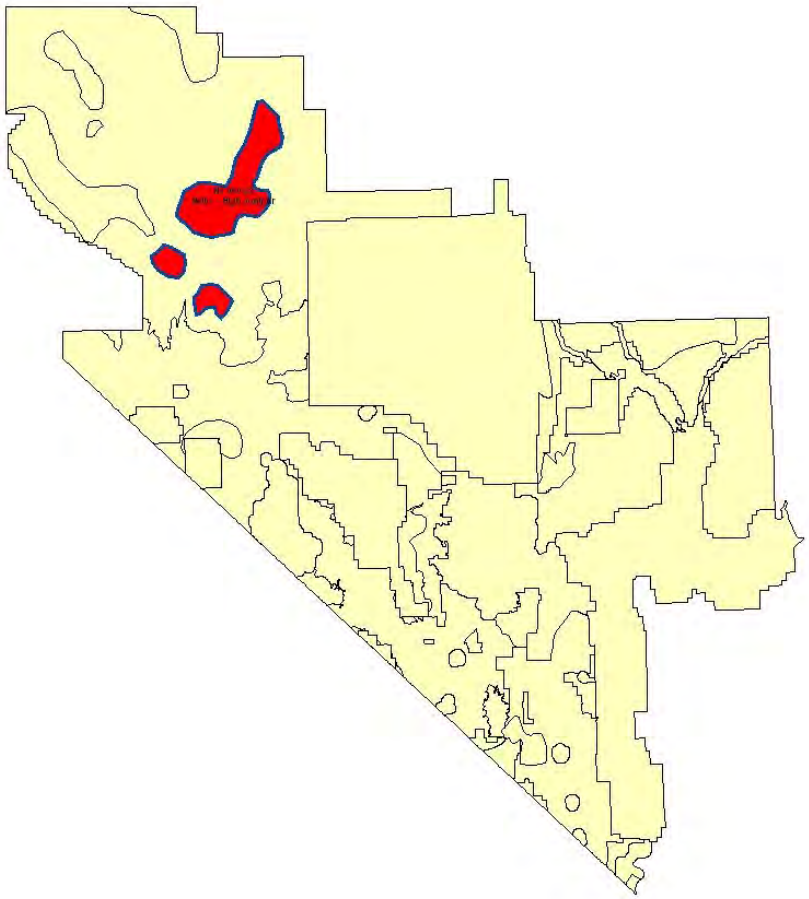
Community Wildfire Safety Education Strategy: Coordinate with Nellis Air Force Base and Nellis Test and Training Range

A.3.4.22.3. FMU Fire Program Analysis - Quantifiable Objective Summary

Initial Attack Success	Decadal Wildfire Acres Burn Tolerance	WFU Decadal Target Acres	Rx Fire Acres Per Decade	Non-Fire Acres Per Decade
25 acres @ 90%	20,000	N/A	500	50

A.3.4.23. Nellis-High Juniper

NV050-22



FMU Name & Unit No.: **Nellis-High Juniper; NV050-22**

FMU Type/Category: **Vegetation**

A.3.4.23.1. FMU Description:

A.3.4.23.1.1. FMU Location Information

Geographic boundaries: This discontinuous FMU is comprised of mountain ranges having pinyon-juniper and mountain chaparral vegetation (mountain mahogany, scrub oak, bitterbrush, and other shrubs). White fir is found above 8,000 feet on Wheelbarrow Peak, in the Belted Range.

Note: This FMU is located entirely in the NTTR (Nellis Test & Training Range, Department of Defense) and the adjacent NTS (Nevada Test Site, National Nuclear Security Administration. Under Reciprocal Agreement with the Air Force, the BLM is responsible for fire management

activities on the NTTR. However, the BLM role and responsibility for wildfire management activities on the Nevada Test Site has yet to be officially established. The NTS withdrawal area was created from a total of four Public Land Orders dated 1952, 1958, 1961, and 1965 (PLO's #805, 1662, 2568, 3759). Under the first two PLO's, the land is withdrawn from all forms of public-land law appropriation. Under the other two PLO's, "the withdrawal does not alter the applicability of public-land laws governing ... their mineral and vegetative resources." It is reasonable to surmise that if BLM retains authority for vegetative resources, then that must necessarily also extend to wildfire management activities. The past unofficial BLM practice has been to defer wildfire activities to the NTS Fire Department, at the Mercury administrative and research facility. However, the impending conversion to the Fire Planning Analysis system will likely require that the implied partial BLM wildfire management authority for the Nevada Test Site be officially reconciled.

A.3.4.23.1.2. FMU Acre Total

Ownership by Acres and Percent		
NV 050-22	**Nellis - High Juniper**	
Ownership	**Acres**	**Percent**
Department of Defense	101,436	43.3
Department of Energy	132,640	56.7
Total Acres	234,076	

A.3.4.23.1.3. Fire Occurrence and History

FMU Number	**Decadal (94-03)**	**24 Years (80-03)**	**Ignition Cause (80-03)**	
NV 050-22			Lightning	0
Number of Fires	1	1	Human/Other	1
Largest Fire (Acres)	5,000.0	5,000.0	**Multiple Fire Days (80-03)**	
Total Acres Burned	5,000.0	5,000.0	Total Multiple Fire Days (MFD)	1
Average Fire Size (Acres)	5,000.0	5,000.0	Number of MFD Fires	1
			Total Acres Burned by Multiple Fires	5,000.0

Narrative Description: The vegetation in this FMU is comprised of fire disturbance tolerant plant communities, including pinyon pine-Utah juniper and mountain chaparral. Until such time as fire use plans and prescriptions can be put in place, it would be desirable from a resource standpoint to allow non-human caused wildfires to burn small (under 25-acres), mosaic openings in the closed canopy pinyon-juniper stands. This resource objective must be balanced against the need to prevent fire of catastrophic size and intensity.

General Fire Protection Characteristics: The vegetation in this FMU is comprised of fire disturbance tolerant plant communities, including pinyon pine-Utah juniper and mountain chaparral. Until such time as fire use plans and prescriptions can be put in place, it would be desirable from a resource standpoint to allow non-human caused wildfires to burn small (under 25-acres), mosaic openings in the closed canopy pinyon-juniper stands. This resource objective must be balanced against the need to prevent fire of catastrophic size and intensity.

A.3.4.23.1.4. FMU Vegetation

FMU Vegetation/Fuel Types	
NV 050-22	**Nellis - High Juniper**

Veg/Fuel Type	Acres	Percent
Grassland	15,596	6.7
Mojave	3,672	1.6
Mountain Shrub	32,808	14.0
Pinyon/Juniper Woodlands	89,966	38.4
Sagebrush	90,322	38.6
Salt Desert Scrub/Shadscale	1,711	0.7
Grand Total	234,075	

Vegetation Narrative:

- Mountain chaparral: Mountain mahogany, scrub oak, bitterbrush, and other shrubs
- Pinyon-juniper (savanah, open stands, closed stands)
- White fir: above 8,000 feet (Wheelbarrow Peak)

A.3.4.23.1.5. FMU Fuel Models & Live Fuel Moisture Characteristics

Surface Fuel Model & Canopy Cover: Cheatgrass is widely distributed throughout the FMU, which significantly contributes to fire fuel loadings and behavior.

Live Fuel Moisture Averages:

LFM Site	May	June	July	Aug	Sept	Oct
N5C	189%	130%	93%	92%	99%	89%

Live Fuel Moisture Characteristics:

- At live fuel moisture levels of 181% and above fires typically will exhibit Very Low Fire Behavior characteristics
- At live fuel moisture levels of 151% to 180% fires typically will exhibit Low Fire Behavior characteristics
- At live fuel moisture levels of 126% to 150% fires typically will exhibit Moderate Fire Behavior characteristics
- At live fuel moisture levels of 101% to 125% fires typically will exhibit High Fire Behavior characteristics
- At live fuel moisture levels of 75% to 100% fires typically will exhibit Extreme Fire Behavior characteristics
- At live fuel moisture levels of 75% and below fires typically will exhibit Advanced Fire Behavior characteristics

A.3.4.23.1.6. Fire Weather & Climate Related Impacts

(Detailed weather station data for this FMU will be added to the FMP Appendix upon completion of the national fire weather data validation/correction project.)

- Wet lightning is common in this area. Fires generally remain small when starts occur under these common conditions.

- Dry Lightning is possible in this area. Larger fires can occur with these erratic and gusty thunderstorm events.
- Larger fires occur when human ignitions occur under typical warm and windy summer weather.
- Fire behavior can be extreme under these conditions when there are heavy buildups of ephemeral light flashy fuels.
- Fire behavior can be extreme under these conditions in heavy brush and/or Pinyon-Juniper fuels.

A.3.4.23.1.7. Fire Regime

- Fire Regime IV; Condition Class III (ridge tops are Condition Class II)

FMU by Condition Class and Fire Regime			
NV 050-22		**Nellis - High Juniper**	
CC	FR	Acres	Percent
2	II	50,962	21.9
3	I	24,317	10.4
	II	153,500	65.8
	IV	4,409	1.9
Total		233,188	

A.3.4.23.1.8. FMU Physical Characteristics

Topography:

- Elevation Range: 4,592 feet to 8,200 feet
- Slope:
  - Fan piedmonts and bajadas: 2 to 30%
  - Ridge tops: 30 to 40+%
- Aspect: Variable
- Major topographical features:
  - Wheelbarrow Peak
  - Belted Range
  - Timber Mountain
  - Shoshone Mountain
  - Limestone Ridge

Access Information: Access consists only of unpaved roads and a large portion of this FMU is road-less. Permission to enter the NTTR must be coordinated with Range Operations. The NTS is for all intents and purposes currently off-limits to BLM personnel.

A.3.4.23.1.9. FMU Resource Values & Attributes

Wildland-Urban Interface/Intermix:

- DOD communication sites and other developments

Resource Use:

- Defense activities by the Nellis Air Force Base and NTTR
- Mule deer habitat

Air Quality: There are no non-attainment airsheds in this FMU. Rx fire burn plans will have an approved variance (Open Burn Permit) from the State of Nevada, Division of Environmental Protection; Smoke Management Program.

Soils: Soils have formed under conditions of physical weathering (rather than chemical dissolution) because of the arid climate. Mountain slopes tend to be covered by an unstable layer of large rocks, boulders, stones, and cobbles. Runoff from periodic rainstorms transports large amounts of material to lower elevations, forming alluvial fans of coarse material and depositing thick sequences of gravelly loams, sands, and finer grained sediments on valley floors.

Soils are susceptible to water and wind erosion. Water erosion occurs during periodic high-intensity, short duration summertime thunderstorms and less frequent, sustained wintertime rainstorms. Water erosion occurs by a combination of sheet flow, rill formation, splashing, and channelized flow in ephemeral washes and stream channels. Wind erosion occurs in areas where the desert pavement layer has been disturbed by human activities or heavy use by wild horses and burros, where large areas of vegetation have been burned by fire, sand dune areas, and as part of physical weathering processes. Soils in very high elevation areas have formed under conditions of greater rainfall. Resulting soils reflect a combination of physical weathering of rocks, chemical dissolution of rocks, and the decomposition of organic materials. Relative shallow soil layers occur on bedrock surfaces in these areas. Soils in these areas contain low to moderate amounts of organic material, are slightly to highly alkaline, and contain lower concentrations of dissolved salts than soils at lower elevations.

Cultural and Paleontological Values: To be identified by DOD personnel

T&E and Sensitive Species: None

Habitat Values:

- Mule deer habitat
- Wild horse and burro range
- Raptor nesting and forage habitat

Hydrology and Water Quality: The Nellis-High Juniper FMU lies within the Central Region hydrographic region which is a topographically closed, internally drained basin. Ephemeral wash channels drain most of the Nellis-High Juniper FMU and only convey flow after periodic high-intensity summer thunderstorms or sustained winter rainstorms. Rapid runoff to ephemeral wash channels can produce flash flooding and transport large quantities of sediment as water flows from mountainous areas and alluvial fans towards valley floors.

Wilderness or WSA: N/A

A.3.4.23.1.10. FMU Public Safety, Economic & Community Values at Risk

- DOD infrastructure, including communication sites.
- Mule deer habitat
- Wild horse and burro range
- Raptor nesting and forage habitat

A.3.4.23.1.11. FMU Fire Protection Responsibility

Wildland fire protection on all BLM public lands and DOD lands within this FMU is provided by the Las Vegas Field Office. Structural fire protection on private lands within this FMU is provided by the Department of Defense and/or Department of Energy.

A.3.4.23.2. FMU Objectives & Strategies

A.3.4.23.2.1. FMU Fire Management Objectives Priority Statement

- Support viable wildlife populations by providing and maintaining sufficient quality and quantity of food, water, cover, and space to satisfy needs of wildlife species using habitats on withdrawn public land. *(Planning Document Reference: NTTR RMP 2.6.7 Objective 1)*
- Evaluate wildlife habitat quality and quantity on the NTTR and where appropriate re-establish appropriate native fauna (including naturalized species) to historic use areas, and/or increase population numbers in current use areas. *(Planning Document Reference: NTTR RMP 2.6.7 Objective 2)*
- Maintain or improve the condition of vegetation on public lands to a Desired Plant Community or to a Potential Natural Community. *(Planning Document Reference: LVFO RMP Objective VG-1)*
- Restore plant productivity on disturbed areas of the public lands. Rehabilitate, reclaim, or revegetate areas subjected to surface-disturbing activities, where feasible. When rehabilitating, manage for optimum species diversity by seeding native species, except where non-native species are appropriate. *(Planning Document Reference: LVFO RMP Objective VG-2)*
- Protect human life, safety of wildland firefighters, and protection of human safety and health. *(Planning Document Reference: National Fire Plan, 2001.)*
- Provide fire suppression efforts commensurate with resource and adjacent property values at risk. *(Planning Document Reference: LVFO RMP, 1998. Mgt Direction FE-1-a)*
- Determine specific hazard reduction priorities, including any noxious or invasive species infestations, and implement according to the existing budget. *(Planning Document Reference: LVFO RMP, 1998. Mgt Direction FE-2-a)*

- Determine specific prescribed burn priorities annually, including any noxious or invasive species infestations, and implement where possible. *(Planning Document Reference: LVFO RMP, 1998. Mgt Direction FE-3-a)*

- Determine site-specific potentials and prescribed fire priorities, based on survey data of expansion rates of pinyon-juniper forests and understory fuel loads. *(Planning Document Reference: NTTR RMP 2.6.19 Objective 1, Mgt Direction 6)*

- Maintain woodland and conifer forest where possible for all-aged stands, with understory vegetation forage value rating at moderate or better (LVFO RMP 1998. Forestry Mgt Objective FR-1).

- Use integrated weed management techniques to control and eradicate tamarisk, such as burning, chemical, biological or mechanical treatments, where potential for treatment is good. Rehabilitate with native species to help reduce the potential for tamarisk re-establishment and improve ecosystem health (LVFO RMP, 1998. Riparian Mgt Objective RP-1-f).

- Protect important resting/nesting habitats, such as riparian areas and mesquite/acacia woodlands. *(Planning Document Reference: LVFO RMP, 1998. Mgt Direction FW-3-g.)*

- Protect and improve key nesting areas, migration routes, important prey base areas, and concentration areas for birds of prey. *(Planning Document Reference: NTTR RMP 2.6.7 Objective 1, Mgt Direction 5)*

- Protect and improve important non-game resting/nesting habitat in riparian areas and other important habitat types. (NTTR RMP)*(Planning Document Reference: NTTR RMP 2.6.7 Objective 1, Mgt Direction 6)*

- Improve disturbed non-game bird habitat, including the water table supporting these habitats, by emphasizing maintenance and enhancement of natural biodiversity. *(Planning Document Reference: LVFO RMP, 1998. Mgt Direction FW-3-h.*

- Maintain and improve Mule deer...habitat based on the forage and water needs of ...(the) species. *(Planning Document Reference: NTTR RMP 2.6.7 Objective 1, Mgt Direction 1)*

Wildfire Management Priorities:

- Protect DOD infrastructure and developments

- Prevent catastrophic loss of wildlife habitat from wildfire

A.3.4.23.2.2. FMU Wildland Fire Suppression Objectives & Strategies

Fire Suppression Objectives:

- In order to improve Mule deer browse and forage habitat, employ Appropriate Management Response practices to allow lightning caused wildfires to create openings in the closed canopy pinyon-juniper woodlands, not to exceed 100 acres per incident.

- Prevent wildfires of catastrophic size and intensity.

- Protect DOD facilities and infrastructure.

Fire Suppression Strategies:

- Prevent catastrophic loss of wildlife habitat due to wildfire
- When no threat to fire fighter or public safety is present, use Appropriate Management Response tactics to allow low intensity fires to open the closed pinyon-juniper canopy in a mosaic pattern, not to exceed 100 acres per incident.
- Protect DOD facilities and infrastructure

Suppression/Protection Priorities:

- Life safety (public and firefighters)
- DOD infrastructure and developments
- Cultural resource sites (to be identified by DOD personnel)
- Mule deer habitat
- Riparian habitat
- Wild horse and burro range

FMU Target Individual Wildland Fire Size: 100 acres @ 90%

FMU Target Acres Burned Per Decade: 20,000 acres

A.3.4.23.2.3. FMU Wildland Fire Operational Constraints, Objectives & Strategies

Special Fire Management Consideration/Areas:

- Timber Mountain Caldera ACEC
- DOD infrastructure and developments
- Cultural resource sites (to be identified by DOD personnel)
- Mule deer habitat
- Raptor nests
- Wild horse and range

A.3.4.23.2.3.1. Wildland Fire Operational Constraints Objectives & Strategies:

A.3.4.23.2.3.1.1. Riparian Areas:

- Apply M.I.S.T. within riparian habitat
- In riparian areas, prioritize suppression actions to minimize damage to native vegetation from wildfire or suppression operations
- Fire suppression in riparian habitat will be coordinated with the approved Resource Advisor

- In riparian areas, use natural barriers or openings in riparian vegetation where possible as the easiest, safest method to manage a riparian wildfire. Where possible and practical use wet firebreaks rather than constructing firelines by hand or with heavy equipment
- Avoid burning out unburned islands, whenever possible
- Utilize firing tactics only if necessary to protect firefighter or public safety
- Avoid surface disturbing suppression activities in riparian areas whenever possible
- Avoid dropping retardant within 300 feet of water sources, to the maximum extent feasible
- Use of containment systems for portable pumps to avoid fuel spills in riparian or aquatic systems will be required.

A.3.4.23.2.3.1.2. Noxious Weeds and Invasive Species Transport Control Procedures:

Las Vegas Field Office Noxious Weed Control and Fire Management Weed Transport Control:

- Off-district engines, crew carriers, overhead vehicles, and helitack/helicopter support vehicles will, upon check-in and prior to proceeding to the line, wash down at the, Logandale, Red Rock, Pahrump Fire Stations or a commercial truck washing station. This will be determined by the location of the units' last fire assignment and if they were cleaned at release from that assignment.
    - The washdown will concentrate on the undercarriage, with special emphasis on axles, frame, crossmembers, motor mounts, and on and underneath steps, running boards, and front bumper/brushguard assemblies. Vehicle cabs will be swept out with refuse disposed of in waste receptacles. In wilderness areas, all portable equipment used on an incident (pumps, hose, fittings, water storage items) will be washed off to rid them of any seed or spores that may be attached from previous fires in noxious weed infested sites.
    - During initial briefings, washdowns will be mentioned and facilities made available for oncoming crews.
- Las Vegas Field Office crews will follow the same procedures identified in Item 1 when returning from fieldwork or wildland fires, especially when vehicles are used in know noxious weed areas infested with known noxious or invasive species common to the Field Office area.
- Upon leaving the Field Office when released from an incident, all off-unit vehicles will follow aforementioned washdown procedures so that Las Vegas' noxious weed problems do not become someone else's problems.
- All equipment used off pavement will be cleaned of weed and grass seed stems, stalks, etc. prior to release from an incident. This includes, but is not limited to, tents, tarps, helicopter support equipment, foldatanks and free-standing tanks, mechanic's vehicles, and logistical support vehicles, trailers and equipment. These vehicles will be washed as in 1.a. above.

This Field Office policy will be followed by all equipment involved in fire suppression while on Las Vegas Field Office assignments. Vehicles will be cleared of washdown procedures during checkout and crew evaluations. In the event vehicles are released from fires away from the district office, the closest wash facility, (government or commercial) will be utilized.

A.3.4.23.2.4. FMU Wildland Fire Use Objectives & Strategies

Wildfire will not be used as a management tool within this FMU at this time.

A.3.4.23.2.5. Burned Acre Objective Review

IF the FMU decadal wildfire acre-burned target has been reached or exceeded PRIOR TO THE COMPLETION OF THE 10-YEAR PLANNING PERIOD, from either wildfire or prescribed fire, a review of fire management objectives and strategies will be initiated to develop new suppression criteria on wildland fire occurrence and prescribed fire acre goals.

A.3.4.23.2.6. FMU Prescribed Fire Objectives & Strategies

Prescribed Fire Objectives & Strategies: Prescribed fire will be used as a management tool within this FMU. Prescribed fire treatment strategies and project information will be further defined through the LVFO RAMS Fire Plan update, which is scheduled for 2005.

Rx Fire Annual & Decadal Acre Target:

- Annual: 100 acres
- Decadal: 1,000 acres

T & E Species Strategies: N/A

Air Quality Strategy: Any burning operations will be conducted to minimize smoke impacts to urban communities, dispersed residences, and nearby highway traffic. Project level prescribed fire plans will address smoke management.

NEPA Compliance: Prior to implementation of any proposed projects, site-specific NEPA documentation will be completed, as applicable.

Rx Fire Monitoring Strategy: Monitoring will be completed for attainment/non-attainment of project specific resource management objectives, as applicable.

A.3.4.23.2.7. FMU Non-Fire Fuels Treatment Objectives & Strategies

Non-Fire Fuels Treatment Objectives: Spread of junipers, tamarix, or other similar trees and shrubs into “open” habitats through plant succession, regression, or exotic plant introduction will be controlled to preserve open habitats.

Non-Fire Fuels Treatment Strategies: No specific non-fire fuels treatments are planned at this time. However, non-fire fuel treatment strategies and project information will be further defined through the LVFO RAMS Fire Plan update, which is scheduled for 2005.

Non-Fire Annual & Decadal Acre Target:

- Annual: 5 acres
- Decadal: 50 acres

T & E Species Strategies: N/A

Air Quality Strategies: N/A

NEPA Compliance: Prior to implementation of any proposed projects, site-specific NEPA documentation will be completed, as applicable.

Treatment Monitoring Strategy: Monitoring will be completed for attainment/non-attainment of project specific resource management objectives, as applicable.

A.3.4.23.2.8. FMU Post Fire Rehab/Restoration Objectives & Strategies

Restore plant productivity on disturbed areas of the public lands. Rehabilitate, reclaim, or revegetate areas subjected to surface-disturbing activities, where feasible. When rehabilitating, manage for optimum species diversity by seeding native species, except where non-native species are appropriate.

- Conduct all treatment activities in accordance with the Las Vegas Field Office Normal Year Fire Rehabilitation Plan (1990); Environmental Assessment no. NV-054-90-24.
- In the event that suppression efforts require off-road vehicle operations, replant and visually camouflage the first 200 feet of tire tracks in order to prevent further habitat impacts (due to public use of these track ways).
- Whenever feasible, utilize native species in seeding and/or re-planting treatments.
- Cultivate local supplies of live plant materials for use during riparian restoration efforts.
- Maintain a seed bank of locally collected native plant species for use in restoring both fire fuels treatments and fire-disturbed sites.
- Cultivate and develop varieties of locally grown native seed by means of plant material centers.

A.3.4.23.2.9. FMU Community Protection/Community Assistance Objectives & Strategies

Communities at Risk/WUI Areas: N/A. Communities-at-risk, community protection/assistance and public education strategies and objectives will be further defined, in collaboration with Nellis Air Force Base and Nellis Test and Training Range, through the LVFO RAMS Fire Plan update, which is scheduled for 2005.

Community Protection/Community Assistance Objectives: Collaborate with Nellis Air Force Base and Nellis Test and Training Range to identify and mitigate fuels hazards near DOD facilities or developments.

Community Protection/Community Assistance Strategy: Collaborate with Nellis Air Force Base and Nellis Test and Training Range to identify and mitigate fuels hazards near DOD facilities or developments.

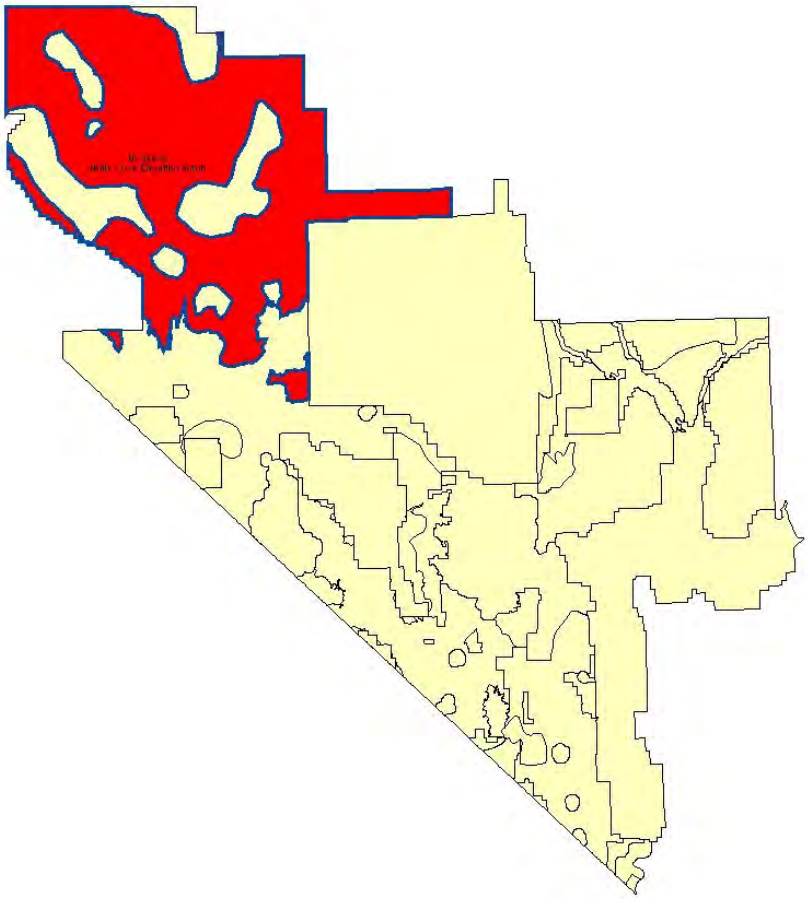
Community Wildfire Safety Education Strategy: Coordinate with Nellis Air Force Base and Nellis Test and Training Range

A.3.4.23.3. FMU Fire Program Analysis - Quantifiable Objective Summary

Initial Attack Success	Decadal Wildfire Acres Burn Tolerance	WFU Decadal Target Acres	Rx Fire Acres Per Decade	Non-Fire Acres Per Decade
100 acres @ 90%	20,000	N/A	1,000	50

A.3.4.24. Nellis Low Elevation Shrub

NV050 - 23



FMU Name & Unit No.: Nellis Low Elevation Shrub; NV050 - 23

FMU Type/Category: Vegetation (VEG)

A.3.4.24.1. FMU Description:

A.3.4.24.1.1. FMU Location Information

Geographic boundaries: This discontinuous FMU comprises the lowland shrub areas lying *outside and north of the recognized range of the T&E species, Desert tortoise* (i.e., based on the reference mapping in the Desert Tortoise Recovery Plan). The heterogenous vegetation mix is predominantly sagebrush, salt desert scrub and blackbrush, with lesser expanses of Mojave mixed scrub and creosote-bursage along the southern FMU edge; together with scattered pockets of pinyon-juniper, hopsage, greasewood, and perennial grasses.

Note: The vast majority of this FMU lies within the Nellis Test & Training Range-NTTR (Department of Defense) and the adjacent Nevada Test Site (National Nuclear Security Administration (NNSA). The FMU includes a smaller public land withdrawal for the proposed Yucca Mountain national high-level radioactive waste storage facility (Department of Energy-DOE). For obvious safety reasons, it is not anticipated that BLM will respond to wildland fires on the Yucca Mountain withdrawn lands. Under Reciprocal Agreement with the Air Force, the BLM is responsible for fire management activities on the NTTR. However, the issue of BLM role and responsibility for wildfire management activities on the Nevada (nuclear) Test Site is yet to be officially established. The NTS withdrawal area was created from a total of four Public Land Orders dated 1952, 1958, 1961, and 1965 (PLO's #805, 1662, 2568, 3759). Under the first two PLO's, the land is withdrawn from all forms of public-land law appropriation. The other PLO's stipulate that "the withdrawal does not alter the applicability of public-land laws governing ... their mineral and vegetative resources." It is thus reasonable to surmise that if BLM retains authority for vegetative resources, then that must necessarily also extend to wildfire management activities. The past unofficial BLM practice has been to defer wildfire activities to the NTS Fire Department, at the Mercury administrative and research facility. However, the impending conversion to the Fire Planning Analysis system will likely require that the implied partial BLM wildfire management authority for the Nevada Test Site be officially reconciled.

A.3.4.24.1.2. FMU Acre Total

Ownership by Acres and Percent		
NV 050-23	**Nellis - Low Elevation Shrub**	
Ownership	**Acres**	**Percent**
Bureau of Land Management	50,345	2.4
Department of Defense	1,538,789	73.7
Department of Energy	497,824	23.8
Private	769	0.0
Total Acres	2,087,727	

A.3.4.24.1.3. Fire Occurrence and History

FMU Number	**Decadal (94-03)**	**24 Years (80-03)**	**Ignition Cause (80-03)**	
NV 050-23			Lightning	7
Number of Fires	4	12	Human/Other	5
Largest Fire (Acres)	500.0	8,320.0	**Multiple Fire Days (80-03)**	
Total Acres Burned	501.2	8,951.3	Total Multiple Fire Days (MFD)	3

Average Fire Size (Acres)	125.3	745.9	Number of MFD Fires	3
			Total Acres Burned by Multiple Fires	25.1

Narrative Description: The human-caused fire occurrence history in this FMU primarily results from the use of incendiary flares and other ordnance during military training exercises. In recent years, FMU fire occurrence has shown a marked decrease, in part due to the Air Force's use of shorter-timed fuses on the training ordnance. The lightning-caused wildfire history most typically results from convective thunderstorms during the summer months (monsoonal activity from Gulf of Mexico air masses). Historically, the native vegetative types in this FMU were not prone to large, high-intensity wildfires, due to the paucity and discontinuity of the fine fuels component. Since the introduction of invasive red brome and cheatgrass however, the potential for large fires exists in all years when precipitation patterns promote heavy buildups of these and other invasive annual grasses.

General Fire Protection Characteristics: Wildfires in this FMU have the potential to become quite large, due to the long response times and security access delays for non-DOD firefighting resources. BLM will continue to strive for improvement in the relationship with the Air Force, in order to receive more timely notification of wildland fire starts.

While this FMU does have a larger management tolerance for burned acres, there is still the need to prevent catastrophic fire sizes as well as widespread conversions of native vegetation to non-native annual grasses (primarily red brome, with some cheatgrass).

A.3.4.24.1.4. FMU Vegetation

FMU Vegetation/Fuel Types		
NV 050-23	**Nellis - Low Elevation Shrub**	
Veg/Fuel Type	Acres	Percent
Grassland	8,576	0.8
Mojave	440,334	42.8
No Significant Vegetation	21,879	2.1
Pinyon/Juniper Woodlands	7,857	0.8
Sagebrush	549,028	53.4
Grand Total	1,027,675	

Vegetation Narrative: Predominantly sagebrush, salt desert scrub and blackbrush, with lesser expanses of Mojave mixed scrub and creosote-bursage to the south. Scattered islands of pinyon-juniper, hopsage, greasewood, and perennial grasses

A.3.4.24.1.5. FMU Fuel Models & Live Fuel Moisture Characteristics

Surface Fuel Model & Canopy Cover: Red brome and cheatgrass are found throughout the FMU, and often occur in high densities (usually on sites of prior surface disturbance). With the exception of localized swales of native galleta grass, there is insufficient fine fuel loading and spacing in the native vegetative types to otherwise support the spread of wildfire.

Live Fuel Moisture Averages:

LFM Site	May	June	July	Aug	Sept	Oct
N5C	189%	130%	93%	92%	99%	89%

Live Fuel Moisture Characteristics:

- At live fuel moisture levels of 181% and above fires typically will exhibit Very Low Fire Behavior characteristics
- At live fuel moisture levels of 151% to 180% fires typically will exhibit Low Fire Behavior characteristics
- At live fuel moisture levels of 126% to 150% fires typically will exhibit Moderate Fire Behavior characteristics
- At live fuel moisture levels of 101% to 125% fires typically will exhibit High Fire Behavior characteristics
- At live fuel moisture levels of 75% to 100% fires typically will exhibit Extreme Fire Behavior characteristics
- At live fuel moisture levels of 75% and below fires typically will exhibit Advanced Fire Behavior characteristics

A.3.4.24.1.6. Fire Weather & Climate Related Impacts

(Detailed weather station data for this FMU will be added to the FMP Appendix upon completion of the national fire weather data validation/correction project.)

- Wet lightning is common in this area. Fires generally remain small when starts occur under these common conditions.
- Dry Lightning is possible in this area. Larger fires can occur with these erratic and gusty thunderstorm events.
- Larger fires occur when human ignitions occur under typical warm and windy summer weather.
- Fire behavior can be extreme under these conditions when there are heavy buildups of ephemeral light flashy fuels.
- Fire behavior can be extreme under these conditions in heavy brush and/or Pinyon-Juniper fuels.

A.3.4.24.1.7. Fire Regime

- Fire Regime: northern FMU- IV; southern FMU- II
- Condition Class: III (except for some ridgelines, which are Class II)

A.3.4.24.1.8. FMU Physical Characteristics

Topography:

- Elevation Range: 3,936 feet to 7,544 feet
- Slope:
  - Fan piedmonts and bajadas: 2 to 30%

  - Ridge tops: 30+%
- Aspect: Mainly flat
- Major topographical features:
  - Stonewall Flat
  - Cactus Flat
  - Monotony Valley
  - Yucca Flat

Access Information: Access consists of paved and dirt roads. Much of the FMU is road-less. Permission to enter the NTTR must be coordinated with Range Operations. For all intents and purposes, the Nevada Test Site and the Yucca Mountain nuclear depository withdrawn lands are currently off-limits to BLM personnel.

A.3.4.24.1.9. FMU Resource Values & Attributes

Wildland-Urban Interface/Intermix: DOD facilities and infrastructure

Resource Use:

- Defense activities by the Nellis Air Force Base and NTTR
- Wild horse and burro range

Air Quality: This FMU does not contain any non-attainment airsheds. Fire management activities in this FMU may include fire suppression, open burning, and light and heavy equipment mobilization. Rx fire burn plans will have an approved variance (Open Burn Permit) from the State of Nevada, Division of Environmental Protection; Smoke Management Program.

Soils: Soils have formed under conditions of physical weathering (rather than chemical dissolution) because of the arid climate. Soils on lower portions of alluvial fans and valley floors contain very little organic material, are moderately to highly alkaline, and can contain high concentrations of gypsum and dissolved salts. A gravelly surface crust (called desert pavement) occurs throughout these areas. Desert pavement is very stable and protects underlying fine-grained soils from erosion. A cemented hardpan layer commonly occurs at shallow depths beneath surface soils throughout these areas. Mountain slopes tend to be covered by an unstable layer of large rocks, boulders, stones, and cobbles. Runoff from periodic rainstorms transports large amounts of material to lower elevations, forming alluvial fans of coarse material and depositing thick sequences of gravelly loams, sands, and finer grained sediments on valley floors.

Soils are susceptible to water and wind erosion. Water erosion occurs during periodic high-intensity, short duration summertime thunderstorms and less frequent, sustained wintertime rainstorms. Water erosion occurs by a combination of sheet flow, rill formation, splashing, and channelized flow in ephemeral washes and stream channels. Wind erosion occurs in areas where the desert pavement layer has been disturbed by human activities or heavy use by wild horses and burros, where large areas of vegetation have been burned by fire, sand dune areas, and as part of physical weathering processes.

Cultural and Paleontological Values: Soils have formed under conditions of physical weathering (rather than chemical dissolution) because of the arid climate. Soils on lower portions of alluvial fans and valley floors contain very little organic material, are moderately to highly alkaline, and can contain high concentrations of gypsum and dissolved salts. A gravelly surface crust (called desert pavement) occurs throughout these areas. Desert pavement is very stable and protects underlying fine-grained soils from erosion. A cemented hardpan layer commonly occurs at shallow depths beneath surface soils throughout these areas. Mountain slopes tend to be covered by an unstable layer of large rocks, boulders, stones, and cobbles. Runoff from periodic rainstorms transports large amounts of material to lower elevations, forming alluvial fans of coarse material and depositing thick sequences of gravelly loams, sands, and finer grained sediments on valley floors.

Soils are susceptible to water and wind erosion. Water erosion occurs during periodic high-intensity, short duration summertime thunderstorms and less frequent, sustained wintertime rainstorms. Water erosion occurs by a combination of sheet flow, rill formation, splashing, and channelized flow in ephemeral washes and stream channels. Wind erosion occurs in areas where the desert pavement layer has been disturbed by human activities or heavy use by wild horses and burros, where large areas of vegetation have been burned by fire, sand dune areas, and as part of physical weathering processes.

T&E and Sensitive Species: N/A

Habitat Values:

- Pronghorn antelope habitat
- Mule deer habitat
- Wild horse and burro range
- Raptor nesting and forage habitat

Hydrology and Water Quality: The Nellis-Low Elevation Shrub FMU lies within the Central Region hydrographic region which is a topographically closed, internally drained basin. Ephemeral wash channels drain most of the Nellis-Low Elevation Shrub FMU and only convey flow after periodic high-intensity summer thunderstorms or sustained winter rainstorms. Rapid runoff to ephemeral wash channels can produce flash flooding and transport large quantities of sediment as water flows from mountainous areas and alluvial fans towards valley floors.

Wilderness or WSA: N/A

A.3.4.24.1.10. FMU Public Safety, Economic & Community Values at Risk

- DOD facilities and infrastructure
- Mule deer habitat
- Pronghorn antelope habitat
- Raptor nesting and forage habitat
- Wild horse and burro range NTTR Herd Management Area

A.3.4.24.1.11. FMU Fire Protection Responsibility

Wildland fire protection on all BLM public lands and DOD lands within this FMU is provided by the Las Vegas Field Office. Structural fire protection on private lands within this FMU is provided by the Department of Defense and/or Department of Energy.

A.3.4.24.2. FMU Objectives & Strategies

A.3.4.24.2.1. FMU Fire Management Objectives Priority Statement

- Support viable wildlife populations by providing and maintaining sufficient quality and quantity of food, water, cover, and space to satisfy needs of wildlife species using habitats on withdrawn public land (Planning Document Reference: NTTR RMP 2.6.7 Objective 1).

- Evaluate wildlife habitat quality and quantity on the NTTR and where appropriate re-establish appropriate native fauna (including naturalized species) to historic use areas, and/or increase population numbers in current use areas *(Planning Document Reference: NTTR RMP 2.6.7 Objective 2).*

- Maintain or improve the condition of vegetation on public lands to a Desired Plant Community or to a Potential Natural Community *(Planning Document Reference: LVFO RMP Objective VG-1).*

- Restore plant productivity on disturbed areas of the public lands. Rehabilitate, reclaim, or revegetate areas subjected to surface-disturbing activities, where feasible. When rehabilitating, manage for optimum species diversity by seeding native species, except where non-native species are appropriate *(Planning Document Reference: LVFO RMP Objective VG-2).*

- Protect human life, safety of wildland firefighters, and protection of human safety and health (Planning Document Reference: National Fire Plan, 2001).

- Provide fire suppression efforts commensurate with resource and adjacent property values at risk *(Planning Document Reference: LVFO RMP, 1998. Mgt Direction FE-1-a).*

- Determine specific hazard reduction priorities, including any noxious or invasive species infestations, and implement according to the existing budget *(Planning Document Reference: LVFO RMP, 1998. Mgt Direction FE-2-a).*

- Use integrated weed management techniques to control and eradicate tamarisk, such as *burning*, chemical, biological or mechanical treatments, where potential for treatment is good. Rehabilitate with native species to help reduce the potential for tamarisk re-establishment and improve ecosystem health *(LVFO RMP, 1998. Riparian Mgt Objective RP-1-f).*

- Protect important resting/nesting habitats, such as riparian areas and mesquite/acacia woodlands *(Planning Document Reference: LVFO RMP, 1998. Mgt Direction FW-3-g).*

- Protect and improve key nesting areas, migration routes, important prey base areas, and concentration areas for birds of prey *(Planning Document Reference: NTTR RMP 2.6.7 Objective 1, Mgt Direction 5).*

- Protect and improve important non-game resting/nesting habitat in riparian areas and other important habitat types (NTTR RMP) *(Planning Document Reference: NTTR RMP 2.6.7 Objective 1, Mgt Direction 6).*

- Improve disturbed non-game bird habitat, including the water table supporting these habitats, by emphasizing maintenance and enhancement of natural biodiversity *(Planning Document Reference: LVFO RMP, 1998. Mgt Direction FW-3-h).*

Wildfire Management Priorities:

- Protect DOD infrastructure and developments

- Prevent catastrophic loss of wildlife habitat from wildfire

A.3.4.24.2.2. FMU Wildland Fire Suppression Objectives & Strategies

Fire Suppression Objectives:

- Protect DOD facilities and infrastructure.

- Employ Appropriate Management Response practices, commensurate with resource values at risk.

- Prevent wildfires of catastrophic size and intensity.

- Prioritize protection of riparian habitats

Fire Suppression Strategies:

- Protect DOD facilities and infrastructure

- Prevent catastrophic loss of wildlife habitat due to wildfire

Suppression/Protection Priorities:

- Life safety (public and firefighters)

- DOD infrastructure and developments

- Cultural resource sites (to be identified by DOD personnel)

- Mule deer habitat

- Antelope habitat

- Riparian habitat

- Wild horse and burro range

FMU Target Individual Wildland Fire Size: 500 acres @ 90%

FMU Target Acres Burned Per Decade: 10,000 acres

A.3.4.24.2.3. FMU Wildland Fire Operational Constraints, Objectives & Strategies

Special Fire Management Consideration/Areas:

- DOD infrastructure and developments
- Cultural resource sites (to be identified by DOD personnel)
- Riparian habitats
- Wild horse and burro range

A.3.4.24.2.3.1. Wildland Fire Operational Constraints Objectives & Strategies:

A.3.4.24.2.3.1.1. Riparian Areas:

- Apply M.I.S.T. within riparian habitat
- In riparian areas, prioritize suppression actions to minimize damage to native vegetation from wildfire or suppression operations
- Fire suppression in riparian habitat will be coordinated with the approved Resource Advisor
- In riparian areas, use natural barriers or openings in riparian vegetation where possible as the easiest, safest method to manage a riparian wildfire. Where possible and practical use wet firebreaks rather than constructing firelines by hand or with heavy equipment
- Avoid burning out unburned islands, whenever possible
- Utilize firing tactics only if necessary to protect firefighter or public safety
- Avoid surface disturbing suppression activities in riparian areas whenever possible
- Avoid dropping retardant within 300 feet of water sources, to the maximum extent feasible
- Use of containment systems for portable pumps to avoid fuel spills in riparian or aquatic systems will be required.

A.3.4.24.2.3.1.2. Noxious Weeds and Invasive Species Transport Control Procedures:

Las Vegas Field Office Noxious Weed Control and Fire Management Weed Transport Control:

- Off-district engines, crew carriers, overhead vehicles, and helitack/helicopter support vehicles will, upon check-in and prior to proceeding to the line, wash down at the, Logandale, Red Rock, Pahrump Fire Stations or a commercial truck washing station. This will be determined by the location of the units' last fire assignment and if they were cleaned at release from that assignment.
    - The washdown will concentrate on the undercarriage, with special emphasis on axles, frame, crossmembers, motor mounts, and on and underneath steps, running boards, and front bumper/brushguard assemblies. Vehicle cabs will be swept out with refuse disposed of in waste receptacles. In wilderness areas, all portable equipment used on an incident (pumps,

hose, fittings, water storage items) will be washed off to rid them of any seed or spores that may be attached from previous fires in noxious weed infested sites.

  - During initial briefings, washdowns will be mentioned and facilities made available for oncoming crews.

- Las Vegas Field Office crews will follow the same procedures identified in Item 1 when returning from fieldwork or wildland fires, especially when vehicles are used in know noxious weed areas infested with known noxious or invasive species common to the Field Office area.

- Upon leaving the Field Office when released from an incident, all off-unit vehicles will follow aforementioned washdown procedures so that Las Vegas' noxious weed problems do not become someone else's problems.

- All equipment used off pavement will be cleaned of weed and grass seed stems, stalks, etc. prior to release from an incident. This includes, but is not limited to, tents, tarps, helicopter support equipment, foldatanks and free-standing tanks, mechanic's vehicles, and logistical support vehicles, trailers and equipment. These vehicles will be washed as in 1.a. above.

This Field Office policy will be followed by all equipment involved in fire suppression while on Las Vegas Field Office assignments. Vehicles will be cleared of washdown procedures during checkout and crew evaluations. In the event vehicles are released from fires away from the district office, the closest wash facility, (government or commercial) will be utilized.

A.3.4.24.2.4. FMU Wildland Fire Use Objectives & Strategies

Wildfire will not be used as a management tool within this FMU at this time.

A.3.4.24.2.5. Burned Acre Objective Review

IF the FMU decadal wildfire acre-burned target has been reached or exceeded PRIOR TO THE COMPLETION OF THE 10-YEAR PLANNING PERIOD, from either wildfire or prescribed fire, a review of fire management objectives and strategies will be initiated to develop new suppression criteria on wildland fire occurrence and prescribed fire acre goals.

A.3.4.24.2.6. FMU Prescribed Fire Objectives & Strategies

Prescribed Fire Objectives & Strategies: Prescribed fire will not be used as a management tool within this FMU at this time.

Rx Fire Annual & Decadal Acre Target: N/A

T & E Species Strategies: N/A

Air Quality Strategy: N/A

NEPA Compliance: Prior to implementation of any proposed projects, site-specific NEPA documentation will be completed, as applicable.

Rx Fire Monitoring Strategy: Monitoring will be completed for attainment/non-attainment of project specific resource management objectives, as applicable.

A.3.4.24.2.7. FMU Non-Fire Fuels Treatment Objectives & Strategies

Non-Fire Fuels Treatment Objectives & Strategies: Non-fire fuels treatment will not be used as a management tool within this FMU at this time.

Non-Fire Annual & Decadal Acre Target: N/A

T & E Species Strategies: N/A

Air Quality Strategies: N/A

NEPA Compliance: Prior to implementation of any proposed projects, site-specific NEPA documentation will be completed, as applicable.

Treatment Monitoring Strategy: Monitoring will be completed for attainment/non-attainment of project specific resource management objectives, as applicable.

A.3.4.24.2.8. FMU Post Fire Rehab/Restoration Objectives & Strategies

Restore plant productivity on disturbed areas of the public lands. Rehabilitate, reclaim, or revegetate areas subjected to surface-disturbing activities, where feasible. When rehabilitating, manage for optimum species diversity by seeding native species, except where non-native species are appropriate.

- Conduct all treatment activities in accordance with the Las Vegas Field Office Normal Year Fire Rehabilitation Plan (1990); Environmental Assessment no. NV-054-90-24.
- In the event that suppression efforts require off-road vehicle operations, replant and visually camouflage the first 200 feet of tire tracks in order to prevent further habitat impacts (due to public use of these track ways).
- Whenever feasible, utilize native species in seeding and/or re-planting treatments.
- Cultivate local supplies of live plant materials for use during riparian restoration efforts.
- Maintain a seed bank of locally collected native plant species for use in restoring both fire fuels treatments and fire-disturbed sites.
- Cultivate and develop varieties of locally grown native seed by means of plant material centers.

A.3.4.24.2.9. FMU Community Protection/Community Assistance Objectives & Strategies

Communities at Risk/WUI Areas: N/A. Communities-at-risk, community protection/assistance and public education strategies and objectives will be further defined, in collaboration with Nellis Air Force Base and Nellis Test and Training Range, through the LVFO RAMS Fire Plan update, which is scheduled for 2005.

Community Protection/Community Assistance Objectives: Collaborate with Nellis Air Force Base and Nellis Test and Training Range to identify and mitigate fuels hazards near DOD facilities or developments.

Community Protection/Community Assistance Strategy: N/A

Community Wildfire Safety Education Strategy: TBD in collaboration with Nellis Air Force Base and Nellis Test and Training Range.

A.3.4.24.3. FMU Fire Program Analysis - Quantifiable Objective Summary

Initial Attack Success	Decadal Wildfire Acres Burn Tolerance	WFU Decadal Target Acres	Rx Fire Acres Per Decade	Non-Fire Acres Per Decade
500 acres @ 90%	10,000	N/A	0	0

A.4. Fire Management Components

A.4.1. Wildland Fire Suppression

A.4.1.1. Las Vegas Field Office Large Fire History

During the period of 1980-2003 the LVFO Fire Planning Unit averaged 163 fires per year, burning 11,200 acres annually. Approximately 98% of these wildfires are Size Class A-D incidents (less than 300 acres in size) with an average of 3.5 fires per year reaching Size Class E, F or G. On average, lightning accounts for 51% of the annual number of fires and 69% of the acres while a variety of human caused fires accounts for the remaining 49% of the fires and 31% of the acres.

***Low to Mid Elevation Mojave Desert**:* The majority of the LVFO protection area is Low to Mid-elevation Mojave desert habitat that has an ephemeral Fuel Bed and Fire Season. Large Fire activity in these areas is dependant on winter and spring rains that promote widespread grass crops (brome and cheat grass). Consistently hot, dry, and windy conditions of the Mojave Desert will usually make the fuels available to burn in May, with significant lightning patterns beginning in late June. High frequency and high intensity lightning generally results in multiple fire starts for each event. Most large fires develop on multiple start fire days.

High Elevation Desert/Mountains: The remaining portion of the LVFO protection area is High Elevation Desert Mountain habitat. Large Fire Activity in these areas is promoted by a combination of rain produced grass crops and drought conditions. Drought patterns over the last 5 years have resulted in a significant increase of mortality in the Pinyon-Juniper woodlands, Ponderosa pine and White fir forested areas. This increased mortality has produced down woody fuel beds, snags as lightning receptors and standing fuels that promote torching and spotting in going fires.

Riparian: Drainages throughout the LVFO protection are a mixture of native riparian speices and invasive Salt cedar (tamarisk) stands. The Salt cedar dominance in the riparian areas has resulted in large fire potential, year round. These stands are characterized by thick brush choked areas with dry flammable needle drape and deep duff layers.

Fire Size and Intensity: Class A and B size fires tend to be low intensity burning single trees or small areas of fuel with short flame lengths in the 1-2 ft range. Larger Fires in the Class C, D, E, F and G ranges tend to burn at High fire intensity levels with short grass fuels developing flame lengths in the 15-20 foot range. These fires are often the result of winter/spring rains, which

have promoted continuous brome species grass crops, creating a significant wildland fire threat. Fire Intensity in the riparian areas is consistently Very High. Needle drape, tight spacing and extremely flammable characteristics of Salt Cedar regularly produce 25-40 foot flame lengths with spotting and fast moving spread rates.

Summary: Most fires in the 1970's and 80's were considered moderate intensity fires in the LVFO protection area. Invasion of the low desert by Red brome has resulted in larger more intense fires, of greater frequency. Invasion of the riparian areas has lead to a significant increase in fire intensity, fire size and control problems.

A.4.1.2. Las Vegas Field Office Suppression/Preparedness Actions

Resources: The LVFO Suppression program relies on four (4) Heavy Engine Modules, an Exclusive use Helicopter Module and Severity ordered Single Engine Air Tankers to implement the full range of Appropriate Management Response options to wildland fires. Please see Section V- A for a more detailed description of the Fire Organization including staffing, equipment and budget.

Appropriate Management Response (AMR) Options: The LVFO protection area includes a variety of Fire Management Units that require familiarity and expertise in utilizing the Monitoring, Confinement, and Suppression response alternatives.

Some FMU's are well suited to a Wildland Fire for Resource Benefit (WFRB) management response. At this time NEPA Compliance has not been completed to allow for use of the WFRB process, although it is being planned for in the future.

In all FMU's Firefighter and Public safety are paramount. Any and all actions necessary to protect life safety are immediately authorized. This includes off road vehicle travel, retardant and onsite use of all water sources.

The Appropriate Management Response process requires that the Initial Attack IC, Dispatch, Duty Officer and Resource Advisor work to clarify Fire Location and review the Areas of Critical Environmental Concern (ACEC) to tailor the attack response.

Desert Tortoise habitat presents a primary concern of reducing fire spread to protect Tortoises from fire and preventing Tortoise habitat from being converted to unwanted invasive species by exposure to fire. Aggressive aerial attack combined with on road Engine attack and dismounted ground attacks are the primary methods employed.

Redrock Canyon/Sloan ACEC and the Joshua Tree Wilderness present a need to minimize fire spread so that the visual, cultural and natural values are not degraded by the impacts of wildland fire. Aggressive aerial attack combined with on road Engine attack and dismounted ground attacks are the primary methods employed.

Wildland Urban Interface (WUI) FMU's: Protected by the LVFO dictate Initial Attack Suppression management responses. All WUI areas are complicated and restricted by protected species/habitat concerns. These concerns limit off road Engine attack options, prohibit most heavy equipment, reduce water source options. Thus firefighting capability of all resources is reduced. Helicopter and SEAT assets are a critical part of suppression operations.

Protection of private property is a primary concern in the WUI FMU areas, which will be balanced with the protected species restrictions.

***Special Management Area (SMA) FMU's*:** Protected by the LVFO include critical tortoise habitat, national conservation areas (Redrock – low elevation/Sloan) and the Ash Meadows & Joshua Tree Forest locations. These FMU's dictate Initial Attack Suppression management response. All SMA FMU's are complicated and restricted by protected species/habitat concerns. These concerns limit off road Engine attack options, prohibit most heavy equipment, reduce water source options. Thus firefighting capability of all resources is reduced. Helicopter and SEAT assets are a critical part of suppression operations.

The Redrock – High Elevation SMA FMU allows for Confinement and Monitoring management response options. These options will be utilized to reduce unnecessary exposure of firefighters to rugged terrain where natural features can be used to prevent unwanted fire spread. A WFSA will be prepared to delineate the confinement strategy on all fires expected to burn beyond the first operational period.

***High Value Habitat FMU's*:** Include areas that require Initial Attack Suppression management response (Mesquite) and other areas that allow for a Confinement and Monitoring management response.

***Vegetation FMU's*: I**nclude Nellis High Juniper and Nellis Low Juniper. These FMU's allow for Confinement and Monitoring management responses, but do include high value government installations that can require Initial Attack – Suppression response. These areas have not yet been delineated on a map. Coordination with Nellis and preplanning is expected to occur in the near future.

Note: ALL Low Desert FMU's are considered Tortoise Habitat and are threatened by the invasion of red brome and other invasive species. This requires Aggressive Initial Attack to minimize adverse direct impacts to the Tortoise by fire and to minimize the spread of undesirable invasive species (red brome) which result in increased fire occurrence, increased fire intensity and increased fire acreage.

Agreements: The LVFO has numerous current and older dated agreements with a wide variety of local, state and federal agencies. The LVFO by agreement and payment provides Fire Protection to other federal agencies ground (USFWS, USDOD, USDOI-BOR). Most mutual aid agreements provide for non-reimbursable and reimbursable assistance. Below is a summary of the various agreements and their current status.

Las Vegas Interagency Communications Center (LVICC) – Expired

This agreement describes the Interagency Organization with an Interagency FMO and Center Manager. It was extendable until 2006, but has lapsed due to changes in organization. A master interagency agreement for Southern Nevada is being pursued.

LVICC Operations Plan – Current/Annual

An interagency operations plan is updated annually for interagency dispatching, initial attack, extended attack, helitack, fire cache and general wildland fire operations guidelines.

Town of Pahrump – Term – None

BLM lands are interspersed with Pahrump Valley Fire Rescue service response areas. Agreement provides for mutual aid and independent action on each other's jurisdictional areas to suppress wildland fire. Reimbursement after 48 hours.

Boulder City – Expired

Boulder City lands are adjacent to BLM lands; several power generation plants on Boulder City property are WUI concerns in the Eldorado Valley. Agreement should be pursued.

Clark County – Expired

Agreement between BLM and Clark County is currently in CC solicitor's office. An existing agreement between USFS and CC is in force. A master interagency agreement is also being pursued.

Nye County - Term – None

BLM lands are interspersed with Nye county suppression responsibility. A new agreement is being pursued between Nye County and the BLM field offices with adjacency.

Nevada Division of Forestry (NDF)

NDF has very little wildland fire protection responsibility in the Las Vegas Area. NDF seasonally staffs 1 Engine Module in Kyle Canyon. NDF maintains a significant source of inmate fire crews. The state wide master agreement provides a framework. A local agreement is being pursued.

Nevada Division of State Parks – (Valid until 29 January 2006)

BLM will provide all wildland fire control on all Division of State Parks property in the Red Rock Canyon Recreation Lands area (600 acres). No exchange of funds provided.

Bureau of Reclamation – Expired 2003

BLM provided fire protection on BOR lands within the Lower Colorado Region in the State of Nevada. BOR provided nominal payment (approx $7,000)

US Fish and Wildlife Service – Expired 2003

BLM provides significant fire suppression and support to USFWS for fire suppression, monitoring and logistics for USFWS fires. Previous agreement provided nominal payment to the BLM (approx $6,000). A new agreement is being pursued.

Nellis Air Force Base (DOD) - Indefinite

The BLM provides fire suppression, detection preplanning and large fire support for Nellis Air Force Base property. Nellis provides a significant payment for services $0.07 to 0.15 per acre (approx $300,000). The Agreement is being reviewed and an operations plan is being developed. Use parameters of the Indian Springs facilities for SEAT operations is being investigated.

Department of Energy (DOE) – Term - None

Provides for Mutual Aid and reporting of fires. Reimbursement is provided for the assisting agency by the protecting agency. This agreement is old (1984) and should be revisited.

Lake Mead National Recreation Area (NPS)

BLM lands are adjacent to the Lake Mead Recreation Area on its entire Nevada Boundary. No local agreement exists, although an interagency agreement is being pursued. The Nevada Master Agreement provides a foundation.

Bureau of Indian Affairs – Phoenix

BLM is responsible for fire suppression on the Moapa Indian Reservation. The BIA - Southern Paiute Field Station will pay the BLM on a per acre basis for presuppression costs. The LVFO has not billed under this agreement. Research is being conducted to determine if the State Office has billed for presuppression costs.

Severity Funding: With the invasion of Red brome in the Mojave Desert, Tamarisk in the riparian areas, heavy influx of residents/visitors to the Las Vegas Area, and typically hot, dry and windy conditions the LVFO has seen a regular request for Severity over the past few years. The Severity requests are generally for extended staffing to provide greater than 5 day, 8 hour wildland fire coverage to the protection area. This Severity staffing has resulted in more rapid Initial Attack Response and smaller fire size for those fires that occurred on days that Engines would normally be off duty or during the morning and evening hours when they would be unstaffed. The LVFO is not a typical wildland community where everyone lives in the same small town. Typically Engine call backs can require 1 hour, resulting in significant fire growth leading to increased cost and resource damage.

Other uses of severity funding have been for Extended Helitack coverage and SEAT coverage. There is no regular budget for a SEAT in the LVFO and given the ground based equipment constraints, SEAT's have proven to be very cost effective Initial Attack tools for the district. This year (2004) Severity funding has also been requested and received for fire prevention, an ICT3, and additional firefighter staffing.

Without additional funding for the base program, the LVFO will likely see a need for Severity funding in the future.

Fleet Impacts: In the past few years the LVFO has been pressured to reduce vehicle fleet size. This pressure and the understaffed history of the LVFO Fire Management program has resulted in an insufficient number of Command and Support vehicles.

The LVFO fire program requires 2 additional Command vehicles and 1 Support truck for fire operations. Currently the program has 2 Command vehicles and NO Support vehicles.

Requirements for fire operations/suppression plans can be found in the "Interagency Standard for Fire and Fire Aviation Operations" (Red Book). All plans for fire and resource personnel use can be accessed at the LVFO Dispatch Office.

A.4.1.3. LVFO Fire Prevention, Community Education, Community Risk Assessment, and Other Community Assistance Activities.

Fire Prevention: The past LVFO Fire Prevention program has been very small in limited to establishing fire restrictions, Engine Module appearances at local schools, and visibility at community events in Logandale, Pahrump and Redrock.

Recently the LVFO has filled the Fire Mitigation and Education Specialist position that will be tasked to begin building a more effective Fire Prevention program. Community Education efforts will be established in coordination with local community groups, volunteer fire departments (VFD's) and the Clark and Nye County Fire Organizations. Educational opportunities at the Redrock's Visitors Center, schools and other locations will be considered as part of the duties of the new position. Increased use of the Smokey logo and message will be utilized.

Hazard Mitigation in WUI areas will be developed with direction from the Nevada State Office of the BLM, VFD's and the Clark and Nye County Fire Organizations.

Fire Restrictions: Fire Restrictions on Public Lands in the LVFO typically begin June 1st through October 15th of each year. For the last five (5) years Fire Restriction Periods have been coordinated jointly with the US Forest Service and the National Park Service in the Las Vegas area. This has worked well to inform a public that doesn't seem to distinguish between the different jurisdictional areas.

Prevention Patrol: The LVFO does not have any form of Fire Patrol and public contact program. The US Forest Service operates several Forest Patrol Prevention Units that make public contacts to educate, inform and enforce Fire Restrictions. Severity funds have been requested to fund a Fire Patrol and Prevention program to reduce the incidence of man cause fire.

The LVFO would benefit from the addition of a seasonal Fire Patrol position to implement a signing and contact program. This individual could assist with the community outreach and education efforts as well.

A.4.1.4. LVFO Fire Training Activities

Qualifications and Fireline Refresher: Training and fitness requirements for all personell involved in fire/suppression support can be found in the 2004 Interagency Standards for Fire and Fire Aviation Management. Attendance at the refresher training along with successful completion of the appropriate level of work capacity testing is a prerequisite for issuance of a red card.

The LVFO adheres to all requirements of PMS 310-1 for issuance of all wildland fire suppression and prescribed fire qualifications.

The LVFO generally offers the Basic Wildland Firefighter class at least once per year in the spring (S-130.S-190). It is sometimes coordinated with local interagency cooperators when timing permits.

Annual Recurrency Training: The LVFO offers several Fireline refresher classes each spring. It is required every year for all positions with Fireline exposure. In addition the following classes are offered to maintain currency: Bloodborne Pathogens (once), First Aid/CPR (every 2 years), Power Tools Safety (once), Haz-Mat (once), Helicopter Crewmember Refresher (annual), Defensive Driver (every three years), Work Capacity Test (Annual)

Advancement Training: All LVFO personnel involved with Fire Management are having Individual Development Plans (IDP) prepared to guide their advancement, growth and contribution to the program. The IDP's are 3-5 year goal setting documents that highlight course and experience needs of the individual.

Fire Season Readiness: Requirements for preparedness and operational plans can be found in the 2003 Interagency Standards for Fire and Fire Aviation Management.

Annual Readiness reviews and proficiency tests are part of the preseason training regimen. Interagency Local level, State level (every other year) or National level (every 4th year) readiness review teams formally conduct preseason inspections of the LVFO Fire Program before June 15th of each year.

Critical Qualifications Needs:

- ENGB – 8 LVFO has 2
- ENOP – 6 LVFO has 3
- ICT3 – 4 LVFO has 2
- TFLD – 4 LVFO has 1
- HEMG – 3 LVFO has 1
- HECM – 15 LVFO has 7
- FALB – 10 LVFO has 3
- ICT4 – 8 LVFO has 2
- SEMG – 4 LVFO has 1

Critical Position Needs:

1. Interagency Training Specialist – an individual to support USFS and BLM IQCS, Course coordination, 200 and 300 level instruction for both agencies.
2. SEAT Manager – To support critical initial attack platform and ensure availability
3. Fire Patrol – To establish Fire Restriction signage program and assist with education and detection.

A.4.1.5. LVFO Fire Detection Program

Fire Reporting: The LVFO is a very urban area with a population of residents and visitors that are NOT very accustomed reporting wildland fires. LVICC receives calls from many sources that are NOT well versed in wildland fire reporting.

Most calls to LVICC are third party 911 reports with no Reporting Party (RP) call back possible. The majority of wildland fire reports are received from the Clark County Alarm Center, which receives 911 fire calls (primarily structure and EMS). These calls generally have very little in the way of location information, RP size up or ownership information. The second largest group of Fire Reports to LVICC is from Agency personnel, Engine Modules, and Agency Aircraft. Many

of these calls are from Agency personnel monitoring radio traffic and intercepting "brush fire" reports that have not yet been forwarded to LVICC. Other reports are "walk in" reports by citizens that stop by the Fire Stations seeking to make notification.

The remainder of fire reports to LVICC come from Nye Co. Sheriff's Dispatch, Ely Communications Center, Nellis AFB and various Flight Service agencies. VERY FEW REPORTS COME FROM THE PUBLIC DIRECTLY TO LVICC. This leads to a significant delay in Initial Attack.

Aerial Detection: There are no dedicated Aerial Detection platforms working in the LVFO. Some efforts to set up Fixed Wing CWN have been made with no success yet. Primary Aerial detection currently employed is use of the Exclusive Use (EU) Contract Helicopter to fly detection following lightning events. This has worked but is not ideal in that once a fire is located the EU helicopter generally becomes engaged in the suppression activity and thus further detection is suspended. The Eastern and Northern portions of the LVFO protection area suffer the most from the current aerial detection system. Most political concerns are located in the Western side of the district.

A contracted fixed wing, aerial detection platform is needed to adequately protect the lands managed by the LVFO. This resource should fly daily from mid June through Mid September. The large land area, Critical Habitat concerns and poor local reporting system warrant this additional cost and will result in fewer acres burned.

Ground Based Detection: The western portion of the LVFO is fairly well roaded and ground based detection suffices when coupled with the EU helicopter. During and after lightning storms, Engine Modules assume observation positions and are able to report fires from these locations.

USFS, NPS and BLM resources coordinate ground detection activities to avoid duplication.

A.4.1.6. Fire Weather and Fire Danger

LVICC utilizes WIMS and RAWS data to calculate the daily Fire Danger BI and Adjective. These are broadcast with the Daily Fire Weather from the National Weather Service – Las Vegas (Zone 456) to all Engine Modules.

Fire Weather: The agency maintains one Remote Automated Weather Stations (RAWS) as follows:

Name	NWS ID	NESS ID	Elevation	Latitude	Longitude
Red Rock	261705	32516644	3,760	36 08 7	115 25 38

The dispatch center staff is responsible for recurrent daily activities to manage RAWS data and for the input of key dates to initiate and terminate seasonal data collection.

The unit RAWS uses NFDRS fuel models A & C along with the energy release component to develop fire danger ratings on a daily basis.

Fire Danger: The Fire Danger rating is used along with fuel moistures, fuel loadings and local activity to set LVFO staffing levels. The LVFO duty officer sets extended hours, extended work weeks to best meet the current wildland fire potential.

Live Fuel Moisture: The LVFO participates in the Nevada State Office Live Fuel Moisture sampling program. On a bi-weekly basis live fuels are gathered at the Redrock (N5E) and Pine

Creek (N5F) sites and set to the Nevada State Office Fuels Laboratory for measurement. These are tracked throughout the fire season.

A.4.1.7. Aviation Management

Organization: All aviation activities, including Resource flights are managed under the fire program. Aviation activities on LVFO are provided oversight by a Zone Aviation Officer (ZAM), a permanent full-time position (PFT). The ZAM works for both Ely and Las Vegas Fire Management Officers, with the Duty Station in Caliente. The ZAM provides oversight and policy direction to the Ely Air Attack/detection fixed wing platform, the Ely and Las Vegas exclusive use helicopters, the Panaca Single Engine Air Tanker (SEAT), and other call when needed fire aviation and resource flights and personnel. The Field Office FMO or their AFMO provides direct supervision for the exclusive use fire helicopter managers, and SEAT managers.

The ZAM also provides training and direction, and coordinates with the Resource staff on any aviation activities, such as wild horse and burro census and horse gathers, wilderness study area reconnaissance flights, as well as other resource flights.

Infrastructure: The LVFO leases a 5000 square foot building from Clark County, which houses the current Las Vegas Interagency Helitack Program (Helibase) and Las Vegas Interagency Communications Center. The Lease Agreement with Clark County is for 10 years with option for renewal, with annual lease rate tied to cost-of-living increases (current FY 04 lease is $11,700/year.). The BLM LVFO covers the lease and janitorial services at $27,154 per year. The Forest Service covers utilities, phones and copiers at $26,000 per year.

Aviation dispatch is conducted by a PFT Aviation Dispatcher at LVICC or any of the Initial Attack dispatch staff at LVICC.

Additional aviation staff positions are filled by resource order on an as-needed basis.

Helitack: The LVFO has an exclusive-use helicopter on a 90-day contract. It is based at the North Las Vegas Airport, Las Vegas Interagency Helibase, co-located with LVICC. The helicopter is staffed with a nine-person Interagency Helitack crew. The manager is a BLM PFT employee and the assistant a USFS 18/8 long term WAE. There are three seasonal BLM crewmembers, a short term and seasonal Forest Service crewmember and a long term and a seasonal NPS crewmember.

The exclusive use ship has averaged 236 flight hours per fire season over the past 12 years. With the current crew complement, they are able to split the crew to manage a second helicopter. The past three years the crew has also managed CWN helicopters on the LVFO, averaging 65 flight hours per season.

The LVFO spends approximately $314,000 per year on the exclusive use contract for daily availability and flight time. The call when needed ships average $78,000 per year. These costs don't reflect wages for the Helitack crew.

Type 2 and 3 CWN helicopters, as well as other aircraft are occasionally brought in under Severity or for on-going fires.

Single Engine Air Tankers: Single-Engine Air Tankers (SEAT's) are well suited to the Great Basin fuel types and have been effectively used on the LVFO. Temporary SEAT bases have been established and operated from both the Jean and Mesquite airports with the use of cheap motel

rooms for the office, pallets of powdered retardant, and water tenders or fire hydrants as water sources. SEAT managers have been brought in under severity funding and fire resource orders to manage these bases. Currently there are three qualified SEAT managers (SEMG's) in the Las Vegas area to assist in staffing, one each from US Fish & Wildlife, NPS-Lake Mead NRA, and the BLM LVFO. All three personnel have other "day jobs" so a dedicated SEAT manager should be hired to cover this position. The three local SEMG's are heavily relied upon to adjust their regular work schedules to cover the SEAT operations, comply with work/rest guidelines and attend to their job responsibilities. Additional potential SEAT bases have been identified including Indian Springs, Echo Bay/Perkins Field and Pahrump with the lack of fuel being the primary issue. Additional qualified SEAT managers are needed in the LVFO to help manage SEAT's and meet Work/Rest requirements. SEMG's on the LVFO are directly supervised by the Assistant Fire Management Officer with contractual compliance/oversight performed by the ZAM.

Air Attack/Detection: Air Attack and Detection aircraft are brought in as needed during fire activity or under Severity. Often, by the time severity funding is available or significant fire activity occurs, aircraft are in short supply. Occasionally, aircraft that are under exclusive-use contracts with neighboring Field Offices are made available, but this is unreliable. Due to the large expanse of LVFO, an exclusive-use contract for a dedicated detection aircraft/air attack platform is needed. Currently there are no carded fixed wing aircraft on rental agreements in Southern Nevada; the closest would have to come from Ely, Elko or Minden.

Resources Flights: The Wild Horse & Burro program uses approximately 40-60 hours per year on census flights totaling approximately of $25,000-$45,000 annually.

Smoke Jumpers: Smoke Jumpers are available to the LVFO usually from Ely or Cedar City. The LVFO has not utilized jumpers on a regular basis, as much of the protection area is lower desert and accessible by road. The Eastern and Northern portions of the protection area are better suited to use of smoke jumpers given the remote nature, high terrain and slow travel routes. The Unit Aviation Plan will be included in the Appendix.

A.4.1.8. Initial Attack

General: Firefighter and public safety is always the first priority.

All fires within the FPU will be managed with suppression actions consistent with preplanned dispatch protocols (run cards and preplanned dispatch plans) in conformance with resource management objectives identified in this plan. Tactics and strategies will be based on the current and predicted weather and fire behavior. Use the following information for determining initial attack priorities.

The highest priority FMU's within the LVFO fire planning unit for initial attack are ranked as follows:

Name	Type	FMU Number
Highest Priority Suppression:		
Redrock NCA (LE)	SMA	NV-050-06
Mesquite-Bunkerville	WUI	NV-050-10
Moapa-Overton	WUI	NV-050-09
Pahrump	WUI	NV-050-15
Amargosa-Indian Springs	WUI	NV-050-16
Las Vegas Valley – Apex	WUI	NV-050-08
Goodsprings-Primm	WUI	NV-050-18

Laughlin-Nelson	WUI	NV-050-17
Sloan NCA	SMA	NV-050-05
Joshua Tree Forest	SMA	NV-050-19
Mesquite- Acacia	HVH	NV-050-14
Ash Meadows	SMA	NV-050-13
Nellis Sagegrouse	HVH	NV-050-20
Tortoise ACEC North	SMA	NV-050-02
Tortoise ACEC South	SMA	NV-050-03
Virgin-Muddy-Meadow	WUI	NV-050-11
Tortoise Moderate Density	HVH	NV-050-01
Mid-Priority Suppression:		
Tortoise Low Density	HVH	NV-050-04
Redrock NCA (HE)	SMA	NV-050-07
Nellis Bighorn	HVH	NV-050-21
Lower Priority Suppression:		
High Juniper	HVH	NV-050-12
Nellis – High Juniper	VEG	NV-050-22
Nellis - Low Elev. Shrub	VEG	NV-050-23

WILDCAD: LVICC dispatches wildland firefighting resources for the Las Vegas Field Office – BLM, the Spring Mountains NRA – USFS, the Lake Mead National Recreation Area – NPS and starting in 2005 – the Nevada Division of Forestry.

The LVICC FPU is subdivided into Dispatch Zones that reflect Geographic and Management related Wildland Fire response areas. It is very likely that following this Fire Planning Analysis process the Dispatch Zones will be modified to better reflect Resource Values.

Each Dispatch Zone is described on a Map based system in the Wildcad Computer system. Each Dispatch Zone shows Initial Attack Resources set to respond at three (3) Fire Danger Levels (low, moderate and high) which roughly correspond with the Fire Danger Ratings determined on a daily basis.

Each Dispatch Zone has a "Run Card" which is reviewed in the spring by the Operations Group. The run cards set the low, medium and high response resources and describe sensitive features, wilderness, resource advisor information and other pertinent dispatch information for the area.

Agency Notifications: Once LVICC initiates the initial attack dispatch, they inform the agency duty officer of the fire report and response situation. The duty officer may suggest additional response requirements, or request adjustment of other tactical resources.

LVICC will make agency Resource Advisor and Law Enforcement contacts if the run card, duty officer or Initial Attack resources require it.

Closest Forces: LVICC utilizes the closest forces concept for all fire dispatches. Agency jurisdiction is not a factor in dispatching wildland fire suppression resources. Initial attack resources maintain location and availability status with LVICC throughout the duty day.

Mutual Aid: Most local and county fire departments have or are working on written agreements to clarify the parameters of Mutual Aid for Wildland Fire suppression. The Interagency Standards for Fire and Aviation Operations, 2004 provides that in an Emergency all federal agencies may provide assistance to adjacent agencies and jurisdictions to suppress wildland fire. It further directs agencies to purse written agreements, but does not preclude Mutual Aid without a written agreement.

The LVFO provides assistance, when possible to Clark County, Nye County, City of Henderson, and the Town of Pahrump, as these jurisdictions abut BLM protection area lands directly. Except in extreme cases the agency with primary jurisdiction is required to remain on scene in a unified command basis. Mutual Aid is generally reimbursement free for the first 24 hours, except in the case of Pahrump where the agreement is first 48 hours.

Lightning Plan Operations: The LVICC Annual Operating Plan provides for Lightning plan operations which suspends the use of the WildCad system for Initial Attack resource allocation. The lightning plan is activated by Agency Duty Officer and the details are found in the LVICC annual operating plan, which is attached to this document.

Initial Attack Resource Inventory and Type: The LVFO maintains three (3) Fire Stations housing four (4) Heavy Fire Engines as described below:

REDROCK STATION (Central) 14 bed facility, Kitchen, 6 showers, 6 ENG Bays

ENG 5931 Type 3 ENG with 3 Firefighters

ENG 5934 Type 3 ENG with 5 Firefighters

PAHRUMP STATION (West) 14 bed facility, Kitchen, 4 showers, 2 ENG Bays

ENG 5943 Type 4 ENG with 5 Firefighters

LOGANDALE STATION (East) 14 bed facility, Kitchen, 6 showers, 2 ENG Bays

ENG 5932 Type 3 ENG with 5 Firefighters

All Fire stations have a painted Helicopter pad sufficient for Type 2 or 3 Helicopter Operations.

A.4.1.9. LVFO Extended Attack and Large Fire Suppression

LVFO Fire Cache: The LVFO office at 4701 N. Torrey Pines, Las Vegas, NV 89130 houses a 100-person fire cache for Extended Attack and Large Fire Support. Fire funding for the cache is minimal and should be increased.

The current budget is for a GS-7 PFT for 8 work months; the remainder is picked up by ADMIN for FLEET and PROPERTY duties.

This is the only wildland fire cache that is capable of extended attack and Large Fire Support. It regularly provides critical logistical support to BLM, USFS and NPS wildland fires. The LVFO cache is responsible for a 500 person National Interagency Fire Center (NIFC) cache semi-trailer, which is located at the Redrock Fire Station during the fire season.

Fire Business Management: The LVFO Fire Business Management duties in part have been absorbed by the Support Services Division. Capabilities that have recently been lost include a Full-time dedicated fire business position, grant and agreement writing.

A.4.1.10. Other Fire Suppression Considerations in LVFO

Threat Fires and Private Land Considerations: Private lands are interspersed with BLM Protection Lands across the LFVO management area.

LVFO Wildland Fire Suppression Resources may enter private lands to suppress wildland fire under one of the following conditions:

1. Wildland fire on Private Property poses an immediate threat to Federal Lands Managed or protected by the BLM, USFS or NPS local cooperators.

2. Wildland fire is located on Private Property within the jurisdiction of an adjacent cooperator agency that has a written agreement with the BLM **OR** the adjacent agency has requested assistance with suppression of the wildland fire.

3. The property owner has invited the BLM resources onto the land.

Other Protected Federal Lands: The LVFO has by written agreement responsibility to protect other agency lands as described below:

NELLIS/AFB-approx 2.6 million acres	Termination - none
USFWS – Desert Complex	Expired/Renew
USDOI – Bureau of Reclamation	Expired/Renew?
USDOI – BIA – MOAPA	No Termination

Suppression activities on the Nellis AFB lands present a significant complication and require close coordination with the Command Structure. Many ground hazards exist and sensitive areas. All fires will utilize the Unified Command strategy to ensure good communications and safe operations are maintained.

Administration & Support Services Staff: The LVFO receives significant program support from Administrative Services in the form of Fire Station Maintenance, Fire Cache Supervision, Fire Logistical Support, and Information Technology Support.

A.4.2. Wildland Fire Use

Current Status: The LVFO does not have NEPA compliant planning in place to implement Wildland Fire Use at this point in time.

Future Status: The Resource and Fire Management teams have identified 8-10 FMU's where a Wildland Fire Use program could be beneficial. Future planning activities will include a Wildland Fire Use option for consideration. Preparation and approval of a Wildland Fire Implementation Plan is required before Wildland Fire Use is a viable management alternative.

A.4.3. Prescribed Fire

Current: There has been very little use of Prescribed Fire within the LVFO protection/ management area.

Future: The Resource and Fire Management teams have identified 8-10 FMU's where prescribed fire can play a useful role in Hazardous Fuels reduction and habitat improvement. The majority of treatments will involve pile/broadcast burning in conjunction with mechanical treatment. Previous planning documents (Redrock GMP, Nellis RMP and LVFO RMP) have highlighted potential areas.

Needs: The LVFO requires a GS-9/11 Prescribed Fire Specialist to begin significant implementation of any treatments.

Air Quality: The Clean Air Act of 1955, as amended provides the legal framework for the management of air pollutants throughout the United States and requires the Environmental Protection Agency (EPA) to set National Ambient Air Quality Standards NAAQS for pollutants considered to be harmful to human health and the environment. The EPA has approved NAAQS for six pollutants known as, "criteria" pollutants (e.g., Carbon Monoxide (CO), Nitrogen Dioxide (NO2), Ozone (O3), Lead (Pb), Particulate Matter of less than 10 microns and 2.5 microns (PM10)/(PM2.5) and Sulfur Dioxide (SO2). When one or more, "criteria" pollutants exceed the NAAQS, EPA designates the location as, "non-attainment" for that pollutant.

Within the Las Vegas Inter-agency Communications Center (LVICC) Fire Planning Unit (FPU), twenty-three Fire Management Units (FMU's) have been identified. Some of the FMU's are located within the "non-attainment" EPA designated areas, while others are located in what is commonly referred to as, "attainment" areas, with respect to air quality.

Several emissions sources have been identified within each FMU, such as paved and unpaved roads, power plants, urban activity, recreation and other point and stationary sources, including mobile source emissions. FMU activities which occur in, "non-attainment" areas shall comply with all control strategies, mitigation measures and best management practices (BMP's) as required by State Implementation Plans (SIP's) and administered by local county governments.

Fire management activities in the FMUs include fire suppression, open burning, light and heavy equipment mobilization and fuels treatment activities, both chemical and biological. Fire Management Open burning (RX FIRE) is permitted in Clark County with a courtesy call to the Department of Health. Open burning, "where fire is set either by OFFICERS of governmental agencies, in performance of their official duties or the purposes of training and instruction of fire-fighting and fire-rescue personnel." Section 42.1.3 – Open Burning, Clark County Air Quality Regulations.

Rx fire burn plans for activities in NYE Coutny will have an approved variance (Open Burn Permit) from the State of Nevada, Division of Environmental Protection; Smoke Management Program.

The short-term use of small-mechanized equipment used for the project may cause some minor soil disturbances and potential increases in PM10 emissions, however it is anticipated that there will be no significant impact to air quality. Where applicable, water will be used as a dust control measure.

Public concerns may be possible regarding dust emissions during mechanical treatment activities. If this occurs, operations will be evaluated and dust control and mitigation measures will be implemented in the most cost effective manner, feasible and without undue delays to the overall project schedule.

A.4.4. Non-Fire Fuels Treatments

The majority of all LVFO non-fire fuels treatment have been tamarisk eradication. A shaded fuelbreak is planned for the city of Pahrump.

Tamarisk Eradication:

Treatment to Date: Seven hundred fifty (750) foot print acres have been treated using multiple treatment activities totaling approximately 1800 acres of non-fire fuels treatment. These treatments

have included mechanical, chemical, and seeding operations to complete the conversion to restore native communities that greatly reduce threat of wildland fire in the urban interface.

Future Treatment: All of the tamarisk eradication projects require multiple treatments and reentry. Approximately twenty four hundred (2400) acres of re-treatment will be required. All areas impacted by wildland fire within the Riparian WUI FMU's will be converted to native communities using the same prescriptions.

NEPA and Section 7 consultation have been completed for an additional fifteen hundred fifty (1550) acres of treatment, however due to a combination of funding and scheduling, the targets may be spread out over a 10-year period.

Approximately six thousand acres of treatable ground are identified on the Virgin, Muddy and Meadow Valley drainages.

Pinyon – Juniper Treatments:

Planned Treatment: An unidentified number of acres on the Nellis Air Force Base (NTTR) are awaiting identification and planning. These treatments will provide defensible space to sensitive installations threatened by wildland fire fuels. The scale of the individual projects will allow the Fuels Categorical Exclusion authority to be exercised, which will expedite the NEPA consultation process.

Mesquite – Acacia Protection:

Planned Treatment: Fuel breaks have been identified as a management action to protect threatened Mesquite-Acacia woodlands. Six stands (300 acre footprint/67,000 acres protected) have been nominated as Habitat Management Areas and will receive first priority for treatment. The first priority project will be the Pahrump fuel break (54 acres footprint/6,742 acres protected) as it is additionally a WUI protection project.

Approximately 15 projects totaling about 7,500 acres are planned for each year across the FPU/agency. Of this total, approximately Las Vegas 5,000 acres per year will be treated by mechanical treatments (WUI projects).

Fuel reduction in cheatgrass areas, accomplished by a combination of chemical and mechanical treatments, may account for approximately Las Vegas 2,500 acres per year. All Tamarisk treatments will move the condition class 3 vegetation to condition class 1. There are no acres proposed for conversion from condition class 2 to condition class 1. .

Approximately Las Vegas 95% of the WUI projects will be implemented using small business contractors that are locally registered.

A.4.5. Emergency Stabilization and Rehabilitation

Restore plant productivity on disturbed areas of the public lands. Rehabilitate, reclaim, or revegetate areas subjected to surface-disturbing activities, where feasible. When rehabilitating, manage for optimum species diversity by seeding native species, except where non-native species are appropriate.

Treatments in Desert tortoise critical habitat:

In desert tortoise habitat, conduct all activities in accordance with the Reclamation Plan For Critical Tortoise Habitat In The Las Vegas Field Office (1998); Environmental Assessment no. NV-052-98-077.

- Within wilderness, rehabilitation and restoration will be conducted in accordance with the appropriate wilderness management plan(s).
- In the event that suppression efforts require off-road vehicle operations, replant and visually camouflage the first 200 feet of tire tracks in order to prevent further habitat impacts (due to public use of these track ways).
- Whenever feasible, utilize native species in seeding and/or re-planting treatments.
- Cultivate local supplies of live plant materials for use during riparian restoration efforts.
- Maintain a seed bank of locally collected native plant species for use in restoring both fire fuels treatments and fire-disturbed sites.
- Cultivate and develop varieties of locally grown native seed by means of plant material centers.

Treatments in the remainder of the FPU:

Restore plant productivity on disturbed areas of the public lands. Rehabilitate, reclaim, or revegetate areas subjected to surface-disturbing activities, where feasible. When rehabilitating, manage for optimum species diversity by seeding native species, except where non-native species are appropriate. Treatments will comply with the Las Vegas BLM Normal Fire Rehabilitation Plan and Environmental Assessment (E.A. No. NV-054-9-24).

- In the event that suppression efforts require off-road vehicle operations, replant and visually camouflage the first 200 feet of tire tracks in order to prevent further habitat impacts (due to public use of these track ways).
- Whenever feasible, utilize native species in seeding and/or re-planting treatments.
- Cultivate local supplies of live plant materials for use during riparian restoration efforts.
- Maintain a seed bank of locally collected native plant species for use in restoring both fire fuels treatments and fire-disturbed sites.
- Cultivate and develop varieties of locally grown native seed by means of plant material centers.

Treatment activities must conform to the BLM Supplemental Emergency Stabilization and Rehabilitation Guidance, the LUP, and the Normal Year Fire Stabilization and Rehabilitation Plan. (This supplement provides specific BLM guidance and is tiered to the Department of Interior (DOI) ESR Handbook

A.4.6. Community Protection/Community Assistance

BLM Las Vegas Field Office Community Protection/Community Assistance information with the following performance measures:

1. Total number of WUI communities at risk. 19

2. Total number of WUI communities at risk with completed and current fire management plans or risk assessments. 0

3. Total number of WUI communities at risk with fire prevention programs in place and being implemented. 0

4. Total number of WUI communities at risk that initiated volunteer and community funded efforts to reduce hazardous fuels resulting in the removal of the community from the at-risk list.

5. Provide a general overview of the rural fire assistance program within the FPU. Identify priority rural fire assistance workload. Briefly summarize past accomplishments, communities served, and type of assistance (training provided, PPE procured, equipment purchased, etc.).

Rural Fire Assistance monies have been provided to Clark County Fire Department, which oversees, the twelve volunteer fire departments in Clark County. The Clark County Fire Department then allocated the money to the VFD's that they had earmarked has having the greatest needs.

A.5. Organization and Budget

A.5.1. Budget and Organization

Table A.7. Bureau of Land Management Implemented Fire Resources - Attachment 1[a]

Bureau of Land Management Implemented Fire Resources - Attachment 1			
Office: Las Vegas			
Resources	**Quantity**	**Number of Personnel**	**Total Wk. Months**
Number of Engines:	4	18	94
Number of Water tenders:	1	2	8
Number of Dozers:			
Number of Tractors / plows:			
Number of Fire Boats:			
Number of Type 1 Crews:			
Number of Helitack Crews:	1	4	33
Number of Fuels Crews:			
Number of Type 2 Crews sponsored:			
Number of Smokejumpers (AK & NIFC):			
Number of Fire Management Officers:	1		12
Number of Assistant FMOs / FCOs:	1		12
Number of Fire Operations Specialists:	1		12
Number of Dispatchers:	4		36
Number of Other Aviation Staff (Aviation Mgr., Seat Mgr, etc.):			
Number of Mitigation/Education/ Prevention Specialists / Techs:	1		12
Number of Resource Specialists:	1		
Number of Fuels Specialists:	2		
Number of Other Fire Staff:	2		24
Number of PFT funded by Preparedness:	6		

Number of Career Seasonals funded by Preparedness:	7		
Number of Temporaries funded by Preparedness:	11		
Number of PFT funded by Fuels:	3		
Number of Career Seasonals funded by Fuels:			
Number of Temporaries funded by Fuels:			

[a]This Table is prepared in accordance with OF&A Instruction Memorandum 2004-028, 9/9/04 – Identifying Fire Organizations in Fire Management Plans, which states, in part: *"In completing this table, only include Preparedness resource numbers funded by Fire Preparedness (2810) and reflect the peak fire organization resources for the year. Do not include resources funded under severity. The fuels related resources numbers are to include the resource funded by the non-WUI (2823) and WUI (2824) programs."*

Table A.8. Currently Approved MEL

Bureau of Land Management Planned Fire Resources - MEL			
Office: Carson City Field Office, Nevada			
Resources	**Quantity**	**Number of Personnel**	**Total Wk. Months**
Number of Engines:	4	18	94
Number of Water tenders:	1	2	8
Number of Dozers:			
Number of Tractors / plows:			
Number of Fire Boats:			
Number of Type 1 Crews:			
Number of Helitack Crews:	1	4	33
Number of Fuels Crews:			
Number of Type 2 Crews sponsored:			
Number of Smokejumpers (AK & NIFC):			
Number of Fire Management Officers:	1		12
Number of Assistant FMOs / FCOs:	1		12
Number of Fire Operations Specialists:	1		12
Number of Dispatchers:	4		36
Number of Other Aviation Staff (Aviation Mgr., Seat Mgr, etc.):			
Number of Mitigation/Education/ Prevention Specialists / Techs:	1		12
Number of Resource Specialists:	1		
Number of Fuels Specialists:	2		
Number of Other Fire Staff:	2		24
Number of PFT funded by Preparedness:	6		
Number of Career Seasonals funded by Preparedness:	7		
Number of Temporaries funded by Preparedness:	11		
Number of PFT funded by Fuels:	3		
Number of Career Seasonals funded by Fuels:			
Number of Temporaries funded by Fuels:			
2810 MEL OPERATIONS DOLLARS			
2810 MEL DOLLARS TOTAL			
MEL FUELS DOLLARS TOTAL			

Assistance Agreements and Intra/Interagency Agreements

Equipment Rental Agreements

Contract Suppression and Prescribed Fire Resources

A.6. Monitoring and Evaluation

A.6.1. Annual Program Assessment

Nevada State Office Level

The Nevada State Office Fire and Aviation Staff and State Director will annually assess the FMP performance in meeting fire and fuels targets through review of the Management Information System (MIS), the National Fire Plan Operations and Reporting System (NFPORS) and annual fire program readiness reviews.

Nevada Field Office Level

Field Office Fire Staff and Line Officer will annually assess the FMP performance in meeting fire and resource management objectives as set forth in the RMP(s) and pertinent plans. Any proposed changes will be coordinated with appropriate staffs and the Nevada State Office.

The FMP is a working reference for wildland fire management and hazardous fuels treatments within this Field Office(s). It will be reviewed annually, and revised as needed, to ensure that the strategic guidance provided in the plan is assisting the Field Office(s) in meeting its resource management and fire/fuels management goals and objectives as identified in the respective MFP/RMP. Revisions, additions, and adjustments that are compliant with the RMP(s) may be incorporated into the FMP. Any major changes to the Fire Management Plan may require amending the RMP.

Annual review of the FMP will also ensure that the fire/fuels program is being implemented in a safe, cost effective manner and as directed in this fire management plan. As new national wildland fire performance measures are issued, monitoring and evaluation protocols will be developed to meet those requirements and follow Department and Bureau guidelines.

Monitoring and evaluation will play a significant role in adaptive management applications of the Fire Management Plan. Monitoring implementation goals include the following:

- Ensure appropriate implementation of standards and guidelines (implementation monitoring) Track resource conditions and identify trends toward or away from desired conditions (status and change monitoring)
- Clarify uncertainties regarding the effectiveness and effects of land management activities (cause and effect monitoring)

A.6.2. Project Monitoring

Baseline inventory efforts at the Field Office level should take place prior to any vegetation treatments associated with prescribed fire, WFU, and non-fire fuels treatments. Effectiveness monitoring following treatment assesses whether objectives have been met, and allows comparison of pre-treatment and post-treatment conditions. Objectives of prescribed fires and other treatments are substantially compromised if the effects of these management actions are ecologically undesirable. A comprehensive monitoring program will entail photo points and some form of vegetation sampling prior to implementation of fuels or vegetation treatments.

Monitoring of weather, fire behavior, and fuel consumption should also take place during implementation of prescribed fire. After all treatments, effectiveness monitoring should continue for a minimum of two years.

The Fire Management and Fuels Staff in individual field offices will generally be responsible for implementing prescribed fire and fuels monitoring plans. Monitoring will ensure the treatments/actions meet the purpose and need for the project. Monitoring reports will be prepared and filed with the project specific plan.

Current BLM National Office direction allows for both prescribed fire and non-fire treatment funds (2823/2824) to be utilized within one-year post fire or non-fire treatment and is designated for monitoring treatment objectives or specific protection objectives.

A.6.3. Emergency Stabilization and Rehabilitation:

The Nevada Emergency Supplemental Emergency Stabilization, Rehabilitation Guidance and ESR Plan provides guidance that supplements BLM Handbook H-1742-1 Emergency Fire Rehabilitation, which outlines the process for implementing emergency fire rehabilitation projects following wildland fires and wildland fire use. Emergency fire rehabilitation funds may be used to:

- Protect life, property, soil, water, and vegetation resources.
- Prevent unacceptable onsite or offsite damage.
- Facilitate meeting land use plan objectives and other federal laws.
- Reduce the invasion and establishment of undesirable or invasive vegetation species.
- Monitor rehabilitation efforts to facilitate future plans and implementation and to measure effects of efforts.

A.6.4. Reporting

Wildland Fire

All wildland fire actions will be documented on the DI-1202 as appropriate. The Individual Field Office(s)/Cooperating agency is responsible for timely submission of report information.

Prescribed Fire/Non-fire Treatments

Accomplishments of fire and fuels hazard reduction projects will be reported in the Management Information System (MIS) and National Fire Plan Operations and Reporting System (NFPORS).

A.6.5. Fire Research

Fire Management Plans and programs will be based on a foundation of sound science. Information needed to support fire management will be developed through an integrated interagency fire science program. Scientific results must be made available to managers in a timely manner and must be used in the development of land management plans, Fire Management Plans, and implementation plans.

Appendix B. Design Features and Best Management Practices for VRM

B.1. Utility Scale Solar Energy Project Design Features for Visual Resources

The following design features have been identified in the Approved Resource Management Plan Amendments/Record of Decision for Solar Energy Development in Six Southwestern States (2012). The design features have been incorporated to avoid, minimize, and/or mitigate potential impacts on visual resources from utility-scale solar energy development.

B.1.1. General

VR1-1 Project developers shall consult with the BLM in the early phases of project planning to help determine the proposed project's potential conformance to VRM class designations and other potential constraints, thus avoiding costly unforeseen planning implications and re-design.

(a) Assessing conformance to VRM class designations and identifying visual resource conflicts shall include, but is not limited to, the following:

- Consulting with the appropriate BLM field office for VRM class designations and associated management objectives during the early phases of project planning, including those related to project site selection, planning, and design. The BLM visual resource inventory (VRI) class values—including those for scenic quality, sensitivity, and distance zones—shall also be factored into the project planning, design, and decision making.
- Analyzing how the visual values influence project design and how the impacts on these values will be minimized through consideration for the proposed project location and its relationship to the surrounding viewshed.
- Including a qualified professional, such as a landscape architect, with demonstrated experience of the BLM's VRM policies and procedures as part of the developer's and the BLM's respective planning teams, to evaluate visual resource issues as project siting options are considered.
- Consulting with the locally based public to provide input on identifying important visual resources in the project area and on the siting and design process. The public shall be involved and informed about the visual site design elements of the proposed solar energy facilities.
- Consulting on viewshed protection objectives and practices with the respective land management for landscapes having special designations, such as Wilderness Areas, National Scenic and Historic Trails, Wild and Scenic Rivers, National Parks, and National Wildlife Refuges located within the project's viewshed. Developers shall demonstrate a concerted effort to reconcile conflicts while recognizing that the BLM retains authority for final decisions determining project approval and conditions.
- For applications that include artifacts and remnants of a National Historic Trail, are located within the viewshed of a National Historic Trail's designated centerline, or include or are within the viewshed of a trail eligible for listing on the National Register of Historic Places (NRHP)

by virtue of its important historical or cultural values and integrity of setting, evaluating the potential visual impacts on the trail associated with the proposed project; avoiding, minimizing, and/or mitigating adverse effects through the Section 106 consultation process; and identifying appropriate mitigation measures for inclusion as stipulations in the POD.

- Considering landscape settings observed from a unit of the National Park system, National Historic Sites, National Trails, and cultural resources of tribal concern that may be a part of the historic context contributing to the historic significance of the site or trail.
- Project developers are encouraged to obtain topographical data of engineering-design quality and use digital terrain mapping tools at a landscape-viewshed scale for project location selection, site planning and design, visual impact analysis, and visual impact mitigation planning and design. The digital terrain-mapping tools shall be at a resolution and contour interval suitable for site design and accurate placement of proposed developments into the digital viewshed. Visual simulations shall be prepared and evaluated in accordance with BLM Handbook H-8431-1 and other agency directives, to create spatially accurate and realistic depictions of the appearance of proposed facilities. Simulations shall depict proposed project facilities from key observation points (KOPs) and other visual resource sensitive locations.
- Conducting outreach through public forums as necessary to disseminate visual resource information through methods such as offering organized tours of operating solar energy development projects, and using simulations in public presentations.
- Performing visual mitigation planning and design through field assessments, applied global positioning system (GPS) technology, photo documentation, use of computer-aided design and development software, three-dimensional GIS modeling software, and imaging software to depict visual simulations to reflect a full range of visual resource mitigation measures.

B.1.2. Site Characterization, Siting Design and Construction

VR2–1 Solar facilities shall be sited and designed to minimize glint and glare.

(a) Identification of glint and glare effects shall include, but is not limited to, the following:

- Assessing and quantifying potential glint and glare effects and determining the potential safety and visual impacts associated with glint and glare using appropriate and commonly accepted software, procedures, and past project examples.
- Having qualified individuals conduct assessments for glint and glare.

(b) Methods to minimize glint and glare effects may include, but are not limited to, the following:

- Limiting use of signs and project construction signs. Beyond those required for basic facility and company identification for safety, navigation, and delivery purposes, commercial symbols or signs and associated lighting on buildings and other structures should be prohibited.
- Utilizing retro reflective or luminescent markers in lieu of permanent lighting.
- Minimizing off site visibility of all commercial symbols and signs and associated lighting. Necessary signs should be made of non-glare materials and utilize unobtrusive colors. The reverse sides of signs and mounts should be painted or coated using a suitable color selected from the BLM Standard Environmental Color Chart to reduce contrasts with the existing

landscape. However, placement and design of any signs required by safety regulations must conform to regulatory requirements.

- Considering off-site mitigation of visual impacts. In some situations, off-site mitigation may serve as a means to offset and/or recover the loss of visual landscape integrity. For example, off-site mitigation could include reclaiming unnecessary roads, removing abandoned buildings, reclaiming abandoned mine sites, putting utility lines underground, rehabilitating and revegetating existing erosion or disturbed areas, or establishing scenic conservation easements. Appropriate off-site mitigation will be determined on a project-specific basis in consultation with the BLM.

VR2–2 Solar facilities shall be sited and designed to minimize night-sky effects.

(a) Identification of night-sky effects shall include, but is not limited to, the following:

- Assessing and quantifying potential lighting impacts on the night sky and nocturnal wildlife, while providing lighting for hazard marking, safety, and other necessary site needs.
- Conducting assessments for night-sky effects by qualified individuals using appropriate and commonly accepted procedures and past project examples.

(b) Methods to minimize night-sky effects may include, but are not limited to, the following:

- Using minimum intensity lighting that meets safety criteria. When accurate color rendition is not required (e.g., roadway, basic security), lighting shall be amber in color, using low-pressure sodium lamps, yellow LED lighting, or equivalent. When white light is required for accurate color rendition, it shall be equal to or less than 3500° Kelvin color temperature. Bluish-white lighting is discouraged.
- Prohibiting the use of red or white strobe lighting unless the BLM approves its use because of conflicting mitigation requirements.
- Fully shielding all permanent lighting (e.g., full cut-off), except for collision markers required by the FAA or other emergency lighting triggered by alarms.
- Mount lighting so that no light is emitted above an imaginary horizontal plane through the fixture.
- Considering lighting control through timers, sensors, dimmers, or switches that are available to facility operators.
- Considering vehicle-mounted lights over permanently mounted lighting for nighttime maintenance activities. When possible, such vehicle-mounted lighting shall be aimed toward the ground to avoid causing glare and skyglow.

VR2–3 The siting and design of solar facilities, structures, roads, and other project elements shall explore and document design considerations for reducing visual dominance in the viewshed and shall comply with the VRM class objectives in conformance with VR1-1.

(a) Assessing visual dominance shall include, but is not limited to, the following:

- Conforming with VRM class objectives through the use of the BLM contrast rating procedures defined in BLM Handbook H-8431-1. Visual contrast rating mitigation of visual impacts shall

abide by the requirements outlined in the handbook and other BLM directives. Revised project plans and simulations are to be reevaluated by using the contrast rating procedures.

- Selecting KOPs by first determining the extent of the viewshed using the viewshed modeling tools previously cited under VR1-1. The viewshed modeling shall illustrate the areas from which the proposed facilities may be seen out to 25 mi (40 km). From within the areas, KOPs are to be selected at places where people would be expected: scenic overlooks, roads, trails, campgrounds, recreationally active river corridors, residential areas, etc. For the purpose of conducting a visual contrast rating evaluation, the number of KOPs would be reduced to those that serve as the best representations for demonstrating conformance to the respective VRM class objectives. The BLM is consulted on the KOP selections, and reserves the right to require additional KOPs to further determine the extent of visual impacts and conformance to VRM class objectives.

- Integrating visual design elements into the construction plans, details, drawings, and specifications for the project.

- Incorporating facility siting measures to minimize the profile of all facility-related structures to reduce visibility and visual dominance within the viewshed, particularly for facilities proposed within the foreground/middleground distance zone (0–5 mi [0–8 km]) of sensitive viewing locations.

(b) Measures to minimize visual dominance may include, but are not limited to, the following:

- Using existing topography and vegetation as screening or partially screening devices.

- Incorporating visual design elements when planning for grubbing and clearing, vegetation thinning and clearing, grading, revegetation, drainage, and structural measures.

- Minimizing visual dominance of projects by siting projects outside the viewsheds of KOPs or by diminishing dominance through maximizing visible separation with distance.

- Avoiding, when feasible, locating facilities near visually prominent landscape features (e.g., knobs and waterfalls) that naturally draw an observer's attention.

- Avoiding visual "skylining" by placing structures, transmission lines, and other facilities away from ridgelines, summits, or other locations where they would silhouette against the sky from important viewing locations; however, consideration should be given to the potential for increased ground disturbance and other resource impacts.

- Designing linear features (e.g., ROWs and roads) to follow natural land contours rather than straight lines; however, consideration should be given to the potential for increased ground disturbance and other resource impacts.

- Locating linear developments (e.g., transmission lines, pipelines, roads) at the edges of natural clearings or natural lines of transition between vegetation type and topography.

- Considering alternative means of access in visually sensitive areas, to preserve the natural landscape conditions between tower locations.

- Minimizing vegetation and ground disturbance, and taking advantage of existing clearings where feasible.

- Reducing cut and fill for structures and roads by design and location. Retaining walls, binwalls, half bridges, etc., can be used to reduce cut and fill.

- Considering rounded and varied road-cut slopes and the cut-andfill pitches to reduce contrasts in form and line; encouraging slope cuts to preserve specimen trees and nonhazardous rock outcroppings.

- Considering sculpting and shaping natural or previously excavated bedrock landforms when excavation of these landforms is required. For example, percent backslope, benches, and vertical variations may be integrated into a final landform that repeats the natural shapes, forms, textures, and lines of the surrounding landscape. The earthen landform may be integrated and transitioned into the excavated bedrock landform. Sculpted rock face angles, bench formations, and backslope could adhere to the natural bedding planes of the natural bedrock geology. The color contrast from the excavated rock faces may be removed by color treating with a rock stain. Native vegetation or a mix of native and non-native species (if necessary to ensure successful revegetation) could be reestablished with the benches and cavities created within the created bedrock formation.

- Designing and installing natural-looking earthwork landforms, or vegetative or architectural screening to minimize visual impacts. Considering shape and height of earthwork landforms for adaptation to the surrounding landscape.

- Repeating the size, shape, and characteristics of naturally occurring openings in vegetation for facilities, structures, roads, etc.

- Burying electrical collector lines, pipelines, and communication and local utility lines to minimize additional surface disturbance where feasible (e.g., along roads or other paths of surface disturbance).

- Minimizing visual impacts associated with solar energy and electricity transmission projects by choosing appropriate building and structural materials and surface treatments (i.e., paints or coatings designed to reduce contrast and reflectivity). A careful study of the site should be performed to identify appropriate colors and textures for materials; both summer and winter appearance shall be considered, as well as seasons of peak visitor use. Materials and surface treatments shall repeat and/or blend with the existing form, line, color, and texture of the landscape.

- Considering the typical viewing distances and landscape when choosing colors. Appropriate colors for smooth surfaces often need to be two to three shades darker than the background color to compensate for shadows that darken most textured natural surfaces. The BLM Standard Environmental Color Chart CC-001 and guidance shall be referenced when selecting colors.

- Selecting appropriately colored materials for structures, or stains/coatings to blend with the project's backdrop. Materials, coatings, or paints having little or no reflectivity shall be used whenever possible.

- Color treating solar panel/mirror/heliostat backs/supports to reduce visual contrast with the landscape setting.

- Color treating solar towers to reduce visual contrast.

- Considering multiple-color camouflage technology application projects within sensitive viewsheds and with a visibility distance that is between 0.25 and 2 mi (0.40 and 3.20 km).
- Matching aboveground pipelines' paint or coating to their surroundings.
- Considering the appropriate choice of monopoles versus lattice towers for a given landscape setting to further reduce visual impacts.
- Utilizing nonspecular conductors and nonreflective coatings on insulators for electricity transmission/distribution projects.
- Minimizing the use of signs. Where signs are necessary, they shall be made of non-glare materials and utilize unobtrusive colors. The reverse sides of signs and mounts shall be painted or coated by using the most suitable color selected from the BLM Standard Environmental Color Chart; however, placement and design of any signs required by safety regulations must conform to regulatory requirements.
- Clearly delineating construction boundaries and minimizing areas of surface disturbance; preserving vegetation to the greatest extent possible; utilizing undulating surface disturbance edges; stripping, salvaging, and replacing topsoil; using contoured grading; controlling erosion; using dust suppression techniques; and stabilizing exposed soils.
- Considering mulching and spreading slash from vegetation removal over fresh soil disturbances.
- Avoiding leaving slash piles in sensitive viewing areas.
- Considering restoration of disturbed soils by use of weed-free native grasses, forbs, and shrubs representative of the surrounding and intact native vegetation composition and/or using non-native species, if necessary, to ensure successful revegetation.
- Reducing the visual color contrast of graveled surfaces with approved color treatment practices.
- Considering segregating and spreading topsoil from cut-and-fill activities on freshly disturbed areas to reduce color contrast.
- Avoiding leaving topsoil piles in sensitive viewing areas.
- Spreading excess cut and fill material within project disturbance area and vegetate per approved restoration plan requirements while maintaining natural drainage pathways. Where soil cannot reasonably be spread within project disturbance areas, excess cut-and-fill materials should be hauled out to minimize ground disturbance and impacts from piles.
- Removing stakes and flagging from the construction area after completion of construction.

VR2–4 Project developer shall perform a pre-construction meeting with BLM or their designated visual/scenic resource specialists, such as a landscape architect, to coordinate the project construction VRM mitigation strategy. Final design and construction documents will be reviewed with regard to the visual mitigation elements, assuring that requirements and commitments are adequately addressed. The review of construction documents will include, but not be limited to, grading, drainage, revegetation, vegetation clearing, and feathering.

B.1.3. Operations and Maintenance

VR3-1 Compliance with the terms and conditions for VRM mitigation shall be monitored by the project developer. Consultation with the BLM shall be maintained through operations and maintenance of the project, employing an adaptive management strategy and modifications, as necessary and approved by the BLM.

(a) Maintaining the visual resource design elements during operations and maintenance shall include, but is not limited to, the following:

- Maintaining revegetated surfaces until a self-sustaining stand of vegetation is reestablished and visually adapted to the undisturbed surrounding vegetation. No new disturbance shall be created during operations without completion of a VRM analysis and approval by the BLM authorized officer.

- Keeping painted and color-treated facilities in good repair and repainting when the color fades or flakes.

- Using interim restoration during the operating life of the project as soon as possible after land disturbances.

- Including dust abatement and noxious weed control in maintenance activities.

- Deploying and operating mirrors/heliostats to avoid high-intensity light (glare) reflected off-site. Where off-site glare is unavoidable and project site/off-site spatial relationships favor effective results, fencing with privacy slats or similar screening materials should be considered.

B.1.4. Reclamation and Decommissioning

VR4-1 Reclamation of the construction site shall begin immediately after construction to reduce the likelihood of visual contrasts associated with erosion and invasive weed infestation and to reduce the visibility of temporarily disturbed areas as quickly as possible. Developers shall coordinate with BLM in advance of interim/final reclamation to have BLM or other designated visual/scenic resource specialists, such as a landscape architect, on-site during reclamation to work on implementing visual resource requirements and BMPs.

(a) Methods for minimizing visual contrast associated with reclamation and decommissioning of the project may include, but are not limited to, the following:

- Including treatments, such as thinning and feathering vegetation along project edges, enhanced contour grading, salvaging landscape materials from within construction areas, special revegetation requirements (e.g., use of mix of native and non-native species).

- Designing and implementing restoration of the project area to predevelopment visual conditions and the inventoried visual quality rating, or to that of the surrounding landscape setting conditions to the best extent possible or to conditions agreed upon by the BLM.

- Removing aboveground and near-ground-level structures. Some structures may need to be removed to a level below the ground surface to allow reclamation/restoration.

- Considering contouring soil borrow areas, cut-and-fill slopes, berms, water bars, and other disturbed areas to approximate naturally occurring slopes. Contouring to a rough texture would trap seeds and discourage off-road travel, thereby reducing associated visual impacts. Cut slopes can be randomly scarified and roughened to reduce texture contrasts with existing landscapes and aid in revegetation.
- Utilizing native vegetation to establish a composition consistent with the form, line, color, and texture of the surrounding undisturbed landscape.
- Reapplying stockpiled topsoil to disturbed areas, where applicable, or using a mix of native and non-native species if necessary to ensure successful revegetation.
- Removing or burying gravel and other surface treatments.
- Restoring rocks, brush, and forest to approximate pre-existing visual conditions.
- Integrating feathering edges of vegetation to reduce form and line contrasts with the existing landscapes.

B.2. Best Management Practices for Reducing Visual Impacts of Renewable Energy Facilities

The following applications have been identified in the Best Management Practices for Reducing Visual Impacts of Renewable Energy Facilities on BLM-Administered Lands (2013). The use of best management practices (BMPs) to avoid or reduce the visual impacts of development is a key component of the BLM's fulfillment of its scenic resource management requirements while meeting is goals to facilitate renewable energy development on BLM-administered lands. The BLM publication presents 122 BMPs to avoid or reduce potential visual impacts associated with the siting, design, construction, operation, and decommissioning of utility-scale renewable energy generation facilities, including wind, solar, and geothermal facilities. The BLM publication provides a complete detailed description of the BMPs, which are summarized below.

Table B.1. Wind Energy

Facility BMPs and Applicable Project Phases	Siting and Design	Construction	Operations	Decommissioning and Reclamation
Consider Topography When Siting Wind Turbines	X			
Cluster or Group Turbines to Break up Overly Long Lines of Turbines	X			
Create Visual Order and Unity among Turbine Clusters	X			
Site Wind Turbines to Minimize Shadow Flicker	X			
Relocate Turbines to Avoid Visual Impacts	X			

Facility BMPs and Applicable Project Phases	Siting and Design	Construction	Operations	Decommissioning and Reclamation
Use Audio Visual Warning System (AVWS) Technology to Reduce Night Sky Impacts	X			
Create Visual Uniformity in Shape, Color, and Size	X			
Use Fewer, Larger Turbines	X			
Use Non-reflective Coatings on Wind Turbines and Other Facility Components	X			
Prohibit Commercial Messages and Symbols on Wind Turbines	X			
Keep Wind Turbines in Good Repair			X	
Clean Nacelles and Towers			X	

Table B.2. Solar Energy

Facility BMPs and Applicable Project Phases	Siting and Design	Construction	Operations	Decommissioning and Reclamation
Develop and Glint and Glare Assessment, Mitigation, and Monitoring Plan	X			
Use Dry-Cooling Technology for CSP Facilities	X			
Site and Operate Solar Collectors to Avoid Off-site Glare	X		X	
Screen Solar Collectors to Avoid Off-site Glare	X			
Use Color-Treated Solar Collectors and Support Structures	X			
Maintain Color-Treated Surfaces of Solar Collectors			X	
Avoid Complete Removal of Vegetation beneath Solar Collector Array		X		

Facility BMPs and Applicable Project Phases	Siting and Design	Construction	Operations	Decommissioning and Reclamation
Prohibit Commercial Messages and Symbols on Solar Power Towers and Solar Collector Arrays	X			

Table B.3. Geothermal Energy

Energy Facility BMPs and Applicable Project Phases	Siting and Design	Construction	Operations	Decommissioning and Reclamation
Use Dry-Cooling Technology	X			
Screen Pipelines from Roads and Other Sensitive Viewpoints	X			
Paint or Coat Aboveground Pipelines	X			
Minimize Drill Rig and Well Test Facility Lightning		X	X	

Despite using very different approaches and technologies for generating energy, there are numerous facility elements in common, including electric transmission infrastructure, roads, buildings, tanks, and other structures. Development of the facilities involves common processes as well, including both planning activities, such as facility siting and design, and "on the ground" activities, such as vegetation clearance and recontouring. BMPs that relate to these common facility elements and processes separately are referred to as "Common Element" BMPs and are based on common themes. Although they may deal with different physical or planning elements, the BMPs within each topic area share a common principle or purpose. The BLM publication provides a complete detailed description of the BMPs. The ten topic areas are summarized below.

- Mitigation Planning — Address planning issues concerning visual impact analysis and mitigation, including making sure that qualified parties conduct the work using appropriate methods, and that necessary planning documents are in place.
- Siting and Design — Ensure that facilities and their components are sited and designed to avoid or reduce impacts on visually sensitive areas.
- Structure Design and Materials Selection — Address the selection and design of structures, landforms, and other materials to blend with the existing landscape setting.
- Materials Surface Treatment — Address the selection of appropriate colors and surface treatments for structures to reduce color contrast with the surrounding natural environment.
- Lighting — Ensure that projects minimize dark sky impact through proper lighting design and usage.

- Avoiding Disturbance — Avoid or minimize lands and other types of disturbance.
- Soils and Erosion Management — Avoid or reduce visual impacts from wind and water erosion through dust control, erosion and sediment control, and topsoil management.
- Vegetation Management — Vegetation protection, vegetation clearing techniques, and measures to promote successful revegetation.
- Reclamation — Promote successful interim and long-term reclamation through good recontouring practices, site preparation to promote revegetation, and removal of structures and surface treatments.
- Good Housekeeping — Address measures to keep the site clean and orderly during construction, operations, and decommissioning.

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Appendix C. Fluid Leasable Mineral Management

C.1. Summary

Fluid minerals include oil and gas; geothermal resources and by-products, and oil shale, native asphalt, oil impregnated sands, and any other material in which oil is recoverable only by special treatment after the deposit is mined or quarried. Leasable minerals are associated with the following laws: Mineral Leasing Act of 1920, as amended and supplemented, Mineral Leasing Act for Acquired Lands of 1947, as amended, and the Geothermal Steam Act of 1970, as amended.

These acts provide that all public lands are open to fluid mineral leasing, unless a specific order has been issued to close an area. However, it is important to note that lease issuance by the Secretary of the Interior, through the BLM, is a discretionary action. The BLM can control the geographic location and timing of lease parcels it offers. The agency can also add lease stipulations to the standard lease terms and conditions; this can impose additional constraints on the timing and methods of drilling for oil and gas. It is BLM's policy to apply the least restrictive constraint to meet the resource protection objective. Table C.1, "Summary of Fluid Mineral Leasing Acreages" (p. 1713) summarizes the acres that are open and closed to fluid mineral leasing under the Proposed RMP.

Areas available for fluid mineral leasing are identified through management determinations during the planning process. These determinations designate the land as closed or open to leasing, and if open, what constraints, if any should be applied to the lease. The BLM can apply mitigation measures to surface use activities associated with existing land-use authorizations as a Condition of Approval (COA). The BLM has the discretion to modify surface operations to change or add specific mitigation measures when supported by scientific analysis. All mitigation/conservation measures not already required as stipulations would be analyzed in a site-specific NEPA document, and be incorporated, as appropriate, into conditions of approval of the permit, plan of development, and/or other use authorizations. In discussing surface use rights, 43 CFR 3101.1-2 states that the lessee has the right "to use so much of the leased lands as is necessary to explore for, drill for, mine, extract, remove and dispose of all the leased resource" but lessees are still subject to lease stipulations, nondiscretionary statutes, and "such reasonable measures as may be required by the authorized officer to minimize adverse impacts to other resource values, land uses or users not addressed in the lease stipulations at the time operations are proposed". Lessees are also required to conduct operations in a manner that not only "results in maximum ultimate economic recovery of oil and gas with minimum waste" but also "protects other natural resources and environmental quality" (43 CFR 3162.1). While it would not be consistent with lease rights granted to preclude any development of the lease, the BLM may require relocation of proposed operations by more than 200 meters and may prohibit surface disturbing operations for more than 60 days when such action has been deemed necessary, through a site-specific NEPA analysis, to minimize adverse impacts to other resource values, land uses, or users.

Stipulations modify the lease rights beyond the standard lease terms. Constraints are considered to be either major, such as No Surface Occupancy (NSO), or moderate. Moderate constraints consist of timing limitations (seasonal restrictions) and Controlled Surface Use (CSU) restrictions. Timing Limitations (TL) indicate that a leased area generally is open to development activities except during a specified period of time to protect identified resource values such as wildlife.

CSU stipulations may require operating constraints to protect resources year round; for example, limiting travel to existing roads and trails or a requirement for the operator to submit a plan outlining how development will be conducted on steep slopes so that erosion is controlled and interim and final reclamation is ensured in accordance with Gold Book standards. A stipulation is an enforceable term of the lease contract, supersedes any inconsistent provisions of the standard lease form, and is attached to and made a part of the lease. Lease stipulations further implement the BLM's regulatory authority to protect resources or resource values.

A Lease Notice may be attached to the lease to inform potential lessees of important resource issues or to convey certain operational, procedural, or administrative requirements relative to lease management within the terms and conditions of the standard lease form. Lease Notices are listed with Stipulations below.

Resources are further protected during operational activities through the application of Best Management Practices (BMP) (state-of-the-art mitigation measures) www.blm.gov/bmp and as contained in the Gold Book (U.S. Department of the Interior and U.S. Department of Agriculture 2007). The operator may incorporate BMPs into the permit application or the BLM may incorporate BMPs into the approved permit as site-specific conditions of approval.

Under certain conditions, exceptions, modifications, and waivers to lease stipulations may be granted. The circumstances for granting an exception, waiver, or modification are attached to each stipulation.

An exception is a one-time exemption for a particular site within the leasehold; exceptions are determined on a case-by-case basis; the stipulation continues to apply to all other sites within the leasehold. An exception is a limited type of waiver. For example, an exception could be granted for a seasonal restriction on drilling by allowing construction later into the season if the winter is more severe than normal and the desert tortoise is not expected to emerge from their burrows until later in the season when it is warmer. In subsequent years, the conditions could change and preclude an exception being granted. Normally, exceptions are considered minor actions and, therefore, are not subject to a 30-day public review.

A modification is a change to the provisions of a lease stipulation, either temporarily or for the term of the lease. A Modification may maintain, increase, or decrease the level of environmental protection. Depending on the specific modification, the stipulation may or may not apply to all sites within the leasehold to which the restrictive criteria are applied. An example of a modification could be changing the terms of a big horn sheep controlled surface use stipulation or changing the area where the lease stipulation applies if BLM, in consultation with Nevada Department of Wildlife, determines that the terms are less restrictive or more restrictive than necessary based on new science or portions of the area can be occupied without adversely affecting the big horn sheep. Public notice is required only if the Authorized Officer determines it is of major public concern.

A waiver is a permanent exemption from a lease stipulation. The stipulation no longer applies anywhere within the leasehold. The stipulation waiver can be considered concurrent with application for permit to drill approvals and can be accomplished with any NEPA vehicle available such as an environmental assessment, determination of NEPA adequacy, categorical exclusion, or any similar process available to the Southern Nevada District Office. Waivers are identified with the stipulations for various resource concerns.

A lease stipulation may be excepted, waived, or modified as per Title 43 Code of Federal Regulations Section 3101.1-4 and BLM policy. An exception, waiver, or modification is allowable only if the Authorized Officer determines that the factors leading to its inclusion in the lease have changed sufficiently to make requirements of the stipulation(s) no longer justified, or mitigation contained in individual permits will preclude unacceptable impacts. If the exception, waiver, or modification is of major concern to the public, such modification will be subject to a 30-day public review. This review can be held concurrent with the required 30-day posting of Applications for Permit to Drill (APD).

Table C.1. Summary of Fluid Mineral Leasing Acreages[a]

Summary of Fluid Mineral Leasing Acreages	Acres
Open to Fluid Mineral Leasing	
Standard Lease Terms and Conditions	1,542,307
Moderate Restrictions (Timing Limitations /Controlled Surface Use)	369,834
Major Restrictions (No Surface Occupancy)	838,824
Open Total	2,750,965
Closed to Fluid Mineral Leasing	
Designated Wilderness/Wilderness Study Areas	182,771
Discretionary Closures	199,952
Closed – Total	382,723
Total Acreage	3,133,688

[a]Note: The acreage listed in the table is derived from Alternative 3. These acreages will change based on the management decisions for the RMP. Acreage is shown on Map 2.6.2.3 - 3.

C.2. Open to Fluid Mineral Leasing

Standard Lease Terms and Conditions – Allow leasing on approximately 1.5 million acres open to leasing subject to existing laws, regulations, formal orders, notices attached to the lease form, and the terms and conditions of the standard lease form. Standard lease terms and conditions are included within the lease forms.

C.3. Open to Fluid Mineral Leasing Subject to Moderate Constraints

Timing Limitations (TL) and Controlled Surface Use (CSU)

Where standard lease terms and conditions are deemed insufficient to protect sensitive resources, but where a NSO stipulation is deemed overly restrictive, the BLM will apply seasonal or time limited stipulations or controlled surface use stipulations to leases. In general, timing limitations are used to protect resources that are sensitive to disturbance during certain periods. Such stipulations are generally applicable to specific areas, seasons, and resources. They are commonly applied to wildlife activities and habitat, such as active season for desert tortoise; nesting habitat for raptors and migratory birds; and breeding areas for bighorn sheep. CSU and TL stipulations apply to the following Species:

- **Desert Tortoise Habitat** – The desert tortoise is listed as a threatened species under the Endangered Species Act. Timing limitations and controlled surface use are required to protect desert tortoise during the most active period.

- **Desert Bighorn Sheep Habitat** – The desert bighorn sheep is a Nevada BLM sensitive species and is a priority species in the planning area. Timing limitations are required to protect desert bighorn sheep from disturbance during lambing and the crucial hot summer months.

- **Raptors** – Raptors (i.e., hawks, eagles, owls, etc.) are protected under numerous laws including the Migratory Bird Treaty Act, the Bald and Golden Eagle Protection Act, and the Endangered Species Act of 1973. Timing limitations are required to protect raptor nesting activities.

- **Special Status Plant Species -** Lands which may have areas known to contain threatened, endangered, or BLM or State sensitive species and will require additional measures before surface disturbing activities can occur. A rare plant survey following the SNDO rare plant survey protocol by a BLM approved botanist is typically required.

CSU stipulations require that vehicular activity be confined to preexisting roads and trails to achieve resource protection. Lands open to leasing with timing limitations and controlled surface use stipulations total 369,834 acres. Table C.2, "SNDO Stipulations for Fluid Minerals " (p. 1716) contains a complete description of all the lease stipulations.

C.4. Open to Fluid Mineral Leasing Subject to Major Constraints

No Surface Occupancy (NSO)

An NSO is appropriate when the standard terms and conditions and other less restrictive lease stipulations are determined to be insufficient to achieve the resource protection objectives. Areas with a NSO designation will not be accessible from the surface and no surface disturbance would be allowed. This means that these leases could be directionally drilled from outside the designated boundary to drain the resource. Based on a NEPA analysis, geophysical exploration may be allowed on a case-by-case basis. Areas designated NSO are listed in Table C.2, "SNDO Stipulations for Fluid Minerals " (p. 1716).

The BLM cannot lease land for fluid mineral exploration and development, if an operator cannot access the resource to drain it, or it would be considered a "take." NSO areas greater than 2 miles wide will have their cores or centers closed to mineral entry leaving a one mile NSO buffer around the interior. This would allow an operator to still drain the resource under the NSO areas by setting up a drill rig just outside of the NSO boundary and drill underneath the NSO using current drilling and recovery technology while facilitating feasible, near future, technological advances which would expand their range. For example, if an ACEC is five miles wide and has an NSO stipulation, an operator may not be able to access the resource more than a half mile to a mile inside the ACEC boundary. Therefore, leasing the land beyond that one mile lateral access may be considered a "take." Closing the interior beyond the one mile NSO buffer inside the ACEC would avoid "takes" and still maintain the original intent to protect the ACEC. The ACECs with these buffers are Gold Butte Part A, Mormon Mesa, Coyote Springs, Piute/Eldorado and Rainbow Gardens. Please refer to Maps 2.6.3.1 - 1 to 2.6.3.1 - 4.

C.5. Closed to Fluid Mineral Leasing

These are areas where it has been determined that the exploration and development of fluid minerals would severely impact the desert tortoise or other resources. Approximately 1 million acres will be closed to leasing including designated wilderness/wilderness study areas,

congressionally mandated closures, ACECs, wild and scenic rivers, SRMAs, and additional discretionary closures.

As noted under the Open to Fluid Mineral Leasing Subject to Major Constraints, ACECs that exceed two miles in width, the outer one mile perimeter is designated as No Surface Occupancy and the remainder is closed to leasing. Areas closed to leasing are shown in Table C.2, "SNDO Stipulations for Fluid Minerals " (p. 1716).

C.6. Geophysical Exploration

Geophysical exploration on public land requires approval of the methods employed and mitigation of impacts. The BLM Resource Area Office must receive a Notice of Intent (NOI) to perform geophysical operations. BLM specialists examine the NOI and the site to be explored, as well as the RMP in determining appropriate mitigative measures and reclamation requirements. The mitigative measures and reclamation requirements are attached to the approval.

C.7. Stipulation Maintenance

The BLM will regularly maintain wildlife databases of species subject to the above stipulations to reflect current inventory status. For example, an updated desert tortoise inventory may show the location of a new critical habitat for which the BLM will apply the appropriate lease stipulation in subsequent lease sales.

C.8. Split Estate Minerals

Public land can involve split mineral estate situations, which have separate surface ownership than subsurface ownership. For example, a parcel may contain private surface ownership and federal subsurface ownership, or it may contain federal surface ownership and private subsurface ownership. Authorization to conduct geophysical exploration on a split estate lands are only necessary when the surface owner denies access to the oil and gas lessee or its operator. The BLM will use the procedures in section VI, Operating on Lands With Non-Federal Surface and Federal Oil and Gas of Onshore Oil and Gas Order No. 1. If it becomes necessary, the authorized officer (AO) will grant permission to conduct geophysical exploration under the authority in 43 CFR 3150 using the Notice of Intent to Conduct Oil and Gas Geophysical Exploration Operations, Form 3150-4.

C.9. Hydraulic Fracturing

The BLM's existing hydraulic fracturing regulations are found at 43 CFR 3162.3-2. These regulations were established in 1982. The increased use of hydraulic fracturing over the last decade has generated concern from the public and from such other sources as the Secretary of Energy's Advisory Board Subcommittee on Natural Gas, about how these operations may be affecting surface and subsurface water. The SNDO will review applications under the current regulations and apply the recommendations on hydraulic fracturing from the Secretary of Energy.

The State of Nevada Division of Minerals requires the operator to submit the amount and type of chemicals used in a hydraulic fracturing operation as part of the condition of approval for all oil and gas drilling permits and sundry notices.

Hydraulic fracturing will be analyzed separately, assessing geologic and hydrologic impacts.

C.9.1. Groundwater Protection Analysis and Documentation Process

It will be required to protect usable groundwater zones, including Sole Source Aquifers (SSAs) and Drinking Water Source Protection Zones (DWSPZs), are protected through review and analysis at the filing of a notice of staking (NOS) or application for permit to drill (APD), and during subsequent drilling and completion operations. The applicant will submit adequate documentation on geologic and hydrologic data and proposed casing-cement program adequacy. These documents must include, at a minimum, the requirements found in the Onshore Order No. 1, Section III, D., 3. Drilling Plan, and D., 4. Surface Use Plan of Operations, and contain the necessary mitigation measures, Conditions of Approval (COAs), references and other documentation.

Specialists Review – The geologist and hydrologist review the operator's submitted NOI, ADP, Surface Use Plan of Operations (SUPO) and hydraulic fracking sundry notices for surface and/or usable groundwater resource protection adequacy, including potential impacts to shallow groundwater from reserve pit design and construction. If during the geologic and hydrogeologic review process groundwater occurrence and/or depth cannot be determined, a hydrologic assessment of the proposed well pad and pit location will be required. A semi-closed loop system for drilling fluids must be used if a well is proposed to be drilled in a SSA and may be required in a DWSPZ if deemed necessary by the AO. In all cases, the reserve pit will be inspected after construction and prior to drilling to verify the absence of porous soils/fractured bedrock or integrity of the liner. Utilize Gold Book guidance to complete a comprehensive review.

Further stipulations, modifications and mitigation measures could be identified in the NEPA processes for each project and be included as needed.

C.10. Fluid Mineral Lease Notice and Stipulations Specific to SNDO

SNDO may attach the Desert Tortoise Notice to a lease to inform the potential lessees of important resource issues under existing laws and regulations that may result in delays associated with subsequent permitting, and appropriate mitigation of those resource concerns.

Table C.2. SNDO Stipulations for Fluid Minerals

Resource	Stipulation
ACEC's	Controlled Surface Use (CSU)
Desert Tortoise Critical Habitat in ACEC's	No Surface Occupancy (NSO)
Desert Tortoise Habitat	Timing Limitation (TL)
Special Status Plants	Controlled Surface Use (CSU)
Split Estate	No Surface Occupancy (NSO)
Threatened, Endangered and Special Status Species	Controlled Surface Use (CSU)
Valley of Fire State Park	No Surface Occupancy (NSO)

C.10.1. Desert Tortoise Notice

All proposed projects in desert tortoise habitat will require Section 7 consultation with the U.S. Fish and Wildlife Services. The BLM must ensure that the impacts from the operation do not jeopardize the continued existence of the desert tortoise or result in the destruction or adverse modification of critical habitat. The U.S. Fish and Wildlife Service and the BLM must also agree that the proposed actions are below the jeopardy or adverse modification threshold. If it is determined through the review of the lease and the use of mitigation measures that the operation is not below the jeopardy or adverse modification threshold the project will not go forward.

C.10.2. Aquatic/Riparian Species Notice

All proposed projects in a hydrographic groundwater basin that is within a regional flow system that supports proposed or listed and threatened or endangered aquatic species will require Section 7 consultation with the U.S. Fish and Wildlife Service. The lessee must provide adequate information to demonstrate the impacts from the operation will not jeopardize the continued existence of the aquatic species or result in the destruction or adverse modification of critical habitat. The lessee may need to propose special mitigation measures in order to protect surface and subsurface resources necessary for proposed or listed and threatened or endangered aquatic species survival. The BLM's role is to ensure that the impacts from the proposed operation will not jeopardize the continued existence of the aquatic species or result in the destruction or adverse modification of critical habitat. The U.S. Fish and Wildlife Service and the BLM will evaluate the proposed action and will make a determination whether the action may be approved as proposed or as modified, or that the action will not be approved.

C.10.3. Stipulations

Lease stipulations are a condition of lease issuance that provide a level of protection for other resource values or land uses to an extent greater than standard lease terms or conditions. Stipulations can restrict lease operations during certain times, at certain locations or by mitigating unacceptable impacts. SNDO specific stipulations would be applied as appropriate by the Authorized Officer to any leases for lands that are available for fluid mineral leasing. Nevada state wide notices and stipulations are listed following the SNDO Stipulations.

C.10.4. ACEC's

Stipulation	Controlled Surface Use (CSU): Surface activity would be limited to designated roads.
Objective	To protect the relative and important values in ACEC's from disturbance to help maintain the purpose for the ACEC habitat.
Exception	The Authorized Officer may grant an exception if an environmental review determines that the action, as proposed or otherwise restricted, does not adversely affect the resource being protected by the restriction. An exception may also be granted if the proponent, BLM, and other affected interests negotiate mitigation that would satisfactorily offset the anticipated impacts. Actions designed to enhance the long-term utility or availability of the habitat may be exempted from the otherwise applicable restriction.

Modification The boundaries of the stipulated area may be modified if the Authorized Officer, in consultation with other affected interests, determines that portions of the area no longer contain the habitat or that the proposed action would not affect the species and habitat.

Waiver The restriction may be waived if it is determined that the described lands do not contain suitable habitat, or are otherwise incapable of serving the requirements of the species and therefore no longer warrant consideration as a component necessary for their protection. In certain instances this determination would come after consulting with other managing agencies or interested publics.

Parcel #	Legal Description

C.10.5. Desert Tortoise Critical Habitat in ACEC's

Stipulation No Surface Occupancy (NSO): No surface activity would be allowed within designated Desert Tortoise critical habitat.

Objective To protect Desert Tortoise Critical Habitat to help maintain wildlife populations.

Exception None

Modification None

Waiver None

Parcel #	Legal Description

C.10.6. Desert Tortoise Habitat

Stipulation Timing Limitation (TL): No surface activity would be allowed within Desert Tortoise habitat from March 16 through May 31 and from September 1 through October 31.

Objective To protect Desert Tortoise Habitat from disturbance during the crucial spring and fall active periods, to help maintain wildlife populations.

Exception The Authorized Officer, in consultation with US Fish and Wildlife Service, may grant a one-time exception if an environmental review determines that the action, as proposed or otherwise restricted, does not adversely affect the desert tortoise habitat. An exception may also be granted if the proponent, BLM, and other affected interests negotiate mitigation that would satisfactorily offset the anticipated impacts. Actions designed to enhance the long-term utility or availability of the desert tortoise habitat may be exempted from the otherwise applicable restriction.

Modification The boundaries of the stipulated area may be modified if the Authorized Officer, in consultation with US Fish and Wildlife Service, determines that portions of the area no longer contain the habitat or that the proposed action would not affect the species and habitat. The dates for the timing restriction may also be modified if new information indicates the dates are not valid for the leasehold.

Waiver The TL restriction may be waived by the Authorized Officer, in consultation with the US Fish and Wildlife Service, if it is determined that the described lands do not contain suitable desert tortoise habitat, or are otherwise incapable of serving the requirements of the species and therefore no longer warrant consideration as a component necessary for their protection.

Parcel #	Legal Description

C.10.7. Special Status Plants

Stipulation Controlled Surface Use (CSU): Controlled Surface Use will be applied to lands within two miles of a known BLM specials status plant species occurrence as described by the most recent Nevada Natural Heritage Program database. Prior to surface disturbance, a survey by a qualified botanist with at least three years survey experience would be required to determine if BLM rare plant species are present. If present, operations would be moved or modified to protect the resource values. If avoidance is not possible suitable mitigation would be developed. This could include, but not limited to: (1) salvage and translocation, (2) seed collection and container propagation of replacement plants at a minimum ratio of 2:1 with a minimum 80% survival, (3) weed control or site protection within threatened populations, (4) Off site mitigation in the form of seed collection form the affected population and a one-time sponsorship of the species into the Center for Plant Conservation Imperiled Plant Program for $25,000.

Objective To protect and minimize impacts to BLM Special Status Plants managed under BLM Manual 6840.

Exception The Authorized Officer may grant an exception if the survey determines occupied habitat is not present. An exception may also be granted if the proponent, BLM, and other affected interests negotiate mitigation that would satisfactorily offset the anticipated impacts.

Modification The boundaries of the stipulated area may be modified if the Authorized Officer, in consultation with a BLM approved botanist, determines that portions of the area no longer contain the habitat or that the proposed action would not affect the species and habitat.

Waiver The restriction may be waived if it is determined that the described lands do not contain suitable habitat, or are otherwise incapable of serving the requirements of for the species and therefore no longer warrant consideration as a component necessary for their protection. In certain instances this determination would come after consulting with other managing agencies or interested publics.

Parcel #	Legal Description

C.10.8. Threatened and Endangered and Special Status Species

Stipulation Controlled Surface Use (CSU): The lease area may now or hereafter contain plants, animals, or their habitats determined to be threatened, endangered, or other special status species. BLM may recommend modification to explorations and development proposals to further its conservation and management objectives to avoid BLM-approved activity that will contribute to a need to list such a species or their habitat. BLM may require modification to or disapprove proposed activity that that is likely to result in jeopardy to the continued existence of a proposed or listed threatened or endangered species or result in the destruction or adverse modification of a designated or proposed critical habitat. BLM will not approve any ground disturbing activity that may affect any such species or critical habitat until it completes its obligations under applicable requirements of the Endangered Species Act as amended, 16 U.S.C. 1531 et seq., including completion of any required procedure for concurrence or consultation.

Objective To protect and minimize impacts to Threatened and Endangered and Special Status Species.

Exception The Authorized Officer may grant an exception if the survey determines occupied habitat is not present. An exception may also be granted if the proponent, BLM, and other affected interests negotiate mitigation that would satisfactorily offset the anticipated impacts.

Modification The boundaries of the stipulated area may be modified if the Authorized Officer, in consultation with a BLM biologist, determines that portions of the area no longer contain the habitat or that the proposed action would not affect the species and habitat.

Waiver The restriction may be waived if it is determined that the described lands do not contain suitable habitat, or are otherwise incapable of serving the requirements of for the species and therefore no longer warrant consideration as a component necessary for their protection. In certain instances this determination would come after consulting with other managing agencies or interested publics.

Parcel #	Legal Description

C.10.9. Valley of Fire State Park

Stipulation No Surface Occupancy (NSO): No Surface Occupancy inside the park and extending ½ mile outside the park boundary.

Objective To protect the view shed of the Valley of Fire State Park.

Exception The BLM Authorized Officer and Nevada Division of State Lands (NDSL) may grant an exception if it is determined that the action, as proposed or otherwise restricted, does not adversely affect the view shed of the park. An exception may also be granted if the proponent, BLM, and NDSL negotiate mitigation that would satisfactorily offset the anticipated negative impacts.

Modification The Authorized Officer may modify the size and shape of the restricted area outside the park if exploration and/or production activity is proposed on a site that is hidden from the parks view shed.

Waiver The restriction may be waived if it is determined that the specific location of the proposed action is not within the view shed of the Valley of Fire State Park. This determination can only come after consultation with the NDSL officer and other interested publics.

Parcel # **Legal Description**

C.11. Nevada BLM Fluid Mineral Lease Notice and Stipulations

Table C.3. Stipulation Numbering System (Ex: NV-B-02-A-TL)

State	District	Resource	Resource #	Stip #	Constraint (TL, CSU, NSO, NTL)
NV	Battle Mtn = **B**	Pronghorn Antelope Seasonal Habitat	01	A	TL
		Pronghorn Antelope Calving Habitat	01	B	TL
		Mule Deer Seasonal Habitat	02	A	TL
		Mule Deer Migration Corridors	02	B	TL
	Carson City = **C**	Mule Deer Fawning Habitat	02	C	TL
		Elk Seasonal Habitat	03	A	TL
		Elk Calving Habitat	03	B	TL
		Bighorn Sheep Year Round Habitat	04	A	CSU
	Elko = **E**	Bighorn Sheep Lambing/Crucial Winter Habitat	04	B	TL
		Bighorn Sheep Summer Range	04	C	TL
		Wild Horse and Burros Notice	05	A	NTL
		T&E, Sensitive and Special Status Species Notice	06	A	NTL
	Ely = **L**	Raptor Nests	06	B	TL
		Cultural Resources Notice	07	A	NTL
		National Register of Historic Places	07	B	NSO
		Eligible Sites for National Register of Historic Places	07	C	NSO
	Southern NV = **S**	Trails	07	D	NSO
		Fossils (PFYC 2) Notice	08	A	NTL
		Fossils (PFYC 3) Notice	08	B	NTL
		Fossils (PFYC 4) Notice	08	C	NTL
	Winnemucca = **W**	Fossils (PFCY-5) Stipulation	08	D	NSO
		Recreation	09	A	NSO
		Riparian Habitat	10	A	NSO
		Riparian Habitat Buffer	10	B	CSU
		100-Year Flood Plains	10	C	NSO
		Playas	10	D	NSO
		Municipal Wellhead Zones Notice	10	E	NTL
		Soil Slopes >30 percent	11	A	CSU
		Soil Slopes >40 percent	11	B	NSO
		Severe Soil Erosion	11	C	CSU
		NDOT Mineral Sites Notice	12	A	NTL
		Saleable Minerals — Community Pit Notice	12	B	NTL
		Mining Claims Notice	13	A	NTL
		Solid Mineral Leasing Notice	14	A	NTL
		* Continue this numbering system for all district-specific stipulations unique to their own district after these standard ones.			

C.11.1. Pronghorn Antelope Seasonal Habitat (NV-S-01-A-TL)

Stipulation Timing Limitation (TL) -No surface activity within Pronghorn Antelope crucial winter habitat from December 1 through February 28.

Objective To protect Pronghorn Antelope crucial winter habitat necessary to maintaining the critical life stages of Pronghorn wildlife populations.

Exception The Authorized Officer may grant an exception if an environmental review determines that the action, as proposed or otherwise restricted, does not adversely affect the Pronghorn Antelope and its habitat. An exception may also be granted if the proponent, BLM, and other affected interests negotiate mitigation that would satisfactorily offset the anticipated impacts to Pronghorn Antelope and its habitat. An exception may be granted for actions designed to enhance the long-term utility or availability of the habitat.

Modification The boundaries of the stipulated area may be modified if the authorized officer, in consultation with Nevada Department of Wildlife, determines that portions of the area no longer contain the crucial winter pronghorn habitat or that the proposed action would not affect the species and habitat. The dates for the timing restriction may also be modified by the Authorized Officer if new information indicates the dates are not valid for the leasehold.

Waiver The restriction may be waived by the Authorized Officer if it is determined that the described lands do not contain suitable pronghorn habitat, or are otherwise incapable of serving the requirements of for the species and therefore no longer warrant consideration as a component necessary for their protection.

Parcel #	Legal Description

C.11.2. Pronghorn Antelope Calving Habitat (NV-?-01-B-TL)

Stipulation Timing Limitation (TL) -No surface activity within pronghorn antelope calving areas from June 1 through July 31.

Objective To protect Pronghorn Antelope Calving habitat necessary to maintaining the critical life stages of Pronghorn wildlife populations.

Exception The Authorized Officer may grant an exception if an environmental review determines that the action, as proposed or otherwise restricted, does not adversely affect the Pronghorn Antelope Calving Areas. An exception may also be granted if the proponent, BLM, and other affected interests negotiate mitigation that would satisfactorily offset the anticipated impacts to Pronghorn Antelope Calving Areas. An exception may be granted for actions designed to enhance the long-term utility or availability of the habitat.

Modification The boundaries of the stipulated area may be modified if the authorized officer, in consultation with Nevada Department of Wildlife, determines that portions of the area no longer contain Pronghorn Antelope Calving habitat or that the proposed action would not affect the species and habitat. The dates for the timing restriction may also be modified by the Authorized Officer if new information indicates the dates are not valid for the leasehold.

Waiver The restriction may be waived by the Authorized Officer if it is determined that the described lands do not contain suitable Pronghorn Calving habitat, or are otherwise incapable of serving the requirements of for the species and therefore no longer warrant consideration as a component necessary for their protection.

Parcel #	Legal Description

C.11.3. Mule Deer Seasonal Habitat (NV-S-02-A-TL)

Stipulation Timing Limitation (TL) -No surface activity within crucial winter habitat from December 1 through February 28.

Objective To protect mule deer crucial winter habitat necessary to maintaining the critical life stages of Mule Deer wildlife populations.

Exception The Authorized Officer may grant an exception if an environmental review determines that the action, as proposed or otherwise restricted, does not adversely affect the Mule Deer and its habitat. An exception may also be granted if the proponent, BLM, and other affected interests negotiate mitigation that would satisfactorily offset the anticipated impacts the Mule Deer and its habitat. An exemption may be granted for actions designed to enhance the long-term utility or availability of the habitat.

Modification The boundaries of the stipulated area may be modified if the authorized officer, in consultation with Nevada Department of Wildlife, determines that portions of the area no longer contain the crucial winter mule deer habitat or that the proposed action would not affect the species and habitat. The dates for the timing restriction may also be modified by the Authorized Officer if new information indicates the dates are not valid for the leasehold.

Waiver The restriction may be waived by the Authorized Officer if it is determined that the described lands do not contain suitable Mule Deer habitat, or are otherwise incapable of serving the requirements of for the species and therefore no longer warrant consideration as a component necessary for their protection.

Parcel #	Legal Description

C.11.4. Mule Deer Migration Corridors (NV-S-02-B-TL)

Stipulation Timing Limitation (TL) -No surface activity within Mule Deer migration corridors.

Objective To protect mule deer migration corridors necessary to maintaining the critical life stages of Mule Deer wildlife populations.

Exception The Authorized Officer may grant an exception if an environmental review determines that the action, as proposed or otherwise restricted, does not adversely affect the Mule Deer and its habitat. An exception may also be granted if the proponent, BLM, and other affected interests negotiate mitigation that would satisfactorily offset the anticipated impacts to Mule Deer and its habitat. An exception may be granted for actions designed to enhance the long-term utility or availability of the habitat.

Modification The boundaries of the stipulated area may be modified if the authorized officer, in consultation with Nevada Department of Wildlife, determines that portions of the area no longer contain the crucial winter mule deer habitat or that the proposed action would not affect the species and habitat. The dates for the timing restriction may also be modified by the Authorized officer if new information indicates the dates are not valid for the leasehold.

Waiver No waiver.

Parcel # **Legal Description**

C.11.5. Mule Deer Fawning Habitat (NV-S-02-C-TL)

Stipulation Timing Limitation (TL) -No surface activity within Mule Deer fawning from May 1 through August 31.

Objective To protect Mule Deer Fawning habitat necessary to maintaining the critical life stages of Mule Deer wildlife populations.

Exception The Authorized Officer may grant an exception if an environmental review determines that the action, as proposed or otherwise restricted, does not adversely affect the Mule Deer and its Fawning habitat. An exception may also be granted if the proponent, BLM, and other affected interests negotiate mitigation that would satisfactorily offset the anticipated impacts to Mule Deer and its Fawning habitat. An exception may be granted for actions designed to enhance the long-term utility or availability of the habitat.

Modification The boundaries of the stipulated area may be modified if the authorized officer, in consultation with Nevada Department of Wildlife, determines that portions of the area no longer contain the summer mule deer habitat or that the proposed action would not affect the species and habitat. The dates for the timing restriction may also be modified by the Authorized Officer if new information indicates the dates are not valid for the leasehold.

Waiver The restriction may be waived by the Authorized Officer if it is determined that the described lands do not contain suitable mule deer habitat, or are otherwise incapable of serving the requirements of for the species and therefore no longer warrant consideration as a component necessary for their protection.

Parcel # **Legal Description**

C.11.6. Elk Seasonal Habitat (NV-S-03-A-TL)

Stipulation Timing Limitation (TL) -No surface activity within Elk crucial winter habitat from December 1 through February 28.

Objective To protect elk from disturbance during crucial winter habitat necessary to maintaining the critical life stages of Elk wildlife populations.

Exception The Authorized Officer may grant an exception if an environmental review determines that the action, as proposed or otherwise restricted, does not adversely affect the Elk Seasonal habitat. An exception may also be granted if the proponent, BLM, and other affected interests negotiate mitigation that would satisfactorily offset the anticipated impacts to Elk and its habitat. An exception may be granted for actions designed to enhance the long-term utility or availability of the habitat.

Modification The boundaries of the stipulated area may be modified if the authorized officer, in consultation with Nevada Department of Wildlife, determines that portions of the area no longer contain the crucial winter Elk habitat or that the proposed action would not affect the species and habitat. The dates for the timing restriction may also be modified by the Authorized Officer if new information indicates the dates are not valid for the leasehold.

Waiver The restriction may be waived by the Authorized Officer if it is determined that the described lands do not contain suitable Elk habitat, or are otherwise incapable of serving the requirements of for the species and therefore no longer warrant consideration as a component necessary for their protection.

Parcel # **Legal Description**

C.11.7. Elk Calving Habitat

Stipulation Timing Limitation (TL) -No surface activity within Elk calving areas from May 15 through June 30.

Objective To protect Elk summer, habitat necessary to maintaining the critical life stages of Elk wildlife populations.

Exception The Authorized Officer may grant an exception if an environmental review determines that the action, as proposed or otherwise restricted, does not adversely affect the Elk and its habitat. An exception may also be granted if the proponent, BLM, and other affected interests negotiate mitigation that would satisfactorily offset the anticipated impacts to Elk and its habitat. Actions designed to enhance the long-term utility or availability of the habitat.

Modification The boundaries of the stipulated area may be modified if the authorized officer, in consultation with Nevada Department of Wildlife, determines that portions of the area no longer contain the summer elk habitat or that the proposed action would not affect the species and habitat. The dates for the timing restriction may also be modified by the Authorized Officer if new information indicates the dates are not valid for the leasehold.

Waiver The restriction may be waived by the Authorized Officer if it is determined that the described lands do not contain suitable elk habitat, or are otherwise incapable of serving the requirements of for the species and therefore no longer warrant consideration as a component necessary for their protection.

Parcel # **Legal Description**

C.11.8. Bighorn Sheep Year Round Habitat (NV-S-04-A-CSU)

Stipulation Controlled Surface Use (CSU) applies to lands within bighorn year round occupied habitat. Surface occupancy or use is subject to the following special operating constraint:

Objective To protect bighorn sheep year round occupied habitat necessary to maintaining the critical life stages of bighorn sheep populations.

Exception The Authorized Officer may grant an exception if an environmental review determines that the action, as proposed or otherwise restricted, does not adversely affect the Bighorn Sheep and its habitat. An exception may also be granted if the proponent, BLM, and other affected interests negotiate mitigation that would satisfactorily offset the anticipated impacts. Actions designed to enhance the long-term utility or availability of the habitat may exempt from the otherwise applicable restriction.

Modification The boundaries of the stipulated area may be modified if the authorized officer, in consultation with Nevada Department of Wildlife, determines that portions of the area no longer contain the habitat or that the proposed action would not affect the species and habitat. The dates for the timing restriction may also be modified if new information indicates the dates are not valid for the leasehold.

Waiver The restriction may be waived if it is determined that the described lands do not contain suitable habitat, or are otherwise incapable of serving the requirements of for the species and therefore no longer warrant consideration as a component necessary for their protection. In certain instances this determination would come after consulting with other managing agencies or interested publics.

Parcel # **Legal Description**

C.11.9. Bighorn Sheep Lambing/Crucial Winter Range Habitat (NV-S-04-B-TL)

Stipulation Timing Limitation (TL) -No surface activity within bighorn lambing/crucial winter range from November 1 through March 31 for Desert Bighorn and from November 1 through May 15 for California and Rocky Mountain Bighorn Sheep.

Objective To protect bighorn sheep from disturbance during the lambing/crucial winter habitat necessary to maintaining the critical life stages of bighorn sheep wildlife populations.

Exception The Authorized Officer may grant an exception if an environmental review determines that the action, as proposed or otherwise restricted, does not adversely affect the Bighorn Sheep and its lambing and crucial winter range. An exception may also be granted if the proponent, BLM, and other affected interests negotiate mitigation that would satisfactorily offset the anticipated impacts. Actions designed to enhance the long-term utility or availability of the habitat may exempt from the otherwise applicable restriction.

Modification The boundaries of the stipulated area may be modified if the authorized officer, in consultation with Nevada Department of Wildlife, determines that portions of the area no longer contain the habitat or that the proposed action would not affect the species and habitat. The dates for the timing restriction may also be modified if new information indicates the dates are not valid for the leasehold.

Waiver The restriction may be waived if it is determined that the described lands do not contain suitable habitat, or are otherwise incapable of serving the requirements of for the species and therefore no longer warrant consideration as a component necessary for their protection. In certain instances this determination would come after consulting with other managing agencies or interested publics.

Parcel # **Legal Description**

C.11.10. Bighorn Sheep Summer Range (NV-S-04-C-TL)

Stipulation Timing Limitation (TL) -No surface activity within bighorn summer range from April 1 through November 31 for Desert Bighorn and from May 15 through October 31 for California and Rocky Mountain Bighorn.

Objective To protect bighorn sheep and its summer range habitat necessary to maintaining the critical life stages of bighorn sheep wildlife populations.

Exception	The Authorized Officer may grant an exception if an environmental review determines that the action, as proposed or otherwise restricted, does not adversely affect the bighorn sheep and its summer range. An exception may also be granted if the proponent, BLM, and other affected interests negotiate mitigation that would satisfactorily offset the anticipated impacts. Actions designed to enhance the long-term utility or availability of the habitat may exempt from the otherwise applicable restriction.
Modification	The boundaries of the stipulated area may be modified if the authorized officer, in consultation with Nevada Department of Wildlife, determines that portions of the area no longer contain the habitat or that the proposed action would not affect the species and habitat. The dates for the timing restriction may also be modified if new information indicates the dates are not valid for the leasehold.
Waiver	The restriction may be waived if it is determined that the described lands do not contain suitable habitat, or are otherwise incapable of serving the requirements of for the species and therefore no longer warrant consideration as a component necessary for their protection. In certain instances this determination would come after consulting with other managing agencies or interested publics.

Parcel #	Legal Description

C.11.11. Notice to Lessee - Wild Horse and Burro (NV-S-05-A-NTL)

Wild horse or burro herds are known to use some or all of the proposed lease area. If proposed fluid mineral activities are to occur in a herd management area (HMA) or a Herd Area (HA) the BLM Authorized Officer may identify mitigation measures necessary for reducing adverse impacts to wild horses and/or burros. These measures would be designed in a manner that does not hinder the wild and free-roaming behavior of the horses and burros and may include, but are not limited to, providing alternative water sources for horses of equal quality and quantity as well as fencing to prevent access to project area. Additional specific measures to protect horses and burros may be developed during review of proposals.

Parcel #	Legal Description

C.11.12. Notice to Lessee - T&E, Sensitive and Special Status Species (NV-S-06-A-NTL)

Endangered Species Act Section 7 Consultation Stipulation:

The lease area may now or hereafter contain plants, animals, or their habitats determined to be threatened, endangered, or other special status species. The BLM may recommend modifications to exploration and development proposals to further its conservation and management objective to avoid BLM-approved activity that will contribute to a need to list such species or their habitat. The BLM may require modifications to or disapprove proposed activity that is likely to result in jeopardy to the continued existence of a proposed or listed threatened or endangered species or result in the destruction or adverse modification of a designated or proposed critical habitat. The BLM will not approve any ground-disturbing activity that may affect any such species or critical habitat until it completes its obligations under applicable requirements of the Endangered Species

Act as amended, 16 U.S.C. §1531 et seq., including completion of any required procedure for conference or consultation.

Parcel #	Legal Description

C.11.13. Raptor Nest Sites (NV-S-06-B-TL)

Stipulation	Timing Limitation. No surface activity from December 1 through September 31 within 0.5 mile of a raptor nest site which has been active within the past five years.
Objective	To protect raptor nesting activities necessary to maintaining the critical life stages of existing raptor populations.
Exception	An exception to this stipulation may be granted by the authorized officer, in consultation with Nevada Department of Wildlife, if the operator submits a plan that demonstrates that impacts from the proposed action are minimal or can be adequately mitigated.
Modification	The boundaries of the stipulated area may be modified if the authorized officer, in consultation with Nevada Department of Wildlife, determines that portions of the area can be occupied without adversely affecting raptor nesting activity. The dates for the timing restriction may be modified if new information indicates the dates are not valid for the leasehold.
Waiver	The stipulation may be waived if the authorized officer, in consultation with Nevada Department of Wildlife determines that the entire leasehold no longer contains raptor nest sites.

Parcel #	Legal Description

C.11.14. Notice to Lessee - Cultural Resources (NV-S-07-A-NTL)

Cultural Resources and Tribal Consultation Stipulation:

This lease may be found to contain historic properties and/or resources protected under the National Historic Preservation Act (NHPA), American Indian Religious Freedom Act, Native American Graves Protection and Repatriation Act, Executive Order 13007, or other statutes and executive orders. The BLM will not approve any ground-disturbing activities that may affect any such properties or resources until it completes its obligations (e.g., State Historic Preservation Officer (SHPO) and tribal consultation) under applicable requirements of the NHP A and other authorities. The BLM may require modification to exploration or development proposals to protect such properties, or disapprove any activity that is likely to result in adverse effects that cannot be successfully avoided, minimized, or mitigated.

Parcel #	Legal Description

C.11.15. National Register of Historic Places (NV-S-07-B-NSO)

Stipulation No Surface Occupancy (NSO) within the boundaries of National Register-listed Properties and Districts, National Historic Landmarks, and Traditional Cultural Properties listed or eligible for the National Register of Historic Places (NRHP)and additional lands outside their designated boundaries to the extent necessary to protect values where the setting and visual integrity are critical to their eligibility.

Objective To protect National Register-listed Properties and Districts, National Historic Landmarks, and Traditional Cultural Properties (TCPs) listed or eligible for the National Register of Historic Places (NRHP).

Exception The Authorized Officer may grant an exception if the BLM determines, in consultation with the Nevada SHPO (if required by the Statewide Protocol Agreement), that the action, as proposed or otherwise restricted, does not adversely affect National Register-listed Properties and Districts, National Historic Landmarks, and Traditional Cultural Properties listed or eligible for the NRHP. An exception may also be granted if BLM, in consultation with the Nevada State Historic Preservation Office (SHPO), negotiate mitigation that would satisfactorily take into account any anticipated adverse effects. The authorized officer may also grant an exception if the BLM determines, in consultation with Tribes, interested parties, and the Nevada SHPO (if required by the Statewide Protocol Agreement) that the action, as proposed or otherwise restricted, does not adversely affect TCPs listed on, or eligible for the NRHP.

Modification The Authorized Officer may modify the size and shape of the restricted area if the BLM determines, in consultation with the Nevada SHPO, interested parties, and/or Tribes, that the Area of Potential Effect to the National Register-listed Properties and Districts, National Historic Landmarks, and TCPs listed or eligible on the NRHP may be modified without causing adverse effects from those described in the original stipulation.

Waiver Restrictions may be waived if it is determined that the described lands do not, in fact, contain sites listed on the NRHP or TCPs listed or eligible for the NRHP, or if the described lands within extended boundaries are determined to be not necessary to protect listed sites or listed or eligible TCPs where the setting and visual integrity are critical to their eligibility.

Parcel #	Legal Description

C.11.16. Sites Eligible for National Register of Historic Places (NV-S-07-C-NSO)

Stipulation No Surface Occupancy (NSO) within National Register-eligible Properties and Districts. Prior to surface disturbance, a survey would be required confirm the Area of Potential Effect of National Register-eligible Properties (NRHP) and Districts.

Objective To protect National Register-eligible Properties and Districts setting and visual integrity critical to their eligibility.

Exception The Authorized Officer may grant an exception if the BLM determines, in consultation with the Nevada SHPO (if required by the Statewide Protocol Agreement), that the action, as proposed or otherwise restricted, will not adversely affect National Register-listed Properties and Districts, National Historic Landmarks, and Traditional Cultural Properties listed or eligible for the NRHP. An exception may also be granted if BLM, in consultation with the Nevada State Historic Preservation Office (SHPO), negotiate mitigation that would satisfactorily take into account any anticipated adverse effects. The authorized officer may also grant an exception if the BLM determines, in consultation with Tribes, interested parties, and the Nevada SHPO (if required by the Statewide Protocol Agreement) that the action, as proposed or otherwise restricted, does not adversely affect Traditional Cultural Properties (TCP) listed on, or eligible for the NRHP.

Modification The Authorized Officer may modify the size and shape of the NSO restricted area if the BLM determines, in consultation with the Nevada SHPO, interested parties, and/or Tribes, that the Area of Potential Effect to the National Register-listed Properties and Districts, National Historic Landmarks, and TCPs listed or eligible on the NRHP may be modified without causing adverse effects from those described in the original stipulation.

Waiver NSO restrictions may be waived if it is determined that the described lands do not, in fact, contain sites listed on the NRHP or TCPs listed or eligible for the NRHP, or if the described lands within extended boundaries are determined to be not necessary to protect listed sites or listed or eligible TCPs where the setting and visual integrity are critical to their eligibility.

Parcel #	Legal Description

C.11.17. Trails (NV-S-07-D-NSO)

Stipulation No Surface Occupancy (NSO) will be applied directly on National Scenic and Historic Trails and Trails under Study or Recommended as Suitable for Congressional Designation and within National Trail Management Corridors. NSO may be applied to additional bordering lands; the extent will be dependent upon the topography and integrity of the setting surrounding individual trail segments along the designated NHT and National Historic Trail Corridor. Prior to the establishment of a National Trail Management Corridor, at a minimum, NSO will be applied 1/8-mile on either side of the center line of the trail (for a total of a 1/4-mile wide corridor). The center line will be established either through the GIS-based line provided by the Trail Administering Agency (NPS or BLM) or through GPS-based inventories uploaded on the Nevada Cultural Resource Inventory System (NVCRIS).

Objective To protect the National Scenic and Historic Trails and Trails under Study or Recommended as Suitable for Congressional Designation, and National Trail Management Corridor resources, qualities, values, and associated settings.

Exception The Authorized Officer may grant an exception if, through the National Historic Preservation Act (NHPA) and Management of National Scenic and Historic Trails and Trails Under Study or Recommended as Suitable for Congressional Designation Manual 6280 requirements, it is determined that the action, as proposed or otherwise restricted, does not adversely affect the resource. An exception may also be granted if mitigations satisfactorily off-set the anticipated impacts.

Modification The Authorized Officer may modify the size and shape of the restricted area if the NHPA and Management of National Scenic and Historic Trails and Trails under Study or Recommended as Suitable for Congressional Designation Manual 6280 requirements indicate the proposed action does not adversely impact the resource.

Waiver The restriction may be waived if the NHPA and Management of National Scenic and Historic Trails and Trails under Study or Recommended as Suitable for Congressional Designation Manual 6280 requirements determine that the described lands are not contributing elements to the resource. This determination can only come after consultation with the National Park Service, Nevada State Historic Preservation Office and other interested publics.

Parcel # **Legal Description**

C.11.18. Notice to Lessee - Fossils (PFYC-2) (NV-S-08-A-NTL)

This area has low potential for vertebrate paleontological resources. This area may contain vertebrate paleontological resources. In the event that previously undiscovered paleontological resources are discovered in the performance of any surface disturbing activities, the item(s) or condition(s) will be left intact and immediately brought to the attention of the authorized officer of the BLM. Operations within 250 feet of such discovery will not be resumed until written authorization to proceed is issued by the Authorized Officer. The lessee will bear the cost of any required paleontological appraisals, surface collection of fossils, or salvage of any large conspicuous fossils of significant scientific interest discovered during the operations.

Parcel # **Legal Description**

C.11.19. Notice to Lessee - Fossils (PFYC-3) (NV-S-08-B-NTL)

This area has moderate potential for vertebrate paleontological resources. Inventory and/or on-site monitoring during disturbance or spot checking may be required by the operator. Operations within 250 feet of such discovery will not be resumed until written authorization to proceed is issued by the Authorized Officer. The lessee will bear the cost of any required paleontological appraisals, surface collection of fossils, or salvage of any large conspicuous fossils of significant scientific interest discovered during the operations.

Parcel # **Legal Description**

C.11.20. Notice to Lessee - Fossils (PFYC-4) (NV-S-08-C-NTL)

This area has high and very high potential for paleontological resources. This land is underlain by geologic units that have been documented to contain a high occurrence of fossils, which may consist of scientifically significant paleontological resources protected by Public Law 111-11, Paleontological Resources Preservation Act. A field survey by a qualified paleontologist, and at the lessee's expense, will be required prior to surface disturbing activities. If significant paleontological resources of scientific or educational importance are discovered they will require avoidance or data recovery prior to their disturbance. On site monitoring may be necessary during construction activities.

Parcel #	Legal Description

C.11.21. Fossils (PFYC-5) (NV-S-08-D-NSO)

Stipulation	No surface occupancy (NSO) within the limits of identified paleontological resource occurrences classified by WO-IM-2008-009 (Potential Fossil Yield Classification [PFYC] System for Paleontological Resources on Public Lands) as PFYC 5 (being of scientific or educational interest). This area has very high potential for paleontological resources or is known to contain paleontological resources of scientific or educational importance, and protected by Public Law 111-11, Paleontological Resources Preservation Act. Any quarter-quarter-quarter section (10-acre parcel) within or intersected by the limits of the site are subject to NSO.
Objective	Protection of Potential Fossil Yield Classification (PFYC) 5: Very High Potential.
Exception	The Authorized Officer may grant an exception if an environmental review determines that the action, as proposed or otherwise restricted, does not affect the resource. An exception may also be granted if the proponent, BLM, and other affected interests (e.g. NDOW) negotiate mitigation that would satisfactorily offset the anticipated negative impacts. Actions designed to enhance the long-term utility or availability of the protected resource may be exempted from the otherwise applicable restriction.
Modification	The Authorized Officer may modify the size and shape of the restricted area if an environmental analysis indicates the actual suitability of the land for the paleontological resource in question differs from that in the otherwise applicable restriction. Modifications may be made to allow for an increasing level of environmental protection when changing circumstances warrant stronger measures.
Waiver	The restriction may be waived if it is determined that the described lands do not contain the subject resource, or are incapable of serving the requirements of the resource and therefore no longer warrant consideration as a component necessary for protection of the resource.

Parcel #	Legal Description

C.11.22. Recreation (NV-S-09-A-NSO)

Stipulation	No Surface Occupancy (NSO) on developed recreational facilities/sites, Special Recreation Management Areas, and areas with significant recreational use with which fluid mineral development is deemed incompatible.
Objective	Protection of Recreation Management areas.
Exception	The Authorized Officer may grant an exception if an environmental review determines that the action, as proposed or otherwise restricted, does not affect the resource. An exception may also be granted if the proponent, BLM, and other affected interests (e.g. NDOW) negotiate mitigation that would satisfactorily offset the anticipated negative impacts. Actions designed to enhance the long-term utility or availability of the protected resource may be exempted from the otherwise applicable restriction.

Modification The Authorized Officer may modify the size and shape of the restricted area if an environmental analysis indicates the actual suitability of the land for the resource in question differs from that in the otherwise applicable restriction. Modifications may be made to allow for an increasing level of environmental protection when changing circumstances warrant stronger measures.

Waiver The restriction may be waived if it is determined that the described lands do not contain the subject resource, or are incapable of serving the requirements of the resource and therefore no longer warrant consideration as a component necessary for protection of the resource. In certain instances this determination would come after consulting with other managing agencies or interested publics.

Parcel #	Legal Description

C.11.23. Riparian Habitat (NV-S-10-A-NSO)

Stipulation No Surface Occupancy (NSO) on and within riparian-wetland vegetated areas to protect the values and functions of these areas.

Objective To protect the values and functions of riparian and wetland areas based on the nature, extent, and value of the area potentially affected.

Exception The Authorized Officer may grant an exception if an environmental review determines that the action, as proposed or otherwise restricted, does not affect the resource. An exception may also be granted if the proponent, BLM, and other affected interests (e.g. NDOW) negotiate mitigation that would satisfactorily offset the anticipated negative impacts. Actions designed to enhance the long-term utility or availability of the protected resource may be exempted from the otherwise applicable restriction.

Modification The Authorized Officer may modify the size and shape of the restricted area if an environmental analysis indicates the actual suitability of the land for the resource differs from that in the otherwise applicable restriction.

Waiver The restriction may be waived if it is determined that the described lands do not contain the subject resource, or are incapable of serving the requirements of the resource and therefore no longer warrant consideration as a component necessary for protection of the resource.

Parcel #	Legal Description

C.11.24. Riparian Habitat Buffer (NV-S-10-B-CSU)

Stipulation Controlled Surface Use (CSU) will be applied within 500 to 2000 feet of riparian-wetland vegetation to protect the values and functions of these areas. An engineering plan or a study may be required by the operator that identifies the extent of the resource or how the resource will be managed or protected.

Objective To protect the values and functions of riparian and wetland areas based on the nature, extent, and value of the area potentially affected.

Exception The Authorized Officer may grant an exception if an environmental review determines that the action, as proposed or otherwise restricted, does not affect the resource. An exception may also be granted if the proponent, BLM, and other affected interests (e.g. NDOW) negotiate mitigation that would satisfactorily offset the anticipated negative impacts. Actions designed to enhance the long-term utility or availability of the protected resource may be exempted from the otherwise applicable restriction.

Modification The Authorized Officer may modify the size and shape of the restricted area if an environmental analysis indicates the actual suitability of the land for the resource differs from that in the otherwise applicable restriction.

Waiver The restriction may be waived if it is determined that the described lands do not contain the subject resource, or are incapable of serving the requirements of the resource and therefore no longer warrant consideration as a component necessary for protection of the resource.

Parcel # **Legal Description**

C.11.25. 100-year Flood Plains (NV-S-10-C-NSO)

Stipulation No Surface Occupancy (NSO) on 100-year flood plains of major rivers that have a one percent chance of flooding in any given year.

Objective To protect the unique biological and hydrological features associated with 100-year flood plains of major rivers.

Exception The Authorized Officer may grant an exception if an environmental review determines that the action, as proposed or otherwise restricted, does not affect the resource. An exception may also be granted if the proponent, BLM, and other affected interests (e.g. NDOW) negotiate mitigation that would satisfactorily offset the anticipated negative impacts. Actions designed to enhance the long-term utility or availability of the protected resource may be exempted from the otherwise applicable restriction.

Modification The Authorized Officer may modify the size and shape of the restricted area if an environmental analysis indicates the actual suitability of the land for the resource differs from that in the otherwise applicable restriction.

Waiver The restriction may be waived if it is determined that the described lands do not contain the subject resource, or are incapable of serving the requirements of the resource and therefore no longer warrant consideration as a component necessary for protection of the resource.

Parcel # **Legal Description**

C.11.26. Playas (NV-S-10-D-NSO)

Stipulation No Surface Occupancy (NSO) on playas. Playas are defined as the ephemeral round depressions within areas of dry lake beds in which water collects after a rain event and evaporates relatively quickly.

Objective Protection of playas.

Exception	The Authorized Officer may grant an exception if an environmental review determines that the action, as proposed or otherwise restricted, does not affect the resource. An exception may also be granted if the proponent, BLM, and other affected interests (e.g. NDOW) negotiate mitigation that would satisfactorily offset the anticipated negative impacts. Actions designed to enhance the long-term utility or availability of the protected resource may be exempted from the otherwise applicable restriction.
Modification	The Authorized Officer may modify the size and shape of the restricted area if an environmental analysis indicates the actual suitability of the land for the resource differs from that in the otherwise applicable restriction.
Waiver	The restriction may be waived if it is determined that the described lands do not contain the subject resource, or are incapable of serving the requirements of the resource and therefore no longer warrant consideration as a component necessary for protection of the resource.

Parcel #	Legal Description

C.11.27. Notice to Lessee — Municipal Wellhead Zones (NV-S-10-E-NTL)

The lease area may be within a source water protection zone designated by a specific public water system or community with endorsement from the Nevada Division of Environmental Protection (NDEP). Source water protection areas are defined as the land surface and area beneath in which activities and land uses must be managed in order to protect the underlying groundwater which is used as a source of drinking water (also commonly referred to as a Wellhead Protection Area). The areas are typically delineated using a computer generated model and outline a specific time it may take a contaminant to reach the well. It may be necessary to manage activities in areas located some distance from the well (outside of the protection area) because any spills or discharge activities could contribute to groundwater contamination in the event of heavy precipitation (snow melt and rain) which recharges the well or spring. If proposed mineral activities/lease activities could result in fluid spills or discharges in a source water protection area, it is mandatory to work with local communities and/or public water systems that are responsible for implementing source water protection activities. Analysis to determine if any impacts due to the activity is to be expected, either avoid areas or coordinate with local agencies and NDEP to develop and implement mitigation measures to reduce adverse impacts.

Parcel #	Legal Description

C.11.28. Soil Slopes > 30 and < 41 percent (NV-S-11-A-CSU)

Stipulation Controlled Surface Use (CSU) applies to lands with slopes greater than 30 percent and less than 41 percent. An engineering/reclamation plan must be submitted by the applicant and approved by the BLM Authorized Officer before any surface disturbance can occur.The plan must demonstrate to the Authorized Officer's satisfaction how the operator will meet the following performance standards:

- Soil stability is maintained preventing slope failure and wind or water erosion.
- The site will be stable with no evidence of accelerated erosion features.
- The rate of soil erosion will be controlled to maintain or improve soil quality and sustainability. The disturbed soils shall have characteristics that approximate the reference site with regard to quantitative and qualitative soil erosion indicators described in H-7100-1 Soil Inventory, Monitoring, and Management Handbook.
- Sufficient topsoil is maintained for ensuring successful final reclamation. How interim reclamation will be completed for producing well locations and long-term roads, including the re-spreading of all salvaged topsoil over the areas of interim reclamation.
- The original landform and site productivity will be partially restored during interim reclamation and fully restored as a result of final reclamation.

Objective To maintain soil productivity, provide necessary protection to prevent excessive soil erosion on steep slopes, to avoid areas subject to slope failure, mass wasting, piping, or having excessive reclamation problems, and to ensure successful interim and final reclamation.

Exception An exception may be granted if the operator can demonstrate in a plan of operations that adverse effects can be minimized and activities safely conducted.

Modification The area affected by this stipulation may be modified by the authorized officer if it is determined that portions of the area do not include slopes over 30 percent, or the operator can demonstrate in a plan of operations that adverse effects can be minimized. The authorized officer may modify the size and shape of the restricted area subject to the stipulation based upon a Natural Resource Conservation Service (NRCS) soil survey or BLM evaluation. The stipulation and performance standards identified above may also be modified based on negative or positive monitoring results from similar proposed actions on similar sites or increased national or state performance standards.

Waiver This stipulation can be waived by the authorized officer if is determined that none of the leasehold includes slopes over 30 percent.

Parcel #	Legal Description

C.11.29. Soil Slopes >40 percent (NV-S-11-B-NSO)

Stipulation No Surface Occupancy (NSO) on slopes greater than 40 percent.

Objective To maintain soil productivity, provide necessary protection to prevent excessive soil erosion on steep slopes, to avoid areas subject to slope failure, mass wasting, piping, or having excessive reclamation problems.

Exception The Authorized Officer may grant an exception if a staff review determines that the proposed action is of a scale (pipeline, vs. road, vs. well pad) or sited in a location or a site specific evaluation determines that the slope would not result in mass slope failure or accelerated erosion and the operator would be able to meet BLM's reclamation standards.

Modification The Authorized Officer may modify the area subject to the stipulation based upon a BLM evaluation of the area. The stipulation and performance standards identified above may also be modified based on negative or positive monitoring results from similar proposed actions on similar sites or increased national or state performance standards.

Waiver The restriction may be waived if it is determined that the described lands do no do not include lands with slopes greater than 40 percent. This determination shall be based upon USGS mapping and a BLM evaluation of the area.

Parcel #	Legal Description

C.11.30. Soil Severe Erosion (NV-S-11-C-CSU)

Stipulation Controlled Surface Use (CSU) on lands with a severe soil wind or water erosion hazard rating (as designed by NRCS soil survey data when available). Prior to surface disturbance on soils with a severe erosion hazard rating, a site-specific construction, stabilization, and reclamation plan (Plan) must be submitted to the BLM by the applicant as a component of the Geothermal Drilling/Application for Permit to Drill – Plan of Operations. The operator may not initiate surface disturbing activities unless the Authorized Officer has approved the Plan or approved it with conditions. The plan must demonstrate to the Authorized Officer's satisfaction how the operator will meet the following performance standards:

- Soil stability is maintained preventing slope failure and wind or water erosion.
- The site will be stable with no evidence of accelerated erosion features.
- The rate of soil erosion will be controlled to maintain or improve soil quality and sustainability. The disturbed soils shall have characteristics that approximate the reference site with regard to quantitative and qualitative soil erosion indicators described in H-7100-1 Soil Inventory, Monitoring, and Management Handbook.
- Sufficient topsoil is maintained for ensuring successful final reclamation. Interim reclamation will be completed, by re-spreading the topsoil over the areas being reclaimed.
- The original landform and site productivity will be partially restored during interim reclamation and fully restored as a result of final reclamation.

Objective To maintain soil productivity, provide necessary protection to prevent excessive soil erosion on steep slopes, to avoid areas subject to slope failure, mass wasting, piping, or having excessive reclamation problems, and ensure successful interim and final reclamation.

Exception The Authorized Officer may grant an exception if a staff review determines that the proposed action is of a scale (pipeline, vs. road, vs. well pad) or sited in a location, or a soil survey determines that the soil properties do not meet the severe erosion hazard criteria so that the proposed action would not result in a failure to meet the performance standards above.

Modification The Authorized Officer may modify the size and shape of the restricted area subject to the stipulation based upon a NRCS soil survey or BLM evaluation. The stipulation and performance standards identified above may also be modified based on negative or positive monitoring results from similar proposed actions on similar sites or increased national or state performance standards. The authorized officer may modify the size and shape of the restricted area subject to the stipulation based upon a NRCS soil survey or BLM evaluation. The stipulation and performance standards identified above may also be modified based on negative or positive monitoring results from similar proposed actions on similar sites or increased national or state performance standards.

Waiver The restriction may be waived if it is determined that the described lands do no do not include soils with severe erosion hazard. This determination shall be based upon NRCS mapping and BLM evaluation of the area.

Parcel # **Legal Description**

C.11.31. Notice to Lessee - NDOT Mineral Pits (NV-S-12-A-NTL)

The lessee accepts this lease subject to the right of the State of Nevada to remove road building material from the land embraced in Material Site No. (See below) and agrees that its operations will not interfere with the material operations of the Department of Transportation.

Parcel # **Legal Description**

C.11.32. Notice to Lessee - Saleable Minerals: Community Pits (NV-S-12-B-NTL)

The lessee accepts this lease subject to the right of individuals, authorized by Bureau of Land Management District Office, to remove sand and gravel from the land embraced in Community Pit No. (see below) The lessee agrees that its operations will not interfere with the use of the pit(s) by these individuals.

Parcel # **Legal Description**

C.11.33. Notice to Lessee — Mining Claims (NV-S-13-A-NTL)

This parcel may contain existing mining claims and/or mill sites located under the 1872 Mining Law. To the extent it does, the oil and gas lessee must conduct its operations, so far as reasonably practicable, to avoid damage to any known deposit of any mineral for which any mining claim on this parcel is located, and should not endanger or unreasonably or materially interfere with the mining claimant's operations, including any existing surface or underground improvements, workings, or facilities which may have been made for the purpose of mining operations. The

provisions of the Multiple Mineral Development Act (30 U.S.C. 521 et seq.) shall apply on the leased lands.

Parcel #	Legal Description

C.11.34. Notice to Lessee — Solid Mineral Leasing (NV-S-14-A-NTL)

Provisions of the Mineral Leasing Act (MLA) of 1920, as amended by the Solid Mineral Leasing Amendments Act of 1976, affect an entity's qualifications to obtain an oil and gas lease. Section 2(a) (2) (A) of the MLA, 30 U.S.C. 201(a) (2) (A), requires that any entity that holds and has held a Solid Mineral lease for 10 years beginning on or after August 4, 1976, and who is not producing solid minerals in commercial quantities from each such lease, cannot qualify for the issuance of any other lease granted under the MLA. Compliance by solid mineral lessees with Section 2(a) (2) (A) is explained in 43 CFR 3472.

In accordance with the terms of this oil and gas lease with respect to compliance by the initial lessee with qualification concerning federal solid mineral lease holdings, all assignees and transferees are hereby notified that this oil and gas lease is subject to cancellation if: (1) the initial lessee as assignor or as transferor has falsely certified compliance with Section 2(a)(2)(A) or (2) because of denial or disapproval by State Office of a pending solid mineral action, i.e., arms-length assignment, relinquishment, or logical mining unit, the initial lessee as assignor or as transferor is no longer in compliance with Section 2(a)(2)(A). The assignee or transferee does not qualify as a bona fide purchaser and, thus, has no rights to bona fide purchaser protection in the event of cancellation of this lease due to noncompliance with Section 2(a)(2)(A).

Information regarding assignor or transferor compliance with Section 2(a)(2)(A) is contained in the lease case file as well as in other Bureau of Land Management records available through the State Office issuing this lease.

Parcel #	Legal Description

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Appendix D. Lands with Wilderness Characteristics

D.1. Arrow Canyon Addition Subunit B

The subunit is located approximately 35 miles northeast of Las Vegas and is contiguous with the Arrow Canyon Wilderness (BLM). The northern boundary of the unit is adjacent to utility rights-of-ways south of Highway 168. The subunit appears to be primarily affected by the forces of nature with man's work substantially unnoticeable. There are four small game wildlife water developments, a well, and several primitive routes located within the unit. There is no additional known evidence of human use or occupation within the subunit.

The vegetation is typical of the Mojave Desert consisting of shrubs, cacti, grasses, and yucca. The vegetation is low growing and sparse, which provides minimal screening. The topography includes gently rolling low hills, desert pavement, a portion of the Pahranagat Wash, and the northern cliffs of Arrow Canyon. The size and configuration of the unit is sufficient to provide some opportunities for solitude. While the vegetation lends little to outstanding opportunities for solitude, the topography, particularly in the southwest portion of the subunit around Arrow Canyon, provides rugged terrain in the form of narrows, sides canyons, and draws where opportunities for solitude are outstanding.

Opportunities for recreation include hiking, nature study, and photography. Bird and small game hunting are possible. This subunit contains the northern near-vertical wall that makes up Arrow Canyon. Primitive recreation is outstanding in this area due to the distinct and unique opportunity for hiking in this long narrows. Technical rock climbing is also possible. The unit has outstanding opportunities for recreation due to the outstanding quality of one activity.

The subunit contains geological, biological, archeological, and scenic values. There are three areas of critical environmental concern (ACEC) overlapping the subunit: the Mormon Mesa/Arrow Canyon ACEC; Arrow Canyon ACEC; and Mormon Mesa ACEC. The unit contains critical habitat for the federally endangered desert tortoise (*Gopherus agassizii*). There are several known prehistoric cultural sites including petroglyphs, pictographs, agave roasting pits, shelter caves, lithic and ceramic scatters, and rock alignments. The subunit contains a unique geologic formation of scientific interest in addition to vertebrate and invertebrate fossils.

D.2. Billy Goat Peak

The unit is located east of the Overton Arm of Lake Mead in the north east portion of the Gold Butte region. The entire east boundary is contiguous with the Nevada/Arizona state border and the BLM Arizona Strip District, Grand Canyon–Parashant National Monument. The north boundary is an R.S. 2477 road called Whitney Pass Road (also known as Whitney Ranch Road) which connects to Pakoon Springs Road in Arizona. The west boundary is an R.S. 2477 road known as the Gold Butte Road and is part of the Gold Butte Backcountry Byway. The south boundary is an R.S. 2477 road known as St. Thomas Gap (also known as Grand Gulch Road).

The major intrusions within the unit are located in Greasewood Basin where there are a series of earthen dams that have been constructed. Other evidence of human occupation and use include developments associated with former grazing activities in the region (stock tank and trough near

Whitney Pass). However, grazing allotments have been closed in this region; as there is no longer a need for these developments they could be removed and the area restored to bring it back to a natural condition. South of Whitney Pocket, a small cave has been enclosed with rock and mortar, possibly the remnant of a shelter or explosives magazine. An old fence lines cuts across the lower portion of the unit from the west boundary to the southeast corner. Most of the unit north of Greasewood Basin generally appears to be affected primarily by the forces of nature with the imprint of man's work substantially unnoticeable.

The unit size and configuration allow the user to avoid contact with adjacent roads and offers some opportunity for solitude. The vegetation is comprised primarily of creosote and other low desert shrubs, which provides minimal screening. Improved opportunities for solitude occur in those portions of the unit (primarily on Whitney Ridge) where pinyon-juniper is present. Whitney Ridge and Billy Goat Peak are located in the northeastern portion of the unit and provide good topographic variation while the remainder of the unit is comprised of low hills and basin or bajada. Because of the size, configuration, ruggedness, and topographic variation within the unit, only a portion of the unit offers outstanding opportunities for solitude. The ability for visitors to find seclusion and avoid contacts with the sights and sounds of others within the canyons and drainages is exceedingly probable.

The unit is characterized by two distinct landforms: gently sloping bajadas/low hills and rugged mountain range. The portion of the unit within Whitney Ridge and Billy Goat Peak offers outstanding opportunities for primitive recreation, especially hiking. Backpacking and camping may be limited due to the lack of available water in the region. Sightseeing is also outstanding in this area, with views toward the Colorado River and the Grand Canyon. Much of the terrain is conducive to horseback riding though extended trips are limited due to lack of available water. Big and small game hunting are possible throughout the unit.

D.3. Black Ridge

The unit is located northeast of the Overton Arm of Lake Mead in the northwest portion of the Gold Butte region. The northern boundary follows an R.S. 2477 road and the southeastern boundary is the Fisherman Cove Road. The western boundary is contiguous with private land and Bureau of Reclamation lands. The area is predominantly natural. Impacts from old mining activity are present in Township 15 S., Range 69 E., Section 63. Several routes are located within the unit, however, they are mainly located within washes and overall have the potential to be restored to a natural condition. No other evidence of modern developments and use (e.g., mining, grazing, wildlife water developments) are located within the unit. No other evidence of human occupation or improvement was observed. The unit generally appears to be affected primarily by the forces of nature with the imprint of man's work substantially unnoticeable.

The unit size and configuration are adequate to offer an opportunity for solitude. The vegetation is comprised of desert shrubs typical of the Mojave Desert, and includes some grasses. The vegetation is near to the ground and therefore provides minimal screening. The major topographic feature is Black Ridge, a long, narrow, and steep-sided ridge found in the southern and central portion. Few short canyons intersect this main ridge, providing some topographic screening. While only a portion of the unit offers outstanding opportunities for solitude (e.g., Black Ridge and Little Virgin Peak), the ability for visitors to find seclusion and avoid contacts with the sights and sounds of others within the canyons and drainages is likely.

There are a number of primitive recreation opportunities available across the unit, including hiking, big game hunting, nature study, and sightseeing. Backpacking and horseback riding are limited due to the lack of available water; however, hiking opportunities are outstanding for a wide range of skill levels. Most of the available opportunities would be of fair to good quality; however, sightseeing of the Virgin Mountains to the east and Lake Mead to the west would be of outstanding opportunity.

D.4. Garrett Buttes

The unit is located east of the Overton Arm of Lake Mead in the southwest portion of the Gold Butte region. It is contiguous on its west boundary with Lake Mead National Recreation Area and in the southwest with the Bureau of Reclamation. The north and east boundaries follow Catclaw Wash Road and Scanlon Ferry Road, respectively. The south boundary follows an R.S. 2477 road along Walker Wash. The unit is predominantly natural. There are several routes within the unit that are maintained solely by the passage of vehicles, have the potential to return to a natural condition, and are substantially unnoticeable. The only other evidence of human use and occupation includes a small number of water developments and a water tank at Gann Spring.

The Fork Fire (2005) burned more than 50 percent of the unit, therefore the vegetation in these areas is limited to perennial grasses and invasive annuals that provide no vegetative screening. The vegetation in the remainder of the unit consists of low and sparse desert shrubs typical of the Mojave Desert and provide little to no vegetative screening. The topography consists of a low north-south trending ridge in the eastern portion of the unit, with a few buttes, including the unit's namesake Garrett Butte. The ridge is intersected by two distinct washes running west to the Overton Arm. The west half of the unit is generally characterized as a gently sloping bajada with little topographic variety. The limited vegetative and topographic screening limits the ability to locate secluded spots. Although the unit's size, configuration, and natural screening provide some opportunities for solitude, it is limited in extent and not outstanding compared to other areas.

While this subunit lacks outstanding opportunities for solitude, it is contiguous with National Park Service wilderness proposal unit #13 Twin Springs, which is identified as having outstanding opportunities for solitude. This unit is considered a small, roadless area contiguous with the NPS wilderness proposal area. The discussion of the opportunity for solitude concludes that because the subunit under review is contiguous with NPS wilderness proposal unit #12 Overton, opportunities for solitude do not stop at the administrative boundary. If the BLM land is eventually separated from the NPS wilderness proposal, opportunities for solitude would not exist to an outstanding degree.

Although opportunities for primitive and unconfined recreation exist, they are not outstanding and are not unlike those opportunities found relative to general public lands. Horseback riding, hiking, camping, hunting, and nature study are possible, but the low natural screening, vegetative and topographic diversity, and lack of challenge limit primitive recreational opportunities to less than outstanding. Six springs are located within the unit, which increases the potential for horseback riding and camping. The unit lacks outstanding opportunities for recreation both in the diversity in activities possible and the outstanding quality of one opportunity.

While this subunit in and of itself lacks outstanding opportunities for primitive and unconfined recreation, it is contiguous with National Park Service wilderness proposal unit #13 Twin Springs, which is identified as having outstanding opportunities for primitive and unconfined recreation. This subunit is considered a small, roadless area contiguous with the NPS wilderness proposal

area. The discussion of the opportunity for primitive and unconfined recreation concludes that since the subunit under review is contiguous with NPS wilderness proposal unit #13 Twin Springs, opportunities for primitive and unconfined recreation do not stop at the administrative boundary. If the BLM land is eventually separated from the NPS wilderness proposal, opportunities for primitive and unconfined recreation would not exist to an outstanding degree. There are no known supplemental values.

D.5. Highland Range

The unit is located approximately 5 miles northwest of Searchlight and includes the Highland Range of mountains. The unit is generally triangular in shape with its eastern and western boundaries adjacent to powerline right-of-way corridors, and a portion of the Boulder City Conservation Easement; while its southern boundary is defined by several R.S. 2477 roads. Seven (small and big game) wildlife water developments are located within the unit. There are several designated routes within the unit which are maintained solely by the passage of vehicles. Several of these routes are located within washes and have the potential to return to a natural condition. Evidence of former grazing activity exists in the form of fences, corrals, troughs, and pipes; these developments are limited in extent and have the potential for removal. No other evidence of human occupation or development was observed. The unit generally appears to be affected primarily by the forces of nature with the imprint of man's work substantially unnoticeable.

The vegetation primarily consists of low desert shrubs, cactus, yucca, with some Joshua tree and willow in the washes typical of the Mojave Desert region. The vegetation offers some diversity in type though screening is only moderate and the overall impact of the vegetation on solitude is less than outstanding. The range is narrow, and intersected with numerous steep, short canyons and draws; the edges of the unit are characterized by rolling hills and valleys with little to no topographic variability. Because of the size, configuration, ruggedness, and topographic variation within the unit, the central portion of the unit offers outstanding opportunities for solitude. The ability for visitors to find seclusion and avoid contacts with the sights and sounds of others within the canyons and drainages is exceedingly probable.

The unit offers a number of primitive recreational opportunities including hiking, wildlife viewing, hunting, and nature study. Three springs are located within the unit which increases the opportunity for backpacking and horseback riding, although horseback riding would be limited in portions of the unit due to the nature of the terrain. Opportunities for big game hunting and wildlife viewing are outstanding as the unit provides year-round habitat for desert bighorn sheep and mule deer, in additional to crucial habitat for quail.

D.6. Ireteba Peaks Addition

The unit is located approximately eight miles northeast of Searchlight and encompasses the southernmost extent of the north-south trending Eldorado Mountains. The unit includes its namesake, the Ireteba Peaks in the easternmost portion of the unit, and its boundary is contiguous with the Ireteba Peaks Wilderness to the east. The west and south boundaries generally include the foothills of the Eldorado Mountains and are contiguous with private lands. The area is predominantly natural. No documented roads or routes are located within the unit due to the rugged and loose terrain. No other evidence of modern developments and use (e.g. mining, grazing, wildlife, and water developments) are located within the unit. No other evidence of human occupation or improvement was observed. Opportunities for solitude exist, though they

are less than outstanding due to lack of vegetative and topographic diversity. While this unit lacks outstanding opportunities for solitude, this entire unit is located in what was formerly the Ireteba Peaks Wilderness Study Area. This WSA was contiguous to the east with an NPS wilderness proposal that was identified as having outstanding opportunities for solitude.

The unit is located approximately eight miles northeast of Searchlight and encompasses the southernmost extent of the north-south trending Eldorado Mountains. The unit includes its namesake, the Ireteba Peaks in the easternmost portion of the unit, and its boundary is contiguous with the Ireteba Peaks Wilderness to the east. The west and south boundaries generally include the foothills of the Eldorado Mountains and are contiguous with private lands. The area is predominantly natural. No documented roads or routes are located within the unit due to the rugged and loose terrain. No other evidence of modern developments and use (e.g. mining, grazing, wildlife, and water developments) are located within the unit. No other evidence of human occupation or improvement was observed. Opportunities for solitude exist, though they are less than outstanding due to lack of vegetative and topographic diversity. While this unit lacks outstanding opportunities for solitude, this entire unit is located in what was formerly the Ireteba Peaks Wilderness Study Area. This WSA was contiguous to the east with an NPS wilderness proposal that was identified as having outstanding opportunities for solitude.

Hiking, camping, hunting, and nature studies are possible, although not unlike those opportunities in relation to general public lands. Backpacking and camping may be limited due to the lack of available water. Horseback riding would be limited due to the lack of water and ruggedness in some areas that would make horse travel difficult or impossible. While this unit in and of itself lacks outstanding opportunities for primitive and unconfined recreation, this entire unit is located in what was formerly the Ireteba Peaks Wilderness Study Area (WSA). This WSA was contiguous to the east with an NPS wilderness proposal that was identified as having outstanding opportunities for primitive and unconfined recreation.

D.7. Lime Canyon Addition Subunit A

The unit is located east of the Overton Arm of Lake Mead in the Gold Butte region. The unit is contiguous with National Park Service, Lake Mead National Recreation Area wilderness proposal #12 Overton to the west, Lime Canyon Wilderness (BLM) to the north, and Scanlon Ferry Road to the south. The subunit appears to be primarily affected by the forces of nature with man's work substantially unnoticeable. The only known structures include a wildlife water development, fence line, a mine site, and a developed spring with corral. Several documented primitive routes are located within the subunit.

The vegetation within the subunit is typical of the Mojave Desert, consisting of shrubs, cacti, grasses, Joshua trees, and yucca. The vegetation is low growing and sparse, providing minimal screening. The subunit includes rolling hills, bajadas, and the impressive canyon of Quail Springs Wash among other lesser washes. The majority of this subunit is included in what was formerly the Lime Canyon Wilderness Study Area. While this subunit lacks outstanding opportunities for solitude, it is contiguous with National Park Service wilderness proposal unit #12 Overton, which is identified as having outstanding opportunities for solitude. This unit is considered a small, roadless area contiguous with the NPS wilderness proposal area. The discussion of the opportunity for solitude concludes that because the subunit under review is contiguous with NPS wilderness proposal unit #12 Overton, opportunities for solitude do not stop at the administrative boundary. If the BLM land is eventually separated from the NPS wilderness proposal, opportunities for solitude would not exist to an outstanding degree.

Recreational opportunities include hiking and nature study. Horseback riding and backpacking are limited due to the lack of available water. Hunting of small game birds is possible. The lack of vegetative and topographic screening or diversity provides a less than outstanding opportunity for primitive and unconfined recreation. The majority of this subunit is included in what was formerly the Lime Canyon Wilderness Study Area.

While this subunit lacks outstanding opportunities for primitive and unconfined recreation, it is contiguous with National Park Service wilderness proposal unit #12 Overton, which was identified as having outstanding opportunities for primitive and unconfined recreation. This subunit is considered a small, roadless area contiguous with the NPS wilderness proposal area. The discussion of the opportunity for primitive and unconfined recreation concludes that because the subunit under review is contiguous with NPS wilderness proposal unit #12 Overton, opportunities for primitive and unconfined recreation do not stop at the administrative boundary. If the BLM land is eventually separated from the NPS wilderness proposal, opportunities for primitive and unconfined recreation would not exist to an outstanding degree. There are no known supplemental values.

D.8. Lime Canyon Addition Subunit B

The unit is located east of the Overton Arm of Lake Mead in the Gold Butte region. The unit is contiguous with National Park Service, Lake Mead National Recreation Area wilderness proposal #12 Overton to the west and the Lime Canyon Wilderness to the south. This subunit appears to be primarily affected by the forces of nature with man's work substantially unnoticeable. There is no known evidence of human use or occupation.

The vegetation is typical of the Mojave Desert, consisting of shrubs, cacti, grasses, Joshua trees, and yucca. The vegetation is low growing and sparse, providing minimal screening. The topography is composed of the lower west slope of Lime Ridge and the associated washes and gently sloping bajada that drain west toward Lake Mead.

While this subunit lacks outstanding opportunities for solitude, it is contiguous with National Park Service wilderness proposal unit #12 Overton, which is identified as having outstanding opportunities for solitude. This unit is considered a small, roadless area contiguous with the NPS wilderness proposal area. The discussion of the opportunity for solitude concludes that since the subunit under review is contiguous with NPS wilderness proposal unit #12 Overton, opportunities for solitude do not stop at the administrative boundary. If the BLM land is eventually separated from the NPS wilderness proposal, opportunities for solitude would not exist to an outstanding degree.

The opportunity for hiking exists although challenge, interesting features, and destinations are lacking. Horseback riding is possible due to the gentle terrain, but a lack of water limits this activity and the potential for backpacking. Nature study and photography are also possible. While the opportunity for some types of primitive and unconfined recreation exists, it is less than outstanding relative to the general public lands. This entire subunit is included in what was formerly the Lime Canyon Wilderness Study Area.

While this subunit in and of itself lacks outstanding opportunities for primitive and unconfined recreation, it is contiguous with National Park Service wilderness proposal unit #12 Overton, which is identified as having outstanding opportunities for primitive and unconfined recreation. This subunit is considered a small, roadless area contiguous with the NPS wilderness proposal

area. The discussion of the opportunity for primitive and unconfined recreation concludes that since the subunit under review is contiguous with NPS wilderness proposal unit #12 Overton, opportunities for primitive and unconfined recreation do not stop at the administrative boundary. If the BLM land is eventually separated from the NPS wilderness proposal, opportunities for primitive and unconfined recreation would not exist to an outstanding degree. There are no known supplemental values.

D.9. Lime Canyon Addition Subunit C

The unit is located east of the Overton Arm of Lake Mead in the Gold Butte region. The unit is contiguous with Lime Canyon Wilderness (BLM) while the Gold Butte Backcountry Byway is the eastern boundary. The subunit appears to be primarily affected by the forces of nature with man's work substantially unnoticeable. The only known structure is a fence line, and disturbance is limited to a single primitive route.

The vegetation is typical of the Mojave Desert, consisting of shrubs, cacti, grasses, Joshua trees, and yucca. The Tramp Fire (2005) burned much of the area, and as a result, the vegetation is in the early stages of succession. The topography primarily consists of an unnamed canyon east of Lime Ridge and includes the lower hill slopes, small side canyons, and a portion of Gold Butte Wash. This entire subunit is located in what was formerly the Lime Canyon Wilderness Study Area, which was identified as having outstanding opportunities for solitude. This discussion concludes that because this wilderness element had been identified previously, release from wilderness study does not eradicate the existence of outstanding solitude, and therefore this subunit meets this wilderness element.

The opportunity for hiking exists although challenge, interesting features and destinations are mostly fair to good quality. Horseback riding is limited to the lower elevations where possible. However, horseback riding and backpacking are limited due to lack of available water. Nature study and photography are also possible. While the opportunity for some types of primitive and unconfined recreation exists, it is less than outstanding relative to the general public lands.

This entire subunit is located in what was formerly the Lime Canyon Wilderness Study Area, which was identified as having outstanding opportunities for primitive and unconfined recreation. This discussion concludes that because this wilderness element had been identified previously, release from wilderness study does not eradicate the existence of outstanding primitive and unconfined recreation, and therefore this subunit meets this wilderness element. There are no known supplemental values.

D.10. McCullough Mountains

This unit is one parcel composed entirely of public lands administered by the Las Vegas Field Office. It is generally located in southwestern Clark County, approximately 2 miles east of the town of Primm and comprises the bajada east and west of the Lucy Gray Mountains. The western boundary is contiguous with the California state line. Topography consists of very gently sloping bajada trending northwest and bisected by numerous small washes. The unit is located within the Mojave Desert ecoregion with vegetation dominated by Sonora-Mojave creosotebush-white bursage desert scrub, which is common to this region. Human activities include extensive OHV use, including permitted racing events.

The area is predominantly natural. It is intersected by numerous routes that penetrate the area in the western portions, especially in the portions of the unit located on the bajadas. These routes receive heavy use throughout the year, but use decreases during the hottest summer months. The remainder of the area has been affected primarily by the forces of nature, with the effects of man's work substantially unnoticeable. The Lucy Gray Mountains are a rugged range with steep cliffs and canyons and therefore are undeveloped overall.

The unit offers outstanding opportunities for solitude within the Lucy Gray Mountains. The rugged, broken landform provides excellent screening for visitors. The open areas on the western and southern peripheries of the unit are topographically and vegetatively less conducive to solitude and are exposed to the effects and developments of power lines and maintained roads. Current visitation to this area is unknown, but approximately five OHV racing events are permitted annually. Because of the size, configuration, ruggedness, and topographic variation, only a portion of the unit offers outstanding opportunities for solitude. The ability for visitors to find seclusion and avoid contact with the sights and sounds of others within the canyons and drainages is exceedingly probable.

The unit is characterized by two distinct landforms: gently sloping bajadas and steep, rugged mountain range. The portion of the unit within the Lucy Gray Mountains offers outstanding opportunities for primitive recreation, especially hiking. Backpacking and camping may be limited due to the lack of available water in the region, which is ephemeral in nature. Horseback riding would be limited due to the lack of water and ruggedness in some areas that would make horse travel difficult or impossible.

The portion of the unit located within the bajadas contains habitat for the endangered desert tortoise, while the cliffs and canyons provide habitat for desert bighorn sheep. Several known prehistoric cultural sites are located within the unit. While these features add interest, they are not exceptional or unique to the region.

D.11. Muddy Mountains Subunit A

The unit is located approximately 16 miles northeast of Las Vegas and is contiguous with the Muddy Mountains Wilderness, which is managed in part by the Las Vegas Field Office and National Park Service, Lake Mead National Recreation Area. The subunit appears to be primarily affected by the forces of nature with man's work substantially unnoticeable. There are numerous primitive routes located within the unit. Several of these primitive routes are located within washes and therefore have the potential to rehabilitate naturally. There is no additional known evidence of human use or occupation within the subunit.

The vegetation is typical of the Mojave Desert consisting of shrubs, cacti, grasses, and yucca. The vegetation is low growing and sparse, which provides minimal screening. The topography includes sloping valley lands, canyons, and benches. The combination of size and topography makes the majority of the area outstanding for solitude opportunities. Furthermore, this entire subunit is located in what was formerly the Muddy Mountains Wilderness Study Area, which was identified as having outstanding opportunities for solitude. This discussion concludes that because this wilderness element had been identified previously, release from wilderness study does not eradicate the existence of outstanding solitude, and therefore this subunit meets this wilderness element.

Recreational opportunities include nature study, bird watching, horseback riding, hunting, and hiking. The variety of the ecosystem provides good opportunities to observe various plant and animal communities within the area. Much of the terrain is conducive to horseback riding although extended trips would be limited due to lack of available water. There is a great variety of hiking opportunities that exist for all skill levels. This entire subunit is located in what was formerly the Muddy Mountains Wilderness Study Area, which was identified as having outstanding opportunities for primitive and unconfined recreation. This discussion concludes that because this wilderness element had been identified previously, release from wilderness study does not eradicate the existence of outstanding primitive and unconfined recreation, and therefore this subunit meets this wilderness element. The subunit contains a portion of the Rainbow Gardens ACEC, which is identified for geologic, scenic, scientific, cultural, and sensitive plants.

D.12. Muddy Mountains Subunit B

The unit is located approximately 16 miles northeast of Las Vegas and is contiguous with the Muddy Mountains Wilderness, which is managed in part by the Las Vegas Field Office and National Park Service, Lake Mead National Recreation Area. The subunit appears to be primarily affected by the forces of nature with man's work substantially unnoticeable. There are few primitive routes located within the unit, and those are primarily located in the wash. There is no additional known evidence of human use or occupation within the subunit.

The vegetation within the subunit is typical of the Mojave Desert consisting of shrubs, cacti, grasses, and yucca. The vegetation is low growing and sparse, which provides minimal screening. The topography includes a gentle sloping valley, washes, and the lower slopes of the Muddy Mountains. This entire subunit is located in what was formerly the Muddy Mountains Wilderness Study Area, which was identified as having outstanding opportunities for solitude. This discussion concludes that because this wilderness element had been identified previously, release from wilderness study does not eradicate the existence of outstanding solitude, and therefore this subunit meets this wilderness element.

Recreational opportunities include nature study, bird watching, horseback riding, and hiking. The variety of the ecosystem provides good opportunities to observe various plant and animal communities within the area. Much of the terrain is conducive to horseback riding, although extended trips are limited due to lack of available water. There is a great variety of hiking opportunities for all skill levels. This entire subunit is located in what was formerly the Muddy Mountains Wilderness Study Area, which was identified as having outstanding opportunities for primitive and unconfined recreation. This discussion concludes that because this wilderness element had been identified previously, release from wilderness study does not eradicate the existence of outstanding primitive and unconfined recreation, and therefore this subunit meets this wilderness element. There are no known supplemental values.

D.13. Muddy Mountains Subunit C

The unit is located approximately 16 miles northeast of Las Vegas and is contiguous with the Muddy Mountains Wilderness, which is managed in part by the Las Vegas Field Office and National Park Service, Lake Mead National Recreation Area. The subunit appears to be primarily affected by the forces of nature with man's work substantially unnoticeable. There are few documented primitive routes, located primarily within washes of the subunit. There is no additional known evidence of human use or occupation within the subunit.

The vegetation is typical of the Mojave Desert, consisting of shrubs, cacti, grasses, and yucca. The vegetation is low growing and sparse, which provides minimal screening. The topography includes washes, benches, and lower ridges of the Muddy Mountains. This entire subunit is located in what was formerly the Muddy Mountains Wilderness Study Area, which was identified as having outstanding opportunities for solitude. This discussion concludes that because this wilderness element had been identified previously, release from wilderness study does not eradicate the existence of outstanding solitude, and therefore this subunit meets this wilderness element.

Recreational opportunities include nature study, bird watching, horseback riding, hunting, and hiking. The variety of the ecosystem provides good opportunities to observe various plant and animal communities. Much of the terrain is conducive to horseback riding, although extended trips are limited due to lack of available water. There is a great variety of hiking opportunities for all skill levels. This entire subunit is located in what was formerly the Muddy Mountains Wilderness Study Area, which was identified as having outstanding opportunities for primitive and unconfined recreation. This discussion concludes that because this wilderness element had been identified previously, release from wilderness study does not eradicate the existence of outstanding primitive and unconfined recreation, and therefore this subunit meets this wilderness element. There are no known supplemental values.

D.14. Muddy Mountains Subunit D

The unit is located approximately 16 miles northeast of Las Vegas and is contiguous with the Muddy Mountains Wilderness, which is managed in part by the Las Vegas Field Office and National Park Service, Lake Mead National Recreation Area. The subunit appears to be primarily affected by the forces of nature with man's work substantially unnoticeable. There are few documented primitive routes that are located primarily within the washes of the subunit; others are maintained solely by the passage of vehicles and have the potential to return to a natural condition following manual rehabilitation. The only known evidence of human use includes a small parking area delineated with a post barricade and information sign. There is no additional known evidence of human use, occupation, or disturbances within the subunit.

The vegetation within the subunit is typical of the Mojave Desert consisting of shrubs, cacti, grasses, and yucca. The vegetation is low growing and sparse, which provides minimal screening. The topography primarily consists of a wide valley east of a low ridgeline of the Muddy Mountains. This entire subunit is located in what was formerly the Muddy Mountains Wilderness Study Area which was identified as having outstanding opportunities for solitude. This discussion concludes that because this wilderness element had been identified previously, release from wilderness study does not eradicate the existence of outstanding solitude and therefore this subunit meets this wilderness element.

Recreational opportunities include nature study, bird watching, horseback riding, hunting, and hiking. The variety of the ecosystem provides good opportunities to observe various plant and animal communities. Much of the terrain is conducive to horseback riding although extended trips are limited due to lack of available water. There is a great variety of hiking opportunities for all skill levels. This entire subunit is located in what was formerly the Muddy Mountains Wilderness Study Area, which was identified as having outstanding opportunities for primitive and unconfined recreation. This discussion concludes that because this wilderness element had been identified previously, release from wilderness study does not eradicate the existence of outstanding primitive and unconfined recreation, and therefore this subunit meets this wilderness element.

The unit contains a portion of the Hidden Valley ACEC, which is identified for its prehistoric cultural value.

D.15. Muddy Mountains Subunit E

The unit is located approximately 16 miles northeast of Las Vegas and is contiguous with the Muddy Mountains Wilderness which is managed in part by the Las Vegas Field Office and National Park Service, Lake Mead National Recreation Area. The subunit appears to be primarily affected by the forces of nature with man's work substantially unnoticeable. There are several documented primitive routes located primarily in the eastern portion of the subunit. The majority of these are located within washes, and others have the potential to return to a natural condition following manual rehabilitation efforts. There is no additional known evidence of human use or occupation within the subunit.

The vegetation is typical of the Mojave Desert consisting of shrubs, cacti, grasses, and yucca. The vegetation is low growing and sparse, which provides minimal screening. The topography primarily consists of numerous washes and benches of Bitter Spring Valley while the western portion includes the lower hillslopes of Bitter Ridge. This entire subunit is located in what was formerly the Muddy Mountains Wilderness Study Area, which was identified as having outstanding opportunities for solitude. This discussion concludes that because this wilderness element had been identified previously, release from wilderness study does not eradicate the existence of outstanding solitude, and therefore this subunit meets this wilderness element.

Recreational opportunities include nature study, bird watching, horseback riding, and hiking. The variety of the ecosystem provides good opportunities to observe various plant and animal communities. Much of the terrain is conducive to horseback riding although extended trips are limited due to lack of available water. There is a great variety of hiking opportunities for all skill levels. This entire subunit is located in what was formerly the Muddy Mountains Wilderness Study Area, which was identified as having outstanding opportunities for primitive and unconfined recreation. This discussion concludes that because this wilderness element had been identified previously, release from wilderness study does not eradicate the existence of outstanding primitive and unconfined recreation, and therefore this subunit meets this wilderness element.

The unit contains habitat for rare and sensitive plants such as Las Vegas buckwheat (*Eriogonum corymbosum var. nilesii*), a candidate species for federal listing, and Las Vegas bearpoppy (*Arctomecon californica*).

D.16. Muddy Mountains Subunit F

The unit is located approximately 16 miles northeast of Las Vegas and is contiguous with the Muddy Mountains Wilderness, which is managed in part by the Las Vegas Field Office and National Park Service, Lake Mead National Recreation Area. The subunit appears to be primarily affected by the forces of nature with man's work substantially unnoticeable. There are several documented primitive routes located primarily in the western portion of the subunit, west of West End Wash. The majority of these are located within washes, and others have the potential to return to a natural condition following manual rehabilitation efforts. There is no additional known evidence of human use or occupation within the subunit.

The vegetation is typical of the Mojave Desert consisting of shrubs, cacti, grasses, and yucca. The vegetation is low growing and sparse, which provides minimal screening. The topography primarily consists of numerous small canyons, benches, and draws of the southernmost extent of the Gale Hills, as well as numerous washes, the largest being West End. This entire subunit is located in what was formerly the Muddy Mountains Wilderness Study Area, which was identified as having outstanding opportunities for solitude. This discussion concludes that because this wilderness element had been identified previously, release from wilderness study does not eradicate the existence of outstanding solitude, and therefore this subunit meets this wilderness element.

Recreational opportunities include nature study, bird watching, horseback riding, hunting, and hiking. The variety of the ecosystem provides good opportunities to observe various plant and animal communities. Much of the terrain is conducive to horseback riding although extended trips are limited due to lack of available water. There is a great variety of hiking opportunities for all skill levels. This entire subunit is located in what was formerly the Muddy Mountains Wilderness Study Area, which was identified as having outstanding opportunities for primitive and unconfined recreation. This discussion concludes that because this wilderness element had been identified previously, release from wilderness study does not eradicate the existence of outstanding primitive and unconfined recreation, and therefore this subunit meets this wilderness element.

The unit contains habitat for the Las Vegas bearpoppy (*Arctomecon californica*).

D.17. Newberry Mountains

This triangular-shaped single unit is approximately 38 acres. The eastern boundary of the unit is contiguous with Spirit Mountain Wilderness to the east (National Park Service, Lake Mead National Recreation Area). The northwestern boundary of the unit lies south of Empire Wash, which provides access to Lake Mead National Recreation Area. The southern boundary of the unit is contiguous with the boundary of the community pit. The unit is predominantly natural. Numerous mining claim posts are located in the northwestern portion of the unit and are the only evidence of human development. This unit remains largely in its natural condition with man's work substantially unnoticeable.

The vegetation consists of low desert shrubs, cactus, yucca, and occasional pinyon-juniper characteristics of the Mojave Desert. The vegetation is low to the ground and generally sparse, providing little screening. The terrain includes the lower hills of the Newberry Mountains with short and shallow draws of little topographic variability. While opportunities for solitude exist, the limited vegetative and topographic diversity make it less than outstanding. While this unit lacks outstanding opportunities for solitude, it is contiguous with the Spirit Mountain Wilderness (NPS), which is identified as having outstanding opportunities for solitude. This unit is considered a small, roadless area contiguous with the designated wilderness, and therefore the discussion of the opportunity for solitude concludes that because the unit under review is contiguous with the Spirit Mountain Wilderness, opportunities for solitude do not stop at the administrative boundary.

Although opportunities for primitive and unconfined recreation exist, they are not outstanding. Opportunities for hiking and photography exist and are not unlike those opportunities found relative to general public lands. Opportunities for other types of recreation are limited due to the absence of water. The unit lacks outstanding opportunities for recreation both in the diversity of activities possible and the outstanding quality of one opportunity.

While this unit in and of itself lacks outstanding opportunities for primitive and unconfined recreation, it is contiguous with Spirit Mountain Wilderness, which is identified as having outstanding opportunities for primitive and unconfined recreation. This unit is considered a small, roadless area contiguous with the designated wilderness, and therefore the discussion of the outstanding opportunities for primitive and unconfined recreation concludes that since the unit under review is contiguous with Spirit Mountain Wilderness, opportunities for primitive and unconfined recreation do not stop at the administrative boundary. There are no known supplemental values.

D.18. Resting Springs Addition

The unit is located within 10 miles of the town of Pahrump. The northern and eastern portion of the unit is adjacent to utility corridors and rights-of-ways. The Southern Nevada District Office-designated utility corridor is located in the southeast portion, but no developments currently exist within the unit. The western portion of the unit is contiguous with the Resting Springs Wilderness Study Area (BLM, Pahrump Field Office) and Resting Spring Range Wilderness (BLM, Barstow Field Office) along the California/Nevada border. The unit is predominantly natural. There is no known evidence of human use or occupation, and primitive routes were located within the unit. This unit remains largely in its natural condition with man's work substantially unnoticeable.

Although opportunities for primitive and unconfined recreation exist, they are not outstanding. Opportunities for hiking within the unit are not unlike those opportunities found relative to general public lands. Opportunities for other types of recreation (horseback riding, camping) are limited due to limited water availability. No big game animals are known to exist within the unit. The unit lacks outstanding opportunities for recreation both in the diversity of the number of primitive and unconfined recreational activities possible or the outstanding quality of one opportunity.

While this unit lacks outstanding opportunities for primitive and unconfined recreation, it is contiguous with the Resting Spring Range Wilderness, which is identified as having outstanding opportunities for primitive and unconfined recreation. This unit is considered a small, roadless area contiguous with the designated wilderness, and therefore the discussion of the outstanding opportunities for primitive and unconfined recreation concludes that because the unit under review is contiguous with the Resting Spring Range Wilderness, opportunities for primitive and unconfined recreation do not stop at the administrative boundary.

The Amargosa niterwort (*Nitrophila mohavensis*) is a federally listed endangered plant species located within the subunit. Wild horses are also found within the subunit.

D.19. South McCullough Addition Subunit A

This unit is located approximately 15 miles east of Primm and includes the lower slopes of the McCullough Mountains contiguous with the South McCullough Wilderness (BLM). The subunit appears to be primarily affected by the forces of nature with man's work substantially unnoticeable. There is no known evidence of human occupation, use, or disturbance.

The vegetation is typical of the Mojave Desert consisting of shrubs, cacti, grasses, yucca, and Joshua trees and transitions to pinyon and juniper. The diverse vegetation adds interest in terms of shape and form, as well as providing sufficient cover. The topography consists of gently

rolling bajada intersected by numerous washes and transitions to the broken lower hills of the McCullough Mountains characterized by numerous small canyons and draws. The area has sufficient vegetative and topographic screening for adequate solitude. Furthermore, this entire subunit is located in what was formerly the McCullough Mountains Wilderness Study Area, which was identified as having outstanding opportunities for solitude. This discussion concludes that because this wilderness element had been identified previously, release from wilderness study does not eradicate the existence of outstanding solitude, and therefore this subunit meets this wilderness element.

Recreational opportunities include nature study, horseback riding, hunting, and hiking. The variety of the ecosystem provides good opportunities to observe various plant and animal communities within the area. Much of the terrain is conducive to horseback riding, although extended trips are limited due to lack of available water. There is a good variety of hiking opportunities for all skill levels. This entire subunit is located in what was formerly the South McCullough Wilderness Study Area, which was identified as having outstanding opportunities for primitive and unconfined recreation. This discussion concludes that because this wilderness element had been identified previously, release from wilderness study does not eradicate the existence of outstanding primitive and unconfined recreation, and therefore this subunit meets this wilderness element. There are no known supplemental values.

D.20. Temple Mesa Subunit B

This unit is located east of the Overton Arm of Lake Mead in the southernmost Gold Butte region. The southern boundary of the subunit is contiguous with the Jumbo Springs Wilderness on the south and National Park Service, Lake Mead National Recreation Area wilderness proposal area unit #16 Hell's Kitchen. The subunit appears affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable. No known developments or other evidence of human disturbance or occupation exists.

The vegetation consists primarily of low desert shrubs, species of cacti, and scattered pinyon and juniper. The topography is composed of a low hilltop with little variability of terrain, making opportunities for solitude less than outstanding.

While this subunit lacks outstanding opportunities for solitude, it is contiguous with National Park Service wilderness proposal unit #16 Hell's Kitchen, which is identified as having outstanding opportunities for solitude. This unit is considered a small, roadless area contiguous with the NPS wilderness proposal area. The discussion of the opportunity for solitude concludes that because the subunit under review is contiguous with NPS wilderness proposal unit #16 Hell's Kitchen, opportunities for solitude do not stop at the administrative boundary. If the BLM land is eventually separated from the NPS wilderness proposal or the wilderness proposal on the LMNRA land is eventually withdrawn or rejected by Congress, opportunities for solitude would not exist to an outstanding degree and wilderness consideration on BLM lands should be removed.

The few primitive recreation opportunities available include hiking and nature study. Backpacking and horseback riding is limited due to the lack of available water. Neither the diversity in the number of primitive and unconfined recreational activities possible nor the quality of one opportunity would be considered outstanding. While this subunit in and of itself lacks outstanding opportunities for primitive and unconfined recreation, it is contiguous with National Park Service wilderness proposal unit #16 Hell's Kitchen, which is identified as having outstanding opportunities for primitive and unconfined recreation. This unit is considered a small, roadless

area contiguous with the NPS wilderness proposal area. The discussion of the opportunity for primitive and unconfined recreation concludes that since the subunit under review is contiguous with NPS wilderness proposal unit #16 Hell's Kitchen, opportunities for primitive and unconfined recreation do not stop at the administrative boundary. If the BLM land is eventually separated from the NPS wilderness proposal or the wilderness proposal on the LMNRA land is eventually withdrawn or rejected by Congress, opportunities for primitive and unconfined recreation would not exist to an outstanding degree and wilderness consideration on BLM lands should be removed. There are no known supplemental values.

D.21. Whitney Pockets West

The unit is located at the northeast end of the Overton Arm of Lake Mead in the northwest portion of the Gold Butte region. The northern boundary of this unit is the Fisherman Cove Road and an R.S. 2477 road; it is contiguous with Lake Mead National Recreation Area at its very southwest corner. The southern boundary is north of an R.S. 2477 road. The eastern boundary is the Gold Butte Road. The area is predominantly natural. No documented routes are located within the unit. No other evidence of modern developments and use (e.g., mining, grazing, and wildlife water developments) are located within the unit. No other evidence of human occupation or improvement was observed. The unit generally appears to be affected primarily by the forces of nature with the imprint of man's work substantially unnoticeable.

The unit size and configuration are adequate to offer an opportunity for solitude. The vegetation is comprised of desert shrubs typical of the Mojave Desert, and includes some grasses. The vegetation is near to the ground, of average density, and therefore provides minimal screening. The topography is generally a flat, gently sloping outwash plain, offering little topographic variability across much of the unit. However, the central portion of the unit provides some outstanding opportunities for solitude within a series of braided drainages cut by ephemeral washes.

Primitive and unconfined recreational opportunities include nature study, horseback riding, sightseeing, and hiking. Horseback riding is possible owing to the gentle terrain, however lack of water availability limits use. Hiking opportunities within the central portion of the wilderness, dominated by a series of braided drainages, are outstanding and sightseeing of the Virgin Mountains to the east and Lake Mead to the west would also be of outstanding opportunity.

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Appendix E. Noxious Weeds

A PLAN FOR INTEGRATED WEED MANAGEMENT LAS VEGAS FIELD OFFICE

Prepared by Everett Bartz - Noxious Weed Coordinator

December 2006

LAS VEGAS FIELD OFFICE

NOXIOUS WEED PLAN

2006

The Las Vegas Field Office Noxious Weed Plan is approved for implementation in the Bureau of Land Management, Las Vegas Field Office and shall remain in effect until amended or withdrawn by written notice by the Authorized Officer. All existing weed mitigation measures are replaced by those in this document.

Approved: Carolyn Ronning — 12/8/2006
Carolyn Ronning, Acting
Assistant Field Manager, Renewable Resources
Date

Approved: Juan Palma — 12/18/06
Juan Palma
Field Manager
Date

2

E.1. Executive Summary

Southern Nevada rangelands are being impacted by the presence of invasive, non-native vegetation (weeds). The Las Vegas Field Office (LVFO) of the Bureau of Land Management (BLM) has prepared this document to provide guidance for an active integrated weed management program using best management practices (BMP). The BMPs originated from a cooperative effort between BLM and other federal agencies which produced the document, Partners Against Weeds. The Las Vegas Field Office Noxious Weed Plan will narrow that focus as it dovetails into the Partners Against Weeds action plan,

Weeds are seen as a major threat to ecosystem health in southern Nevada, The presence of weeds in any landscape increases the inter-specific competition for resources. In most situationsweeds out-compete native plants and displace them. Wildland fire frequency and size has increased in cheatgrass/red brome infested plant communities. These two winter miliual grass species provide fine fuels for fire in plant communities that, historically, rarely burned. Additionally some riparian areas are infested with tamarisk. Tamarisk that dominate riparian areas use precious water resources, nutrients and space, Established stands of tamarisk will alter soil chemistry increasing salt deposition, leading to changes in plant community composition.

This strategy includes seven objectives for effective control of noxious and invasive weeds:

- Implementation of an integrated weed management (IWM) program
- Inventory and monitoring of noxious weeds
- Integration of a weed management component in all L VFO planning efforts with surveys, inventories and monitoring measures
- Development of research, detection, prevention, and control efforts
- Development of an education and awareness program for internal and external partners
- Development of a means of coordination between agencies, industry and private landowners to control noxious weeds
- Development of monitoring and evaluation procedures for treated sites

The management of weeds is further guided by the Las Vegas Resource Management Plan which identifies two objectives for resource management involving weeds. I) **RP-l-f.,** which states; *"Use integrated weed management techniques to control and eradicate tamarisk, such as burning, chemical, biological or mechanical treatments, where potential for treatment is good. Rehabilitate the area with native species to help reduce the potential for tamarisk reestablishment and improve ecosystem health."* 2) **VGl,** which states; *"Maintain or improve the condition of the vegetation on public lands to a Desired Plant Community or to a Potential Natural Community."*

Stable funding is necessary for the implementation and maintenance of an integrated weed management effort. This plan identifies an initial funding level of approximately $110,000 to accomplishment these strategies. Additional funding will be requested as the program achieves the goals listed above.

E.2. Background

The Bureau of Land Management defines Noxious Weeds as: "A plant that interferes with management objectives for a given area of land at a given point in time". (http://www.nv.blm.govlResources/noxiousweeds.htm). The State of Nevada defines Noxious

Weeds as: "Any species of plant which is, or liable to be, detrimental or destructive and difficult to control or eradicate ... " (NRS 555.005) The species on the Nevada state list of noxious weeds are those receiving primary focus in the LVFO and have been recognized as having major impacts on ecosystem health and associated natural resources (Appendix I).

Weeds spread without respect for jurisdiction or property boundaries. Weeds are everyone's problem and will require a cooperative effort between all stakeholders. Each LVFO program must recognize its role and responsibility to assist in weed control by incorporating BMPs into all aspects of planning and on the ground activities. Several documents have been published regarding invas ive plant management, such as the BLM Partners Against Weeds - An Action Plan for the Bureau of Land Management (January 1996); Pulling Together - National Strategy for Invasive Plant Management (FlCMNEW 1997) and Executive Order 13112 Invasive Species (February 1999). The Noxious Weed Strategy Plan for the Las Vegas Field Office builds on the strategies outlined in the above mentioned publications. There are several laws, regulations and policies that govern the management and control of noxious weeds on Public lands are listed in appendix 2.

The purpose of this strategy plan is to define the scope and resource impacts of weeds and proposes a course of action on Public lands administered by the LVFO. The intent is to prevent further resource degradation from noxious weeds and ultimately to have a no net increase to the size of areas infested with weeds.

Impacts associated with noxious weeds include, but are not limited to the following:

- Increased fire frequency and intensity
- Costly control efforts
- Degradation of wildlife and plant habitats
- Loss of ecosystem biodiversity
- Physical displacement of native vegetation
- Increased soil erosion
- Hydrologic cycle changes
- Reduced recreation opportunities

E.3. Current Situation

Weeds are most likely present throughout the boundaries of the LVFO. Infestations typically range from a few widely isolated plants to large areas dominated by weeds. These types of infestations may vary depending on weed species and previous control efforts. Inventories have been conducted over the years but a complete LVFO wide inventory remains to be accomplished.

High profile areas such as the Virgin River, Las Vegas Wash, Ash Meadows, Red Rock National Conservation Area, major roadways and some of the area of critical environmental concern or ACECs, have received most of the attention regarding weed inventories and treatments.

A list of some of the weed species that are a concern includes; Sahara mustard, camelthorn, perennial pepper weed, several knapweeds, malta and yellow starthistles, Johnson grass, Scotch thistle, Canada thistle, green fountain grass, puncture vine, tamarisk/salt cedar and other weedy species which may be found in various locations in the LVFO. The likelihood of new species being introduced is always present. Early detection of new weed species is critical in preventing further resource degradation and keeping control costs down.

Areas occupied by invasive weeds typically grow at an exponential rate without action. Weeds quickly invade disturbed and some undisturbed areas and cause even greater ecosystem damage. With proper planning and funding, the LVFO can slow the rate of new infestations and reduce the spread of existing weeds infestations.

Current treatment of weed infestations range from hand pulling to full herbicidal/mechanical treatment on the riparian areas of the Virgin River. Examples of treatment sites include herbicide research areas, riparian areas, fire rehabilitation areas, roadsides, trails, trailhead areas, parking areas and around BLM fac ilities, storage yards, campgrounds, parking lots and other areas used by the BLM in the execution of our work. Surveys (Appendix 3), inventories and treatments will continue to be conducted until weedy species have been either eradicated or controlled.

E.4. NEPA noxious weed analysis

Impacts associated with the presence of noxious weeds on the project footprint must be analyzed. Therefore the project lead will review the LVFO Weed Plan and/or consult with the LVFO noxious weed coordinator regarding their project. The L VFO weed plan and/or L VFO Noxious Weed Coordinator will provide BMPs to control the impacts associated with weeds on most project footprints. Review of this document and consultation with the LVFO Noxious Weed Coordinator should occur early in the project development. Completion of the weed risk assessment will begin the process of identifying any weed issues associated with the proposed project and provide the focus for mitigation measures that are to be incorporated into either the projects weed management plan or weed management component of plan of development. An example of a weed management plan is provided in appendix 4. Examples of necessary documents and a "Rapid Start" (Appendix 5) section have been provided in this weed plan for project leads.

E.5. Disposal areas

Currently there are areas within the LVFO that through past, present and future legislation may become develop into the infrastructure that support the human environment such as a school, parking lot, movie theater, business, hospital and other developments for human use. These parcels of land will be drastically altered relative to what the area is like today. With these uses in mind, it would be more judicious to spend the weed budget on lands that will remain under the management of the LVFO. Therefore, weeds in disposal areas are being viewed as a non-issue. Exceptions would be flood control structures and right-of-way corridors or other projects that span that interface between the public lands and future development.

E.6. Budget

Funding levels for weed management have been flat but are expected to stabilize and increase with the L VFO's commitment to control and manage weeds. Weed management in the past was partially funded by Southern Nevada Public Lands Management Act. Currently, funding comes from appropriated funds for the LVFO noxious weed program and fire rehabilitation. A plan of operations, by year, for the L VFO noxious weed coordinator is shown in appendix 14. As the LVFO weed program grows, funding is expected to increase. An annual budget will be developed based on the BLM Planning Target Allocation and Annual Work Plan and will be appended yearly to this strategy plan. The duties of the Weed Coordinator are shown in appendix 6.

E.7. Goals, Management Opportunities and Recommended Strategies

The seven goals mentioned earlier are further detailed below.

E.7.1. Goal 1: Implementation of an Integrated Weed Management (IWM) program

"An IWM program is used to determine which methods are best for an overall approach to weed control through on the ground activities."

E.7.1.1. Management Opportunities

An active IWM program involves the use of four general categories of management options, which includes chemical, physical, biological and cultural. IWM is best described as a decision making process that uses site-specific information to determine treatment options that will most effectively control weeds. IWM is based on combined strategies for weed management that is more successful than a single method alone.

E.7.1.2. Recommended Strategies

Conduct IWM on Public lands administered by the LVFO using the following methods:

E.7.1.2.1. Chemical Control

1. Determine the effectiveness of herbicide on the target species, application rates, techniques, timing of application and impacts to non-target plants/animals.

2. Implement chemical control methods on locations where herbicide can be most effective on target species and site characteristics or in combination with other treatment methods.

E.7.1.2.2. Physical Control (manual/mechanical control methods)

1. Determine if the site and weed species are appropriate for manual/mechanical control methods.

2. Determine whether control methods may reduce or increase the infestation.

3. Implement physical control methods on target species, which are susceptible to this treatment regime.

E.7.1.2.3. Biological Control

1. Determine if sites are appropriate for biological control agents.

2. Implement biological control on infestations that can be feasibly controlled with this treatment method and/or as a supplement to other treatments.

3. Determine the feasibility of using grazing animals as a form of biological control on weed patches that would be consistent with other resource management objectives.

E.7.1.2.4. Cultural Control Prevention

1. Implement preventative measures such as quarantine and closure to reduce and contain existing infestations.

2. Determine if past management activities have facilitated the introduction and spread of noxious weeds and determine how to change activities and practices to reduce the spread of weeds.

3. Re-vegetate bare soil following disturbance, where practical.

4. Select plant species for seeding that will help to reduce the spread of noxious weeds.

5. Defer soil disturbance if possible until weeds are controlled or under management.

6. Determine whether specific public awareness programs could reduce infestations or control the spread of weeds.

E.8. Goal 2: Inventory and subsequent re-inventory of weeds

"Early detection of new weed species and new infestations is a primary step in weed management."

E.8.1. Management Opportunities

Inventory data provides necessary baseline information such as infestation locations, infestation size and density, associated environmental conditions and disturbance factors. This information is the minimum required when planning treatment activities.

Over the years weed inventories have been sporadic. However, with a firm commitment, weed surveys and monitoring will become routine, more complete and comprehensive. Additional surveys will be conducted in areas not yet inventoried. This information will be combined with past surveys. Then all survey data will be used to analyze trend characteristics on infestations which have never received treatment. Inventory information is needed to identify management actions in areas with weed infestations which will allow for budgetary planning.

E.8.2. Recommended Strategies

1. Develop a periodic inventory system for weeds that includes information such as weed species, infestation size and density, disturbance factors and other associated site characteristics. Commensurate with funding, 20% of the land mass for the LVFO will be inventoried each year.

2. Periodic re-survey of known infestations will show trend data and be used to determine rate of spread.

3. Maintain up to date noxious weed inventory data in the LVFO's Geographic Information System (GIS) database in the "Risk_Assessment" main folder. This folder can be found at: M:/gis_work/districtlWeeds_Information. Inside the Risk Assessment folder are five additional files, "Survey_Areas", "Weed_Points", "Weed_Lines", "Weed_Areas" and the L VFO_ Weed_Map. The LVFO weed map will be used to provide weed information during the NEPA process. Weed data will be provided to the Nevada Natural Heritage program to produce a statewide weed map. The same data will be provided for the BLM National Weeds Database that will be distributed freely. All data from the current L VFO weed inventory will be converted to a format compatible with a spatial GeoDatabase.

4. Use the District inventory database for planning and NEPA analysis. Create maps showing weed species, infestation location and other pertinent information for internal and external use.

E.9. Goal 3: Integration of a weed management component in all planning efforts with standard mitigation measures

"Include provisions for weed management in all BLM funded or BLM authorized actions."

E.9.1. Management Opportunities

The BLM can fulfill its responsibilities under the Federal Noxious Weed Act and Executive Order 13112 by incorporating weed management into all NEPA documents. The integration of weed management into project and activity planning will help to ensure adequate weed management.

E.9.2. Recommended Strategies

1. Incorporate weed management as a review component ll1 NEPA documents for projects, activity plans and land use plans.

2. Incorporate the Best Management Practices (Appendices 7 & 8) as mitigation measures for various BLM activities.

E.10. Goal 4: Development of Prevention, Detection and Control efforts

"Develop a comprehensive prevention, early detection and aggressive control program."

E.10.1. Management Opportunities

Prevention and early detection of new locations for developing weed species and control of isolated weed infestations are the most practical and effective aspects of weed management. Prevention is best accomplished by ensuring that new weed species are not introduced into a new area. Avenues of introduction include weather, wildlife, hikers, mountain bikers, all-terrain vehicles, off-highway vehicles (OHVs), passenger vehicles, contaminated seed, straw, hay and/or mulch, activities that are staged in areas that are infested with weeds and un-restored disturbed areas.

E.10.2. Recommended Strategies

1. Continue to use standards designed to ensure seed, straw and mulch are certified weed seed free.
2. Implementation of BMP procedures listed in Appendices 7 & 8 when performing road maintenance activities and other BLM authorized activities.
3. Ensure BLM personnel are trained in identification of noxious weed species that are likely to be introduced so that early detection & rapid response procedures can be used.
4. Develop a treatment prioritization system, which combines weed species, site characteristics and available funding, in order to plan treatment regimes. This prioritization outline is shown in Appendix 9.

E.11. Goal 5: Development of an Education and Awareness program for internal and external partners

"Generate internal and external awareness of and support for noxious weed management."

E.11.1. Management Opportunities

Awareness of weed species and their impact to the environment, along with what can be done to reduce their spread is a primary step in weed management. Education and awareness includes BLM personnel, outside partners and the general public. All resources may be impacted by weeds or are vectors in their spread.

E.11.2. Recommended Strategies

1. Provide annual weed identification and management training to BLM employees and make this available to the general public. Encourage participants to evaluate how their actions can either prevent or increase the spread of weeds.
2. Provide outreach efforts to the general public about weed concerns and what can be done to prevent their spread.
3. Develop public service announcements, educational displays and materials for release to the public.

4. Give presentations at local and regional conferences on the impacts of weeds and steps being taken to control the problem.

E.12. Goal 6: Development of a means of coordination between agencies, industry and private landowners to control weeds

"Ensure that management for weeds IS carried out efficiently and consistently across jurisdictional and political boundaries."

E.12.1. Management Opportunities

Weeds do not respect jurisdictional or property boundaries. All partners, federal, state, local governments and interest groups must be involved and share coordination and cooperation.

E.12.2. Recommended Strategies

1. Participate in local, state and national training/workshops attended by other individuals working with weeds.
2. Participate in interagency weed control efforts.
3. Encourage weed control by Cooperative Weed Management Areas (CWMA) and local Conservation Districts.
4. Establish working relationships with County and State governments.

E.13. Goal 7: Development of monitoring and evaluation procedures for treated sites

"Ensure sufficient data are available to evaluate management actions, to provide a basis for making informed management decisions, to assess progress towards management objectives, and to develop new and more effective management methods."

E.13.1. Management Opportunities

Monitoring programs are necessary to evaluate management activities and demonstrate BLM compliance with applicable laws, policies, and regulations. Data from monitoring can provide information to show whether or not weed control efforts are making progress towards stated management objectives and the efficacy of specific control efforts and possible changes in management actions.

E.13.2. Recommended Strategies

1. Monitor weed locations that have had some treatment.
2. Ensure that other LYFO resource monitoring plans have some noxious weed component in their procedures.

E.14. Resource Needs

To accomplish the goals listed in this strategy plan, the following five resources and funding components are needed.

1. Continue to support a part/full-time noxious weed coordinator position within the LYFO. The responsibilities of this person are to design and direct the noxious weed program, plan weed control efforts, coordinate with other area BLM field offices, agencies and interest groups, maintain a weed inventory database and administer weed control contracts. This person would be responsible for the yearly planning of the weed program.

2. Toxicological research will be needed to determine which herbicides approved for public land use are safe for threatened and endangered plants and animals and other species of concern within the LVFO.

3. Explore possible development of a program for the use, support, and maintenance of a staff of weed control technicians. This may include crew leaders and a number of seasonal employees familiar with weed control procedures. Crew leaders and seasonal employees would perform most of the field work by the BLM in weed management.

4. Continue to use available contract labor for weed control. Contract labor consists of licensed contractors hired under a competitive bid process and also cooperative weed control projects by local Conservation Districts, Weed Districts and Cooperative Weed Management Areas.

5. Continue to involve LVFO personnel in weed management. A successful weed program includes participation among all programs within the Las Vegas Field Office. A suggested list of duties for Field Office staff is shown in appendix 10.

E.15. Annual Operation Plan

An operating plan specifically addresses work done annually to implement the LVFO weed management plan. This section will be updated no later than May 1 of each year to provide input to the Nevada State Office for funding for the following year. The L VFO should provide a stable funding source for the implementation of this strategy plan on an annual basis. Major emphasis areas for the program include inventory, control efforts, education/awareness, and coordination with external partners.

Below is a table summarizing the initial budget for the L VFO weed program. This table shows the minimum required to maintain the weeds program at the level accomplished during Fiscal Year 2006. See appendix 14 for the Annual Operating Plan(s).

Table E.1. Initial 2006 Budget and Workload Targets for the Noxious Weeds Program[a]

Weed Management Component	Program Element	Estimated Cost	Deliverables
Education/Awareness	AL	$ 7,600	5 Events
Weed Inventory	BS	$ 25,000	250,000 Acres
Weed Treatment	JD	$ 60,000	150 Acres

Treatment Evaluation/ Monitoring	MK	$ 11,400	150 Acres
Total: $104,000			

[a]The following table represents fiscal year 2006 and would be the minimum in total workload accomplishments and funding.

E.16. Appendix 1. State of Nevada Noxious Weed List.

Noxious weeds are designated by the Nevada Department of Agriculture and recognized and managed on Public lands by the BLM. Listed plants are categorized into one of three levels depending upon infestation characteristics. The listed weeds are in accordance with Nevada Administrative Code (effective 10-31-05) 555.010.

E.16.1. Category A

Category A weeds generally are not found or are limited in distribution throughout the State.

Such weeds are subject to:

1. Active exclusion from the State and active eradication wherever found.
2. Active eradication from the premises of a dealer of nursery stock.

Category A Weeds:

1. African rue (*Peganum harmala*)
2. Austrian fieldcress (*Rorippa austriaca*)
3. Austrian peaweed (*Sphaerophysa salsula*)
4. Black henbane (*Hyoscyamus niger*)
5. Camelthorn (*Alhagi pseudalhagi*)
6. Common Crupina (*Crupina vulgaris*)
7. Dalmatian toadflax (*Linaria dalmatica*)
8. Dyer's woad (*Isatis tinctoria*)
9. Eurasian water-milfoil (*Myriophyllum spicatum*)
10. Giant Salvinia (*Salvinia molesta*)
11. Giant reed (*Arundo donax)*
12. Goats rue (*Galega officinalis*)
13. Green fountain grass (*Pennisetum setaceum*)
14. Houndstongue (*Cynoglossum officinale*)
15. Hydrilla (*Hydrilla verticillata*)

16. Iberian starthistle (*Centaurea iberica*)
17. Klamath weed (*Hypericum perforatum*)
18. Malta starthistle (*Centaurea melitensis*)
19. Mayweed chamomile (*Anthemis cotula*)
20. Mediterranean sage (*Salvia aethiopis*)
21. Purple loosestrife (*Lythrum salicaria*, *Lythrum virgatum* and their cultivars)
22. Purple starthistle (*Centaurea calcitrapa*)
23. Rush skeletonweed (*Chondrilla juncea*)
24. Sow thistle (*Sonchus arvensis*)
25. Spotted knapweed (*Centaurea maculosa*)
26. Squarrose knapweed (*Centaurea virgata*)
27. Sulfur cinquefoil (*Potentilla recta*)
28. Syrian bean caper (*Zygophyllum fabago*)
29. Yellow starthistle (*Centaurea solstitialis*)
30. Yellow toadflax (*Linaria vulgaris*)

E.16.2. Category B

Category B weeds generally established in scattered populations in some counties of the state. Such weeds are subject to:

1. Active exclusion where possible.
2. Active eradication from the premises of a dealer of nursery stock.

Category B Weeds:

1. Carolina horse nettle (*Solanum carolinense*)
2. Diffuse knapweed (*Centaurea diffusa*)
3. Leafy spurge (*Euphorbia esula*)
4. Medusahead (*Taeniatherum caput-medusae*)
5. Musk thistle (*Carduus nutans*)
6. Russian knapweed (*Acroptilon repens*)
7. Sahara mustard (*Brassica tournefortii*)
8. Scotch thistle (*Onopordum acanthium*)

9. White horse nettle (*Solanum elaeagnifolium*)

E.16.3. Category C

Category C weeds generally established and widespread in many counties of the state. Such weeds are subject to active eradication from the premises of a dealer of nursery stock.

Category C Weeds:

1. Canada thistle (*Cirsium arvense*)
2. Hoary cress (*Cardaria draba*)
3. Johnson grass (*Sorghum halepense*)
4. Perennial pepperweed (*Lepidium latifolium*)
5. Poison Hemlock (*Conium maculatum*)
6. Puncture vine (*Tribulus terrestris*)
7. Salt cedar (tamarisk) (*Tamarix* spp.)
8. Water Hemlock (*Cicuta maculata*)

E.17. Appendix 2. Laws, Regulations and Policies

The following laws, regulations and policies provide the basis for management of weeds on public lands.

Executive Order 13112 - Invasive Species - Defines federal agency duties and responsibilities. This order further creates the Invasive Species Council and the requirement of an invasive species management plan.

Federal Land Policy and Management Act (FLPMA) of 1976, as amended - Directs the BLM to "take any action necessary to prevent unnecessary and or undue degradation of the public lands."

Public Rangelands Improvement Act (PRIA) of 1976 - Requires that BLM will manage, maintain and improve the condition of the public rangeland so that they will become as productive as feasible.

Federal Noxious Weed Act of 1974, as amended by Sec. 15, Management of Undesirable Plants on Federal Lands, 1990 - Authorizes the Secretary "to cooperate with other federal and state agencies, and others in carrying out operations or measures to eradicate, suppress, control or prevent or retard the spread of noxious weeds. Each federal agency shall 1) designate an office or person adequately trained to develop and coordinate an undesirable plants management for control of undesirable plants on federal lands under the agency's jurisdiction; 2) establish and adequately fund an undesirable plants management program through the agency's budgetary process; 3) complete and implement cooperative agreements with State agencies regarding the management of undesirable plant species on federal lands; and 4) establish integrated management systems to control or contain undesirable plant species targeted under cooperative agreements."

BLM Manual 9011 - Provides policy for conducting chemical pest control programs under and integrated pest management approach.

BLM Manual 9015 - Provides policy relating to the management and coordination of noxious weed activities among BLM, organizations and individuals.

E.18. Appendix 3. Weed Survey Protocols

Invasive Weed Survey Protocol

Robert E. Wilson, UNCE White Pine Extension Educator

Ted Angle, Nevada BLM Noxious Weed Program Coordinator

The primary goal of the Nevada invasive weed survey process is to detect and map all established populations within the state. It is impossible to devote adequate resources to survey every square foot of the landscape in Nevada to fully inventory for invasive weed populations. Therefore, this protocol uses a tiered approach that relies first on the premise that the most likely place that invasive weed populations will become established or occur (the target population) are in disturbed areas. The second tier addresses other, presumably less probable areas with limited disturbance. This insures that invasive weed populations are also surveyed that might have been inadvertently started by livestock or wildlife in remote or undisturbed areas. The third tier is a random check to validate the reliability of survey done in the first and second tiers. This multitiered approach is designed to ensure a high degree of accuracy and reliability across the landscape.

PLANNING - Initial assessment of the problem and the necessary resources. Personnel must be trained using reliable information, standardized protocol, and adequate resources.

a. Identify all invasive plant species of concern.

b. Understand enough of the biology of each species to know how they are spread from an area to form new infestations.

c. Select areas to survey that are easily definable by a natural boundary, such as a watershed or valley.

d. Select a GPS database library compatible with your GIS system and with others that will be using the information.

e. Insure that fields are available in the GPS database library to note not only the size and location, but also to tag information, such as infestation species, density, individual collecting the data, or any other data needed for future planning.

TIER I - The assumption is that most likely places that weeds might become established are near transportation systems, in disturbed areas, and areas near water. Therefore all of these areas are scouted. Inventory and place in a GPS database library any invasive weed infestations found.

f. Scout all roads, trails, by-ways, railways, utility cOITidors, or other transportation systems.

g. Scout all known seeps, springs, streams, dry streambeds, riparian systems, irrigation canals, stock ponds, or any wetlands.

h. Scout any additional man-made or natural disturbed areas including, but not limited to, campgrounds, corral systems, mining disturbances, chainings, seismic exploration sites, material stockpiles, and any other disturbances.

i. Identify all paths, routes, or ways traveled by inclusion within the GPS database library.

These document places surveyed where no invasive plant populations were found.

j. Additional areas may be specifically selected to survey based upon such issues as likely rare or endangered species presence, or for other management considerations.

TIER II - Stratified random check of areas not associated with disturbances, but potentially can be infested with invasive weed species. (Areas not necessarily considered impacted by disturbances constitute huge geographic areas in Nevada, therefore it is not feasible to survey in detail.)

k. Random areas are selected from grid maps where no known disturbances have occurred.

l. Stratify the area by either elevation or plant community, not both.

m. Randomly select a representative number of field check sites within the stratified area.

TIER III - Randomly check at least 5-20% of work previously surveyed and stored in a PS database library to establish accuracy of survey efforts.

PERSONNEL MANAGEMENT -These are suggestions which help to increase personnel safety, efficiency, and accountability. These items are important to developing a cost-effective survey of invasive weeds across the landscape.

n. Try to find personnel with experience working alone in rural environments, familiar with local plant communities, and knowledgeable about electronic technology.

o. Provide adequate training and supervision.

   i. Insure that all members of the team are familiar enough with the invasive plant species to be inventoried so that they can quickly and accurately identify all stages of plant growth.

   ii. Insure that all members have a comprehensive knowledge of inventory procedures, GPS operation, and database management.

p. For safety reasons, survey personnel should preferably work in crews of at least two.

   i. Travel preferably with two persons per vehicle; when traveling by foot, surveyors should maintain a reasonable distance from each other.

   ii. Vehicles should stay within radio contact of each other; one vehicle should be within radio contact of base station

   iii. Keep vehicles in proper condition to ensure safety and reliability during off-highway use.

References:

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E.19. Big Time Weed Plan

An Example of the Big-Time Noxious Weed Plan

Before you begin. What follows is a real example of a weed plan that is as close to the state of the art as possible. This was merely intended to guide you in the preparation of a Noxious Weed Plan if a plan is required. Actual facts listed in this document would not be relevant to your project and then they might. When reviewing this document, keep in mind the scope of your project. If you project involves walking or a casual trip across the desert much of what is being discuss would not pertain and your plan would be much less detailed. Not all NEPA actions will require this type of a plan, most however would. If you should have any questions contact the LVFO Noxious Weed Coordinator at 702 515-5000.

LIST OF TABLES (although not in this document, these are ideas for the tables)

Noxious Weed Populations Identified along the Proposed Pipeline Loops

Designated Noxious Weeds of the State of Wyoming and Appropriate Agencies and Counties within Wyoming

Designated Noxious Weeds of the State of Utah and Federal Agencies within Utah

Designated Noxious Weeds of the State of Utah and Appropriate Counties within Utah

Designated Noxious Weeds of the State of Nevada and Appropriate Agencies and Counties within Nevada

Designated Noxious Weeds of the State of California and Appropriate Agencies and Counties within California

Weed Management Areas and Mitigation Restrictions by States and Appropriate Agencies and Counties along the Pipeline Right-Of-Way

3-1 Herbicides Approved for Use on U.S. Forest Service Land

Herbicides Approved for Use on Bureau of Land Management Land

APPENDIX LIST (Just an example of what could be included)

State Laws Regarding Noxious Weeds

Agency Contact Reports/ Any Information Provided by the Agencies

Copies of Agency Correspondence Letters

California State List of Noxious Weed Species

United States Department of the Interior, Bureau of Land Management Noxious Weed General Requirement.

United States Forest Service Noxious Weed General Requirements

E.19.1. Introduction

Noxious weed control practices for the Big-Time project as described in this plan have been developed utilizing the following sources: Information, in addition to surveys performed in 2001 by the Big-Time, from County Weed and Pest Control Districts in Lincoln and Uinta Counties in Wyoming; County Weed Supervisors from Summit, Morgan, Salt Lake, Utah, Juab, Millard, Beaver, Iron, and Washington Counties in Utah; Nevada Weed Action Committees in Lincoln and Clark Counties in Nevada; Weed Management Areas in Kern (Mountain Desert) and San Bernardino (Mojave) Counties in California; The Bureau of Land Management (BLM) Kemmerer Field Office in Wyoming; the Salt Lake, Fillmore, Cedar City, and St. George Field Offices in Utah; the Las Vegas and Red Rock Canyon Field Office in Nevada; and the Barstow and Needles Field Offices in California; Dixie National Forest; Humboldt-Toiyabe National Forest; Camp W.G. Williams, National Guard; United States Marine Corps Firing Range (Marine Corps Logistics Base); Edwards Air Force Base; Nellis Air Force Base; Fort Irwin; Moapa Indian Reservation; Utah Department of Agriculture and Food; Utah Noxious Weed Act; Wyoming Weed and Pest Control Act of 1973; Nevada Weed Action Committee; Nevada Revised Statutes: Chapter 555—Control of Insects, Pests and Noxious Weeds; California Commissioner of Agriculture; and California Codes, Food and Agricultural Code, Sections 7270-7274.

E.19.2. 1.1 Plan Purpose

The purpose of this plan is to prescribe methods to prevent and control the spread of noxious weeds during and following construction of the Big-Time project. This project and its Contractors will be responsible for carrying out the methods described in this plan.

This plan is applicable to the construction and operation of the proposed pipeline facilities, including the pipeline right-of-way (PROJECT FOOT PRINT), the proposed compressor stations, the meter stations, areas of extra temporary workspaces (ATWS), and any other areas disturbed during construction.

E.19.3. 1.2 Goals and Objectives

The goal of weed control is to implement early detection, containment, and control leading to eradication of noxious weeds during project construction. Noxious weeds are opportunistic plant species that readily flourish in disturbed areas, thereby preventing native plant species from establishing communities. Monitoring and maintenance during the construction and operational phases will include identification of any local infestation areas on and adjacent to the

PROJECT FOOT PRINT that may pose potential infestation. An evaluation of the efficiency of the prescribed control measures will also be implemented during the operational phase.

E.19.4. 1.3 Project Description

THIS PROJECT proposes to construct and operate facilities to expand the existing project from southwestern Wyoming to southern California. Proposed facilities include this and that of the THIS PROJECT , describe more about this project here. For more detailed information regarding the proposed facilities, see Federal Energy Regulatory Commission Docket No. CP01-422, Resource Report No. 1.

E.19.5. 2.0 Noxious Weed Inventory

Preconstruction field surveys were conducted and agency contacts made to identify existing noxious weed infestations along the pipeline PROJECT FOOT PRINT, and at the proposed facilities. Preconstruction surveys and literature reviews are presented in Table xx. In addition to preconstruction field surveys, THIS PROJECT's internal records were also reviewed to identify existing noxious weed infestations. The results of this review are presented for the Yahoo District in Table xx.

Each state crossed by THIS PROJECT will maintains an official list of weed species that are designated noxious species. Local Weed Supervisors designate additional weed species as noxious within individual counties. Noxious weeds are defined as weeds "…arbitrarily defined by law as being especially undesirable, troublesome, and difficult to control. Definition will vary according to legal interpretation (USU Cooperative Extension 1992)." The noxious weeds listed for the states; other agencies; and counties in Wyoming, Utah, Nevada, and California are presented in Tables xxs, respectively. Information such as species identified within or adjacent to the project area, locations of infestations, and extent of infestations was collected from local regulatory offices (e.g., Weed District and BLM). Weed Management Areas and Mitigation Restrictions along the pipeline PROJECT FOOT PRINT and at proposed facilities are listed in Table xx.

THIS PROJECT, the Bureau of Land Management (BLM), and other federal, state and local agencies recognize that there are species, such as Cheatgrass (Bromus tectorum) and other grass species (Schismus spp.), that because of their widespread distribution are not considered feasible for general control. In addition, THIS PROJECT's objective is to prevent the spread of noxious weeds, and treat selected areas along the Project Footprint where target species are problematic and form a significant portion of the vegetation community in comparison to adjacent undisturbed areas. Repeated control measures on the PROJECT FOOT PRINT are generally not considered feasible where those species are already established and abundant in the adjacent areas.

The preventive measures identified in Section 3.2 will be implemented along the PROJECT FOOT PRINT and at all of the proposed facilities to minimize the spread of noxious weeds during construction activities.

E.19.5.1. Wyoming

Under the authority of the Wyoming Weed and Pest Control Act of 1973 (Wyoming Statute 115-119), 22 plant species officially have been designated as noxious. The list of noxious weed species applies to the entire state (unless otherwise noted), and is presented in Table xx. Table

xx also presents noxious weeds listed by federal and local agencies in addition to the state list, and highlights species identified as being of special concern (species targeted for control) by the agencies.

E.19.5.2. Utah

Nineteen plant species officially have been designated as noxious for the State of Utah, per the authority vested in the Commissioner of Agriculture under Section 4-17-3 of the Utah Noxious Weed Act. The state list of noxious weeds is presented Tables xx and xx, which also includes noxious weeds listed by federal and local agencies. Species identified as being of special concern (species targeted for control) by the agencies are also highlighted.

E.19.5.3. Nevada

The Nevada Control of Insects, Pests and Noxious Weeds Act (Nevada Revised Statutes: Chapter 555) grants the Director of the Nevada Department of Agriculture the authority to investigate and control noxious plants. Forty-three species officially have been designated as noxious for the State of Nevada. The state list of noxious weeds is presented in Table xx, which also includes noxious weeds listed by federal and local agencies. Species identified as being of special concern (species targeted for control) by the agencies are also highlighted.

E.19.5.4. California

Under California Code, Food and Agriculture Code, Sections 7270-7224, the California Commissioner of Agriculture is granted the authority to investigate and control noxious weeds. The State of California has 167 listed noxious weeds. Those listed weeds pertinent to southern California are listed in Table xx. Federal and local agency lists of noxious weeds not found on the state list are presented in Table xx, as well as species identified as being of special concern (species targeted for control). Appendix C includes the complete list of noxious weed species for the State of California.

E.19.5.5. 2.1 Weed Management Areas

Table xx presents county known noxious weed infestations along the PROJECT FOOT PRINT that are actively included in eradication programs.

E.19.6. 3.0 Noxious Weed Management

Regulatory agencies along the PROJECT FOOT PRINT and at the proposed facilities have varying requirements for weed management. Those requirements that diverge from the basic preventive measures for THIS PROJECT already requires of its Contractors are noted in Section xx. Implementation of preventive measures to control the spread of noxious weeds is the most cost-effective management approach.

E.19.6.1. 3.1 Identification of Problem Areas

Prior to construction, THIS PROJECT will provide information and training regarding noxious weed management; identification; and the impacts on agriculture, livestock, and wildlife to the

Contractors. The importance of preventing the spread of noxious weeds in areas not infested, and controlling the proliferation of weeds already present, will be explained. During construction, areas of concern will be identified and flagged in the field by THIS PROJECT staff. The flagging will alert construction personnel and prevent access into areas until noxious weed management control measures have been implemented.

E.19.6.2. 3.2 Preventive Measures

The following preventive measures will be implemented to prevent the spread of noxious weeds: All Contractor vehicles and equipment will be cleaned prior to arrival at the work site using power or high pressure equipment. The wash down will concentrate on tracks, feet, or tires and on the undercarriage, with special emphasis on axles, frame, cross members, motor mounts, and on underneath steps, running boards, and front bumper/brush guard assemblies. Vehicle cabs will be swept out and refuse will be disposed of in waste receptacles.. The Contractor, with Environmental Inspector (EI) oversight, will ensure that vehicles and equipment are free of soil and debris capable of transporting noxious weed seeds, roots, or rhizomes before the vehicles and equipment are allowed use of access roads; In areas where infestations are identified or noted in the field, the Contractor will stockpile cleared vegetation and salvaged topsoil adjacent to the area from which they are stripped to eliminate the transport of soil-borne noxious weed seeds, roots, or rhizomes. During reclamation, the Contractor will return topsoil and vegetative material from infestation sites to the areas from which they were stripped; The Contractor will use compressed air to remove seeds, roots, and rhizomes from the equipment before transport off site. Cleaning sites will be recorded using GPS equipment and this information will be reported to the local contact person or agency; The Contractor will ensure that straw or hay bales used for sediment barrier installations or mulch distribution are obtained from state-cleared sources that are free of primary noxious weeds; The Contractor will implement the reclamation of disturbed lands immediately following construction as outlined in the Reclamation Plan if called for. Continuing revegetation efforts will ensure adequate vegetative cover to prevent the invasion of noxious weeds; and The Contractor will apply fertilizer to reclaimed areas only according to the Reclamation Plans and as directed by the jurisdictional land management agency, property owner, or EI.

E.19.6.3. 3.3 Treatment Methods

THIS PROJECT will implement noxious weed control measures that will be in accordance with existing regulations and jurisdictional land management agency or landowner agreements. Before construction, only herbicides that are approved by the BLM will be applied to the identified weed infestations on BLM lands to reduce the spread or proliferation of weeds (each federal agency may have a different list, check it out). Post-construction control measures may include one or more of the following methods:

Mechanical methods rely on equipment that is used to mow or disc weed populations. If such a method is used, subsequent seeding will be conducted to re-establish a desirable vegetative cover that will stabilize the soils and slow the potential re-invasion of noxious weeds. Seed selection will be based on site-specific conditions and the appropriate seed mix identified for those conditions, as presented in the Reclamation Plan; Disking or other mechanical treatments that would disturb the soil surface within native habitats will be avoided; Herbicide application is an effective means of reducing the size of noxious weed populations. Applications will be controlled, as described in Section 5.1, to minimize the impacts on the surrounding vegetation. In areas of dense infestation, a broader application will be used and a follow-up seeding program

implemented. Supplemental seeding will be based on the criteria in the Reclamation Plan if called for. The timing of subsequent re-vegetation efforts will be based on the life of the selected herbicide; Treatment methods will be based on species-specific and area-specific conditions (e.g., proximity to water or riparian areas, or agricultural areas, and time of year) and will be coordinated with the local regulatory offices; and If areas are not seeded until the following spring because of weather or scheduling constraints, all annuals and undesirable vegetation that have become established will be eradicated before seeding. However, THIS PROJECT's schedule includes restoration and re-vegetation by the November 1, 2002, completion date on the northern spreads and the May 1, 2003, completion date on the southern spreads.

E.19.6.4. 3.4 Agency-Specific Requirements

As noted in Section 3.1, federal agency requirements that are more stringent than those imposed by local agencies are presented below.

E.19.6.4.1. 3.4.1 Bureau of Land Management Lands

The Final Environmental Impact Statement on Vegetation Treatment on BLM Lands in Thirteen Western States (Note that there is a new EIS that expands the number of states and will soon be final) lists 19 herbicides acceptable for use on BLM lands (USDI 1991). The approved herbicides are listed in Table xx. Guidelines for the use of chemical control of vegetation on BLM lands are presented in the Chemical Pest Control Manual. These guidelines require submittal of a Pesticide Use Proposal (PUP) and Pesticide Application Records (PARs) for the use of herbicides on BLM lands. The forms required for submittal of PUPs and PARs are included in Appendix A.

Although a PUP usually is required for chemical treatment of vegetation on BLM lands, THIS PROJECT has established an agreement with BLM that allows for submittal of a comprehensive PUP for each state biannually, rather than before each use. THIS PROJECT will be required to submit a PAR for each use of herbicides on BLM lands within 24 hours of application. The occurrence of noxious weeds within the PROJECT FOOT PRINT will be reported to the BLM district office where the weeds occur. The appropriate weed control procedures, including target species, timing of control, and method of control, will be determined in consultation with BLM personnel. THIS PROJECT may be able to take advantage of the existing cooperative agreements between BLM and most of the counties by providing the funds required for county personnel to implement the necessary weed control procedures. If not, THIS PROJECT will be responsible for providing the necessary personnel or hiring a Contractor to implement the weed control procedures.

E.19.6.4.2. 3.4.2 Other Agency and Landowner Requirements

Other agencies, such as counties and military installations, occasionally have unique requirements. These requirements are located in Table xx, and are correlated with weed infestation data provided by the agencies.

E.19.7. 4.0 Monitoring

Monitoring of noxious weeds will be conducted during reclamation monitoring, on an ongoing basis, as well as on an annual basis in areas of known infestations.

E.19.7.1. 4.1 Reclamation Monitoring

During Reclamation Monitoring. THIS PROJECT intends to begin monitoring during the first project foot printing season following construction, so reclamation monitoring will be done on the basis of overall division of construction spreads.

Reclamation and the associated noxious weed monitoring of the northern spreads (1 through 6 to MP 428.60) will begin in the spring of 2003 following June-November 2002 construction; Reclamation and the associated noxious weed monitoring inspections of the southern spreads (7through 10) will begin in the spring of 2004 following the November 2002 through May 2003 construction.

Noxious weed monitoring would occur biannually for approximately 5 years. Accordingly, on the northern spreads this would occur during the springs of 2003, 2005, and 2007; and on the southern spreads this would occur during the springs of 2004, 2006, and 2008. In addition, noxious weed conditions will be included in the primary second project foot printing season evaluations of re-vegetation success (2004). THIS PROJECT will implement this schedule on BLM or state-owned lands as well as private lands.

THIS PROJECT will document its observations following the above noted field inspections and make these monitoring reports available to BLM, USFS, County and the FERC as required.

Any areas where a spread of noxious weed infestation is noted, particularly in previously unaffected areas, will be further evaluated to determine if these areas require remedial action and additional treatment. THIS PROJECT will identify such areas to the agencies by state, county, and milepost, and will record any additional noxious weed control treatments. A report summarizing right-of-way stability, re-vegetation progress, percent cover, and weed infestation will be provided to the landowners every two years.

E.19.7.2. 4.2 Ongoing Monitoring

Based on its arrangement for THIS PROJECT communicates with individual land owners, counties, and land management agencies if they have a concern pertaining to noxious weeds within their jurisdiction. These parties may also contact THIS PROJECT to report on the presence of noxious weeds. THIS PROJECT will control the weeds on a case-by-case basis and include a summary of actions taken in the next Reclamation Monitoring Report (above). Furthermore, THIS PROJECT operations personnel are trained in the identification of predominant noxious weed populations and will report spreads of noxious weeds during the normal course of maintenance. Therefore, the right-of-way is essentially monitored on an ongoing basis.

E.19.7.3. 4.3 Monitoring of Known Infestation Areas

In addition to biannual and ongoing noxious weed monitoring (as noted by counties/ landowners or by THIS PROJECT's pipeline maintenance and operations team), THIS PROJECT will conduct annual site visits to monitor known infestation areas (see below). These areas will be evaluated and controlled. THIS PROJECT will continue to visit these infestation areas on and ongoing basis or until noxious weeds in the area are controlled.

E.19.8. 5.0 Herbicide Application, Handling, Spills , and Cleanup

E.19.8.1. 5.1 Herbicide Application and Handling

Herbicide application will be based on information gathered from the Weed Districts, and BLM. Before application, THIS PROJECT or its Contractor will obtain any required permits from the local authorities (the Weed Districts and BLM). Permits may contain additional terms and conditions that go beyond the scope of this management plan. A licensed Contractor will perform the application in accordance with applicable laws and regulations and permit stipulations.

All herbicide applications must follow United States Environmental Protection Agency label instructions. Application of herbicides will be suspended when any of the following conditions exists:

Wind velocity exceeds 6 miles per hour (mph) during application of liquids or 15 mph during application of granular herbicides; Snow or ice covers the foliage of noxious weeds; or Precipitation is occurring or is imminent.

Vehicle-mounted sprayers (e.g., handgun, boom, and injector) will be used mainly in open areas that are readily accessible by vehicle. Hand application methods (e.g., backpack spraying) that target individual plants will be used to treat small or scattered weed populations in rough terrain. Calibration checks of equipment will be conducted at the beginning of spraying and periodically to ensure that proper application rates are achieved.

Herbicides will be transported to the project site daily with the following provisions: Only the quantity needed for that day's work will be transported; Concentrate will be transported in approved containers only and in a manner that will prevent tipping or spilling, and in a location that is isolated from the vehicle's driving compartment, food, clothing, and safety equipment; Mixing will be done off site, over a drip catching device and at a distance greater than 200 feet from open or flowing water, wetlands, or other sensitive resources. No herbicides will be applied at these areas unless authorized by appropriate regulatory agencies; and all herbicide equipment and containers will be inspected for leaks daily. Disposal of spent containers will be in accordance with the herbicide label.

E.19.8.2. 5.2 Herbicide Spills and Cleanup

All reasonable precautions will be taken to avoid herbicide spills. In the event of a spill, cleanup will be immediate. Contractors will keep spill kits in their vehicles and in herbicide storage areas to allow for quick and effective response to spills. Items to be included in the spill kit are: Protective clothing and gloves (PPE), absorptive clay, "kitty litter," or other commercial adsorbent, plastic bags and bucket, shovel, fiber brush and screw-in handle, dust pan, caution tape, highway flares (use on established roads only), and detergent. Also in accordance with the herbicide label.

Response to a herbicide spill will vary with the size and location of the spill, but general procedures include: BLM notification, traffic control; dressing the clean-up team in protective clothing; stopping the leaks; containing the spilled material; cleaning up and removing the spilled herbicide and contaminated adsorptive material and soil; and transporting the spilled pesticide and contaminated material to an authorized disposal site.

E.19.8.3. 5.3 Worker Safety and Spill Reporting

All herbicide Contractors will be state certified to apply pesticides and obtain and have readily available copies of the appropriate material safety data sheets for the herbicides used. All herbicide spills will be reported in accordance with applicable laws and requirements.

E.19.9. 6. References

United States Department of Agriculture (USDA), 2000. Environmental Assessment for Noxious Weed Management, Dixie National Forest. Forest Service, Intermountain Region. January.

United States Department of the Interior (USDI), 1991. Final Environmental Impact Statement on Vegetation Treatment on BLM Lands in Thirteen Western States. Washington, D.C.

E.20. Appendix 5. Rapid Start

A "how to" for the LVFO field going staff, FY07

1. You need to prepare a **Weed Risk Assessment** for your project proposal. If that is the case, complete the following steps. If you are asked to participate in an ID team, do as much of the following as possible prior to the first ID team meeting. When you are at the ID team meetings, think proactively about ways to reduce weed introductions or spread. Remember to ensure compliance with relevant laws and authorities such as E.O. 13112.

2. Please keep the LVFO Weed Coordinator briefed as much as is possible, especially on larger/longer-term projects.

3. Get a good project description and location from the project leader. If inadequate information is presented, ask for additional detail.

Questions to ask:

- Will additional materials be brought in from off-site?
- If materials (such as gravel) will be brought in from off-site, the gravel pit should be examined.
- Where will vehicle wash-downs occur?
- Will there be regular truck traffic between public and private land? Around public lands?
- Where will turn-around areas be located?
- Where will staging or pit areas be located?

If the proposed action states that monitoring, flagging and treatments will occur, find out WHO is responsible for these actions. If the proponent is responsible for these actions, who is the BLM contact to ensure that these actions occur. If the BLM is responsible, how will these activities be paid for and who will do it?

4. Consult the LVFO_Weed_Map (in development). Weed inventory data will be contained in the GIS folder. (M:/gis_work/district/Weeds_Information/Risk_Assessment/LVFO_Weed_Map) When you look in the Risk Assess folder, you will find five files. The LVFO_Weed_Map

will contain all of the present information on weeds found on the LVFO. Remember to look at the attribute tables to see when a weed infestation was mapped, how big it was, how dense the plants were etc. Remember that not every acre of the yearly inventories have been examined in detail.

Survey data gives you an indication of what may be in the area. It is not necessarily a substitute for a field visit. Also, remember that the survey data generally includes only Nevada listed noxious weeds, it rarely contains inventory of non-listed plants such as those species on the Clark County MSHCP weed list.

5. If necessary or possible, conduct a field tour. When you are in the field, GPS any additional weed infestations that you find. Take some photographs/digital images for the file. If you can't identify suspicious plants, take several photos of the best quality possible so that you can capture as much information as possible which will be used for plant identification and bring them back to the office. The LVFO botanist or others can help you with plant identification.

6. Prepare a draft risk assessment. As appropriate, discuss proposed mitigations with the project lead and/or proponent, and the LVFO Noxious Weed Coordinator. Remember to refer to other legislative authorities, land use plans, Executive Orders etc. Refer to Partners Against Weeds (http://www-a.blm.gov/education/weed/paws/) and the Noxious Weed Plan for the Las Vegas Field Office. If you have questions about specific plants, please ask the Botanist or the LVFO Noxious Weed Coordinator.

7. When you are satisfied with the Weed Risk Assessment, please initial it.

8. Have the LVFO Noxious Weed Coordinator sign the Weed Risk Assessment. A copy of the Weed Risk Assessment and map will be retained for the LVFO Weed Coordinator in their files.

9. Prepare the Weed Management Plan or that sections for the plan of operation.

E.21. Appendix 6. LVFO Weed Coordinator Duties

1. Coordinate and conduct awareness/prevention programs.

2. Conduct inventory, monitoring, detection and evaluation.

3. Prioritize, prepare and review treatment plans by species and project.

4. Prepare risk assessments, environmental assessments, memorandum of understandings, and cooperative agreements as needed.

5. Prepare and administer contracts.

6. Prepare Pesticide Use Proposals (PUP) and Pesticide Application Records (PAR).

7. Prepare yearly Pesticide Use Report and Integrated Weed Management Report for submission to Nevada State Office and Washington Office.

8. Implement Policy Manual 9015.

9. Develop and coordinate pesticide use safety plan.

10. Provide direction/supervision of seasonal employees in the LVFO Weed Program.

11. Maintain a Nevada State Pesticide Application Certification.

12. Prepare and track the yearly 1020 Weed budget.

13. Coordinate weed activities with major landowners, county, State, federal agencies, cooperative weed management areas and conservation districts.

14. Solicit participation internally and externally for inventory and prevention activities.

15. Review all NEPA actions for compliance with this plan.

E.22. Appendix 7. Best Management Practices

Table E.2. All Vegetation and Soil Surface Disturbing Activities

ALL VEGETATION AND SOIL SURFACE DISTURBING ACTIVITIES	
A. To limit the creation of bare soil and other factors that support invasive weed seeds and to retain the maximum shade possible to suppress weeds and prevent their establishment and growth. To incorporate weed prevention and control into project design, layout, alternative evaluation and project description and to avoid or remove sources of weed seed or propagules to prevent new weed infestations and the spread of existing weeds.	Stipulations 1, 2, 3, 4, 5, 6, 7, 8, & 9
OPERATIONS	
B. Minimize roadside sources of weed seed that could be transported to other areas.	10
RECREATION	
C. To minimize the spread of weeds from infested areas into areas that are relatively weed free.	7 & 11
D. To minimize transport of weed seed by pack and saddle stock.	12 & 13
WILDERNESS	
E. To encourage a weed-free trail user's ethic.	14
CULTURAL RESOURCES	
F. To ensure that all bare ground created by archeology excavations is covered by desirable vegetation to discourage weeds.	15
WILDLIFE	
G. Incorporate weed prevention into wildlife habitat improvement project design.	16
LIVESTOCK GRAZING MANAGEMENT	
H. To minimize the creation of bare soil and other factors that support seeds.	17
I. Minimize weed seed transport to relatively weed-free areas.	18
J. Minimize spread of noxious weeds by livestock movement.	19 & 20
LOCATABLE, LEASABLE AND MINERAL MATERIAL PROGRAM	
K. Minimize the chances of weed establishment in mining operations.	21, 22 & 23
L. Remove seed sources that could be picked up by project related vehicles and equipment used on the project site and limit seed transport into relatively weed-free areas.	24 & 25
M. Improve effectiveness of prevention practices through weed awareness and education.	26
FIRE	
N. Ensure that fire suppression and rehabilitation efforts minimize weed spread.	27
LAS VEGAS FIELD OFFICE	
O. Maintain all LVFO building facilities, parking lots, visitor centers and other BLM facilities weed free.	28

E.23. Appendix 8. Stipulations

1. The project proponent will limit the size of any vegetation and/or ground disturbance to the absolute minimum necessary to perform the activity safely and as designed. The

project proponent will avoid creating soil conditions that promote weed germination and establishment.

2. At the onset of project planning in the NEPA analysis phase, the project proponent, project lead or the LVFO noxious weed coordinator will complete the Risk Assessment Form for Noxious/Invasive Weeds (Appendix 11). This will provide information about the types of weed surveys to be conducted, the methods of weed treatments and weed prevention schedules for the management of noxious weeds on the project footprint. This will identify the level of noxious weed management necessary for stipulation 3 below.

3. The project proponent will coordinate project activities with the BLM Weed Coordinator (702-515-5000) regarding any proposed herbicide treatment. The project proponent will prepare, submit, obtain and maintain a pesticide use proposal (PUP) for the proposed action (Appendix 12). Weed treatments may include the use of herbicides, and only those herbicides approved for use on Public lands by the BLM.

4. Before ground-disturbing activities begin, the project proponent will review the weed risk assessment and prepare a weed management plan that will inventory and prioritize weed infestations for treatment within the project foot print. Should the weed spread beyond the project foot print then these weeds will be treated as a part of the project. This will include access routes.

5. The project proponent will begin project operations in weed free areas whenever feasible before operating in weed-infested areas.

6. The project proponent will locate pits and staging areas for the use of equipment storage, machine and vehicle parking or any other area needed for the temporary placement of people, machinery and supplies. These staging areas will be selected from locations that are relatively weed-free. The project proponent will avoid or minimize all types of travel through weed-infested areas or restrict major activities to periods of time when the spread of seed or plant parts are least likely.

7. BLM or the project proponent will determine equipment cleaning sites. These sites will be coordinated with the BLM. Project related equipment and machinery (**this especially includes the nooks and crannies of undercarriages**) will be cleaned of all mud, dirt and plant parts before moving into relatively weed-free areas and when leaving weed infested sites. Seeds and plant parts need to be collected, bagged and deposited in land fills through the waste disposal system when practical. (This is not meant to apply to service vehicles that will stay on roadways avoiding weed infested sites.)

8. Project workers need to inspect, remove, and dispose of weed seed and plant parts found on their clothing and equipment. Disposal methods vary depending on the project. Therefore call the LVFO Noxious Weed Coordinator.

9. The project proponent will evaluate options, including area closures, to regulate the flow of traffic on sites where native vegetation needs to be established.

10. Operation personnel shall include noxious weeds surveys in their daily field going operations. Weed infestation locations will be reported using the techniques provided at the annual LVFO noxious weed training.

11. Courses and routes for all speed and non-speed events will be inspected by recreational staff for weeds prior to scheduled events on that particular course. Any areas found to be infested will be marked and will be avoided until the weeds are either eradicated or under control. If weed infestations along courses and routes cannot be avoided or treatments cannot be done to control the weed infestations, then that portion of the course(s) and route(s) will be avoided entirely.

12. It is **strongly suggested** that the project proponent ensure that all pack and saddle stock on public lands within the LVFO use only certified weed-free and straw bedding which are available locally.

13. It is **strongly suggested** that the project proponent's pack and saddle stock be quarantined and fed only weed-free feed for 24 hours prior to using Public lands. Before quarantine, the entire animal should be brushed down to remove any weed seed.

14. Signage about weed awareness information will be provided at trailheads and incorporated in weed prevention techniques.

15. All archeological site excavations will be reseeded.

16. Environmental analysis for habitat improvement projects will include weed-risk considerations in the development and evaluation of alternatives.

17. Manage allotments to prevent excessive soil disturbance at salt licks, watering sites, and areas with sensitive soil conditions.

18. In range allotments that have both weed infested and relatively weed-free areas, control timing of animal movement from infested to non-infested areas. Prevent movement from infested to non-infested areas after weed seed set.

19. Livestock should be quarantined and fed weed seed free hay and other feeds for 2-4 days until weed seeds and plant propagules have passed through digestive tracts of livestock before they are transported into relatively weed-free areas in any active allotment.

20. Livestock permittees should notify their rangeland management specialist of weed infestation locations and coordinate livestock management with the goal of minimizing the spread of weeds by livestock.

21. The operator/permittee shall be responsible for controlling all undesirable invading plant species (including listed noxious weeds and other invasive plants identified as undesirable by federal, state or local authorities) within the boundaries of their authorization area and Bureau-authorized ancillary facilities (e.g. access and utility corridors), including all operating and reclaimed areas, until revegetation activities have been deemed successful and responsibility released by the authorized officer. Control standards and measures proposed must conform to applicable state and federal regulations.

22. The operator shall use weed free seed for reclamation and for other organic products for erosion control, stabilization, or revegetation (e.g. straw bales, organic mulch) must be certified weed free. According to Nevada law (NRS 587.111), "all seed shipped to or sold within Nevada is to be free of noxious weed seeds".

23. Prior to any application of herbicide on public lands the operator shall have a current PUP (Appendix 12) that outlines application methods, rates, weather constraints and the specific dates of applications. See Stipulation 3.

24. The operator/permittee is responsible for ensuring that all project related vehicles and equipment arriving at the site (including, but not limited to, drill rigs, dozers, support vehicles, pickups and passenger vehicles, including those of the operator, any contractor or subcontractor and invited visitors) do not transport noxious weeds onto the project site. The operator shall ensure that all such vehicles and equipment that will be traveling off constructed and maintained roads or parking areas within the project area have been power washed, including the undercarriage, since their last off road use and prior to off road use on the project. When beginning off road use on the project, such vehicles and equipment shall not harbor soil, mud or plant parts from another locale. Depending on the site setting such as remoteness, or other site condition, the operator may be required to have an on-site wash area identified and readily available. If a noxious weed infestation is known or later discovered on the project site, project related vehicles or equipment that have traveled through such an infestation shall be power washed including the undercarriage prior to leaving the site, at an established, identified wash area. Wash water and sediment shall be contained in an adjacent settling basin. Should any vegetation emerge in the wash area or settling basin, it will be promptly identified and appropriately controlled if found to be an undesirable invasive plant.

25. Should undesirable invasive plants become established on developed areas prior to reclamation reshaping; appropriate measures will be taken to ensure that the invasive plants are eradicated prior to reclamation earthwork. Should undesirable invasive plants become established on reshaped areas prior to reclamation seeding; appropriate measures will be taken to ensure that invasive plants are eradicated prior to seeding the site.

26. Noxious weed training will be provided at annual fire fighter training. All field going fire personal should attend the annual LVFO weed awareness and weed prevention training.

27. Weed abatement procedures will not impede initial attach response. Public safety comes first. Include weed risk factors and weed prevention considerations in the Resource Advisor duties on all fire incidents. Set up vehicle wash down stations to clean, off district fire suppression equipment, prior to mobilization, and all vehicles during demobilization, if possible.

28. BLM staff will work to maintain weed free facilities and control the spread of weed seeds into surrounding areas. Assign to the LVFO volunteer coordinator the development of qualified (knowledgeable of noxious weeds and threatened and endangered plants and desert tortoise trained) ***intermediaries*** to lead volunteer weed pullers.

E.24. Appendix 9. Treatment Prioritization

There are numerous documented infestations of weeds on the public lands managed by the LVFO. Use of a prioritization system will enable the LVFO to focus efforts on areas that will provide the most effective and economic benefit. Weed infestations will be placed into three categories: high priority, medium priority and low priority. Each category is further described below.

High Priority: High priority infestations are those isolated weed patches that exist in relatively un-infested areas. Early detection and rapid response procedures will be used when infestations of High Priority areas by noxious weeds is documented. Previously treated weed patches will

also be considered High Priority so as not to abandon the effort already completed. Also, High Priority status will be given to infestations occurring in burned areas because of their already fragile condition.

Medium Priority: Medium priority infestations are those infestations that are considered to be somewhat widespread but still controllable. This would include weed species such as perennial pepper weed, knapweeds, starthistles, Scotch thistle, camelthorn, giant reed, and tamarisk. Weed species that do not exhibit very invasive characteristics but are found in habitats such as riparian corridors and roadway will be placed in this category.

Low Priority: Low priority infestations are those that are too extensive for effective or economic control.

E.25. Appendix 10. LVFO Weed Prevention Schedule and Duties

Table E.3. LVFO Weed Prevention Schedule and Duties

Prevention Activity	Responsible Persons
Report weed locations during formal/informal field surveys and report to the LVFO weed coordinator.	**All personnel**
Monitor spread/control of weeds	LVFO Weed Coordinator and field personnel
Wash returning vehicles from off-LVFO fires	Returning fire personnel
Wash vehicles and OHVs of all mud, dirt and plant parts after field duties	**All field personnel**
Reestablish vegetation on all disturbances resulting from construction, reconstruction and maintenance activities	Engineers/Contract Administrators
Review recreation areas for presence of weeds	Recreation Specialists/LVFO Weed Coordinator
Secure weed free seed for all seeding projects	Project Lead/ESR Coordinator/LVFO Weed Coordinator
Distribute weed awareness information to the public	LVFO Weed Coordinator
Work with adjacent landowners on weed awareness and control	CWMAs/LVFO Weed Coordinator
Conduct weed identification/awareness training for field employees and managers	LVFO Weed Coordinator
Prior to ground disturbance activities, consider potential impact on existing seed banks of weeds	Project proponent/ Project Lead/LVFO Weed Coordinator
Prepare and complete a weeds risk assessment	Project proponent/ Project Lead/LVFO Weed Coordinator
Removal of isolated/satellite infestations of weeds	**All field personnel**
Work with county and state agencies on control and prevention of weeds	LVFO Weed Coordinator
Include weeds as part of NEPA analysis	EA preparers/NEPA coordinator/LVFO Weed Coordinator
Maintain records of weed infestations on the LVFO geospatial database	LVFO Weed Coordinator/GIS Specialist
Ensure gravel and fill for road material is weed free	Engineers/ LVFO Weed Coordinator/Minerals Staff/Operation Staff

E.26. Appendix 11. Risk Assessment Instructions and Form

NOXIOUS/INVASIVE WEEDS RISK ASSESSMENT

Directions: This document is intended for electronic use and will be uploaded into NEPA LV. Adjust the spacing as necessary. Retain one copy of this document with your project files. Provide the LVFO Weed Coordinator with a second copy of the form and a project map which will be retained for future use. A definition for each of the two factors can be found on the next page.

1. **Project Name:** (fill in) **NEPA LV No.**

2. **Date Risk Assessment was completed**:

3. **Describe steps taken to complete Risk Assessment:**

4. **Project Description:**

5. **Project Location:**

   (If the proposed action requires regular traffic between one location for the proposed action and another location for various other uses, consider the second site to be part of the project area.)

6. **Factor 1** assesses the likelihood of noxious/invasive weed species spreading to the project area. For this project, the factor rates as _____, _____ **(List rating and score**) at the present time. This rating was based on the following findings:

   (**Input your rationale here for this rating**.)

7. **Factor 2** assesses the consequences of noxious/invasive weed establishment in the project area. For this project, the factor rates as _____, _____ **(List rating and score)**. This rating was based on the following findings:

   (**Input your rationale here for this rating**.)

8. Factor 1 * Factor 2 = **Risk Rating: _____, _____ (Score and rating**).

   (The Risk Rating is obtained by multiplying Factor 1 by Factor 2.)

9. Based on this risk rating, preventative management measures **are/ are not** (circle one) needed for this project. Preventative management measures developed for this project are as follows:

10. Based on this risk rating, project modifications **are/are not** (circle one) needed for this project. Project modifications developed for this project are as follows.

Weed Risk Assessment completed by: _____
_____

Reviewed by/Date Reviewed: Date:

(Noxious Weed Coordinator)

E.26.1. Risk Factors

Factor 1

NONE, (0): Noxious/invasive weed species are not found within or are adjacent to the proposed project area. Project activity is not likely to result in the establishment of noxious/invasive weed species in the project area.

LOW, (1-3): Noxious/invasive weed species present in areas adjacent to but not within the project area. Project activities can be implemented and prevent the spread of noxious/invasive weeds into the project area.

MODERATE, (4-7): Noxious/invasive weed species located immediately adjacent to or within the project area. Project activities are likely to result in some areas becoming infested with noxious weed species even when preventative management actions are followed. Control measures are essential to prevent the spread of noxious/invasive weeds within the project area.

HIGH, (7-10): Heavy infestations of noxious/invasive weeds are located within or immediately adjacent to the project area. Project activities, even with preventative management actions, are likely to result in the establishment and spread of noxious/invasive weeds on disturbed sites throughout much of the project area.

Factor 2

LOW TO NONEXISTENT (1-3): None. No cumulative effects expected.

MODERATE, (4-7): Possible adverse effects on site and possible expansion of infestation within the project area. Cumulative effects on native plant communities are likely, but limited.

HIGH, (7-10): Obvious adverse effects within the project area and probable expansion of noxious weed infestations to areas outside the project area. Adverse cumulative effects on native plant communities are probable.

*FACTOR 1 * FACTOR 2* = Risk Rating

Risk Rating

NONE, (0): Proceed as planned.

LOW, (1-10): Proceed as planned. Initiate control treatment on noxious weed populations that get established in the area.

MODERATE, (11-49): Develop preventative management measures for proposed project to reduce the risk of introduction or spread of noxious weeds into the area. Preventative management measures should include modifying the project to include seeding the area to occupy disturbed sites with desirable species. Monitor area for at least 3 consecutive years and provide for control of newly established populations of noxious weeds and follow-up treatment for previously treated infestations.

HIGH, (50-100): Project must be modified to reduce risk level through preventative management measures, including seeding with desirable species to occupy disturbed sites and controlling existing infestations of noxious weeds prior to project activity. Project must provide at least 5

consecutive years of monitoring. Projects must also provide for control of newly established populations of noxious weeds and follow-up treatment for previously treated infestations.

E.27. Appendix 12. Pesticide Use Proposal Form and Example

E.27.1. Blank Document Nevada BLM Pesticide Use Proposal

PROPOSAL NUMBER: 06-NV-xx-xxx

REFERENCE NUMBER: EA. NV-052-xx-xxx

DNA# NV-050-01-xx-xxx

EA. NV-052-xx-xxx

EA. NV-052-xx-xxx

FIELD OFFICE Las Vegas **COUNTY** _____

LOCATION:

_____

DURATION OF PROPOSAL:

_____

I. **PESTICIDE APPLICATION** (including mixtures and surfactants):

Table E.4. Pesticide Application

	Trade Names:	Common Names:	EPA Registration No.	Manufactures:	Fomulations (Liquid or Granular)	Method of Application
1						
2						

Table E.5. Maximum Rate of Application

MAXIMUM RATE OF APPLICATION:	
USE UNIT ON LABEL:	POUNDS ACID EQUILIVENT/ACRE:
1.	1.
2.	2.

INTENDED RATE OF APPLICATION:

APPLICATION DATES:

NUMBER OF APPLICATIONS:

II. **II. PEST** (List specific pest(s) and reason(s) for application):

III. **III. MAJOR DESIRED PLANT SPECIES PRESENT:**

TREATMENT SITE: (Describe land type or use, size, stage of growth of target species, slope and soil type).

ESTIMATED ACRES

IV. **V. SENSITIVE ASPECTS AND PRECAUTIONS:** (Describe sensitive areas [e.g., marsh, endangered, threatened, candidate and sensitive species habitat] and distance to treatment site. List measures taken to avoid impact to sensitive areas).

V. **VI. NON TARGET VEGETATION:** (Describe the impacts, cumulative impacts, and mitigations to non target vegetation that will be lost as a result of this chemical application).

VI. **VII. INTEGRATED PEST MANAGEMENT:** (Describe how this chemical application fits into your overall integrated pest management program for the treatment area.)

Originator: Originator: _____ Date: _____

Company Name: Bureau of Land Management

Phone: (702) 515-5000

Certified Pesticide Applicator:

____ Date: _____

(Signature)

Field Office Pesticide/Noxious Weed Coordinator

____ Date: _____

(Signature)

APPROVALS:

_____ Date:

Karla D. Norris

Assistant Field Manger

Recreation and Renewable Resources

(Signature)

APPROVALS (State Office Use Only):

Date:

BLM State Pesticide Coordinator

(Signature)

Date:

Deputy State Director, Natural Resources,

Lands and Planning

(Signature)

CONCUR OR APPROVED

NOT CONCUR OR DISAPPROVED

CONCUR OR APPROVED WITH MODIFICATIONS (Sept 06)

E.27.2. Real Example Nevada BLM Pesticide Use Proposal

PROPOSAL NUMBER: 06-NV-05-001

REFERENCE NUMBER: EA. NV-052-98-061

DNA# NV-050-01-00-266

EA. NV-052-2003-173

EA. NV-052-03-239

FIELD OFFICE Las Vegas **COUNTY** Clark

LOCATION:

This project is located downstream from Mesquite NV and adjacent to the Virgin River.

Project JE15 – T., 13 South, R., 70 East, Sections 4 and 5.

Project JE22 – T., 14 South, R., 69 East, Section 28.

Project JE23 – T., 14 South, R., 70 East, Sections 7.

Project JE25 – T., 13 South, R., 71 East, Sections 15-17, 19, 20, and 21. And

T., 13 South, R., 70 East, Sections 23-27, 33, and 34. And

T., 14 South, R., 70 East, Section 4.

DURATION OF PROPOSAL: September 01, 2006 through August 31, 2011

I. **PESTICIDE APPLICATION** (including mixtures and surfactants):

Table E.6. Pesticide Application

	Trade Names:	**Common Names:**	**EPA Registration No.**	**Manufactures:**	**Fomulations (Liquid or Granular)**	**Method of Application**
1	Triclopyr	Garlon 3A Garlon 4	Garlon 3A EPA # 62719-37 Garlon 4 – EPA # 62719-40	Dow AgroSciences	Liquid	Backpack sprayer; ATV tank with single nozzle sprayer

2	Imazapyr	Habitat Arsenal	Habitat - EPA # 241-426; Arsenal - EPA # 241-346	BASF	Liquid	
3	Methylated seed oils and nonionic surfactants	Pro-Mate Basal with Dye	EPA # not required	Helena Chemical Co.	Liquid	
4	Mixture of surfactants (Kinetic).	Kinetic	EPA # not required	Helena Chemical Co.	Liquid	

Table E.7. Maximum Rate of Application

MAXIMUM RATE OF APPLICATION:	
USE UNIT ON LABEL:	**POUNDS ACID EQUILIVENT/ACRE:**
1. Garlon 3A, 0.25 – 3.0 gal/acre	1. Garlon 3A; 0.75 – 9.0 lbs. AE/acre
2. Garlon 4, 1.0 – 8.0 qts/acre	2. Garlon 4, 1.0 – 8.0 lbs. AE/acre
3. Habitat, 2.0 – 6.0 pints/acre	3. Habitat, 0.5 – 1.50 lbs. AE/acre
4. Arsenal, 2.0 – 6.0 pints/acre	4. Arsenal, 0.5 – 1.50 lbs. AE/acre
5. Pro-Mate Basal with Dye – N/A	5. Pro-Mate Basal with Dye – N/A
6. Kinetic – N/A	6, Kinetic – N/A

INTENDED RATE OF APPLICATION:

1. Garlon 3A, 1.5 lbs. AI/acre; Garlon 4, 6 lbs. AI/acre; 2. Habitat – 1.5 lbs. AI/acre; Arsenal - 1 lb. AI/acre 3. Pro-Mate Basal with Dye – N/A; 4. Kinetic - N/A.

APPLICATION DATES:

Applications will begin in September and end in March of each year for the next 5 years, beginning in September 2006 and ending March 2011.

NUMBER OF APPLICATIONS:

There will be 5 applications, one per year, beginning in September 2006 and ending in 2011.

II. **PEST** (List specific pest(s) and reason(s) for application):

This will be for the control of tamarisk, (*Tamarix ramosissima)*, a noxious weed species which is being controlled as a WUI fuels reduction project and riparian habitat restoration for T&E habitat.

III. **MAJOR DESIRED PLANT SPECIES PRESENT:**

Quailbush, desert saltbush, mesquite, acacia, wolfberry, iodine bush, arrowweed and saltgrasses.

IV. **TREATMENT SITE:** (Describe land type or use, size, stage of growth of target species, slope and soil type).

River floodplain. Soils are mixed alluvium with various textures; 1 % slope. Target species is tamarisk in various stages of growth.

ESTIMATED ACRES 1,400

V. **V. SENSITIVE ASPECTS AND PRECAUTIONS:** (Describe sensitive areas [e.g., marsh, endangered, threatened, candidate and sensitive species habitat] and distance to treatment site. List measures taken to avoid impact to sensitive areas).

Open flowing water with listed fish species present, together with three endangered or candidate avian species. Minimization measures include: 1. The EPA-aquatic registered herbicide Garlon 3A will be used exclusively within 25-feet of the daily high water mark; 2. Within 25-feet of the daily high water mark, chemical applicators will be limited only to backpack sprayers. 3. No chemical will be applied closer than 5-feet above the daily high water mark; 4. Garlon 4 will be used above 25-feet of the daily high water mark; 5. Marking dye will be used to insure proper coverage and to avoid repeat application on individual target plants; 6. Weather data will be recorded daily. No chemical applications will occur within 24-hours of forecasted precipitation events. Chemical operations will be shut-down whenever the ground level wind gusts exceed 10 mph; 7. To minimize the extent of triclopyr volatization, Garlon applications will occur in late fall through early spring, when ambient air temperatures average 60-90° Fahrenheit; 8. Field mixing of chemicals and transfers into spray equipment will occur inside spill tubs, at least 200 feet from the daily high water mark. Refer to EA for more detailed minimization measures.

VI. **VI. NON TARGET VEGETATION:** (Describe the impacts, cumulative impacts, and mitigations to non target vegetation that will be lost as a result of this chemical application).

Spray will be applied directly to the target species; non-target species will be affected from drift and/or leaching from the soil.

VI-I. **VII. INTEGRATED PEST MANAGEMENT:** (Describe how this chemical application fits into your overall integrated pest management program for the treatment area.)

The only proven method to eradicate tamarisk is through chemical, mechanical and cultural methods or a combination thereof. No biological controls are available for the treatment area

Originator: _____ Date: _____

Company Name: Bureau of Land Management

Phone: (702) 515-5000

Certified Pesticide Applicator:

Date: _____

(Signature)

Field Office Pesticide/Noxious Weed Coordinator

_____ Date: _____

(Signature)

APPROVALS:

_____ Date: _____

Karla D. Norris

Assistant Field Manger

Recreation and Renewable Resources

(Signature)

APPROVALS (State Office Use Only):

Date:

BLM State Pesticide Coordinator

(Signature)

Date:

Deputy State Director, Natural Resources,

Lands and Planning

(Signature)

CONCUR OR APPROVED

NOT CONCUR OR DISAPPROVED

CONCUR OR APPROVED WITH MODIFICATIONS

(SEE ATTACHED)

E.28. Appendix 13. Pesticides and adjuvants approved for use on Public Lands

Table E.8. Herbicides Approved for Use on BLM Lands 1[a]

Active Ingredient	States with approval based upon current EIS/ROD & Court Injunctions	Trade Name	Manufacturer	EPA Registration No.	CA Reg-istra-tion No. *
Herbicides Approved for Use on BLM Lands 1.			**Updated: December 2005**		
Atrazine	AZ, CA, CO, ID, MT, ND, NM, NV, OK, SD, UT, WA, WY	Atrazine 4F	Albaugh/Agri-Star	42750-45	N
		AAtrex Nine-O	Syngenta	100-585	Y
		AAtrex 4L	Syngenta	110-497	Y
		Atrazine 4 L	Setre (Helena)	5905-470	N
		Atrazine 90DF	Setre (Helena)	35915-3-38167	N
Bromacil	AZ, CA, CO, ID, MT, ND, NM, NV, OK, SD, UT, WA, WY	Hyvar X	DuPont	352-287	Y
		Hyvar XL	DuPont	352-346	N

Active Ingredient	States with approval based upon current EIS/ROD & Court Injunctions	Trade Name	Manufacturer	EPA Registration No.	CA Reg-istra-tion No. *
Bromacil + Diuron	AZ, CA, CO, ID, MT, ND, NM, NV, OK, SD, UT, WA, WY	Kroval I DF	DuPont	352-505	Y
		DiBro 2+2	Nufarm Americas Inc.	228-227	N
		DiBro 4+4	Nufarm Americas Inc.	228-235	N
		DiBro 4+2	Nufarm Americas Inc.	228-386	N
		Weed Blast 4G	SSI Maxim	34913-19	N
Chlorsul-furon	AZ, CO, ID, MT, ND, NM, NV, OK, SD, UT, WA, WY	Telar DF	DuPont	352-522	Y
Clopyralid	AZ, CO, ID, MT, ND, NM, NV, OK, SD, UT, WA, WY	Reclaim	Dow AgroSciences	62719-83	N
		Stinger	Dow AgroSciences	62719-73	Y
		Transline	Dow AgroSciences	62719-259	Y
Clopyralid + 2,4-D	AZ, CO, ID, MT, ND, NM, NV, OK, SD, UT, WA, WY	Curtail	Dow AgroSciences	62719-48	N
2,4-D	AZ, CA, CO, ID, MT, ND, NM, NV, OK, East-OR, West-OR, SD, UT, WA, WY	Agrisolution 2,4-D LV6	Agriliance, L.L.C.	1381-101	N
		Agrisolution 2,4-D Amine 4	Agriliance, L.L.C.	1381-103	N
		Agrisolution 2,4-D LV4	Agriliance, L.L.C.	1381-102	N
		2,4-D Amine 4	Albaugh, Inc./Agri Star	42750-19	Y
		2,4-D LV 4	Albaugh, Inc./Agri Star	42750-15	Y
		Solve 2,4-D	Albaugh, Inc./Agri Star	42750-22	Y
		2,4-D LV 6	Albaugh, Inc./Agri Star	42750-20	N
		Five Star	Albaugh, Inc./Agri Star	42750-49	N
		D-638	Albaugh, Inc./Agri Star	42750-36	N
		Aqua-Kleen	Cerexagri, Inc.	228-378-4581	Y
		2,4-D LV6	Helena Chem. Co	4275-20-5905	N
		2,4-D Amine	Helena Chem. Co	5905-72	N
		Opti-Amine	Helena Chem. Co	5905-501	N
		Aqua-Kleen	NuFarm Americas Inc.	71368-1	Y
		Esteron 99C	NuFarm Americas Inc.	62719-9-71368	N
		Weedar 64	NuFarm Americas Inc.	71368-1	Y
		Weedone LV-4	NuFarm Americas Inc.	228-139-71368	N
		Weedone LV-4 Solventless	NuFarm Americas Inc.	71368-14	Y
		Weedone LV-6	NuFarm Americas Inc.	71368-11	Y
		Hi-Dep	PBI Gordon Corp.	2217-703	N

Active Ingredient	States with approval based upon current EIS/ROD & Court Injunctions	Trade Name	Manufacturer	EPA Registration No.	CA Reg-istra-tion No. *
		Formula 40	NuFarm Americas Inc.	228-357	N
		2,4-D LV 6 Ester	Nufarm Americas Inc.	228-95	N
		Platoon	Nufarm Americas Inc.	228-145	N
		WEEDstroy AM-40	Nufarm Americas Inc.	228-145	N
		2,4-D Amine	Setre (Helena)	5905-72	N
		Barrage LV Ester	Setre (Helena)	5905-504	N
		2,4-D LV4	Setre (Helena)	5905-90	N
		2,4-D LV6	Setre (Helena)	5905-93	N
		Clean Crop Amine 4	UAP-Platte Chem. Co.	34704-5 CA	Y
		Clean Crop Low Vol 6 Ester	UAP-Platte Chem. Co.	34704-125	N
		Salvo LV Ester	UAP-Platte Chem. Co.	34704-609	N
		2,4-D 4# Amine Weed Killer	UAP-Platte Chem. Co.	34704-120	N
		Clean Crop LV-4 ES	UAP-Platte Chem. Co.	34704-124	N
		Savage DF	UAP-Platte Chem. Co.	34704-606	Y
		Cornbelt 4 lb. Amine	Van Diest Supply Co.	11773-2	N
		Cornbelt 4# LoVol Ester	Van Diest Supply Co.	11773-3	N
		Cornbelt 6# LoVol Ester	Van Diest Supply Co.	11773-4	N
		Amine 4	Wilbur-Ellis Co.	2935-512	N
		Lo Vol-4	Wilbur-Ellis Co.	228-139-2935	N
		Lo Vol-6 Ester	Wilbur-Ellis Co.	228-95-2935	N
Dicamba	AZ, CA, CO, ID, MT, ND, NM, NV, OK, East-OR, West-OR, SD, UT, WA, WY	Dicamba DMA	Albaugh, Inc./Agri Star	42750-40	N
		Clarity	BASF Ag. Products	7969-137	Y
		Vanquish	Syngenta	100-884	Y
		Diablo	Nufarm Americas Inc.	228-379	N
Dicamba +2,4-D	AZ, CA, CO, ID, MT, ND, NM, NV, OK, East-OR, West-OR, SD, UT, WA, WY	Outlaw	Albaugh, Inc./Agri Star	42750-68	N
		Range Star	Albaugh, Inc./Agri Star	42750-55	N
		Weedmaster	BASF Ag. Products	7969-133	Y
		KambaMaster	Nufarm Americas Inc.	71368-34	N
		Veteran 720	Nufarm Americas Inc.	228-295	Y

Active Ingredient	States with approval based upon current EIS/ROD & Court Injunctions	Trade Name	Manufacturer	EPA Registration No.	CA Reg-istra-tion No. *
Diuron	AZ, CA, CO, ID, MT, ND, NM, NV, OK, SD, UT, WA, WY	Diuron 80DF	Agriliance, L.L.C.	9779-318	N
		Karmex DF	Griffin Company	1812-362	Y
		Direx 80DF	Griffin Company	1812-362	Y
		Direx 4L	Griffin Company	1812-257	Y
		Direx 4L-CA	Griffin Company	1812-257	Y
		Diuron 80WDG	UAP-Platte Chem. Co	34704-648	N
		Diuron-DF	Wilbur-Ellis	00352-00-508-02935	N
Fosamine 2.	CA	Krenite	DuPont	352-395	Y
Glyphos-ate	AZ, CA, CO, ID, MT, ND, NM, NV, OK, East-OR, West-OR, SD, UT, WA, WY	Aqua Star	Albaugh, Inc./Agri Star	42750-59	Y
		Forest Star	Albaugh, Inc./Agri Star	42570-61	Y
		Gly Star Original	Albaugh, Inc./Agri Star	42750-60	Y
		Gly Star Plus	Albaugh, Inc./Agri Star	42750-61	Y
		Gly Star Pro	Albaugh, Inc./Agri Star	42750-61	Y
		Glyfos	Cheminova	4787-31	Y
		Glyfos PRO	Cheminova	67760-57	Y
		Glyfos Aquatic	Cheminova	4787-34	Y
		ClearOut 41	Chem. Prod. Tech., LLC	70829-2	N
		ClearOut 41 Plus	Chem. Prod. Tech., LLC	70829-3	N
		Accord SP	Dow AgroSciences	62719-322	Y
		Glypro	Dow AgroSciences	62719-324	Y
		Glypro Plus	Dow AgroSciences	62719-322	Y
		Rodeo	Dow AgroSciences	62719-324	Y
		DuPont Glyphosate	DuPont	352-607	Y
		DuPont Glyphosate VMF	DuPont	352-609	Y
		Aquamaster	Monsanto	524-343	Y
		Roundup Original	Monsanto	524-445	Y
		Roundup Original II	Monsanto	524-454	Y
		Roundup Original II CA	Monsanto	524-475	Y
		Honcho	Monsanto	524-445	Y
		Honcho Plus	Monsanto	524-454	Y
		Roundup Pro	Monsanto	524-475	Y
		Roundup RT	Monsanto	524-454	N
		GlyphoMate 41	PBI Gordon Corp.	2217-847	Y
		Aqua Neat	Nufarm Americas Inc.	228-365	
		Foresters	Nufarm Americas Inc.	228-381	Y
		Razor	Nufarm Americas Inc.	228-366	Y

Active Ingredient	States with approval based upon current EIS/ROD & Court Injunctions	Trade Name	Manufacturer	EPA Registration No.	CA Reg-istra-tion No. *
		Razor Pro	Nufarm Americas Inc.	228-366	Y
		Rattler	Setre (Helena)	524-445-5905	Y
		Mirage	UAP-Platte Chem. Co.	524-445-34704	Y
		Mirage Plus	UAP-Platte Chem. Co.	524-454-34704	Y
Glyphos-ate + 2,4-D	AZ, CA, CO, ID, MT, ND, NM, NV, OK, East-OR, West-OR, SD, UT, WA, WY	Landmaster BW	Albaugh, Inc./Agri Star	42570-62	N
		Campaign	Monsanto	524-351	N
		Landmaster BW	Monsanto	524-351	N
Glyph-osate + Dicamba	AZ, CA, CO, ID, MT, ND, NM, NV, OK, East-OR, West-OR, SD, UT, WA, WY	Fallowmaster	Monsanto	524-507	N
Hexazi-none	AZ, CA, CO, ID, MT, ND, NM, NV, OK, SD, UT, WA, WY	Velpar ULW	DuPont	352-450	N
		Velpar L	DuPont	352-392	Y
		Velpar DF	DuPont	352-581	Y
		Pronone MG	Pro-Serve	33560-21	Y
		Pronone 10G	Pro-Serve	33560-21	Y
		Pronone 25G	Pro-Serve	33560-45	Y
		Pronone Power Pellet	Pro-Serve	33560-41	Y
Imazapyr	AZ, CO, ID, MT, ND, NM, NV, OK, SD, UT, WA, WY	Arsenal	BASF	241-346	N
		Arsenal Applicators Conc.	BASF	241-299	Y
		Arsenal Railroad Herbicide	BASF	241-273	N
		Arsenal Technical	BASF	241-286	Y
		Chopper	BASF	241-296	Y
		Habitat	BASF	241-426	N
		SSI Maxim Arsenal 0.5G	SSI Maxim Co., Inc.	34913-23	N
		Stalker	BASF	241-398	Y
Imazapyr + Diuron	AZ, CO, ID, MT, ND, NM, NV, OK, SD, UT, WA, WY	Sahara DG	BASF	241-372	N
		SSI Maxim Topsite 2.5G	SSI Maxim Co., Inc.	34913-22	N
		TopSite	BASF	241-344	N
Imazapic		Plateau	BASF	241-365	N

[a]Notes: 1. This is the approved list prior to the completion of the 17 states EIS. 2. If used in areas other than California, refer to the California Veg. Management FEIS and ROD Risk Assessment, 1988.

Table E.9. Herbicides Approved for Use on BLM Lands 1 (updated December 2005)

Herbicides Approved for Use on BLM Lands 1.			Updated: December 2005		
Active Ingredient	**States with approval based upon current EIS/ROD & Court Injunctions**	**Trade Name**	**Manufacturer**	**EPA Registration No.**	**CA Reg-istra-tion No. ***

Mefluidide	AZ, CO, ID, MT, ND, NM, NV, OK, SD, UT, WA, WY	Embark 2-S	PBI Gordon Corp.	2217-759	Y
Metsul-furon methyl	AZ, CO, ID, MT, ND, NM, NV, OK, SD, UT, WA, WY	Cimarron	DuPont	352-616	N
		Escort	DuPont	352-439	N
		Escort XP	DuPont	352-439	N
		Metsulfuron Methyl DF	Vegetation Man., L.L.C.	74477-2	N
		Patriot	Nufarm Americas Inc.	228-391	N
		PureStand	Nufarm Americas Inc.	71368-38	N
Picloram	AZ, CA, CO, ID, MT, ND, NM, NV, OK, East-OR, West-OR, SD, UT, WA, WY	Grazon PC	Dow AgroSciences	62719-181	N
		Tordon K	Dow AgroSciences	62719-17	N
		Tordon 22K	Dow AgroSciences	62719-6	N
Picloram + 2,4-D	AZ, CA, CO, ID, MT, ND, NM, NV, OK, East-OR, West-OR, SD, UT, WA, WY	Grazon P+D	Dow AgroSciences	62719-182	N
		Pathway	Dow AgroSciences	62719-31	N
		Tordon 101M	Dow AgroSciences	62719-5	N
		Tordon 101 R Forestry	Dow AgroSciences	62719-31	N
		Tordon RTU	Dow AgroSciences	62719-31	N
Simazine	AZ, CA, CO, ID, MT, ND, NM, NV, OK, SD, UT, WA, WY	Princep Cali 90	Syngenta	100-603	Y
		Princep 4L	Syngenta	100-526	Y
Sulfome-turon methyl	AZ, CO, ID, MT, ND, NM, NV, OK, SD, UT, WA, WY	Oust	DuPont	352-401	Y
		Oust XP	DuPont	352-601	Y
		SFM 75	Vegetation Man., L.L.C.	72167-11-74477	Y
		Spyder	Nufarm Americas Inc.	228-408	N
Tebuthi-uron	AZ, CA, CO, ID, MT, ND, NM, NV, OK, SD, UT, WA, WY	Spike 20P	Dow AgroSciences	62719-121	Y
		Spike 80W	Dow AgroSciences	62719-107	Y
		Spike 1G	Dow AgroSciences	1471-104	N
		Spike 40P	Dow AgroSciences	62719-122	Y
		Spike 80DF	Dow AgroSciences	62719-107	Y
		SpraKil S-5 Granules	SSI Maxim Co., Inc.	34913-10	Y
Tebuthi-uron+ Di-uron	AZ, CA, CO, ID, MT, ND, NM, NV, OK, SD, UT, WA, WY	SpraKil SK-13 Granular	SSI Maxim Co., Inc.	34913-15	Y
		SpraKil SK-26 Granular	SSI Maxim Co., Inc.	34913-16	Y
Triclopyr	AZ, CA, CO, ID, MT, ND, NM, NV, OK, SD, UT, WA, WY	Garlon 3A	Dow AgroSciences	62719-37	Y
		Garlon 4	Dow AgroSciences	62719-40	Y
		Remedy	Dow AgroSciences	62719-70	Y
		Pathfinder II	Dow AgroSciences	62719-176	Y
		Tahoe 3A	Nufarm Americas Inc.	228-384	N
		Tahoe 4E	Nufarm Americas Inc.	228-385	N
Triclopyr + 2,4-D	AZ, CA, CO, ID, MT, ND, NM, NV, OK, SD, UT, WA, WY	Crossbow	Dow AgroSciences	62719-260	Y

Triclopyr + Clopyralid	AZ, CO, ID, MT, ND, NM, NV, OK, SD, UT, WA, WY	Redeem	Dow AgroSciences	62719-337	Y
*Just because an herbicide has a federal registration, it may or may not be registered for use in California. This column identifies those formulations for which there is a California registration. For BLM purposes, it is taken one step further, a particular formulated herbicide may have a California and federal registration and still not be available for use on BLM administered lands because the active ingredient is not approved according to the California Vegetation Management Environmental Impact Statement Record of Decision and may require tiering to the appropriate EIS.					

Table E.10. Adjuvants Approved for Use on BLM Lands

Adjuvants Approved for Use on BLM Lands 1.			**Updated: December 2005**	
ADJU-VANT CLASS	**ADJUVANT TYPE**	**TRADE NAME**	**MANUFACTURER**	**COMMENTS**
Surfactant	Non-ionic	Spec 90/10	Helena	
		Optima	Helena	CA Reg. No. 5905-50075-AA
		Induce	Setre (Helena)	CA Reg. No. 5905-50066-AA
		Activator 90	Loveland	CA Reg. No. 34704-50034-AA
		LI-700	Loveland	CA Reg. No. 36208-50022, WA Reg. No. AW36208-70004
		Spreader 90	Loveland	WA Reg. No. 34704-05002-AA
		UAP Surfactant 80/20	Loveland	
		X-77	Loveland	CA Reg. No. 36208-50023
		Cornbelt Premier 90	Van Diest Supply Co.	
		Spray Activator 85	Van Diest Supply Co.	
		R-11	Wilbur-Ellis	CA Reg. No. 2935-50142
		R-900	Wilbur-Ellis	
		Super Spread 90	Wilbur-Ellis	WA Reg. No. AW-2935-70016
		Super Spread 7000	Wilbur-Ellis	CA Reg. No. 2935-50170, WA Reg. No. AW-2935-0002
	Spreader/Sticker	Cohere	Helena	CA Reg. No. 5905-50083-AA
		R-56	Wilbur-Ellis	CA Reg. No. 2935-50144
		Bond	Loveland	CA Reg. No. 36208-50005
		Tactic	Loveland	CA Reg. No. 34704-50041-AA
		Lastick	Setre (Helena)	
	Silicone-based	Aero Dyne-Amic	Helena	CA Reg. No. 5905-50080-AA
		Dyne-Amic	Helena	CA Reg. No. 5095-50071-AA
		Kinetic	Setre (Helena)	CA Reg. No. 5905-50087-AA

		Phase	Loveland	CA Reg. No. 34704-50037-AA
		Silwet L-77	Loveland	CA Reg. No. 36208-50025
		Sylgard 309	Wilbur-Ellis	CA Reg. No. 2935-50161
		Syl-Tac	Wilbur-Ellis	CA Reg. No. 2935-50167
Oil-based	Crop Oil Concentrate	Crop Oil Concentrate	Helena	CA Reg. No. 5905-50085-AA
		Crop Oil Concentrate	Loveland	
		Herbimax	Loveland	CA Reg. No. 34704-50032-AA, WA Reg. No. 34704-04006
		R.O.C. Rigo Oil Conc.	Wilbur-Ellis	CA Reg. No. 2935-50098
	Methylated Seed Oil	Methylated Spray Oil Conc.	Helena	
		MSO Concentrate	Loveland	CA Reg. No. 34704-50029-AA, WA Reg. No. 34704-04009
		Hasten	Wilbur-Ellis	CA Reg. No. 2935-50160, WA Reg. No. 2935-02004
		Super Spread MSO	Wilbur-Ellis	
	Vegetable Oil	Amigo	Loveland	CA Reg. No. 34704-50028-AA , WA Reg. No. 34704-04002
		Competitor	Wilbur-Ellis	CA Reg. No. 2935-50173, WA Reg. No. AW-2935-04001
Fertilizer-based	Nitrogen-based	Quest	Setre (Helena)	CA Reg. No. 5905-50076-AA
		Dispatch	Loveland	
		Dispatch 111	Loveland	
		Dispatch 2N	Loveland	
		Dispatch AMS	Loveland	
		Bronc	Wilbur-Ellis	
		Bronc Max	Wilbur-Ellis	
		Bronc Max EDT	Wilbur-Ellis	
		Bronc Plus Dry EDT	Wilbur-Ellis	WA Reg. No.2935-03002
		Cayuse Plus	Wilbur-Ellis	CA Reg. No. 2935-50171
Special Purpose or Utility	Buffering Agent	Buffers P.S.	Helena	CA Reg. No. 5905-50062-ZA
		Tri-Fol	Wilbur-Ellis	CA Reg. No. 2935-50152
	Colorants	Signal	Precision	
		Hi-Light	Becker-Underwood	
		Hi-Light WSP	Becker-Underwood	
	Compatibility/ Suspension Agent	E Z MIX	Loveland	CA Reg. No. 36208-50006
		Support	Loveland	WA Reg. No. 34704-04011
		Blendex VHC	Setre (Helena)	

	Deposition Aid	ProMate Impel	Helena	
		Pointblank	Helena	CA Reg. No. 52467-50008-AA-5905
		Intac Plus	Loveland	
		Liberate	Loveland	CA Reg. No. 34704-50030-AA , WA Reg. No. 34704-04008
		Weather Gard	Loveland	CA Reg. No. 34704-50042-AA
		Bivert	Wilbur-Ellis	CA Reg. No. 2935-50163
		EDT Concentrate	Wilbur-Ellis	
		Sta Put	Setre (Helena)	CA Reg. No. 5905-50068-AA
	Defoaming Agent	No Foam	Wilbur-Ellis	CA Reg. No. 2935-50136
		Buster Foam	Setre (Helena)	CA Reg. No. 5905-50072-AA
		Cornbelt Defoamer	Van Diest Supply Co.	
	Diluent/Deposition Agent	Improved JLB Oil Plus	Brewer International	
	Foam Marker	Align	Helena	
		R-160	Wilbur-Ellis	
	Invert Emulsion Agent	Redi-vert II	Wilbur-Ellis	CA Reg. No. 2935-50168
	Tank Cleaner	Wipe Out	Helena	
		Kutter	Wilbur-Ellis	
		Neutral-Clean	Wilbur-Ellis	
		Cornbelt Tank-Aid	Van Diest Supply Co.	
	Water Conditioning	Blendmaster	Loveland	
		Choice	Loveland	CA Reg. No. 34704-50027-AA WA Reg. No. 34704-04004
		Choice Xtra	Loveland	
		Choice Weather Master	Loveland	CA Reg. No. 34704-50038-AA

E.29. Appendix 14. Plan of Operations, by year, for the LVFO Noxious Weed Coordinator

Table E.11. 2006 Operating Plan

Projects committed to for 2006				
Education/ Awareness	AL	5 Events	$7,600	Provide public information about weeds in the LVFO. Give training to field going staff about weeds. Train volunteers and recreational groups and conservation groups.
Weed Inventory	BS	250,000 Acres	$25,000	Inventory and re-inventory the LVFO with a 20% (600,000 acres) yearly target goal.
Weed Treatment	JD	150 Acres	$60,000	Pending funding levels in 1020 Weed, treatment areas will be done as they become apparent and/or are prioritized.

Treatment Evaluation/ Monitoring	MK	150 Acres	$11,400	Monitor the effectiveness of weed treatments. Treat any weeds found and continue until the weed in treatment areas is eradicated.
		Total:	**~$104,000**	

Table E.12. 2007 Operating Plan

Projects committed to for 2007				
Education/ Awareness	AL	7 Events	$7,600	Provide public information about weeds in the LVFO. Give training to field going staff about weeds. Train volunteers and recreational groups and conservation groups.
Weed Inventory	BS	350,000 Acres	$25,000	Inventory and re-inventory the LVFO with a 20% (600,000 acres) yearly target goal.
Weed Treatment	JD	70 Acres	$60,000	Pending funding levels in 1020 Weed, treatment areas will be done as they become apparent and/or are prioritized.
Treatment Evaluation/ Monitoring	MK	150 Acres	$11,400	Monitor the effectiveness of weed treatments. Treat any weeds found and continue until the weed in treatment areas is eradicated.
		Total:	**~$104,000**	

(Attach yearly plan of operations as another page to the end of this document.)

End.

Appendix F. Recreation Management Actions

F.1. Las Vegas Field Office Recreation Management Areas

F.1.1. Special Recreation Management Areas (SRMAs)

F.1.1.1. Gold Butte Special Recreation Management Area (SRMA)

SUPPORTING INFORMATION

Important Values:

Gold Butte is located between the Grand Canyon Parashant National Monument, Arizona, and Lake Mead National Recreation Area, just south of the city of Mesquite. It is named for the historic mining town and tent city of 1,000 miners in the early 1900s. The town of Gold Butte, long abandoned, now attracts visitors interested in early pioneer history, ranching and ghost towns. Visitors are also attracted to the areas rugged mountains, Joshua tree and Mojave yucca forests, outcroppings of sandstone, and braided washes that turn into slot canyons.

Gold Butte area is popular for a variety of recreation opportunities. Motorized routes provide access to areas with scenic views, cultural sites, and camping opportunities. ACECs protect

Types of Visitors:

Gold Butte is visited by a variety of people from local residents to international visitors. Some visit for the day, and many camp out. Many non-BLM web sites provide information about the Gold Butte area and its major Features.

Opportunities Offered:

BLM-administered lands (public lands) in the area provide settings for a variety of recreational opportunities, including:

- Viewing largely undeveloped scenic views
- Cultural resource viewing
- Wildlife viewing opportunities
- Motorized travel on designated routes
- Access to Wilderness
- Access to neighboring National Recreation Area and National Monument
- Primitive Hiking
- Equestrian
- Bicycling
- Dispersed camping

SRMA/RMZ OBJECTIVE(S) DECISIONS

Objective Statement:

Maintain a variety of dispersed recreation opportunities that facilitate visitor freedom to access a range of outdoor recreation activities associated with a wide-open landscape with limited developments. Maintain the natural settings for multiple recreation opportunities in ACECs, wilderness, WSAs, and lands with wilderness characteristics. Minimize impacts from increasing recreation by providing facilities, interpretation, education, and information.

Activities:

- Camping
- Canyoneering
- Filming and still photography
- Geocaching
- Hiking
- Horseback riding
- Hunting
- Mountain biking
- OHV use
  - – Casual OHV use
  - – Commercial OHV touring
- Recreational shooting
- Rock climbing/Rappelling/Bouldering
- Viewing cultural sites/Historic touring
- Viewing natural settings/Sightseeing
- Viewing wildlife/Birdwatching

Experiences:

- Enjoying the sights, sounds, and smells of a natural landscape
- Participating in exercise/physical activity
- Testing/improving physical endurance
- Enjoying closeness with friends/family
- Enjoying meeting new people with similar interests
- Participating in group outdoor events
- Learning more about the natural environment
- Opportunities for introspection
- Releasing/reducing mental tension
- Escaping everyday responsibilities

Benefits:

- Personal: Improved health (physical and psychological); Restored mind from unwanted stress; Stronger ties with friends/family; Feelings of isolation (introspection); A chance to get away from the city (solitude)
- Community/Social: Developing stronger ties with family/friends; Reduced social isolation; Improved quality of life/lifestyle; Heightened sense of satisfaction with the community/environment; Group activities and social interaction (camaraderie)
- Environmental: Increased sense of place and associated increase of stewardship behaviors; Improved care for community aesthetics; Reduced negative human impacts such as litter or trail pioneering
- Economic: Reduced health maintenance costs; Increased work productivity; Increased desirability as a place to live/retire; Increased property values

RECREATION SETTING CHARACTERISTIC (RSC) DESCRIPTIONS

Physical Characteristics:

- Remoteness: Rural, Front Country, Middle Country, Back Country, Primitve
- Naturalness: Rural, Front Country, Middle Country, Back Country, Primitive
- Visitor Facilities: Front Country, Middle Country, Back Country

Social Characteristics:

- Group size: Urban, Rural, Front Country, Middle Country, Back Country, Primitive
- Contacts: Rural, Front Country, Middle Country, Backcountry, Primitive
- Evidence of Use: Front Country, Middle Country, Back Country, Primitive

Operational Characteristics:

- Visitor services: Front Country, Middle Country, Back Country, Primitive
- Management Controls: Front Country, Middle Country, Back Country, Primitive
- Access: Front Country, Middle Country, Back Country, Primitive

MANAGEMENT ACTIONS AND ALLOWABLE USE DECISIONS

Recreation and Visitor Services Program:

- Coordinate with other federal, state, county, and local agencies to identify and develop recreational trails and trailheads as needed.
- Provide connectivity to surrounding access routes and trail systems.
- Encourage cooperative ventures to enhance recreation opportunities.
- Concentrate recreation use to reduce the impacts to sensitive cultural, biological, and scenic values.
- Prohibit all speed-based OHV activities, including but not limited to hill climbs, and high speed testing.
- Allow non-speed permitted activities on a case-by-case basis.
- Shooting must be at least 1000 feet from roads and structures.
- Limit mechanized vehicles to designated routes.
- Encourage equestrians to use designated routes. If equestrian use is causing undue or unnecessary adverse effects upon managed resources and uses, they may be required to use designated routes.
- Monitor recreation use along developed trails. Close and/or rehabilitate unauthorized routes as needed.

- Develop recreation support facilities to improve the recreation experience and to address human health and safety and resource protection issues.
- Install visitor interpretation/education signs at trailheads and in areas of potential user conflict or resource impact.

Other Programs:

- OHV: Limited to designated routes.
- Lands & Realty: Close the area to site-type ROWs and other land-use authorizations larger than 20 acres, except for those that enhance recreational values, public health and safety (such as R&PP leases) and in support of or ancillary to utility corridors.

IMPLEMENTATION DECISIONS

Implementation Decisions:

A separate Recreation Area Management Plan (RAMP) is being developed for this SRMA. Please refer to the RAMP for implementation-level decisions.

F.1.1.2. Jean/Roach Special Recreation Management Area (SRMA)

SUPPORTING INFORMATION

Important Values:

The Jean/Roach SRMA encompasses a large area where roads and trails render much of the area accessible by OHV and four-wheel drive vehicles. There is a large demand for truck/buggy races and other high-speed motorized events.

Penstemon can be found in relict sand pockets within the area. The area was analyzed for critical habitat for desert tortoise, but was not designated.

The SRMA also encompasses two flat playa areas (dry lake beds) that are part of the Dry Lakes Recreation Management Zone (RMZ). The SRMA also includes the Jean Roach West RMZ which lies on the Northwest side of I-15. This form does not include recreation specific to those areas. See the separate forms for information related to the RMZs.

Types of Visitors:

The area is visited by an adrenaline-seeking community (including dispersed OHV use and high-speed motorized racing). Commercial tour permit holders like to use the area because of the unencumbered open space and multiple trails with minimal disturbances to the natural environment. Several motorized speed events occur in the area every year. In 2009 there were 5 truck and buggy events and 4 motorcycle night events.

Opportunities Offered:

BLM-administered lands (public lands) in this area provide settings for a variety of recreational opportunities, including:

- High speed racing events (several different events and types)
- Trail-based OHV use
- Guided motorized non-speed/non-competitive OHV touring
- Movie filming
- Casual horseback riding
- Casual OHV use
- Hunting
- Dispersed Camping.

SRMA/RMZ OBJECTIVE(S) DECISIONS

Objective Statement:

To provide settings for larger high speed motorized events (longer than a 10 mile course, such as 60-100 mile loops), with an emphasis on the truck/buggy race events. Additionally this area would be managed to provide opportunities for other dispersed motorized events, including high-speed dispersed OHV use and touring.

Activities:

- Camping
- Filming and still photography
- Geocaching
- Hang gliding
- Hiking
- Horseback riding
- Hunting
- Mountain biking
- OHV use
  - Casual use
  - Commercial touring
  - High-speed events
  - Non-speed events
- Rock climbing/Rappelling/Bouldering
- Viewing cultural sites/Historic touring
- Viewing natural settings/Sightseeing
- Viewing wildlife/Birdwatching

Experiences:

- Enjoying the sights, sounds, and smells of a natural landscape
- Participating in exercise/physical activity
- Testing/improving physical endurance
- Enjoying closeness with friends/family
- Enjoying meeting new people with similar interests
- Participating in group outdoor events

Benefits:

- Personal: Improved health (physical and psychological); Restored mind from unwanted stress; Stronger ties with friends/family; Feelings of isolation (introspection); A chance to get away from the city (solitude)

- Community/Social: Developing stronger ties with family/friends; Reduced social isolation; Improved quality of life/lifestyle; Heightened sense of satisfaction with the community/environment; Group activities and social interaction (camaraderie).
- Environmental: Increased sense of place and associated increase of stewardship behaviors; Improved care for community aesthetics; Reduced negative human impacts such as litter or trail pioneering.
- Economic: Reduced health maintenance costs; Increased work productivity.

RECREATION SETTING CHARACTERISTIC (RSC) DESCRIPTIONS

Physical Characteristics:

- Remoteness: Rural, Front Country, Middle Country, Back Country
- Naturalness: Rural, Front Country, Middle Country, Back Country, Primitive
- Visitor Facilities: Front Country, Middle Country

Social Characteristics:

- Group size: Rural, Front Country, Middle Country
- Contacts: Rural, Front Country, Middle Country
- Evidence of Use: Front Country, Middle Country, Back Country

Operational Characteristics:

- Visitor services: Front Country, Middle Country
- Management Controls: Front Country, Middle Country
- Access: Front Country, Middle Country, Back Country

MANAGEMENT ACTIONS AND ALLOWABLE USE DECISIONS

Recreation and Visitor Services Program:

- Coordinate with other federal, state, county, and local agencies to identify and develop recreational trails and trailheads as needed.
- Provide connectivity to surrounding access routes and trail systems.
- Encourage cooperative ventures to enhance recreation opportunities.
- Concentrate recreation use to reduce the impacts to sensitive cultural, biological, and scenic values.
- Allow for permitted recreation activities/events on a case-by-case basis, subject to site-specific restrictions and stipulations needed to meet objectives for other resources and uses. Restrictions and stipulations could include, but are not limited to, seasonal restrictions, group size limits, and limits on the type or number of specific activities.
- Identify a route or routes for high speed event courses.
- Relocate access routes to maintain accessibility and race routes for areas where routes could be part of renewable energy or minerals developments.
- Areas for high-speed testing and extreme touring of OHV racing platforms (including trucks, buggies, UTVs, OHVs, and motorcycles) may be analyzed to provide for this type of need and use.
- Allow non-speed events (such as all-terrain bicycle events, motorcycle trials, noncompetitive off-road vehicle events, and commercial permitted events and activities) on a case-by-case basis.
- Shooting must be at least 1000 feet from roads and structures.

- Monitor recreation use along developed trails. Close and/or rehabilitate unauthorized routes as needed.
- Develop recreation support facilities to improve the recreation experience and to address human health and safety and resource protection issues.
- Install visitor interpretation/education signs at trailheads and in areas of potential user conflict or resource impact.

Other Programs:

- OHV: Limited to designated routes.
- Lands & Realty: Lands that overlap disposal boundaries will be managed as part of the SRMA until such time as the lands are disposed of.
- Close the area to site-type ROWs and other land-use authorizations larger than 20 acres, except for those that enhance recreational values, public health and safety and in support of or ancillary to utility corridors, and the Ivanpah Valley Airport.
- Avoid linear ROWs in the area. Concentrate major utility line ROWs within the confines of designated utility corridors.

IMPLEMENTATION DECISIONS

Implementation Decisions:

A separate Recreation Area Management Plan (RAMP) is being developed for this SRMA. Please refer to the RAMP for implementation-level decisions.

F.1.1.2.1. Dry Lakes Recreation Management Zone (RMZ)

SUPPORTING INFORMATION

Important Values:

The Dry Lakes RMZ of the Jean/Roach Dry Lakes SRMA encompasses two flat playa areas (dry lake beds) where there is a large demand for dispersed OHV use as well as truck/buggy races and other high speed motorized events. Several motorized speed events occur in the area every year, for example in 2009, there were 5 truck and buggy events and 4 motorcycle night events.

Types of Visitors:

The area is visited by an adrenaline-seeking community (including motorized OHV use and events, dispersed camping, and model rocket launching). The area sometimes acts as a staging area for high speed truck/buggy races that take place in the Jean/Roach SRMA adjacent to the Dry Lakes RMZ. Commercial tour permit holders and casual users like to use the area because of the unencumbered open space and multiple trails with minimal disturbances to the natural environment.

Opportunities Offered:

BLM-administered lands (public lands) in this area provide settings for a variety of recreational opportunities, including:

- Casual and permitted OHV use
  - Open cross-country OHV use
  - High speed racing events (several different events and types)
  - Guided motorized OHV touring (non-speed/non-competitive)
- Model airplane/model rocket launching
- Land sailing on Roach Dry Lake
- Movie filming

- Dispersed camping

SRMA/RMZ OBJECTIVE(S) DECISIONS

Objective Statement:

Provide settings for dispersed recreation opportunities, including non-motorized and motorized recreation. Provide access and setting for the staging of motorized speed events (that would mostly occur in the Jean/Roach SRMA adjacent to the Dry Lakes RMZ). Provide opportunities for casual OHV use, including dispersed high speed and cross country OHV use.

Activities:

- Ballooning
- Camping
- Commercial/Competitive Events (e.g. shooting, running, bird dog trails)
- Filming and still photography
- Geocaching
- Kite landboarding
- Land sailing
- Model plane/model rocket launching
- OHV use
  - Casual use
  - Commercial touring
  - High-speed events
  - Non-speed events
  - Staging and watching high speed racing events
- Soaring and gliding
- Viewing natural settings/Sightseeing

Experiences:

- Enjoying the sights, sounds, and smells of a natural landscape
- Participating in exercise/physical activity
- Testing/improving physical endurance
- Enjoying closeness with friends/family
- Enjoying meeting new people with similar interests
- Participating in group outdoor events

Benefits:

- Personal: Improved health (physical and psychological); Restored mind from unwanted stress; Stronger ties with friends/family

- Community/Social: Developing stronger ties with family/friends; Reduced social isolation; Improved quality of life/lifestyle; Group activities and social interaction (camaraderie).
- Environmental: Increased sense of place and associated increase of stewardship behaviors; Improved care for community aesthetics; Reduced negative human impacts such as litter or trail pioneering
- Economic: Increased desirability as a place to live/retire

RECREATION SETTING CHARACTERISTIC (RSC) DESCRIPTIONS

Physical Characteristics:

- Remoteness: Urban, Rural, Front Country
- Naturalness: Front Country, Middle Country, Back Country
- Visitor Facilities: Middle Country, Back Country

Social Characteristics:

- Group size: Rural, Front Country, Middle Country
- Contacts: Rural, Front Country, Middle Country
- Evidence of Use: Front Country, Middle Country

Operational Characteristics:

- Visitor services: Front Country, Middle Country, Back Country
- Management Controls: Rural, Front Country, Middle Country
- Access: Front Country, Middle Country, Back Country

MANAGEMENT ACTIONS AND ALLOWABLE USE DECISIONS

Recreation and Visitor Services Program:

- Explore seasonal closures as necessary to protect the integrity of the dry lake beds.
- Coordinate with other federal, state, county, and local agencies to identify and develop recreational trails and trailheads as needed.
- Provide connectivity to surrounding access routes and trail systems.
- Encourage cooperative ventures to enhance recreation opportunities.
- Allow speed-based OHV events (e.g. motorcycle, truck, and buggy races) on a case-by-case basis.
- Allow non-speed events (such as all-terrain bicycle events, motorcycle trail rides, noncompetitive off-road vehicle events, and commercial permitted events and activities) on a case-by-case basis.
- Shooting must be at least 1000 feet from roads and structures.
- Install visitor interpretation/education signs at trailheads and in areas of potential user conflict or resource impact.

Other Programs:

- OHV: Open to cross country OHV use (Closed when there is standing water.)
- Lands & Realty: Close the Jean Dry Lake to linear ROW's. Lands that overlap disposal boundaries will be managed as part of the RMZ until such time as the lands are disposed of.

IMPLEMENTATION DECISIONS

Implementation Decisions:

A separate Recreation Area Management Plan (RAMP) is being developed for this SRMA. Please refer to the RAMP for implementation-level decisions.

F.1.1.2.2. Jean/Roach West Recreation Management Zone (RMZ)

SUPPORTING INFORMATION

Important Values:

The Jean/Roach Dry Lakes SRMA encompasses a large area where roads and trails render much of the area accessible by OHV and four-wheel drive vehicles. There is a large demand for Motorcycle/ATV routes and staging areas for casual use, events and Rally Car races. The Goodsprings area is popular for hiking.

The area was analyzed for critical habitat for desert tortoise, but was not designated.

Types of Visitors:

The area is visited by an adrenaline-seeking community (including dispersed OHV use and high-speed motorized racing). Commercial tour permit holders and casual users like to use the area because of the unencumbered open space and multiple trails with minimal disturbances to the natural environment. Several motorized speed events occur in the area every year. In 2012 there were 2 motorcycle races and 1 rally car race. Local Goodsprings residents enjoy hiking on public lands near their town.

Opportunities Offered:

BLM-administered lands (public lands) in this area provide settings for a variety of recreational opportunities, including:

- High speed racing events (several different events and types)
- Trail-based OHV use including rock crawling.
- Guided motorized non-speed/non-competitive OHV touring
- Movie filming
- Casual horseback riding
- Casual OHV use
- Hunting
- Hiking
- Dispersed Camping.

SRMA/RMZ OBJECTIVE(S) DECISIONS

Objective Statement:

To provide settings for dispersed recreational opportunities including non-motorized and motorized recreation. Provide access and setting for the staging of motorized events, excluding competitive truck/buggy events. Provide opportunities for casual OHV use, rally car racing, rock crawling, and commercial touring. Provide opportunities for non-motorized trails (hiking and bicycling) near the town of Goodsprings.

Activities:

- Camping
- Commercial/Competitive events (e.g. rally car racing)
- Filming and still photography
- Geocaching
- Hiking
- Hunting
- Horseback riding
- Mountain biking
- OHV use
  - Casual OHV use
  - Commercial OHV touring
  - OHV racing events
- Rock Climbing
- Viewing natural settings/Sightseeing
- Viewing wildlife/Birdwatching

Experiences:

- Enjoying the sights, sounds, and smells of a natural landscape
- Participating in exercise/physical activity
- Testing/improving physical endurance
- Enjoying closeness with friends/family
- Enjoying meeting new people with similar interests
- Participating in group outdoor events

Benefits:

- Personal: Improved health (physical and psychological); Restored mind from unwanted stress; Stronger ties with friends/family; Feelings of isolation (introspection); A chance to get away from the city (solitude)
- Community/Social: Developing stronger ties with family/friends; Reduced social isolation; Improved quality of life/lifestyle; Heightened sense of satisfaction with the community/environment; Group activities and social interaction (camaraderie).
- Environmental: Increased sense of place and associated increase of stewardship behaviors; Improved care for community aesthetics; Reduced negative human impacts such as litter or trail pioneering

- Economic: Reduced health maintenance costs; Increased work productivity

RECREATION SETTING CHARACTERISTIC (RSC) DESCRIPTIONS

Physical Characteristics:

- Remoteness: Rural, Front Country, Middle Country, Back Country
- Naturalness: Rural, Front Country, Middle Country, Back Country, Primitive
- Visitor Facilities: Front Country, Middle Country

Social Characteristics:

- Group size: Rural, Front Country, Middle Country
- Contacts: Rural, Front Country, Middle Country
- Evidence of Use: Front Country, Middle Country, Back Country

Operational Characteristics:

- Visitor services: Front Country, Middle Country
- Management Controls: Front Country, Middle Country
- Access: Front Country, Middle Country, Back Country

MANAGEMENT ACTIONS AND ALLOWABLE USE DECISIONS

Recreation and Visitor Services Program:

- Coordinate with other federal, state, county, and local agencies to identify and develop recreational trails and trailheads as needed.
- Provide connectivity to surrounding access routes and trail systems.
- Encourage cooperative ventures to enhance recreation opportunities.
- Concentrate recreation use to minimize the impacts to sensitive cultural, biological, and scenic values.
- Allow for permitted recreation activities/events on a case-by-case basis, subject to site-specific restrictions and stipulations needed to meet objectives for other resources and uses. Restrictions and stipulations could include, but are not limited to, seasonal restrictions, group size limits, and limits on the type or number of specific activities.
- Designate a route or routes for use in the identification of high speed event courses.
- Relocate access routes to maintain accessibility and race routes for areas where routes could be part of minerals developments.
- Allow non-speed use (such as bicycle events, motorcycle trail rides, noncompetitive off-road vehicle events, and commercial permitted events and activities) on a case-by-case basis.
- Monitor recreation use along developed trails. Close and/or rehabilitate unauthorized routes as needed.
- Develop recreation support facilities such as staging and picnicking areas, to improve the recreation experience and to address human health and safety and resource protection issues.
- Install visitor interpretation/education signs at trailheads and in areas of potential user conflict or resource impact.
- Prohibit high speed truck/buggy events and extreme touring.

Other Programs:

Required management:

- OHV: Limited to designated routes
- Minerals: Case by case basis
- Lands & Realty: Lands that overlap disposal boundaries will be managed as part of the SRMA until such time as the lands are disposed of. Close the area to site-type ROWs and other land-use authorizations larger than 20 acres, except for those that enhance recreational values, public health and safety and in support of or ancillary to utility corridors.
- Avoid linear ROWs in the area. Concentrate major utility line ROWs within the confines of designated utility corridors.

IMPLEMENTATION DECISIONS

Implementation Decisions:

A separate Recreation Area Management Plan (RAMP) is being developed for this SRMA. Please refer to the RAMP for implementation-level decisions.

F.1.1.3. Las Vegas Valley Special Recreation Management Area (SRMA)

SUPPORTING INFORMATION

Important Values:

BLM-administered lands (public lands) on the periphery of the Las Vegas Valley provide settings for a variety of recreational opportunities, including viewing largely undeveloped scenic views, viewing and learning about wildlife, viewing panoramas of the valley, travel in the Mojave Desert, including hiking, equestrian, and mountain biking.

Provides a natural backdrop to Las Vegas and a place of very easily accessible respite and a place to enjoy the natural environment. The importance of these recreational opportunities is their proximity to a major urban area, with the SRMA comprising lands within or near the Las Vegas Valley, which is home to over 1.5 million people. This SRMA provides some of the few remaining undeveloped areas that can provide readily available opportunities for a variety of recreational opportunities and their associated outcomes. The proximity of these lands allows public land users to easily access outdoor recreation opportunities that are “close-to-home,” providing for easily accessed areas for day-use recreation experiences.

Types of Visitors:

Mostly local residents of Las Vegas Valley, seeking part-day experiences after work and on weekends.

Opportunities Offered:

BLM-administered lands (public lands) on the periphery of the Las Vegas Valley provide settings for a variety of recreational opportunities, including:

- Viewing largely undeveloped scenic views
- Viewing and learning about wildlife
- Viewing panoramas of the valley
- Travel in the Mojave Desert, including:
  - Hiking
  - Equestrian
  - Bicycling
  - OHV use (in some areas)

This SRMA provides some of the few remaining urban-interface areas that can provide readily available opportunities for a variety of recreational opportunities and their associated outcomes. The proximity of these lands

to Las Vegas allows public land users to easily access outdoor recreation opportunities that are "close-to-home," providing for easily accessed areas for day-use recreation experiences.

Sunrise Mountain RMZ (non-motorized natural environment).
See the description on a separate form.

River Mountains RMZ (non-motorized natural environment)
See the description on a separate form.

Eldorado RMZ (non-motorized natural environment)
See the description on a separate form.

NCA Gateway RMZ (non-motorized natural environment)
See the description on a separate form.

Fossil Beds RMZ (non-motorized close to home, natural setting)
See the description on a separate form.

Arden RMZ (non-motorized natural environment, far from the community with some screening)
See the description on a separate form.

SRMA/RMZ OBJECTIVE(S) DECISIONS

Objective Statement:

This area would be managed as a SRMA to provide a natural undeveloped setting adjacent to an urban population with non-motorized trail-based recreation opportunities. Use would be dominated by day use, after work, close to home recreation in a natural area.

Activities:

- Day-hikes
- Evening walks
- Bicycling
- Riding horses
- Driving for pleasure
- Viewing natural settings and/or wildlife

Experiences:

- Enjoying the sights, sounds, and smells of a natural landscape
- Participating in exercise/physical activity
- Testing/improving physical endurance
- Enjoying closeness with friends/family
- Enjoying meeting new people with similar interests
- Participating in group outdoor events
- Learning more about the natural environment
- Opportunities for introspection
- Releasing/reducing mental tension
- Escaping everyday responsibilities

Benefits:

- Personal: Improved health (physical and psychological); restored mind from unwanted stress; stronger ties with friends/family.
- Community/Social: Developing stronger ties with family/friends; reduced social isolation; improved quality of life/lifestyle; heightened sense of satisfaction with the community/environment.
- Environmental: Increased sense of place and associated increase of stewardship behaviors; improved care for community aesthetics; reduced negative human impacts such as litter or trail pioneering.
- Economic: Reduced health maintenance costs; increased work productivity; increased desirability as a place to live/retire; increased property values.

RECREATION SETTING CHARACTERISTIC (RSC) DESCRIPTIONS

Physical Characteristics:

- Remoteness: Urban, Rural, Front Country, Middle Country, Back Country
- Naturalness: Front Country, Middle Country, Back Country
- Visitor Facilities: Front Country, Middle Country, Back Country

Social Characteristics:

- Group size: Middle Country, Back Country
- Contacts: Middle Country, Back Country
- Evidence of Use: Front Country, Middle Country, Back Country

Operational Characteristics:

- Visitor services: Front Country, Middle Country
- Management Controls: Front Country, Middle Country
- Access: Front Country, Middle Country, Back Country

MANAGEMENT ACTIONS AND ALLOWABLE USE DECISIONS

Recreation and Visitor Services Program:

- Manage the Las Vegas Valley area as a SRMA:
- Coordinate with other federal, State, County and local agencies and partners to develop an interconnected trails system around the valley (e.g., The Great Circle Trail System). Provide for trailheads, parking and/or staging areas for each trailhead.
- Consider developing trails for separate user groups (e.g., hiking, biking, equestrian) to avoid trail expansion and pioneering, and to reduce inter-group conflicts.
- Monitor use along developed trails. Close and/or rehabilitate unauthorized routes as needed.
- Include the Eldorado portion of the former Nelson Hills/Eldorado SRMA to the Las Vegas Valley SRMA.
- Prohibit camping on public lands within the SRMA, except where specifically authorized and designated.
- Limit mechanized use to designated routes.
- Limit equestrian use to designated routes.
- Prohibit casual/dispersed shooting and/or target practice within one 1000 feet of roads and structures.

Other Programs:

- OHV: Designate the Las Vegas Valley SRMA as limited to designated routes. Limit some areas to licensed street-legal vehicles to enable access to legal travel routes on adjacent public lands.
- Lands & Realty: Close the area to site-type ROWs and other land-use authorizations larger than 20 acres, except for those that enhance recreational values, public health and safety (such as R&PP leases) and in support of or ancillary to utility corridors.

IMPLEMENTATION DECISIONS

Implementation Decisions:

A separate Recreation Area Management Plan (RAMP) is being developed for this SRMA. Please refer to the RAMP for implementation-level decisions.

F.1.1.3.1. Arden Recreation Management Zone (RMZ)

SUPPORTING INFORMATION

Important Values:

Within the Arden RMZ, the SRMA includes lands within the Las Vegas Valley, but outside the SNPLMA disposal area. The Arden RMZ includes the Desert Tortoise Center and specifically provides for non-motorized recreational experiences in a natural environment, far enough from the community for users to feel like they're "getting away" without requiring extensive travel. The geology and topography in this area (transition between valley floor and the Red Rock NCA) provides for visual screening from the more developed areas of the Las Vegas Valley, providing an opportunity for users to recreate in a "natural" setting.

Types of Visitors:

Visitors comprise mostly local residents of Las Vegas Valley, seeking part-day experiences after work and on weekends.

Opportunities Offered:

BLM-administered lands (public lands) on the periphery of the Las Vegas Valley provide settings for a variety of recreational opportunities, including:

- Connecting to outdoor recreation close to home
- Connecting to trail systems on adjacent jurisdictions (including federal, state, local, and private)
- Travel in the Mojave Desert, including:
- Hiking
- Dog Walking
- Equestrian
- Mountain biking
- Viewing largely undeveloped scenic views
- Wildlife viewing opportunities (bighorn sheep)

SRMA/RMZ OBJECTIVE(S) DECISIONS

Objective Statement:

Increasing demands for recreational use would be managed in a manner to protect desert tortoise habitat while providing for opportunities for non-motorized trails-based recreation activities. Manage recreation opportunities in concert with relevant and important values of the Bird Springs Valley/DTCC ACEC.

Activities:

- Geocaching
- Hiking
- Horseback riding
- Bicycling
- Viewing natural settings/Sightseeing
- Viewing wildlife/Birdwatching

Experiences:

- Enjoying the sights, sounds, and smells of a natural landscape
- Participating in exercise/physical activity
- Testing/improving physical endurance
- Enjoying closeness with friends/family
- Enjoying meeting new people with similar interests
- Participating in group outdoor events
- Learning more about the natural environment
- Opportunities for introspection
- Releasing/reducing mental tension
- Escaping everyday responsibilities

Benefits:

- Personal: Improved health (physical and psychological); Restored mind from unwanted stress; Stronger ties with friends/family; Feelings of isolation (introspection); A chance to get away from the city (solitude)
- Community/Social: Developing stronger ties with family/friends; Reduced social isolation; Improved quality of life/lifestyle; Heightened sense of satisfaction with the community/environment;
- Environmental: Increased sense of place and associated increase of stewardship behaviors; Improved care for community aesthetics; Reduced negative human impacts such as litter or trail pioneering
- Economic: Reduced health maintenance costs; Increased work productivity; Increased desirability as a place to live/retire; Increased property values

RECREATION SETTING CHARACTERISTIC (RSC) DESCRIPTIONS

Physical Characteristics:

- Remoteness: Urban, Rural, Front Country, Middle Country, Back Country
- Naturalness: Front Country, Middle Country, Back Country
- Visitor Facilities: Front Country, Middle Country, Back Country

Social Characteristics:

- Group size: Front Country, Middle Country, Back Country
- Contacts: Middle Country, Back Country
- Evidence of Use: Rural, Front Country, Middle Country

Operational Characteristics:

- Visitor services: Front Country, Middle Country
- Management Controls: Rural, Front Country, Middle Country
- Access: Front Country, Middle Country, Back Country, Primitive

MANAGEMENT ACTIONS AND ALLOWABLE USE DECISIONS

Recreation and Visitor Services Program:

- Coordinate with other federal, state, county, and local agencies to identify and develop recreational trails and trailheads as needed.
- Provide connectivity to surrounding access routes and trail systems.
- Concentrate recreation use to reduce the impacts to sensitive cultural, biological, and scenic values.
- Provide trailheads, parking areas, and/or staging areas for trailheads, as needed on a case-by-case basis.
- Shooting must be at least 1000 feet from roads and structures.
- Develop trails for separate user groups (e.g., hiking, biking, equestrian) to avoid trail expansion and pioneering, and to reduce inter-group conflicts.
- Prohibit camping except where specifically authorized and designated.
- Monitor recreation use along developed trails. Close and/or rehabilitate unauthorized routes as needed.
- Develop recreation support facilities to improve the recreation experience and to address human health and safety and resource protection issues.
- Install visitor interpretation/education signs at trailheads and in areas of potential user conflict or resource impact.
- Close the RMZ to competitive off-road use and vehicle events. Casual use and commercial non-speed/competitive events would be limited to the designated routes. The RMZ is closed to all vehicles that are not street-legal (e.g., OHVs, ATVs, dirt bikes).

Other Programs:

- OHV: Limited to designated routes.
- Lands & Realty: Close the area to site-type ROWs and other land-use authorizations larger than 20 acres, except for those that enhance recreational values, public health and safety (such as R&PP leases) and in support of or ancillary to utility corridors.

IMPLEMENTATION DECISIONS

Implementation Decisions:

A separate Recreation Area Management Plan (RAMP) is being developed for this SRMA. Please refer to the RAMP for implementation-level decisions.

F.1.1.3.2. Eldorado Recreation Management Zone (RMZ)

SUPPORTING INFORMATION

Important Values:

The Eldorado RMZ includes public lands adjacent to Henderson where dispersed OHV use and a variety of non-motorized activities take place. Several through routes, including access connectivity to Eldorado Valley connect city dwellers with open space and scenic views. The area includes open space with dirt roads and trails where OHV use currently occurs, as well as non-motorized access to the Sloan Canyon NCA. The area also accesses private land with OHV opportunities in the Eldorado Valley. The adjacent Boulder City also allows OHV use and has dry lake beds open to OHV use.

Types of Visitors:

Visitors comprise mostly local residents of Las Vegas Valley, seeking part-day experiences after work and on weekends.

Opportunities Offered:

- Connecting to outdoor recreation close to home
- Connecting to trail systems on adjacent jurisdictions (including federal, state, local, and private)
- Dispersed OHV use
- Recreational target shooting (there are safety concerns with this activity)
- Travel in the Mojave Desert, including:
  - Hiking
  - Dog Walking
  - Equestrian
  - Mountain biking
- Viewing largely undeveloped scenic views
- Viewing panoramas of the Las Vegas Valley
- Wildlife viewing opportunities

SRMA/RMZ OBJECTIVE(S) DECISIONS

Objective Statement:

Provide a natural setting adjacent to an urban population with mostly non-motorized opportunities and a few motorized routes. Protect scenic and back country values on the part of the RMZ that is adjacent to the Sloan Canyon NCA.

Activities:

- Geocaching
- Hiking
- Horseback riding
- Bicycling
- OHV use
  - Casual use
- Viewing natural settings/Sightseeing
- Viewing wildlife/Birdwatching

Experiences:

- Participating in exercise/physical activity
- Testing/improving physical endurance
- Enjoying closeness with friends/family
- Releasing/reducing mental tension
- Escaping everyday responsibilities

Benefits:

- Personal: Improved health (physical and psychological); Restored mind from unwanted stress; Stronger ties with friends/family
- Community/Social: Developing stronger ties with family/friends; Reduced social isolation; Improved quality of life/lifestyle
- Environmental: Increased sense of place and associated increase of stewardship behaviors; Improved care for community aesthetics; Reduced negative human impacts such as litter or trail pioneering
- Economic: Reduced health maintenance costs; Increased work productivity; Increased desirability as a place to live/retire; Increased property values

RECREATION SETTING CHARACTERISTIC (RSC) DESCRIPTIONS

Physical Characteristics:

- Remoteness: Rural, Front Country, Middle Country
- Naturalness: Front Country, Middle Country
- Visitor Facilities: Front Country, Middle Country, Back Country

Social Characteristics:

- Group size: Front Country, Middle Country, Back Country
- Contacts: Front Country, Middle Country

- Evidence of Use: Rural, Front Country, Middle Country

Operational Characteristics:

- Visitor services: Front Country, Middle Country
- Management Controls: Front Country, Middle Country
- Access: Front Country, Middle Country, Back Country, Primitive

MANAGEMENT ACTIONS AND ALLOWABLE USE DECISIONS

Recreation and Visitor Services Program:

- Coordinate with other federal, state, county, and local agencies to identify and develop recreational trails and trailheads as needed.
- Provide connectivity to surrounding access routes and trail systems.
- Encourage cooperative ventures, to enhance recreation opportunities.
- Concentrate recreation use to reduce the impacts to sensitive cultural, biological, and scenic values.
- Prohibit speed-based OHV events (e.g. motorcycle, truck, and buggy races).
- Allow non-speed events (such as all-terrain bicycle events, motorcycle trail rides, noncompetitive off-road vehicle events, and commercial permitted events and activities) on a case-by-case basis.
- Shooting must be at least 1000 feet from roads and structures.
- Develop trails for separate user groups (e.g., hiking, biking, equestrian) to avoid trail expansion and pioneering, and to reduce inter-group conflicts.
- Prohibit camping except where specifically authorized and designated.
- Monitor recreation use along developed trails. Close and/or rehabilitate unauthorized routes as needed.
- Develop recreation support facilities to improve the recreation experience and to address human health and safety and resource protection issues.
- Install visitor interpretation/education signs at trailheads and in areas of potential user conflict or resource impact.
- Provide trailheads, parking areas, and/or staging areas for trailheads, as needed on a case-by-case basis.
- Conduct restoration activities to restore existing disturbances.

Other Programs:

- OHV: Limited to designated routes.
- Lands & Realty: Close the area to site-type ROWs and other land-use authorizations larger than 20 acres, except for those that enhance recreational values, public health and safety (such as R&PP leases) and in support of or ancillary to utility corridors.

IMPLEMENTATION DECISIONS

Implementation Decisions:

A separate Recreation Area Management Plan (RAMP) is being developed for this SRMA. Please refer to the RAMP for implementation-level decisions.

F.1.1.3.3. Fossil Beds Recreation Management Zone (RMZ)

SUPPORTING INFORMATION

Important Values:

The Fossil Beds RMZ lies of the north of the Las Vegas Valley. The area contains paleontological resources and sensitive plant species. Recreation opportunities include non-motorized trails for hiking, biking, running, and nature viewing. There is the possibility of linking the area to other area trail systems. The area is being considered in a cooperative transfer agreement (CTA) that would transfer it to the NPS. The area has also been considered as a national conservation area (NCA) to protect the sensitive resource there.

The area is more facility-dependent than other RMZs in the Las Vegas Valley SRMA. There is connectivity to other federal, state, and local lands, including the Tule Springs State Park.

Types of Visitors:

Most of the visitors of this area are local residents of the Las Vegas Valley, seeking part-day experiences after work and on weekends. Members of the scientific community are also attracted to the Fossil Beds RMZ because of its paleontological abundance.

Opportunities Offered:

BLM-administered lands (public lands) on the periphery of the Las Vegas Valley provide settings for a variety of recreational opportunities, including:

- Connecting to outdoor recreation close to home
- Connecting to trail systems on adjacent jurisdictions (including federal, state, local, and private)
- Viewing geological and paleontological resources
- Travel in the Mojave Desert, including:
  - Hiking
  - Equestrian
  - Bicycling
- Viewing largely undeveloped scenic views
- Viewing panoramas of the Las Vegas Valley
- Wildlife viewing opportunities

SRMA/RMZ OBJECTIVE(S) DECISIONS

Objective Statement:

Increasing demands for recreational use would be managed in a manner to protect fossil beds while providing for opportunities for non-motorized trails-based recreation activities and educational/scientific benefits. Manage recreation opportunities in concert with relevant and important values of the Upper Las Vegas Wash ACEC.

Activities:

- Geocaching
- Hiking
- Horseback riding
- Viewing natural settings/Sightseeing
- Viewing wildlife/Birdwatching

- Bicycling

Experiences:

- Participating in exercise/physical activity
- Enjoying closeness with friends/family
- Enjoying meeting new people with similar interests
- Releasing/reducing mental tension
- Escaping everyday responsibilities
- Learning more about the natural environment

Benefits:

- Personal: Improved health (physical and psychological); Restored mind from unwanted stress;
- Community/Social: Developing stronger ties with family/friends; Reduced social isolation; Heightened sense of satisfaction with the community/environment
- Environmental: Increased sense of place and associated increase of stewardship behaviors; Improved care for community aesthetics; Reduced negative human impacts such as litter or trail pioneering
- Economic: Reduced health maintenance costs; Increased work productivity; Increased desirability as a place to live/retire; increased property values

RECREATION SETTING CHARACTERISTIC (RSC) DESCRIPTIONS

Physical Characteristics:

- Remoteness: Urban, Rural, Front Country
- Naturalness: Front Country, Middle Country
- Visitor Facilities: Rural, Front Country, Middle Country

Social Characteristics:

- Group size: Rural, Front Country, Middle Country, Back Country
- Contacts: Middle Country, Back Country
- Evidence of Use: Rural, Front Country, Middle Country

Operational Characteristics:

- Visitor services: Rural, Front Country, Middle Country, Back Country
- Management Controls: Rural, Front Country, Middle Country
- Access: Front Country, Middle Country, Back Country, Primitive

MANAGEMENT ACTIONS AND ALLOWABLE USE DECISIONS

Recreation and Visitor Services Program:

- Coordinate with other federal, state, county, and local agencies to identify and develop recreational trails and trailheads as needed.
- Provide connectivity to surrounding access routes and trail systems.
- Concentrate recreation use to reduce the impacts to sensitive cultural, biological, and scenic values.
- Shooting must be at least 1000 feet from roads and structures.
- Prohibit camping except where specifically authorized and designated.
- Monitor recreation use along developed trails. Close and/or rehabilitate unauthorized routes as needed.
- Develop recreation support facilities to improve the recreation experience and to address human health and safety and resource protection issues.
- Install visitor interpretation/education signs at trailheads and in areas of potential user conflict or resource impact.
- Conduct restoration activities to restore existing disturbances.

Other Programs:

- OHV: Limited to designated routes.
- Minerals:
  - Closed to oil and gas leasing.
  - Closed to surface disturbance from exploration activities.
  - Closed to saleable minerals.
  - Withdrawn for locatable minerals.
- Lands & Realty: Close the area to renewable energy developments (large-site type ROW exclusion area). ROW avoidance area for linear ROWs. Concentrate major power line transmission ROWs within the confines of designated utility corridors.

IMPLEMENTATION DECISIONS

Implementation Decisions:

A separate Recreation Area Management Plan (RAMP) is being developed for this SRMA. Please refer to the RAMP for implementation-level decisions.

F.1.1.3.4. NCA Gateway Recreation Management Zone (RMZ)

SUPPORTING INFORMATION

Important Values:

The NCA Gateway RMZ includes lands within the Las Vegas Valley SRMA but outside the SNPLMA disposal area. This RMZ comprises several smaller parcels on the periphery of the Red Rock and Sloan Canyon NCAs. The primary resource values associated with these parcels is that they are access gateways into the NCAs. The parcels contain roads, as well as some trail-based recreation. There are also a lot of non-motorized opportunities in these areas.

Types of Visitors:

Visitors comprise mostly local residents of Las Vegas Valley, seeking part-day experiences after work and on weekends. Visitors seeking unique back country opportunities within the NCAs access public lands via these parcels.

Opportunities Offered:

BLM-administered lands (public lands) on the periphery of the Las Vegas Valley provide settings for a variety of recreational opportunities, including:

- Connecting to outdoor recreation close to home
- Connecting to trail systems on adjacent jurisdictions (including federal, state, local, and private)
- Hunting (adjacent to Red Rock & Sloan Canyon NCAs)
- Travel in the Mojave Desert, including:
  - Hiking
  - Dog Walking
- Viewing largely undeveloped scenic views
- Viewing panoramas of the Las Vegas Valley
- Wildlife viewing opportunities

SRMA/RMZ OBJECTIVE(S) DECISIONS

Objective Statement:

Protect scenic and backcountry values adjacent to Red Rock and Sloan NCAs. Manage access points and gateways into the NCAs for recreation activities that are consistent with the recreation use inside the NCAs.

Activities:

- Filming and still photography
- Geocaching
- Hiking
- Horseback riding
- Hunting
- Bicycling
- Viewing natural settings/Sightseeing
- Viewing wildlife/Birdwatching

Experiences:

- Participating in exercise/physical activity
- Enjoying closeness with friends/family
- Releasing/reducing mental tension
- Escaping everyday responsibilities

Benefits:

- Personal: Improved health (physical and psychological); Restored mind from unwanted stress; Stronger ties with friends/family;
- Community/Social: Developing stronger ties with family/friends; Reduced social isolation; Improved quality of life/lifestyle; Heightened sense of satisfaction with the community/environment

- Environmental: Increased sense of place and associated increase of stewardship behaviors; Improved care for community aesthetics; Reduced negative human impacts such as litter or trail pioneering
- Economic: Reduced health maintenance costs; Increased work productivity; Increased desirability as a place to live/retire; Increased property values

RECREATION SETTING CHARACTERISTIC (RSC) DESCRIPTIONS

Physical Characteristics:

- Remoteness: Urban, Rural, Front Country, Middle Country, Back Country
- Naturalness: Front Country, Middle Country, Back Country
- Visitor Facilities: Front Country, Middle Country, Back Country

Social Characteristics:

- Group size: Front Country, Middle Country, Back Country
- Contacts: Middle Country, Back Country
- Evidence of Use: Rural, Front Country, Middle Country

Operational Characteristics:

- Visitor services: Front Country, Middle Country
- Management Controls: Rural, Front Country, Middle Country
- Access: Front Country, Middle Country, Back Country, Primitive

MANAGEMENT ACTIONS AND ALLOWABLE USE DECISIONS

Recreation and Visitor Services Program:

- Coordinate with other federal, state, county, and local agencies to identify and develop recreational trails and trailheads as needed.
- Provide connectivity to surrounding access routes and trail systems.
- Concentrate recreation use to reduce the impacts to sensitive cultural, biological, and scenic values.
- Prohibit speed-based OHV events (e.g. motorcycle, truck, and buggy races).
- Shooting must be at least 1000 feet from roads and structures.
- Prohibit camping except where specifically authorized and designated.
- Monitor recreation use along developed trails. Close and/or rehabilitate unauthorized routes as needed.
- Develop recreation support facilities to improve the recreation experience and to address human health and safety and resource protection issues.
- Install visitor interpretation/education signs at trailheads and in areas of potential user conflict or resource impact.
- Provide trailheads, parking areas, and/or staging areas for trailheads, as needed on a case-by-case basis.

Other Programs:

- Limit motorized use to designated routes for licensed street legal vehicles.
- Limit mechanized travel to designated routes.

- Lands & Realty: Close the area to site-type ROWs and other land-use authorizations larger than 20 acres, except for those that enhance recreational values, public health and safety (such as R&PP leases) and in support of or ancillary to utility corridors.

IMPLEMENTATION DECISIONS

Implementation Decisions:

A separate Recreation Area Management Plan (RAMP) is being developed for this SRMA. Please refer to the RAMP for implementation-level decisions.

F.1.1.3.5. River Mountains Recreation Management Zone (RMZ)

SUPPORTING INFORMATION

Important Values:

Within the River Mountains RMZ, the SRMA includes lands within and adjacent to the Las Vegas Valley, but outside the SNPLMA disposal area and is adjacent to Lake Mead National Recreation Area. The RMZ would provide for non-motorized recreational experiences in a natural environment, far enough from the community for users to feel like they are "getting away" without requiring extensive travel.

Types of Visitors:

Most of the visitors of this area are local residents of the Las Vegas Valley, seeking part-day experiences after work and on weekends.

Opportunities Offered:

BLM-administered lands (public lands) on the periphery of the Las Vegas Valley provide settings for a variety of recreational opportunities, including:

- Bicycle trail that loops around the RMZ
- Connecting to outdoor recreation close to home
- Connecting to trail systems on adjacent jurisdictions (including federal, state, local, and private)
- Non-motorized trail-based recreation
- Travel in the Mojave Desert, including:
  - Hiking
  - Dog Walking
  - Equestrian
  - Bicycling
- Viewing panoramas of the Las Vegas Valley
- Viewing largely undeveloped scenic views (on the back side of the River Mountains, where the city cannot be seen)
- Wildlife viewing opportunities (Bighorn sheep)

SRMA/RMZ OBJECTIVE(S) DECISIONS

Objective Statement:

Provide a natural setting for non-motorized opportunities adjacent to an urban population. Manage recreation opportunities in concert with relevant and important values of the River Mountains ACEC.

Activities:

- Geocaching
- Hiking
- Horseback riding
- Bicycling
- Viewing natural settings/Sightseeing
- Viewing wildlife/Birdwatching

Experiences:

- Enjoying the sights, sounds, and smells of a natural landscape
- Participating in exercise/physical activity
- Enjoying closeness with friends/family
- Learning more about the natural environment
- Opportunities for introspection
- Participating in group outdoor events
- Releasing/reducing mental tension
- Escaping everyday responsibilities
- Testing/improving physical endurance
- Enjoying closeness with friends/family

Benefits:

- Personal: Improved health (physical and psychological); Restored mind from unwanted stress; Stronger ties with friends/family; Feelings of isolation (introspection);
- Community/Social: Developing stronger ties with family/friends; Reduced social isolation; Improved quality of life/lifestyle; Heightened sense of satisfaction with the community/environment; Group activities and social interaction (camaraderie)
- Environmental: Increased sense of place and associated increase of stewardship behaviors; Improved care for community aesthetics; Reduced negative human impacts such as litter or trail pioneering
- Economic: Reduced health maintenance costs; Increased work productivity; Increased desirability as a place to live/retire; Increased property values

RECREATION SETTING CHARACTERISTIC (RSC) DESCRIPTIONS

Physical Characteristics:

- Remoteness: Middle Country, Back Country, Primitive
- Naturalness: Front Country, Middle Country, Back Country, Primitive
- Visitor Facilities: Front Country, Middle Country, Back Country

Social Characteristics:

- Group size: Middle Country, Back Country, Primitive
- Contacts: Middle Country, Back Country
- Evidence of Use: Middle Country, Back Country

Operational Characteristics:

- Visitor services: Middle Country, Back Country
- Management Controls: Rural, Front Country, Middle Country
- Access: Middle Country, Back Country, Primitive

MANAGEMENT ACTIONS AND ALLOWABLE USE DECISIONS

Recreation and Visitor Services Program:

- Coordinate with other federal, state, county, and local agencies to identify and develop recreational trails and trailheads as needed.
- Provide connectivity to surrounding access routes and trail systems.
- Concentrate recreation use to reduce the impacts to sensitive cultural, biological, and scenic values.
- Shooting must be at least 1000 feet from roads and structures.
- Develop trails for separate user groups (e.g., hiking, biking, equestrian) to avoid trail expansion and pioneering, and to reduce inter-group conflicts.
- Prohibit camping except where specifically authorized and designated.
- Monitor recreation use along developed trails. Close and/or rehabilitate unauthorized routes as needed.
- Develop recreation support facilities to improve the recreation experience and to address human health and safety and resource protection issues.
- Install visitor interpretation/education signs at trailheads and in areas of potential user conflict or resource impact.
- Provide trailheads, parking areas, and/or staging areas for trailheads, as needed on a case-by-case basis.
- Conduct restoration activities to restore existing disturbances.

Other Programs:

- OHV: Limited to designated routes.
- Lands & Realty: Close the area to site-type ROWs and other land-use authorizations larger than 20 acres, except for those that enhance recreational values, public health and safety (such as R&PP leases) and in support of or ancillary to utility corridors.
- Minerals: (River Mountains ACEC) Closed to Fluid Minerals, Solid Leasibles, Saleables, and withdrawn for Locatable Minerals.

IMPLEMENTATION DECISIONS

Implementation Decisions:

A separate Recreation Area Management Plan (RAMP) is being developed for this SRMA. Please refer to the RAMP for implementation-level decisions.

F.1.1.3.6. Sunrise Recreation Management Zone (RMZ)

SUPPORTING INFORMATION

Important Values:

Within the Sunrise RMZ, includes lands within and adjacent to the Las Vegas Valley, but outside the SNPLMA disposal area. The area includes roads that provide access to Lake Mead National Recreation Area and provide scenic views of the Mojave desert and southern Nevada. There are current permits for commercial non-speed touring activities on five designated routes. The designated dirt routes tie into the highway to the Lake Mead NRA and back into city streets with bike routes. The designated routes are also used for hiking, as are several pioneered hiking trails. Hiking is a dominant use in this area.

Sunrise Manor is underserved for park-lands. Clark County comprehensive planning determined this area would provide the public with opportunities for recreation. There are several high schools and junior highs near the RMZ boundaries, creating opportunities for school trips (environmental education). This area would provide a setting for non-motorized outdoor recreation experiences and environmental education opportunities.

There are 3-4 communication sites on the peak, with an access road to them (very steep, closed to casual vehicle use, but used for hiking). There are also hundreds of unauthorized user-created OHV routes. The area is overlapped by an ACEC. Management should include restoration of disturbed areas.

There are two mines adjacent to the area. Both are active and the potential to expand and increase mining. The new areas for disturbance are next to areas that are already disturbed. In addition, one utility corridor (500 feet) with two lines runs through the area.

There is a proposal to develop a non-motorized multiple use trail all around the Las Vegas Valley (Great Circle). It would go through this area. The paved nature of the multiple-use trail would be limited in this area, possibly as a main route through it, but limiting developed/paved trails through the area.

Recreational use in this area is different from the rest of the public lands adjacent to the Las Vegas Valley, as this area is more of a destination-based area sought out specifically for recreation.

Types of Visitors:

Visitors are mostly local residents of Las Vegas Valley, seeking part-day experiences after work and on weekends.

Opportunities Offered:

BLM-administered lands (public lands) on the periphery of the Las Vegas Valley provide settings for a variety of recreational opportunities, including:

- Viewing largely undeveloped scenic views
- Viewing panoramas of the valley
- Travel in the Mojave Desert, including:
  - Hiking
  - Dog Walking
  - Equestrian (though there is not currently heavy use)
  - Bicycling

- Street-legal two-wheel-drive, high-clearance vehicle use (along 3 designated routes)

SRMA/RMZ OBJECTIVE(S) DECISIONS

Objective Statement:

Provide a natural setting for non-motorized opportunities and a few motorized routes adjacent to an urban population. Manage recreation opportunities in concert with relevant and important values of the Rainbow Gardens ACEC and the Sunrise Mountain ISA.

Activities:

- Commercial recreation activities
- Driving for pleasure
- Geocaching
- Hiking
- Horseback riding
- Bicycling
- OHV use
  - Casual use
  - Commercial touring/activities
- Viewing cultural sites/Historic touring
- Viewing natural settings/Sightseeing
- Viewing wildlife/Birdwatching

Experiences:

- Enjoying the sights, sounds, and smells of a natural landscape
- Participating in exercise/physical activity
- Testing/improving physical endurance
- Enjoying closeness with friends/family
- Enjoying meeting new people with similar interests
- Participating in group outdoor events
- Learning more about the natural environment
- Opportunities for introspection
- Releasing/reducing mental tension
- Escaping everyday responsibilities

Benefits:

- Personal: Improved health (physical and psychological); Restored mind from unwanted stress; Stronger ties with friends/family;

- Community/Social: Developing stronger ties with family/friends; Reduced social isolation; Improved quality of life/lifestyle; Heightened sense of satisfaction with the community/environment; Group activities and social interaction (camaraderie)
- Environmental: Increased sense of place and associated increase of stewardship behaviors; Improved care for community aesthetics; Reduced negative human impacts such as litter or trail pioneering
- Economic: Reduced health maintenance costs; Increased work productivity; Increased desirability as a place to live/retire; Increased property values

RECREATION SETTING CHARACTERISTIC (RSC) DESCRIPTIONS

Physical Characteristics:

- Remoteness: Front Country, Middle Country, Back Country
- Naturalness: Front Country, Middle Country, Back Country
- Visitor Facilities: Front Country, Middle Country

Social Characteristics:

- Group size: Rural, Front Country, Middle Country, Back Country
- Contacts: Front Country, Middle Country
- Evidence of Use: Front Country, Middle Country, Back Country

Operational Characteristics:

- Visitor services: Front Country, Middle Country
- Management Controls: Urban, Rural, Front Country
- Access: Urban, Rural, Front Country, Middle Country, Back Country, Primitive

MANAGEMENT ACTIONS AND ALLOWABLE USE DECISIONS

Recreation and Visitor Services Program:

- Coordinate with other federal, state, county, and local agencies to identify and develop recreational trails and trailheads as needed.
- Provide connectivity to surrounding access routes and trail systems.
- Encourage cooperative ventures to enhance recreation opportunities.
- Concentrate recreation use to reduce the impacts to sensitive cultural, biological, and scenic values.
- Prohibit speed-based OHV activities (e.g. motorcycle, truck, and buggy races).
- Allow non-speed activities (such as all-terrain bicycle events, and commercial permitted events and activities) on a case-by-case basis.
- Shooting must be at least 1000 feet from roads and structures.
- Limit Bicycle use to designated routes.
- Limit equestrian use to designated routes.
- Develop trails for separate user groups (e.g., hiking, biking, equestrian) to avoid trail expansion and pioneering, and to reduce inter-group conflicts.
- Prohibit camping except where specifically authorized and designated.

- Monitor recreation use along developed trails. Close and/or rehabilitate unauthorized routes as needed.
- Develop recreation support facilities to improve the recreation experience and to address human health and safety and resource protection issues.
- Install visitor interpretation/education signs at trailheads and in areas of potential user conflict or resource impact.
- Provide trailheads, parking areas, and/or staging areas for trailheads, as needed on a case-by-case basis.

Other Programs:

- OHV: Limited to designated routes for licensed street legal vehicles only.
- Lands & Realty: Close the area to site-type ROWs and other land-use authorizations larger than 20 acres, except for those that enhance recreational values, public health and safety (such as R&PP leases) and in support of or ancillary to utility corridors.
- Minerals: (Rainbow Gardens ACEC) Closed to Fluid minerals, Solid Leasibles, Saleables, and withdrawn for Locatable Minerals.

IMPLEMENTATION DECISIONS

Implementation Decisions:

A separate Recreation Area Management Plan (RAMP) is being developed for this SRMA. Please refer to the RAMP for implementation-level decisions.

F.1.1.4. Laughlin Special Recreation Management Area (SRMA)

SUPPORTING INFORMATION

Important Values:

The Laughlin SRMA area is popular for its OHV riding opportunities. This area is a transition zone for the Mojave and Sonoran deserts. It is highly scenic and connects visitors with views of unique desert vegetation primarily accessed by motorized means. Hiko Wash provides an excellent opportunity for the Non-motorized visitors. The Laughlin SRMA area receives heavy visitation from recreationists who wish to view the native flora and the avian species as they migrate through the area. The area is connected to the Mojave National Preserve in California by the Mojave Road. The northern portion of the SRMA overlaps with big horn sheep habitat. Several cultural sites lie within the SRMA. The Laughlin Chamber of Commerce is actively trying to bring more recreationists to the area.

Types of Visitors:

Visitors to the Laughlin SRMA are from the local area (Laughlin), regional area (greater southern Nevada, southern California, southwestern Utah, and northwestern Arizona), and some national.

Opportunities Offered:

BLM-administered lands (public lands) in the area provide settings for a variety of recreational opportunities, including:

- Motorized casual users mostly OHVs and motorcycles (larger vehicles use the Mojave Road.
- Destination location for local and regional
- Some non-motorized (equestrian, and hiking)
- Events
- Dispersed camping, with no facilities.
- There are no commercial tour operators using the area. This may be due to current limits on permitted activities on the Mojave Road.
- Wildlife viewing opportunities (bighorn sheep)

- Target shooting.

SRMA/RMZ OBJECTIVE(S) DECISIONS

Objective Statement:

Provide a destination for motorized recreation experience in a natural setting with a variety of recreation opportunities with integrated management of wildlife habitat, cultural resources, and other recreational uses.

Activities:

- Camping
- Geocaching
- Hiking
- Horseback riding
- OHV use
  - Casual use
  - Commercial touring
  - Competitive
  - Non-speed events
- Recreational shooting
- Historic touring
- Viewing natural settings
- Viewing wildlife

Experiences:

- Participating in exercise/physical activity
- Enjoying closeness with friends/family
- Enjoying meeting new people with similar interests
- Participating in group outdoor events
- Releasing/reducing mental tension
- Escaping everyday responsibilities

Benefits:

- Personal: Improved health (physical and psychological); Restored mind from unwanted stress; Stronger ties with friends/family; A chance to get away from the city
- Community/Social: Developing stronger ties with family/friends; reduced social isolation; improved quality of life/lifestyle; Group activities and social interaction (camaraderie).
- Environmental: Increased sense of place and associated increase of stewardship behaviors; Improved care for community aesthetics; reduced negative human impacts such as litter or trail pioneering.
- Economic: Reduced health maintenance costs; Increased work productivity; Increased desirability as a place to live/retire

RECREATION SETTING CHARACTERISTIC (RSC) DESCRIPTIONS

Physical Characteristics:

- Remoteness: Front Country, Middle Country
- Naturalness: Front Country, Middle Country,
- Visitor Facilities: Middle Country, Back Country

Social Characteristics:

- Group size: Front Country, Middle Country, Back Country, Primitive
- Contacts: Front Country, Middle Country, Back Country
- Evidence of Use: Front Country, Middle Country

Operational Characteristics:

- Visitor services: Back Country, Primitive
- Management Controls: Middle Country, Back Country
- Access: Middle Country

MANAGEMENT ACTIONS AND ALLOWABLE USE DECISIONS

Recreation and Visitor Services Program:

- Coordinate with other federal, state, county, and local agencies to identify and develop recreational trails and trailheads as needed.
- Encourage cooperative ventures to enhance recreation opportunities.
- Concentrate recreation use to reduce the impacts to sensitive cultural, biological, and scenic values.
- Allow commercial tours and events on designated routes on a case-by-case basis.
- Consider developing limits to the number of SRPs during activity level planning in order to maintain the recreation setting s for a wide variety of potential uses.
- Shooting must be at least 1000 feet from roads and structures.
- Limit mountain bike events to designated routes.
- Limit equestrian use to designated routes.
- Develop trails for separate user groups (e.g., hiking, biking, equestrian) to avoid trail expansion and pioneering, and to reduce inter-group conflicts.
- Monitor recreation use along developed trails. Close and/or rehabilitate unauthorized routes as needed.
- Develop recreation support facilities to improve the recreation experience and to address human health and safety and resource protection issues.
- Install visitor interpretation/education signs at trailheads and in areas of potential user conflict or resource impact.
- Manage the Mojave Road and surrounding area for the scenic recreation experience.
- Allow high-speed permitted events year-round in conformance with the applicable biological opinion.
- Prohibit high-speed permitted events where the SRMA overlaps the Hiko Springs ACEC.

Other Programs:

- OHV: Limited to designated routes.
- Lands & Realty: Avoid site-type ROWs and other land-use authorizations larger than 20 acres in the area except for those that enhance recreational values, public health and safety and in support of or ancillary to utility corridors. Allow for R&PP leases to governmental entities. Avoid linear ROWs in the area.
- Minerals: Most of the SRMA is case by case basis. The Hiko ACEC is closed to fluid minerals, solid leasable, locatable minerals, and will pursue a withdrawal for locatable minerals.

IMPLEMENTATION DECISIONS

Implementation Decisions:

A separate Recreation Area Management Plan (RAMP) is being developed for this SRMA. Please refer to the RAMP for implementation-level decisions.

F.1.1.5. Logandale Special Recreation Management Area (SRMA)

SUPPORTING INFORMATION

Important Values:

The Logandale SRMA area is popular for its motorized recreation opportunities in an area similar to, and shares a boundary with, Valley of Fire State Park. The highly scenic area connects visitors with beautiful geologic features, primarily accessed by motorized means. This experience is augmented by the presence of cultural and wildlife viewing opportunities.

The area is also home to BLM and state sensitive species, including three-cornered milkvetch (on the fringes of the dunes), gila monster, and chuckwalla. Another concern is that sandy soils are being invaded by Sahara mustard. OHV routes are vectors for distribution of the mustard. There is a small pocket of open dunes (not officially designated as open OHV). This area is currently used for camping. Lastly, there is an old mining operation on a private inholding.

Types of Visitors:

The Logandale area is both a local (Moapa Valley), regional (greater southern Nevada, southwestern Utah, and northwestern Arizona), and national destination.

Opportunities Offered:

BLM-administered lands (public lands) in the area provide settings for a variety of recreational opportunities, including:

- Motorized casual users
- Destination location for local, regional and national (present, but limited)
- Some non-motorized (equestrian, generally out of town and up the washes)
- Rock crawling events (“Hump and Bump” and Jeep Jamboree events)
- Dispersed camping, with some facilities scattered around.
- Two commercial tour operators use the area for non-speed touring. Current permits limits allow for two tours a day, with no limits on size, although there are up to 15-20 on each tour.
- Cultural resources viewing (Petroglyphs and sites along trails. Interpretation sites for some of the sites/shelters.)
- Wildlife viewing opportunities (bighorn sheep)
- Target shooting and plinking in Overton Wash (there are safety concerns with this activity)

SRMA/RMZ OBJECTIVE(S) DECISIONS

Objective Statement:

Provide a destination for a motorized recreation experience in a natural setting with a variety of recreation opportunities with integrated management of wildlife habitat, cultural resources, and other recreational uses.

Activities:

- Camping
- Filming and still photography
- Geocaching
- Hiking
- Horseback riding
- Bicycling
- OHV use
  - Casual use
  - Commercial touring
  - Non-speed events
- Recreational shooting
- Viewing cultural sites/Historic touring
- Viewing natural settings/Sightseeing
- Viewing wildlife/Birdwatching

Experiences:

- Participating in exercise/physical activity
- Testing/improving physical endurance
- Enjoying closeness with friends/family
- Enjoying meeting new people with similar interests
- Participating in group outdoor events
- Releasing/reducing mental tension
- Escaping everyday responsibilities

Benefits:

- Personal: Improved health (physical and psychological); Restored mind from unwanted stress; Stronger ties with friends/family; Feelings of isolation (introspection); A chance to get away from the city (solitude)
- Community/Social: Developing stronger ties with family/friends; Reduced social isolation; Improved quality of life/lifestyle; Group activities and social interaction (camaraderie).
- Environmental: Increased sense of place and associated increase of stewardship behaviors; Improved care for community aesthetics, reduced negative human impacts such as liter or trail pioneering.
- Economic: Reduced health maintenance costs; increased work productivity; Increased desirability as a place to live/retire; increased property values.

RECREATION SETTING CHARACTERISTIC (RSC) DESCRIPTIONS

Physical Characteristics:

- Remoteness: Rural, Front Country, Middle Country
- Naturalness: Front Country, Middle Country, Back Country, Primitive
- Visitor Facilities: Front Country, Middle Country

Social Characteristics:

- Group size: Front Country, Middle Country, Back Country
- Contacts: Front Country, Middle Country, Back Country
- Evidence of Use: Rural, Front Country, Middle Country

Operational Characteristics:

- Visitor services: Front Country, Middle Country, Back Country
- Management Controls: Front Country, Middle Country
- Access: Middle Country, Back Country, Primitive

MANAGEMENT ACTIONS AND ALLOWABLE USE DECISIONS

Recreation and Visitor Services Program:

- Coordinate recreation management to accommodate the existing Logandale Management Plan.
- Coordinate with other federal, state, county, and local agencies to identify and develop recreational trails and trailheads as needed.
- Provide connectivity to surrounding access routes and trail systems.
- Encourage cooperative ventures to enhance recreation opportunities.
- Concentrate recreation use to reduce the impacts to sensitive cultural, biological, and scenic values.
- Prohibit speed-based OHV activities (e.g. motorcycle, truck, and buggy races).
- Allow non-speed permitted activities on a case-by-case basis.
- Prohibit casual/dispersed shooting and/or target practice within one 1000 feet of roads and structures, (except for in Overton Wash).
- Limit bicycle use to designated routes.
- Encourage equestrian visitors to utilize designated routes.
- Develop trails for separate user groups (e.g., hiking, biking, equestrian) to avoid trail expansion and pioneering, and to reduce inter-group conflicts.
- Monitor recreation use along developed trails. Close and/or rehabilitate unauthorized routes as needed.
- Develop recreation support facilities to improve the recreation experience and to address human health and safety and resource protection issues.
- Install visitor interpretation/education signs at trailheads and in areas of potential user conflict or resource impact.

Other Programs:

- OHV: Limited to designated routes.

IMPLEMENTATION DECISIONS

Implementation Decisions:

A separate Recreation Area Management Plan (RAMP) is being developed for this SRMA. Please refer to the RAMP for implementation-level decisions.

F.1.1.5.1. Logandale North RMZ

SUPPORTING INFORMATION

Important Values:

The Logandale SRMA area is popular for its motorized recreation opportunities in an area similar to, and shares a boundary with, Valley of Fire State Park. The highly scenic area connects visitors with beautiful geologic features, primarily accessed by motorized means. This experience is augmented by the presence of cultural and wildlife viewing opportunities.

The area is also home to BLM and state sensitive species, including three-cornered milkvetch (on the fringes of the dunes), gila monster, and chuckwalla. Another concern is that sandy soils are being invaded by Sahara mustard. OHV routes are vectors for distribution of the mustard. There is a small pocket of open dunes (not officially designated as open OHV). This area is currently used for camping. Lastly, there is an old mining operation on a private inholding.

Types of Visitors:

The Logandale area is both a local (Moapa Valley), regional (greater southern Nevada, southwestern Utah, and northwestern Arizona), and national destination.

Opportunities Offered:

BLM-administered lands (public lands) in the area provide settings for a variety of recreational opportunities, including:

- Motorized casual users
- Destination location for local, regional and national (present, but limited)
- Some non-motorized (equestrian, generally out of town and up the washes)
- Rock crawling events (“Hump and Bump” and Jeep Jamboree events)
- Dispersed camping, with some facilities scattered around.
- Two commercial tour operators use the area for non-speed touring. Current permits limits allow for two tours a day, with no limits on size, although there are up to 15-20 on each tour.
- Cultural resources viewing (Petroglyphs and sites along trails. Interpretation sites for some of the sites/shelters.)
- Wildlife viewing opportunities (bighorn sheep)
- Target shooting and plinking in Overton Wash (there are safety concerns with this activity)

SRMA/RMZ OBJECTIVE(S) DECISIONS

Objective Statement:

Provide a destination for a motorized recreation experience in a natural setting with a variety of recreation opportunities with integrated management of wildlife habitat, cultural resources, and other recreational uses.

Activities:

- Camping
- Filming and still photography
- Geocaching
- Hiking
- Horseback riding
- Bicycling
- OHV use
- Casual use
- Commercial touring
- Non-speed events
- Recreational shooting
- Viewing cultural sites/Historic touring
- Viewing natural settings/Sightseeing
- Viewing wildlife/Birdwatching

Experiences:

- Participating in exercise/physical activity
- Testing/improving physical endurance
- Enjoying closeness with friends/family
- Enjoying meeting new people with similar interests
- Participating in group outdoor events
- Releasing/reducing mental tension
- Escaping everyday responsibilities

Benefits:

- Personal: Improved health (physical and psychological); Restored mind from unwanted stress; Stronger ties with friends/family; Feelings of isolation (introspection); A chance to get away from the city (solitude)
- Community/Social: Developing stronger ties with family/friends; Reduced social isolation; Improved quality of life/lifestyle; Group activities and social interaction (camaraderie).
- Environmental: Increased sense of place and associated increase of stewardship behaviors; Improved care for community aesthetics, reduced negative human impacts such as liter or trail pioneering.
- Economic: Reduced health maintenance costs; increased work productivity; Increased desirability as a place to live/retire; increased property values.

RECREATION SETTING CHARACTERISTIC (RSC) DESCRIPTIONS

Physical Characteristics:

- Remoteness: Rural, Front Country, Middle Country
- Naturalness: Front Country, Middle Country, Back Country, Primitive
- Visitor Facilities: Front Country, Middle Country

Social Characteristics:

- Group size: Front Country, Middle Country, Back Country
- Contacts: Front Country, Middle Country, Back Country
- Evidence of Use: Rural, Front Country, Middle Country

Operational Characteristics:

- Visitor services: Front Country, Middle Country, Back Country
- Management Controls: Front Country, Middle Country
- Access: Middle Country, Back Country, Primitive

MANAGEMENT ACTIONS AND ALLOWABLE USE DECISIONS

Recreation and Visitor Services Program:

- Coordinate recreation management to accommodate the existing Logandale Management Plan.
- Coordinate with other federal, state, county, and local agencies to identify and develop recreational trails and trailheads as needed.
- Provide connectivity to surrounding access routes and trail systems.
- Encourage cooperative ventures to enhance recreation opportunities.
- Concentrate recreation use to reduce the impacts to sensitive cultural, biological, and scenic values.
- Prohibit speed-based OHV activities (e.g. motorcycle, truck, and buggy races).
- Allow non-speed permitted activities on a case-by-case basis.
- Prohibit casual/dispersed shooting and/or target practice within one 1000 feet of roads and structures.
- Limit bicycle use to designated routes.
- Encourage equestrian visitors to use to designated routes.
- Develop trails for separate user groups (e.g., hiking, biking, equestrian) to avoid trail expansion and pioneering, and to reduce inter-group conflicts.
- Monitor recreation use along developed trails. Close and/or rehabilitate unauthorized routes as needed.
- Develop recreation support facilities to improve the recreation experience and to address human health and safety and resource protection issues.
- Install visitor interpretation/education signs at trailheads and in areas of potential user conflict or resource impact.

Other Programs:

- OHV: Limited to designated routes.

- Minerals Closed to Fluid Leasable Minerals, Closed to Solid Leasable Minerals, Pursue Withdrawal for Locatable Minerals, Closed to Saleable Minerals

- Lands & Realty: Close the area to site-type ROWs except for those requested by the BLM. BLM facilities and ROWs that provide resource protection, enhancement of recreational values, and/or address human health and safety would be allowed on a case-by-case basis.

- Close the area to linear ROWs except for those requested by the BLM.

IMPLEMENTATION DECISIONS

Implementation Decisions:

A separate Recreation Area Management Plan (RAMP) is being developed for this SRMA. Please refer to the RAMP for implementation-level decisions.

F.1.1.6. Nellis Dunes Special Recreation Management Area (SRMA)

SUPPORTING INFORMATION

Important Values:

The Nellis Dunes area is a sand dune area that is open for cross-country OHV use. Because of its proximity to the Las Vegas Valley, the area is used primarily by local, casual OHV recreationists. Although there is some out of state visitation, it is not a major destination area. There are also some commercial touring permits issued for the area.

Expansion of the open OHV area has been considered, from existing open area to the Moapa Reservation, I-15, and NRA. This expansion was dismissed because of resource conflicts with wildlife (i.e., tortoise, bighorn sheep, and rare plants), designated Wilderness, terrain constraints, a backcountry byway, cultural resources, the Old Spanish Trail, and a major power line corridor. Additionally, expanding the area onto more sensitive soil types would exacerbate air quality issues, even though it is outside the nonattainment area, due to blowing dust into the valley.

Types of Visitors:

Typical visitors include motorized users seeking the thrill and speed associated with fast sand washes and dune-related motorized recreation opportunities. Visitors are mainly local residents of Las Vegas Valley, seeking part-day experiences after work and on weekends.

Opportunities Offered:

BLM-administered lands (public lands) on the periphery of the Las Vegas Valley provide settings for a variety of recreational opportunities, including:

- World-class motorized, cross-country sand dune OHV recreation close to home.

- Commercial motorized touring

- Connecting to trail systems on adjacent jurisdictions (including federal, state, local, and private)

- Viewing panoramas of the Las Vegas Valley

SRMA/RMZ OBJECTIVE(S) DECISIONS

Objective Statement:

Protect the unique sand dune setting and adjacent features that provide thrill and speed associated with motorized recreation opportunities on sand washes and dunes. Manage 10,860 acres of the Nellis dunes as an open area for intensive off-road vehicle and other recreation opportunities, including organized off-road vehicle events, casual off-road vehicle free play, picnicking, photography, and other non-off-road vehicle commercial and competitive permitted activities.

Activities:

- OHV use
  - Casual use
  - Commercial touring/activities
  - High-speed events
  - Non-speed events
- Picnicking
- Viewing natural settings/Sightseeing

Experiences:

- Participating in exercise/physical activity
- Testing/improving physical endurance
- Enjoying closeness with friends/family
- Enjoying meeting new people with similar interests
- Participating in group outdoor events
- Releasing/reducing mental tension
- Escaping everyday responsibilities

Benefits:

- Personal: Improved health (physical and psychological); Restored mind from unwanted stress; Stronger ties with friends/family;
- Community/Social: Developing stronger ties with family/friends; Reduced social isolation; Improved quality of life/lifestyle; Heightened sense of satisfaction with the community/environment; Group activities and social interaction (camaraderie)
- Environmental: Increased sense of place and associated increase of stewardship behaviors
- Economic: Reduced health maintenance costs; Increased work productivity; Increased desirability as a place to live/retire; Increased property values

RECREATION SETTING CHARACTERISTIC (RSC) DESCRIPTIONS

Physical Characteristics:

- Remoteness: Rural, Front Country, Middle Country
- Naturalness: Rural
- Visitor Facilities: Front Country, Middle Country

Social Characteristics:

- Group size: Front Country, Middle Country, Back Country
- Contacts: Rural, Front Country, Middle Country
- Evidence of Use: Rural, Front Country

Operational Characteristics:

- Visitor services: Front Country, Middle Country
- Management Controls: Front Country, Middle Country
- Access: Front Country, Middle Country

MANAGEMENT ACTIONS AND ALLOWABLE USE DECISIONS

Recreation and Visitor Services Program:

- Coordinate with other federal, state, county, and local agencies to identify and develop recreational trails and trailheads as needed.
- Encourage cooperative ventures to enhance recreation opportunities.
- Allow non-speed activities (such as all-terrain bicycle events, motorcycle trail rides, non-competitive off-road vehicle events, and commercial permitted events and activities) on a case-by-case basis.
- Shooting must be at least 1000 feet from roads and structures.
- Prohibit camping except where specifically authorized and designated.
- Develop recreation support facilities to improve the recreation experience and to address human health and safety and resource protection issues.
- Install visitor interpretation/education signs at trailheads and in areas of potential user conflict or resource impact.
- Provide trailheads, parking areas, and/or staging areas for trailheads, as needed on a case-by-case basis.
- During implementation-level planning such as the RAMP/CTTMP, areas for high-speed testing of OHV racing platforms (including trucks, buggies, UTVs, ATVs, and motorcycles) may be analyzed for this type of need and use.
- During implementation-level planning such as the RAMP/CTTMP, areas for high-speed commercial touring (including trucks, buggies, UTVs, ATVs, and motorcycles) may be analyzed for this typed of need and use.

Other Programs:

- OHV: Open to cross country OHV use.
- Minerals:
  - Closed for oil and gas leasing.
  - Closed to solid leasable minerals.
  - Closed to saleable minerals.

- Pursue mineral withdrawal for locatable minerals.

- Lands & Realty: Close the area to site type ROWs except for those requested by the BLM. BLM facilities and ROWs that provide resource protection, enhancement of the recreational values, and/or address human health and safety would be allowed on a case by case basis. Avoid linear ROWs in the area. Concentrate major utility line ROWs within the confines of designated utility corridors.

IMPLEMENTATION DECISIONS

Implementation Decisions:

A separate Recreation Area Management Plan (RAMP) is being developed for this SRMA. Please refer to the RAMP for implementation-level decisions.

F.1.2. Extensive Recreation Management Areas (ERMAs)

F.1.2.1. Clark County ERMAs

F.1.2.1.1. Clark County North Extensive Recreation Management Area (ERMA)

ERMA OBJECTIVE DECISIONS

Maintain a variety of dispersed recreation opportunities that facilitate visitor freedom to access a range of outdoor recreation activities associated with a wide-open landscape with limited developments. Maintain the natural settings for multiple recreation opportunities in Wilderness Areas, WSAs, lands with wilderness characteristics, ACECs, and in the Mormon Mesa area. Minimize impacts from increasing recreation by providing facilities, interpretation, education, and information. Recreation occurs on a myriad of routes, trails, and roads and connects to trails systems, such as the Silver State Trail.

BLM-administered lands (public lands) in the area provide settings for a variety of recreational opportunities, including:

- Camping
- Canyoneering
- Filming and still photography
- Geocaching
- Hiking
- Horseback riding
- Hunting
- Mountain biking
- OHV use
  - Casual use
  - Commercial touring/activities
  - Non-speed events
- Recreational shooting

- Rock climbing/Rappelling/Bouldering
- Viewing cultural sites/Historic touring
- Viewing natural settings/Sightseeing
- Viewing wildlife/Birdwatching

MANAGEMENT ACTIONS AND ALLOWABLE USE DECISIONS

Recreation and Visitor Services Program:

- Coordinate with other federal, state, county, and local agencies to identify and develop recreational trails and trailheads as needed.
- Provide connectivity to surrounding access routes and trail systems.
- Encourage cooperative ventures to enhance recreation opportunities.
- Concentrate recreation use to reduce the impacts to sensitive cultural, biological, and scenic values.
- Permit recreation activities/events on a case-by-case basis, subject to site-specific restrictions and stipulations needed to meet objectives for other resources and uses such as ACECs. Restrictions and stipulations could include, but are not limited to, seasonal restrictions, group size limits, and limits on the type or number of specific activities.
- Shooting must be at least 1000 feet from roads and structures.
- Monitor recreation use along developed trails. Close and/or rehabilitate unauthorized routes as needed.
- Develop recreation support facilities to improve the recreation experience and to address human health and safety and resource protection issues.
- Install visitor interpretation/education signs at trailheads and in areas of potential user conflict or resource impact.
- Develop trails for separate user groups (e.g., hiking, biking, equestrian) to avoid trail expansion and pioneering, and to reduce inter-group conflicts.

Other Programs:

- OHV: Limited to designated routes.
- Lands & Realty All new developments would be required to maintain access through or around development areas on designated routes.

F.1.2.1.2. Clark County South Extensive Recreation Management Area (ERMA)

ERMA OBJECTIVE DECISIONS

Maintain a variety of dispersed recreation opportunities that facilitate visitor freedom to access a range of outdoor recreation activities associated with a wide-open landscape with limited developments. Maintain the natural settings for multiple recreation opportunities in ACECs, Wilderness Areas, WSAs, lands with wilderness characteristics, the Mojave Road, and Christmas Tree pass. Minimize impacts from increasing recreation by providing facilities, interpretation, education, and information.

BLM-administered lands (public lands) in the area provide settings for a variety of recreational opportunities, including:

- Camping
- Commercial/Competitive Events (e.g. shooting, running, bird dog trails)

- Filming and still photography
- Geocaching
- Hiking
- Horseback riding
- Hunting
- Mountain biking
- OHV use
  - Casual OHV use
  - Commercial OHV touring
  - High-speed events
- Recreational shooting
- Rock climbing/Rappelling/Bouldering
- Viewing cultural sites/Historic touring
- Viewing natural settings/Sightseeing
- Viewing wildlife/Birdwatching

MANAGEMENT ACTIONS AND ALLOWABLE USE DECISIONS

Recreation and Visitor Services Program:

- Coordinate with other federal, state, county, and local agencies to identify and develop recreational trails and trailheads as needed.
- Provide connectivity to surrounding access routes and trail systems.
- Encourage cooperative ventures to enhance recreation opportunities.
- Concentrate recreation use to reduce the impacts to sensitive cultural, biological, and scenic values.
- Permit recreation activities/events on a case-by-case basis, subject to site-specific restrictions and stipulations needed to meet objectives for other resources and uses such as ACECs. Restrictions and stipulations could include, but are not limited to, seasonal restrictions, group size limits, and limits on the type or number of specific activities.
- Shooting must be at least 1000 feet from roads and structures.
- Monitor recreation use along developed trails. Close and/or rehabilitate unauthorized routes as needed.
- Develop recreation support facilities to improve the recreation experience and to address human health and safety and resource protection issues.
- Install visitor interpretation/education signs at trailheads and in areas of potential user conflict or resource impact.
- Develop trails for separate user groups (e.g., hiking, biking, equestrian) to avoid trail expansion and pioneering, and to reduce inter-group conflicts.

Other Programs:

- OHV: Limited to designated routes.

- Lands & Realty: All new developments would be required to maintain access through or around development areas on designated routes.

F.1.2.1.3. Clark County West Extensive Recreation Management Area (ERMA)

ERMA OBJECTIVE DECISIONS

Maintain a variety of dispersed recreation opportunities that facilitate visitor freedom to access a range of outdoor recreation activities associated with a wide-open landscape with limited developments. Maintain the natural settings for multiple recreation opportunities in ACECs, wilderness areas, WSAs, and lands with wilderness characteristics. Minimize impacts from increasing recreation by providing facilities, interpretation, education, and information.

BLM-administered lands (public lands) in the area provide settings for a variety of recreational opportunities, including:

- Camping
- Canyoneering
- Commercial/Competitive Events (e.g. shooting, running, bird dog trails)
- Filming and still photography
- Geocaching
- Hiking
- Horseback riding
- Hunting
- Mountain biking
- OHV use
  - Casual use
  - Commercial touring
  - High-speed events
- Recreational shooting
- Rock climbing/Rappelling/Bouldering
- Viewing cultural sites/Historic touring
- Viewing natural settings/Sightseeing
- Viewing wildlife/Birdwatching

MANAGEMENT ACTIONS AND ALLOWABLE USE DECISIONS

Recreation and Visitor Services Program:

- Coordinate with other federal, state, county, and local agencies to identify and develop recreational trails and trailheads as needed.
- Provide connectivity to surrounding access routes and trail systems.
- Encourage cooperative ventures to enhance recreation opportunities.
- Concentrate recreation use to reduce the impacts to sensitive cultural, biological, and scenic values.
- Permit recreation activities/events on a case-by-case basis, subject to site-specific restrictions and stipulations needed to meet objectives for other resources and uses such as ACECs. Restrictions and stipulations could include, but are not limited to, seasonal restrictions, group size limits, and limits on the type or number of specific activities.
- Shooting must be at least 1000 feet from roads and structures.
- Monitor recreation use along developed trails. Close and/or rehabilitate unauthorized routes as needed.
- Develop recreation support facilities to improve the recreation experience and to address human health and safety and resource protection issues.
- Install visitor interpretation/education signs at trailheads and in areas of potential user conflict or resource impact.
- Develop trails for separate user groups (e.g., hiking, biking, equestrian) to avoid trail expansion and pioneering, and to reduce inter-group conflicts.

Other Programs:

- OHV: Limited to designated routes.
- Lands & Realty: All new developments would be required to maintain access through or around development areas on designated routes.

F.1.2.2. Gold Butte Extensive Recreation Management Area (ERMA)

ERMA OBJECTIVE DECISIONS

Maintain a variety of dispersed recreation opportunities that facilitate visitor freedom to access a range of outdoor recreation activities associated with a wide-open landscape with limited developments. Maintain the natural settings for multiple recreation opportunities in ACECs, wilderness, WSAs, and lands with wilderness characteristics. Minimize impacts from increasing recreation by providing facilities, interpretation, education, and information.

BLM-administered lands (public lands) in the area provide settings for a variety of recreational opportunities, including:

- Camping
- Canyoneering
- Filming and still photography
- Geocaching
- Hiking
- Horseback riding
- Hunting

- Mountain biking
- OHV use
  - Casual OHV use
  - Commercial OHV touring
- Recreational shooting
- Rock climbing/Rappelling/Bouldering
- Viewing cultural sites/Historic touring
- Viewing natural settings/Sightseeing
- Viewing wildlife/Birdwatching

MANAGEMENT ACTIONS AND ALLOWABLE USE DECISIONS

Recreation and Visitor Services Program:

- Coordinate with other federal, state, county, and local agencies to identify and develop recreational trails and trailheads as needed.
- Provide connectivity to surrounding access routes and trail systems.
- Encourage cooperative ventures to enhance recreation opportunities.
- Concentrate recreation use to reduce the impacts to sensitive cultural, biological, and scenic values.
- Prohibit all OHV speed events, hill climbs, and high speed testing. Allow non-speed and other commercial and competitive recreation activities other than those listed above on a case-by-case basis, subject to site-specific stipulations.
- Shooting must be at least 1000 feet from roads and structures.
- Limit mountain bike use to designated routes.
- Limit equestrian use to designated routes.
- Monitor recreation use along developed trails. Close and/or rehabilitate unauthorized routes as needed.
- Develop recreation support facilities to improve the recreation experience and to address human health and safety and resource protection issues.
- Install visitor interpretation/education signs at trailheads and in areas of potential user conflict or resource impact.

Other Programs:

- OHV: Limited to designated routes.

F.1.2.3. Las Vegas Valley Extensive Recreation Management Area (ERMA)

ERMA OBJECTIVE DECISIONS

Manage dispersed recreation, which takes place on some of the many small public land parcels in the Las Vegas Valley, to protect natural, biological, and cultural resources and access to adjacent recreation opportunities and trail systems. Most of the small, isolated parcels in this ERMA are slated for disposal and/or do not contain significant amounts of recreation opportunities. Larger parts of the ERMA north of Fossil Hills also do not offer many recreation opportunities, but do provide some access points to other areas, such as the Moapa Tribal lands and the Fossil Beds RMZ.

BLM-administered lands (public lands) in the area provide settings for a variety of recreational opportunities, including:

- Filming and still photography
- Geocaching
- Hiking
- Horseback riding
- Bicycling
- Viewing cultural sites/Historic touring
- Viewing natural settings/Sightseeing
- Viewing wildlife/Birdwatching

MANAGEMENT ACTIONS AND ALLOWABLE USE DECISIONS

Recreation and Visitor Services Program:

- Coordinate with other federal, state, county, and local agencies to identify and develop recreational trails and trailheads as needed.
- Provide connectivity to surrounding access routes and trail systems.
- Concentrate recreation use to reduce the impacts to sensitive cultural, biological, and scenic values.
- Shooting must be at least 1000 feet from roads and structures.
- Limit permitted bicycle use to designated routes.
- Limit permitted equestrian use to designated routes.
- Prohibit camping except where specifically authorized and designated.
- Monitor recreation use along developed trails. Close and/or rehabilitate unauthorized routes as needed.

Other Programs:

- OHV: Limited to designated routes.

F.1.2.4. Muddy Mountains Extensive Recreation Management Area (ERMA)

ERMA OBJECTIVE DECISIONS

Maintain a variety of dispersed recreation opportunities that facilitate visitor freedom to access a range of outdoor recreation activities associated with a wide-open landscape with limited developments. Maintain the natural settings for multiple recreation opportunities in ACECs, Wilderness areas, WSAs, lands with wilderness characteristics, Lower Mormon Mesa and the Bitter Springs Backcountry Byway. Minimize impacts from increasing recreation by providing facilities, interpretation, education, and information.
 	
BLM-administered lands (public lands) in the area provide settings for a variety of recreational opportunities, including:
 	
● Camping
● Canyoneering
● Geocaching
● Filming and still photography
● Hiking
● Horseback riding
● Hunting
● Mountain biking
● OHV use
  ○ Casual use
  ○ Commercial touring
  ○ High-speed events
  ○ Non-speed events
● Recreational shooting
● Rock climbing/Rappelling/Bouldering
● Viewing cultural sites/Historic touring
● Viewing natural settings/Sightseeing
● Viewing wildlife/Birdwatching

MANAGEMENT ACTIONS AND ALLOWABLE USE DECISIONS

Recreation and Visitor Services Program:

- Manage the Bitter Springs Byway with a visual buffer to protect viewsheds.
- Coordinate with other federal, state, county, and local agencies to identify and develop recreational trails and trailheads as needed.
- Provide connectivity to surrounding access routes and trail systems.
- Encourage cooperative ventures to enhance recreation opportunities.
- Concentrate recreation use to reduce the impacts to sensitive cultural, biological, and scenic values.
- Permit recreation activities/events on a case-by-case basis, subject to site-specific restrictions and stipulations needed to meet objectives for other resources and uses such as ACECs. Restrictions and stipulations could include, but are not limited to, seasonal restrictions, group size limits, and limits on the type or number of specific activities.
- Shooting must be at least 1000 feet from roads and structures.
- Monitor recreation use along developed trails. Close and/or rehabilitate unauthorized routes as needed.
- Develop recreation support facilities to improve the recreation experience and to address human health and safety and resource protection issues.
- Install visitor interpretation/education signs at trailheads and in areas of potential user conflict or resource impact.
- Develop trails for separate user groups (e.g., hiking, biking, equestrian) to avoid trail expansion and pioneering, and to reduce inter-group conflicts.

Other Programs:

- OHV: Limited to designated routes.
- VRM: Manage corridor along the Bitter Springs Byway as VRM Class II out to the visual horizon.
- Minerals: Case by case.

F.2. Pahrump Field Office Recreation Management Areas

F.2.1. Special Recreation Management Areas (SRMAs)

F.2.1.1. Big Dune Special Recreation Management Area (SRMA)

SUPPORTING INFORMATION

Important Values:

Big Dune offers sand dune environment with OHV (permitted and dispersed) use related to such a setting. The area offers multi-day destination OHV use and camping opportunities unique to the area, but not unique to the region. Similar areas exist in California, but are associated with use fees.

Types of Visitors:

Typical visitation comprises motorized users seeking the thrill and speed associated with fast sand washes and dune-related motorized recreation opportunities. Some local use, but mostly travelers from larger cities in California, Nevada, and occasional other western states.

Opportunities Offered:

BLM-administered lands (public lands) in the area provide settings for a variety of recreational opportunities, including:

- Dune-related OHV activity
  - Hill climbs
  - High marking
  - Jumps
- Dispersed camping
- Commercial filming
- Commercial touring (Sunbuggy Fun Rental and Vegas Off-Road Experience)
- Still photography
- Dark sky astronomy
- Trails outside the dunes (fast riding opportunities)
- Fast sand washes

SRMA/RMZ OBJECTIVE(S) DECISIONS

Objective Statement:

Protect the unique sand dune setting and adjacent features associated with providing thrill and speed associated with fast sand washes and dune motorized recreation opportunities.

Activities:

- Camping
- Filming and still photography
- OHV use
  - Casual OHV use
  - Commercial OHV touring
  - Cross-country sand and dunes
  - Sandy washes
  - Designated trail riding
- Viewing natural settings/Sightseeing

Experiences:

- Participating in exercise/physical activity
- Testing/improving physical endurance
- Enjoying closeness with friends/family
- Enjoying meeting new people with similar interests
- Participating in group outdoor events

- Releasing/reducing mental tension
- Escaping everyday responsibilities

Benefits:

- Personal: Improved health (physical and psychological); Restored mind from unwanted stress; Improved quality of life/lifestyle; Stronger ties with friends/family
- Community/Social: Developing stronger ties with family/friends; Group activities and social interaction (camaraderie)
- Environmental: Increased sense of place and associated increase of stewardship behaviors
- Economic: No fees to recreate compared to the open dunes in California (individual financial benefits)

RECREATION SETTING CHARACTERISTIC (RSC) DESCRIPTIONS

Physical Characteristics:

- Remoteness: Rural, Front Country, Middle Country, Back Country
- Naturalness: Front Country, Middle Country, Back Country
- Visitor Facilities: Front Country, Middle Country, Back Country

Social Characteristics:

- Group size: Back Country, Primitive
- Contacts: Primitive
- Evidence of Use: Rural, Front Country, Middle Country

Operational Characteristics:

- Visitor services: Back Country
- Management Controls: Front Country, Middle Country, Back Country
- Access: Middle Country, Back Country, Primitive

MANAGEMENT ACTIONS AND ALLOWABLE USE DECISIONS

Recreation and Visitor Services Program:

- Coordinate with other federal, state, county, and local agencies to identify and develop recreational trails and trailheads as needed.
- Provide connectivity to surrounding access routes and trail systems.
- Encourage cooperative ventures, such as concession leases, to enhance recreation opportunities.
- Concentrate recreation use to reduce the impacts to sensitive cultural, biological, and scenic values.
- Within the Big Dune ACEC:
  - Within beetle habitat prohibit OHV use except on designated routes.
  - Within the remainder of the ACEC outside beetle habitat, prohibit off-road vehicle speed events, 4-wheel drive hill climbs, mini-events, publicity rides, and high speed testing. Allow other commercial and competitive recreation events other than those listed above on a case-by-case basis, subject to site-specific stipulations needed to protect the ACEC relevant and important values.
- Outside of the Big Dune ACEC:

- Allow for cross-country OHV use in the un-vegetated portion of dunes.
- Limit OHV use on the remainder of the SRMA to designated routes.
- Prohibit speed-based activities (e.g., hill climbs, sand drags) on the dunes.

- Special Recreation Permits
  - Permit recreation activities/events on a case-by-case basis, subject to site-specific restrictions and stipulations needed to meet objectives for other resources and uses. Restrictions and stipulations could include, but are not limited to, seasonal restrictions, group size limits, and limits on the type or number of specific activities
  - Away from the dunes, allow speed-based OHV events (e.g. motorcycle, truck, and buggy races) on a case-by-case basis.
  - Allow non-speed events (such as all-terrain bicycle events, motorcycle trials, noncompetitive off-road vehicle events, and commercial permitted events and activities) on a case-by-case basis.
- Prohibit casual/dispersed shooting and/or target practice.
- Monitor recreation use along developed trails. Close and/or rehabilitate user-created trails.
- Develop recreation support facilities to improve the recreation experience and to address human health and safety and resource protection issues.
- Install visitor interpretation/education signs at trailheads and in areas of potential user conflict or resource impact.

Other Programs:

- OHV: Open in sand dune area only. Driving on vegetation prohibited. Closed in identified occupied beetle habitat. Limited all other areas of SRMA.
- Lands & Realty: Exclude site-type ROWs greater than five acres unless they are ancillary to public health and safety and/or enhance recreational values. Avoid linear ROWS in the area.

IMPLEMENTATION DECISIONS

Implementation Decisions:

A separate Recreation Area Management Plan (RAMP) is being developed for this SRMA. Please refer to the RAMP for implementation-level decisions.

F.2.1.2. Crater Flat Special Recreation Management Area (SRMA)

SUPPORTING INFORMATION

Important Values:

Crater Flat offers high speed OHV trails and sandy washes. The area offers multi-day destination OHV use and camping opportunities unique to the area, but not unique to the region. Similar areas exist in California, but are associated with use fees.

Types of Visitors:

Typical visitation comprises motorized users seeking the thrill and speed associated with fast sand washes and dune-related motorized recreation opportunities. Some local use, but mostly travelers from larger cities in California, Nevada, and occasional other western states.

Opportunities Offered:

BLM-administered lands (public lands) in the area provide settings for a variety of recreational opportunities, including:

- Crater Flat is an open area with fast riding trail opportunities

- Dispersed camping
- Commercial filming
- Commercial touring (Sunbuggy Fun Rental and Vegas Off-Road Experience)
- Still photography
- Dark sky astronomy
- Fast sand washes

SRMA/RMZ OBJECTIVE(S) DECISIONS

Objective Statement:

Protect the unique trail setting and adjacent features associated with providing thrill and speed associated with fast sand washes and similar motorized recreation opportunities.

Activities:

- Camping
- Filming and still photography
- Geocaching
- Hiking
- Horseback riding
- Hunting
- Mountain biking
- OHV use
  - Sandy washes
  - Casual OHV use
  - Commercial OHV touring
  - OHV racing events
- Viewing natural settings/Sightseeing

Experiences:

- Participating in exercise/physical activity
- Testing/improving physical endurance
- Enjoying closeness with friends/family
- Enjoying meeting new people with similar interests
- Participating in group outdoor events
- Releasing/reducing mental tension
- Escaping everyday responsibilities

Benefits:

- Personal: Improved health (physical and psychological); Restored mind from unwanted stress; Stronger ties with friends/family; Feelings of isolation (introspection), A chance to get away from the city (solitude)
- Community/Social: Developing stronger ties with family/friends; Reduced social isolation; Improved quality of life/lifestyle; Group activities and social interaction (camaraderie)
- Economic: No fees to recreate compared to the open dunes in California (individual financial benefits)

RECREATION SETTING CHARACTERISTIC (RSC) DESCRIPTIONS

Physical Characteristics:

- Remoteness: Front Country, Middle Country
- Naturalness: Middle Country, Back Country
- Visitor Facilities: Middle Country, Back Country, Primitive

Social Characteristics:

- Group size: Back Country, Primitive
- Contacts: Primitive
- Evidence of Use: Middle Country, Back Country, Primitive

Operational Characteristics:

- Visitor services: Middle Country, Back Country
- Management Controls: Front Country, Middle Country, Back Country
- Access: Middle Country, Back Country, Primitive

MANAGEMENT ACTIONS AND ALLOWABLE USE DECISIONS

Recreation and Visitor Services Program:

- Coordinate with other federal, state, county, and local agencies to identify and develop recreational trails and trailheads as needed.
- Provide connectivity to surrounding access routes and trail systems.
- Encourage cooperative ventures, such as concession leases, to enhance recreation opportunities.
- Concentrate recreation use to reduce the impacts to sensitive cultural, biological, and scenic values.
- Within the Lava Dune ACEC:
  - Within beetle habitat and prohibit OHV use except on designated routes.
  - Prohibit off-road vehicle speed events, 4-wheel drive hill climbs, mini-events, publicity rides, and high speed testing. Allow other commercial and competitive recreation events other than those listed above on a case-by-case basis, subject to site-specific stipulations needed to protect the ACEC relevant and important values.
- Outside of the Lava Dune ACEC:
  - Allow for cross-country OHV use in the un-vegetated portion of dunes.
  - Limit OHV use on the remainder of the SRMA to designated routes.
- Special Recreation Permits
  - Prohibit speed-based activities (e.g., hill climbs, sand drags) on the dunes.

- Permit recreation activities/events on a case-by-case basis, subject to site-specific restrictions and stipulations needed to meet objectives for other resources and uses. Restrictions and stipulations could include, but are not limited to, seasonal restrictions, group size limits, and limits on the type or number of specific activities
- Away from the dunes, allow speed-based OHV events (e.g. motorcycle, truck, and buggy races) on a case-by-case basis.
- Allow non-speed events (such as all-terrain bicycle events, motorcycle trials, noncompetitive off-road vehicle events, and commercial permitted events and activities) on a case-by-case basis.

- Identify areas within one (1) mile of municipalities and infrastructure vulnerable to recreational shooting. Monitor recreation use along developed trails. Close and/or rehabilitate user-created trails.
- Develop recreation support facilities to improve the recreation experience and to address human health and safety and resource protection issues.
- Install visitor interpretation/education signs at trailheads and in areas of potential user conflict or resource impact.

Other Programs:

- OHV: Open to cross country OHV use (on unvegetated dunes outside of the ACEC and beetle habitat), Limited to designated routes (all other areas of the SRMA).
- Lands & Realty: All renewable energy developments would be required to maintain recreation access through development areas on designated routes. During project specific environmental planning for renewable energy developments, the BLM and proponent will consider off-site mitigation related to loss of recreation opportunities and outcomes by providing for recreational developments (e.g., developing trail heads, recreation facilities) for displaced recreation users. Identify areas within one (1) mile of municipalities and infrastructure vulnerable to recreational shooting.

IMPLEMENTATION DECISIONS

Implementation Decisions:

A separate Recreation Area Management Plan (RAMP) is being developed for this SRMA. Please refer to the RAMP for implementation-level decisions.

F.2.2. Extensive Recreation Management Areas (ERMAs)

F.2.2.1. Amargosa Extensive Recreation Management Area (ERMA)

ERMA OBJECTIVE DECISIONS

Maintain a variety of dispersed recreation opportunities that facilitate visitor freedom to access a range of outdoor recreation activities associated with a wide-open landscape with limited developments. Maintain the natural settings for multiple recreation opportunities in ACECs and Wilderness Areas.

BLM-administered lands (public lands) in the area provide settings for a variety of recreational opportunities, including:

- Camping
- Filming and still photography
- Geocaching
- Hiking
- Horseback riding
- Hunting

- Mountain biking
- OHV use
  - Casual use
  - Commercial touring/activities
- Recreational shooting
- Viewing cultural sites/Historic touring
- Viewing natural settings/Sightseeing
- Viewing wildlife/Birdwatching

MANAGEMENT ACTIONS AND ALLOWABLE USE DECISIONS

Recreation and Visitor Services Program:

- Coordinate with other federal, state, county, and local agencies to identify and develop recreational trails and trailheads as needed.
- Provide connectivity to surrounding access routes and trail systems.
- Encourage cooperative ventures, such as concession leases, to enhance recreation opportunities.
- Concentrate recreation use to reduce the impacts to sensitive cultural, biological, and scenic values.
- Within ACECs prohibit off-road vehicle speed events, 4-wheel drive hill climbs, mini-events, publicity rides, and high speed testing. Allow other commercial and competitive recreation events other than those listed above on a case-by-case basis, subject to site-specific stipulations needed to protect the ACEC relevant and important values.
- Outside of ACECs, permit recreation activities/events on a case-by-case basis, subject to site-specific restrictions and stipulations needed to meet objectives for other resources and uses. Restrictions and stipulations could include, but are not limited to, seasonal restrictions, group size limits, and limits on the type or number of specific activities.
- Allow non-speed events (such as all-terrain bicycle events, motorcycle trials, noncompetitive off-road vehicle events, and commercial permitted events and activities) on a case-by-case basis.
- Prohibit casual/dispersed shooting and/or target practice within one (1) mile of municipalities and towards infrastructure (e.g. substations, powerlines, pipelines, buildings, renewable energy developments).
- Develop trails for separate user groups (e.g., hiking, biking, equestrian) to avoid trail expansion and pioneering, and to reduce inter-group conflicts.

Other Programs:

- OHV: Limited to designated routes.
- Lands & Realty: All renewable energy developments and other large site type ROWs would be required to maintain recreation access through development areas on designated routes. During project specific environmental planning for renewable energy developments, the BLM and proponent will consider off-site mitigation related to loss of recreation opportunities and outcomes by providing for recreational developments (e.g., developing trail heads, recreation facilities) for displaced recreation users.

F.2.2.2. Pahrump Valley Extensive Recreation Management Area (ERMA)

ERMA OBJECTIVE DECISIONS

Maintain a variety of dispersed recreation opportunities adjacent to the city of Pahrump that facilitate access a range of outdoor recreation activities associated with a wide-open landscape with limited developments. Maintain the natural settings for multiple recreation opportunities in ACECs. Minimize impacts from increasing recreation by providing facilities, interpretation, education, and information.

BLM-administered lands (public lands) in the area provide settings for a variety of recreational opportunities, including:

- Camping
- Geocaching
- Hiking
- Horseback riding
- Hunting
- Mountain biking
- Casual OHV use
- Recreational shooting
- Viewing natural settings/Sightseeing

MANAGEMENT ACTIONS AND ALLOWABLE USE DECISIONS

Recreation and Visitor Services Program:

- Coordinate with other federal, state, county, and local agencies to identify and develop recreational trails and trailheads as needed.
- Provide connectivity to surrounding access routes and trail systems.
- Encourage cooperative ventures, such as concession leases, to enhance recreation opportunities.
- Concentrate recreation use to reduce the impacts to sensitive cultural, biological, and scenic values.
- Within ACECs prohibit off-road vehicle speed events, 4-wheel drive hill climbs, mini-events, publicity rides, and high speed testing. Allow other commercial and competitive recreation events other than those listed above on a case-by-case basis, subject to site-specific stipulations needed to protect the ACEC relevant and important values.
- Outside of ACECs, permit recreation activities/events on a case-by-case basis, subject to site-specific restrictions and stipulations needed to meet objectives for other resources and uses. Restrictions and stipulations could include, but are not limited to, seasonal restrictions, group size limits, and limits on the type or number of specific activities.
- Allow non-speed events (such as all-terrain bicycle events, motorcycle trials, noncompetitive off-road vehicle events, and commercial permitted events and activities) on a case-by-case basis.
- Prohibit casual/dispersed shooting and/or target practice within one (1) mile of municipalities and towards infrastructure (e.g. substations, powerlines, pipelines, buildings, renewable energy developments).
- Develop trails for separate user groups (e.g., hiking, biking, equestrian) to avoid trail expansion and pioneering, and to reduce inter-group conflicts.
- Monitor recreation use along developed trails. Close and/or rehabilitate user-created trails.

- Install visitor interpretation/education signs at trailheads and in areas of potential user conflict or resource impact.

Other Programs:

Required management:

- OHV: Limited to designated routes.
- VRM: Manage Pahrump East ERMA as VRM Class III
- Lands & Realty: All renewable energy developments would be required to maintain recreation access through development areas on designated routes. During project specific environmental planning for renewable energy developments, the BLM and proponent will consider off-site mitigation related to loss of recreation opportunities and outcomes by providing for recreational developments (e.g., developing trail heads, recreation facilities) for displaced recreation users. Identify areas within one (1) mile of municipalities and infrastructure vulnerable to recreational shooting.

Appendix G. Consolidated Conservation Measures from Herbicide

Consolidated Conservation Measures from Biological Assessment for the Vegetation Treatments Using Herbicides in 17 States EIS

G.1. General

- The BLM will identify appropriate application methods, including rate, time, and mode of application (source characterization) for projects involving the use of herbicides.

- The BLM will use interactive spreadsheets developed during preparation of the Forest Service and BLM ERAs to determine estimates of chemical exposure for species of interest for herbicide applications in the action area. First, the TEP species will be sorted into the ERA surrogate classes based on food and shelter requirements and taxonomic similarity. Information on the chemical characteristics of the herbicide, mode and rate of application, and local environmental conditions (e.g., soil type, rainfall) are also entered into the spreadsheet to calculate the exposure value. These values can then be compared to a table listing risk levels to determine the potential for an acute or chronic risk to the species of interest. Risk levels for TEP species are provided in the ERA and in the following chapters.

- The BLM will incorporate mitigation and conservation measures identified in the ERAs and BA, and from analysis of exposure levels based on modeling, to eliminate or reduce risks to TEP species. It is possible that conservation measures would be less restrictive than those listed in subsequent sections of this BA if local site conditions were evaluated using the ERAs when developing project-level conservation measures.

- The BLM will use herbicides in a manner that is consistent with labeling instructions, design criteria, and any issued reasonable and prudent measures with terms and conditions to ensure that unlawful taking of an ESA-listed species does not occur. In the event incidental take is likely as a result of the action, the Biological Opinion (BO) will include an incidental take statement that exempts the BLM from the prohibitions of take under Section 9 of the ESA.

G.2. Plants

- A survey of all proposed action areas within potential habitat by a botanically qualified biologist, botanist, or ecologist to determine the presence/absence of the species.

- Establishment of site-specific no activity buffers by a qualified botanist, biologist, or ecologist in areas of occupied habitat within the proposed project area. To protect occupied habitat, treatment activities would not occur within these buffers.

- Collection of baseline information on the existing condition of TEP plant species and their habitats in the proposed project area.

- Establishment of pre-treatment monitoring programs to track the size and vigor of TEP populations and the state of their habitats. These monitoring programs would help in anticipating the future effects of vegetation treatments on TEP plant species.

- Assessment of the need for site revegetation post treatment to minimize the opportunity for noxious weed invasion and establishment.

At a minimum, the following must be included in all management plans:

- Given the high risk for damage to TEP plants and their habitat from burning, mechanical treatments, and use of domestic animals to contain weeds, none of these treatment methods should be utilized within 330 feet of sensitive plant populations UNLESS the treatments are specifically designed to maintain or improve the existing population.
- Off-highway use of motorized vehicles associated with treatments should be avoided in suitable or occupied habitat.
- Biological control agents (except for domestic animals) that affect target plants in the same genus as TEP species must not be used to control target species occurring within the dispersal distance of the agent.
- Prior to use of biological control agents that affect target plants in the same family as TEP species, the specificity of the agent with respect to factors such as physiology and morphology should be evaluated, and a determination as to risks to the TEP species made.
- Post-treatment monitoring should be conducted to determine the effectiveness of the project.

In addition, the following guidance must be considered in all management plans in which herbicide treatments are proposed to minimize or avoid risks to TEP species. The exact conservation measures to be included in management plans would depend on the herbicide that would be used, the desired mode of application, and the conditions of the site. Given the potential for off-site drift and surface runoff, populations of TEP species on lands not administered by the BLM would need to be considered if they are located near proposed herbicide treatment sites.

- Herbicide treatments should not be conducted in areas where TEP plant species may be subject to direct spray by herbicides during treatments.
- Applicators should review understand, and conform to the "Environmental Hazards" section on herbicide labels (this section warns of known pesticide risks and provides practical ways to avoid harm to organisms or the environment).
- To avoid negative effects to TEP plant species from off-site drift, surface runoff, and/or wind erosion, suitable buffer zones should be established between treatment sites and populations (confirmed or suspected) of TEP plant species, and site-specific precautions should be taken (refer to the guidance provided below).
- Follow all instructions and Standard Operating Procedures (SOPs) to avoid spill and direct spray scenarios into aquatic habitats that support TEP plant species.
- Follow all BLM operating procedures for avoiding herbicide treatments during climatic conditions that would increase the likelihood of spray drift or surface runoff.

The following conservation measures refer to sites where broadcast spraying of herbicides, either by ground or aerial methods, is desired. Manual spot treatment of undesirable vegetation can occur within the listed buffer zones if it is determined by local biologists that this method of herbicide application would not pose risks to TEP plant species in the vicinity. Additional precautions during spot treatments of vegetation within habitats where TEP plant species occur

should be considered while planning local treatment programs, and should be included as conservation measures in local-level NEPA documentation.

The buffer distances provided below are conservative estimates, based on the information provided by ERAs, and are designed to provide protection to TEP plants. Some ERAs used regression analysis to predict the smallest buffer distance to ensure no risks to TEP plants. In most cases, where regression analyses were not performed, suggested buffers extend out to the first modeled distance from the application site for which no risks were predicted. In some instances the jump between modeled distances was quite large (e.g., 100 feet to 900 feet). Regression analyses could be completed at the local level using the interactive spreadsheets developed for the ERAs, using information in ERAs and for local site conditions (e.g., soil type, annual precipitation, vegetation type, and treatment method), to calculate more precise, and possibly smaller buffers for some herbicides.

2,4-D

- Because the risks associated with this herbicide were not assessed, do not spray within ½ mile of terrestrial plant species or aquatic habitats where TEP aquatic plant species occur.
- Do not use aquatic formulations in aquatic habitats where TEP aquatic plant species occur.
- Assess local site conditions when evaluating the risks from surface water runoff to TEP plants located within ½ mile downgradient from the treatment area.
- In areas where wind erosion is likely, do not apply within ½ mile of TEP plant species.

Bromacil

- Do not apply within 1,200 feet of terrestrial TEP plant species.
- If using a low boom at the typical application rate, do not apply within 100 feet of an aquatic habitat in which TEP plant species occur.
- If using a low boom at the maximum application rate or a high boom, do not apply within 900 feet of an aquatic habitat in which TEP plant species occur.
- In areas where wind erosion is likely, do not apply within ½ mile ofTEP plant species.

Chlorsulfuron

- Do not apply by ground methods within 1,200 feet of terrestrial TEP species.
- Do not apply by aerial methods within 1,500 feet of terrestrial TEP species.
- Do not apply by ground methods within 25 feet of aquatic habitats where TEP plant species occur.
- Do not apply by aerial methods at the maximum application rate within 300 feet of aquatic habitats where TEP plant species occur.
- Do not apply by aerial methods at the typical application rate within 100 feet of aquatic habitats where TEP plant species occur.
- In areas where wind erosion is likely, do not apply within ½ mile of TEP plant species.

Clopyralid

- Since the risks associated with using a high boom are unknown, use only a low boom during ground applications of this herbicide within ½ mile of terrestrial TEP plant species or aquatic habitats in which TEP plant species occur.
- Do not apply by ground methods at the typical application rate within 900 of terrestrial TEP species.
- Do not apply by ground methods at the typical application rate within ½ mile of terrestrial TEP species.
- Do not apply by aerial methods within ½ mile of terrestrial TEP species.
- In areas where wind erosion is likely, do not apply within ½ mile of TEP plant species.

Dicamba

- If using a low boom at the typical application rate, do not apply within 1,050 feet of terrestrial TEP plant species.
- If using a low boom at the maximum application rate, do not apply within 1,050 feet of terrestrial TEP plant species.
- If using a high boom, do not apply within 1,050 feet of terrestrial TEP plant species.
- Do not apply within 25 feet of aquatic habitats where TEP plant species occur.
- In areas where wind erosion is likely, do not apply within ½ mile of TEP plant species.

Diflufenzopyr

- If using a low boom at the typical application rate, do not apply within 100 feet of terrestrial TEP plant species.
- If using a high boom, or a low boom at the maximum application rate, do not apply within 900 feet of terrestrial TEP plant species.
- If using a high boom, do not apply within 500 feet of terrestrial TEP plant species.
- Do not apply within 25 feet of aquatic habitats where TEP plant species occur.
- In areas where wind erosion is likely, do not apply within ½ mile of TEP plant species.

Diquat

- Do not use in aquatic habitats where TEP aquatic plant species occur.
- Do not apply by ground methods within 1,000 feet of terrestrial TEP species at the maximum application rate.
- Do not apply by ground methods within 900 feet of terrestrial TEP species at the typical application rate.
- Do not apply by aerial methods within 1,200 feet of terrestrial TEP species.

Diuron

- Do not apply within J, 100 feet of terrestrial TEP species.
- If using a low boom at the typical application rate, do not apply within 900 feet of aquatic habitats where TEP aquatic plant species occur.
- If using a high boom, or a low boom at the maximum application rate, do not apply within 1,1000 feet of aquatic habitats where TEP aquatic plant species occur.
- In areas where wind erosion is likely. do not apply within ½ mile of TEP plant species.

Fluridone

- Since effects on terrestrial TEP plant species are unknown, do not apply within ½ mile of terrestrial TEP species.

Glyphosate

- Since the risks associated with using a high boom are unknown, use only a low boom during ground applications of this herbicide within ½ mile of terrestrial TEP plant species.
- Do not apply by ground methods at the typical application rate within 50 feet of terrestrial TEP plant species.
- Do not apply by ground methods at the maximum application rate within 300 feet of terrestrial TEP plant species.
- Do not apply by aerial methods within 300 feet of terrestrial TEP plant species.

Hexazinone

- Since the risks associated with using a high boom or an aerial application are unknown, only apply this herbicide by ground methods using a low boom within ½ mile of terrestrial TEP plant species and aquatic habitats that support aquatic TEP species.
- Do not apply by ground methods at the typical application rate within 300 feet of terrestrial TEP plant species or aquatic habitats that support aquatic TEP plant species.
- Do not apply by ground methods at the maximum application rate within 900 feet of terrestrial TEP plant species or aquatic habitats that support aquatic TEP plant species.
- In areas where wind erosion is likely, do not apply within ½ mile of TEP plant species.

Imazapic

- Do not apply by ground methods within 25 feet of terrestrial TEP species or aquatic habitats where
- TEP plant species occur.
- Do not apply by helicopter at the typical application rate within 25 feet of terrestrial TEP plant species.

- Do not apply by helicopter at the maximum application rate, or by plane at the typical application rate, within 300 feet of terrestrial TEP plant species.
- Do not apply by plane at the maximum application rate within 900 feet of terrestrial TEP species.
- Do not apply by aerial methods at the maximum application rate within 300 feet of aquatic TEP species.
- Do not apply by aerial methods at the typical application rate within 100 feet of aquatic TEP species.
- In areas where wind erosion is likely, do not apply within ½ mile of TEP plant species.

Imazapyr

- Since the risks associated with using a high boom are unknown, use only a low boom for ground applications of this herbicide within ½ mile of terrestrial TEP plant species or aquatic habitats in which TEP plant species occur.
- Do not apply at the typical application rate, by ground or aerial methods, within 900 feet of terrestrial TEP plant species or aquatic habitats in which aquatic TEP species occur.
- Do not apply at the maximum application rate, by ground or aerial methods, within ½ mile of terrestrial TEP plant species or aquatic habitats in which aquatic TEP species occur.
- Do not use aquatic formulations in aquatic habitats where TEP aquatic plant species occur.
- In areas where wind erosion is likely, do not apply within ½ mile of TEP plant species.

Metsulfuron Methyl

- Since the risks associated with using a high boom are unknown, use only a low boom for ground applications of this herbicide within ½ mile of terrestrial TEP plant species or aquatic habitats in which TEP plant species occur.
- Do not apply at the typical application rate, by ground or aerial methods, within 900 feet of terrestrial TEP plant species or aquatic habitats in which aquatic TEP species occur.
- Do not apply at the maximum application rate, by ground or aerial methods, within ½ mile of terrestrial TEP plant species or aquatic habitats in which aquatic TEP species occur.
- In areas where wind erosion is likely, do not apply within ½ mile of TEP plant species.

Overdrive®

- If using a low boom at the typical application rate, do not apply within 100 feet of terrestrial TEP plant species.
- If using a low boom at the maximum application rate, do not apply within 900 feet of terrestrial TEP plant species.
- If using a high boom, do not apply within 900 feet of terrestrial TEP plant species.

- Do not apply within 25 feet of aquatic habitats where TEP plant species occur.
- In areas where wind erosion is likely, do not apply within ½ mile of TEP plant species.

Picloram

- Do not apply by ground or aerial methods, at any application rate, within ½ mile of terrestrial TEP plant species.
- Assess local site conditions when evaluating the risks from surface water runoff to TEP plants located within ½ mile downgradient from the treatment area.
- In areas where wind erosion is likely, do not apply within ½ mile of TEP plant species.

Sulrometuron Methyl

- Do not apply by ground or aerial methods within 1,500 feet of terrestrial TEP species.
- Do not apply by ground methods within 900 feet of aquatic habitats where TEP plant species occur, or by aerial methods within 1,500 feet of aquatic habitats where TEP plant species occur.
- In areas where wind erosion is likely, do not apply within ½ mile of TEP plant species.

Tebuthiuron

- If using a low boom at the typical application rate, do not apply within 25 feet of terrestrial TEP plant species.
- If using a low boom at the maximum application rate or a high boom at the typical application rate, do not apply within 50 feet of terrestrial TEP plant species.
- If using a high boom at the maximum application rate, do not apply within 900 feet of terrestrial TEP plant species.
- Do not apply within 25 feet of aquatic habitats where TEP plant species occur.
- In areas where wind erosion is likely, do not apply within ½ mile of TEP plant species.

Triclopyr Acid

- Since the risks associated with using a high boom are unknown, use only a low boom during ground applications of this herbicide within ½ mile of terrestrial TEP plant species.
- Since the risks associated with using a high boom are unknown, use only a low boom during ground applications at the maximum application rate of this herbicide within ½ mile of aquatic habitats in which TEP plant species occur.
- Do not apply by ground methods at the typical application rate within 300 feet of terrestrial TEP plant species.
- Do not apply by aerial methods at the typical application rate within 500 feet of terrestrial TEP plant species.
- Do not apply by ground or aerial methods at the maximum application rate within ½ mile of terrestrial TEP plant species or aquatic habitats in which TEP plant species occur.

- If applying to aquatic habitats in which aquatic TEP plant species occur, do not exceed the targeted water concentration on the product label.
- In areas where wind erosion is likely, do not apply within ½ mile of TEP plant species.

Triclopyr BEE

- Since the risks associated with using a high boom are unknown, use only a low boom for ground applications of this herbicide within ½ mile of terrestrial TEP plant species or aquatic habitats in which TEP plant species occur.
- Do not apply by ground methods at the typical application rate within 300 feet of terrestrial TEP plant species or aquatic habitats in which TEP plant species occur.
- Do not apply by aerial methods at the typical application rate within 500 feet of terrestrial TEP plant species or aquatic habitats in which TEP plant species occur.
- Do not apply by ground or aerial methods at the maximum application rate within ½ mile of terrestrial TEP plant species or aquatic habitats in which TEP plant species occur.
- Do not use aquatic formulations in aquatic habitats where TEP aquatic plant species occur.
- In areas where wind erosion is likely, do not apply within ½ mile of TEP plant species.

Treatment plans must also address the presence of and expected impacts on noxious weeds on the project site. These plans must be coordinated with BLM weed experts and/or appropriate county weed supervisors to minimize the spread of weeds. In order to prevent the spread of noxious weeds and other unwanted vegetation in occupied or suitable habitat, the following precautions should be taken:

- Cleared areas that are prone to downy brome or other noxious weed invasions should be seeded with an appropriate seed mixture to reduce the probability of noxious weeds or other undesirable plants becoming established on the site.
- Where seeding is warranted, bare sites should be seeded as soon as appropriate after treatment, and at a time of year when it is likely to be successful.
- In suitable habitat for TEP species, non-native species should not be used for revegetation.
- Certified noxious weed seed free seed must be used in suitable habitat, and preference should be given to seeding appropriate plant species when rehabilitation is appropriate.
- Straw and hay bales used for erosion control in suitable habitat must be certified weed- and seed-free.
- Vehicles and heavy equipment used during treatment activities should be washed prior to arriving at a new location to avoid the transfer of noxious weeds.

When BAs are drafted at the local level for treatment programs, additional conservation measures may be added to this list. Where BLM plans that consider the effects of vegetation treatments on TEP plant species already exist, these plans should be consulted, and incorporated (e.g . any guidance or conservation measures they provide) into local level BAs for vegetation treatments.

G.3. Aquatic Animals (Most of these are included in the NMFS Biological Opinion unless noted)

Conservation Measures for Site Access and Fueling/Equipment Maintenance

For treatments occurring in watersheds with TEP species or designated or undesignated critical habitat (i.e., unoccupied habitat critical to species recovery):

- Where feasible, access work site only on existing roads, and limit all travel on roads when damage to the road surface will result or is occurring.
- Where TEP aquatic species occur, consider ground-disturbing activities on a case by case basis, and implement SOPs to ensure minimal erosion or impact to the aquatic habitat.
- **Within riparian areas**, do not use vehicle equipment off of established roads.
- **Outside of riparian areas**, allow driving off of established roads only on slopes of 20% or less.
- Except in emergencies, land helicopters outside of riparian areas.
- **Within 150 feet of wetlands or riparian areas**, do not fuel/refuel equipment, store fuel, or perform equipment maintenance (locate all fueling and fuel storage areas, as well as service landings outside of protected riparian areas).
- Prior to helicopter fueling operations prepare a transportation, storage, and emergency spill plan and obtain the appropriate approvals; for other heavy equipment fueling operations use a slip-tank not greater than 250 gallons; Prepare spill containment and cleanup provisions for maintenance operations.
- Do not conduct biomass removal (harvest) activities that will alter the timing, magnitude, duration, and spatial distribution of peak, high, and low flows outside the range of natural variability.

Conservation Measures Related to Revegetation Treatments

Outside riparian areas, avoid hydro-mulching within buffer zones established at the local level.

- This precaution will limit adding sediments and nutrients and increasing water turbidity.
- Within riparian areas, engage in consultation at the local level to ensure that revegetation activities incorporate knowledge of site-specific conditions and project design (not in the BO).

Conservation Measures Related to Herbicide Treatments

The complexity of this action within riparian areas requires local consultation, which will be based on herbicide risk assessments.

- Maintain equipment used for transportation, storage, or application of chemicals in a leak proof condition.
- Do not store or mix herbicides. or conduct post-application cleaning within riparian areas.
- Ensure that trained personnel monitor weather conditions at spray times during application.

- Strictly enforce all herbicide labels.
- Do not broadcast spray within 100 feet of open water when wind velocity exceeds 5 mph.
- Do not broadcast spray when wind velocity exceeds 10 mph.
- Do not spray if precipitation is occurring or is imminent (within 24 hours).
- Do not spray if air turbulence is sufficient to affect the normal spray pattern.
- Do not broadcast spray herbicides in riparian areas that provide habitat for TEP aquatic species.

Appropriate buffer distances should be determined at the local level to ensure that overhanging vegetation that provides habitat for TEP species is not removed from the site. Buffer distances provided as conservation measures in the assessment of effects to plants (Chapter 4 of this BA) and fish and aquatic invertebrates should be consulted as guidance (Table 5-5). (Note: the Forest Service did not determine appropriate buffer distances for TEP fish and aquatic invertebrates when evaluating herbicides in Forest Service ERAs; buffer distances were only determined for non-TEP species). (not in the BO).

- Do not use diquat, fluridone, terrestrial formulations of glyphosate, or triclopyr BEE, to treat aquatic vegetation in habitats where aquatic TEP species occur or may potentially occur.
- Avoid using glyphosate formulations that include R-11 in the future, and either avoid using any formulations with POEA, or seek to use the formulation with the lowest amount of POEA available, to reduce risks to aquatic organisms.
- Follow all instructions and SOPs to avoid spill and direct spray scenarios into aquatic habitats. Special care should be followed when transporting and applying 2,4-0. bromacil, c1opyralid, Diuron, glyphosate, hexazinone, imazapyr, metsulfuron methyl, picloram, tebuthiuron, and triclopyr.
- Do not broadcast spray diuron, glyphosate, picloram, or triclopyr BEE in upland habitats adjacent to aquatic habitats that support (or may potentially support) aquatic TEP species under conditions that would likely result in off-site drift.
- In watersheds that support TEP species or their habitat, do not apply bromacil, diuron, tebuthiuron, or triclopyr BEE in upland habitats within ½ mile upslope of aquatic habitats that support aquatic TEP species under conditions that would likely result in surface runoff.
- Avoid accidental direct spray and spill conditions to reduce the largest potential impacts. Use the typical application rate, rather than the maximum application rate to reduce risk for most herbicides, where practical (derived from EIS Mitigating Measures - covers most herbicides rather than the specific ones listed in the EIS).
- Reduce the size of the application area, when possible (derived from EIS SOPs - used 'minimize ' in the EIS).
- Establish appropriate (herbicide specific) buffer zones to downstream waterbodies, habitats, or species/populations of interest (in EIS Mitigating Measures). Buffer distances presented in Table 4 below should be consulted as guidance for all site-specific treatments. Local BLM offices will have to determine buffer zones for active ingredients not listed below in Table

4 (2,4-0, clopyralid, glyphosate, hexazinone, imazapyr, metsulfuron methyl, picloram and triclopyr) on a site-specific basis (not in BA, SOPs or Mitigating Measures, but okay to include).

Table G.1. Butler Distances to Minimize Risks to Threatened, Endangered, and Proposed Fish and Aquatic Invertebrates from Off-site Drift of BLM-Evaluated Herbicides from Broadcast and Aerial Treatments[a]

Application Method	BROM	CHLR	DICA	DIFLU	DIQT	DIUR	FLUR	IMAZ	OVER	SULF	TEBU
Minimum Buffer Distance (feet) from TEP Fish and Aquatic Invertebrates											
Typical Application Rate											
Aerial	NA	0	NA	NA	NA	NA	NA	0	NA	0	NA
Low boom	0	0	0	0	NA	0	NA	0	0	0	0
High boom	0	0	0	0	NA	100	NA	0	0	0	0
Maximum Application Rate											
Aerial	NA	0	NA	NA	NA	NA	NA	0	NA	0	NA
Low boom	0	0	0	0	NA	100	NA	0	0	0	0
High boom	0	0	0	0	NA	900	NA	0	0	0	0

[a]BROM = Bromacil; CHLR = Chlorsulfuron; OICA = Oicamba; OIFLU = Oiflufenzopyr; D1QT = Oiquat; OIUR - Oiuron; FLUR = Fluridone; IMAZ = Imazapic; OVER = Overdrive ; SULFM = Sulfometuron methyl; and TEBU = Tebuthiuron. Boom height = The Tier I ground application model allows selection of a low (20 inches) or a high (50 inches) boom height. NA = Not applicable. Sources: Ecological risk assessments for herbicides (Syracuse Environmental Research Associates. Inc. 200 I; ENSR 2005a-j).

Wetland and Riparian Areas

- Minimize the use of terrestrial herbicides (especially bromacil, diuron, and suflometuron methyl) in watersheds with downgradient ponds and streams if potential impacts to aquatic plants exist (from EIS Mitigating Measures).

Fish and Other Aquatic Organisms

- Regulate the use of diquat in waterbodies that have native fish and aquatic resources (from EIS Mitigating Measures).
- Regulate the use of terrestrial herbicides in watersheds, which have characteristics suitable for potential surface runoff, with fish-bearing streams during periods when fish are in life stages most sensitive to the herbicide(s) use (from EIS Mitigating Measures).
- Establish appropriate herbicide-specific buffer zones to waterbodies, habitats, or fish or other aquatic species of interest (from EIS Mitigating Measures).
- At the field level, consider effects to listed species, otherwise special status fish and other aquatic organisms when designing treatment programs (not in BA. SOPs or Mitigating Measures, but okay to include).

Numerous conservation measures were developed from information provided in ERAs. The measures listed below would apply to TEP fish and other aquatic species at the programmatic level in all 17 western states. However, local BLM field offices could use interactive spreadsheets

and other information contained in the ERAs to develop more site-specific conservation measures and management plans based on local conditions (soil type, rainfall, vegetation type, and herbicide treatment method). It is possible that conservation measures would be less restrictive than those listed below if local site conditions were evaluated using the ERAs when developing project-level conservation measures.

Conservation Measures Related to Prescribed Fire

Within riparian areas, in watersheds with TEP species or their habitats:

- Conduct prescribed burning only when long-term maintenance of the riparian area is the primary objective, and where low intensity fires can be maintained.
- Do not construct black lines, except by non-mechanized methods.
- Utilize/create only the following firelines: natural barriers; hand-built lines parallel to the stream channel and outside of buffer zones established at the local level; or hand built lines perpendicular to the stream channel with waterbars and the same distance requirement.
- Do not ignite fires using aerial methods.
- In forested riparian areas, keep fires to low severity levels to ensure that excessive vegetation removal does not occur.
- Do not camp, unless allowed by local consultation.
- Have a fisheries biologist determine whether pumping activity can occur in streams with TEP species.
- During water drafting/pumping, maintain a continuous surface flow of the stream that does not alter original wetted stream width.
- Do not alter dams or channels in order to pump in streams occupied by TEP species.
- Do not allow helicopter dipping from waters occupied by TEP species, except in lakes outside of the spawning period.
- Consult with a local fisheries biologist prior to helicopter dipping in order to avoid entrainment and harassment of TEP species.

Conservation Measures Related to Mechanical Treatments

Note: these measures apply only to treatments occurring in watersheds that support TEP species or in unoccupied habitat critical to species recovery (including but not limited to critical habitat, a designated by USFWS).

Outside riparian areas in watersheds with TEP species or designated or undesignated critical habitat (i.e., unoccupied habitat critical to species recovery):

- Conduct soil-disturbing treatments only on slopes of 20% or less, where feasible.
- Do not conduct log hauling activities on native surface roads prone to erosion, where feasible.

Within riparian areas in these watersheds, more protective measures will be required to avoid negatively affecting TEP species or their habitat:

- Do not use vehicles or heavy equipment, except when crossing at established crossings.
- Do not remove large woody debris or snags during mechanical treatment activities.
- Do not conduct ground disturbing activities (e.g., disking, drilling, chaining, and plowing).
- Ensure that all mowing follows guidance to avoid negative effects to streambanks and riparian vegetation and major effects to streamside shade.
- Do not use equipment in perennial channels or in intermittent channels with water, except at crossings that already exist.
- Leave suitable quantities (to be determined at the local level) of excess vegetation and slash on site.
- Do not apply fertilizers or seed mixtures that contain chemicals by aerial methods.
- Do not apply fertilizer within 25 feet of streams and supersaturated soils; apply fertilizer following labeling instructions.
- Do not apply fertilizer in desert habitats.
- Do not completely remove trees and shrubs.

Conservation Measures Related to Biological Control Treatments using Livestock

For treatments occurring in watersheds that support TEP species or in critical habitat:

- Where terrain permits, locate stock handling facilities, camp facilities, and improvements at least 300 feet from lakes, streams, and springs.
- Educate stock handlers about at-risk fish species and how to minimize negative effects to the species and their associated habitat.
- Employ appropriate dispersion techniques to range management, including judicial placement of saltblocks, troughs, and fencing, to prevent damage to riparian areas but increase weed control.
- Equip each watering trough with a float valve.

Within riparian areas of these watersheds, more protective measures are required.

- Do not conduct weed treatments involving domestic animal, except where it is determined that these treatments will not damage the riparian system, or will provide long-term benefits to riparian and adjacent aquatic habitats.
- Do not locate troughs, storage tanks, or guzzlers near streams with TEP species, unless their placement will enhance weed-control effectiveness without damaging the riparian system.

Local BLM offices should design conservation measures for treatment plans using the above conservation measures as guidance, but altering it as needed based on local conditions and the

habitat needs of the particular TEP aquatic species that could be affected by the treatments. Locally-focused conservation measures would be necessary to reduce or avoid potential impacts such that a Not Likely to Adversely Affect determination would be reached during the local-level NEPA process. BLM offices that are responsible for the protection of Northwest salmonids are directed to the guidance document: *Criteria/or At-Risk Sall1wnids: National Fire Plan Activities,* Version 2.1 (National Fire Plan Technical Team 2002), which contains detailed instructions for developing suitable conservation measures for these TEP species in conjunction with vegetation treatment programs, and from which many of the above-listed conservation measures were taken.

NMFS Conservation Recommendation

We recommend that BLM make efforts to establish or join regional monitoring programs. Such an effort is underway for Oregon and Washington led by the US Forest Service. These efforts will relieve the burden of duplicative monitoring, make more efficient use of increasingly scarce funds and possibly monitor more sites for trends in water quality due to vegetation treatment activities.

G.4. Wildlife

The following conservation measures are the minimum steps required of the BLM to ensure that treatment methods would be unlikely to negatively affect the **Morro shoulderband snail**:

- Survey treatment sites within the range of the Morro shoulderband snail for the presence of the snail, prior to formulating treatment programs (should be conducted by a qualified biologist).
- Do not bum, conduct mechanical treatments, or use broad-spectrum herbicides in habitats occupied by snails.
- Do not perform herbicide treatments in habitats occupied by snails that will result in a substantial reduction of plant (and especially native plant) cover; where feasible, spot treat vegetation rather than spraying.
- Do not apply 2,4-D in Morro shoulderbrand snail habitat, and do not broadcast spray 2,4-D within ¼ mile of Morro shoulderbrand snail habitat.
- When conducting herbicide treatments in or near Morro shoulderbrand snail habitat, avoid use of the following herbicides, where feasible: bromacil, clopyralid, diquat, diuron, glyphosate, hexazinone, imazapyr, picloram, tebuthiuron, and triclopyr.
- Do not broadcast spray bromacil, diquat, diuron, glyphosate, hexazinone, tebuthiuron, or triclopyr in habitats occupied by Morro shoulderbrand snails; and do not broadcast spray these herbicides in areas adjacent to Morro shoulderbrand snail habitat under conditions when spray drift onto the habitat is likely.
- If spraying clopyralid, imazapyr or picloram in habitats occupied by Morro shoulderbrand snails, use the typical, rather than the maximum, application rate.
- If conducting manual spot applications of diquat, diuron, glyphosate, hexazinone, tebuthiuron, or triclopyr to vegetation in Morro shoulderbrand snail habitat, utilize the typical, rather than the, maximum, application rate.

G.4.1. Conservation Measures for Butterflies and Moths

Management plans should, at a minimum, follow this general guidance:

- Use an integrated pest management approach when designing programs for managing pest outbreaks.
- Survey treatment areas for TEP butterflies/moths and their host/nectar plants (suitable habitat) at the appropriate times of year.
- Minimize the disturbance area with a pre-treatment survey to determine the best access routes. Areas with butterfly/moth host plants and/or nectar plants should be avoided.
- Minimize mechanical treatments and OHV activities on sites that support host and/or nectar plants.
- Carry out vegetation removal in small areas, creating openings of 5 acres or less in size.
- Avoid burning all of a species' habitat in any 1 year. Limit area burned in butterfly/moth habitat in such a manner that the unburned units are of sufficient size to provide a refuge for the population until the burned unit is suitable for re-colonization. Bum only a small portion of the habitat at any one time, and stagger timing so that there is a minimum 2-year recovery period before an adjacent parcel is burned.
- Where feasible, mow or wet around patches of larval host plants within the bum unit to reduce impacts to larvae.
- In TEP butterfly/moth habitat, bum while butterflies and/or moths of concern are in the larval stage, when the organisms would receive some thermal protection.
- Wash equipment before it is brought into the treatment area.
- Use a seed mix that contains host and/or nectar plant seeds for road/site reclamation.
- To protect host and nectar plants from herbicide treatments, follow recommended buffer zones and other conservation measures for TEP plants species when conducting herbicide treatments in areas where populations of host and nectar plants occur.
- Do not broadcast spray herbicides in habitats occupied by TEP butterflies or moths; do not broadcast spray herbicides in areas adjacent to TEP butterfly/moth habitat under conditions when spray drift onto the habitat is likely.
- Do not use 2,4-D in TEP butterfly/moth habitat.
- When conducting herbicide treatments in or near habitat used by TEP butterflies or moths, avoid use of the following herbicides, where feasible: bromacil, clopyralid, diquat, diuron, glyphosate, hexazinone, imazapyr, picloram, tebuthiuron, and triclopyr.
- If conducting manual spot applications of diquat, diuron, glyphosate, hexazinone. tebuthiuron, or triclopyr to vegetation in TEP butterfly or moth habitat, utilize the typical, rather than the maximum, application rate.

G.4.2. Conservation Measures - Beetles

The following conservation measures are the minimum steps required of the BLM to ensure that treatment methods would be unlikely to negatively affect TEP species. These measures should be implemented in habitats where beetles are known to occur or are likely to occur.

- Survey proposed treatment sites within the range of the valley elderberry longhorn beetle for the presence of the beetle and its elderberry host plant (should be conducted by a qualified biologist).
- Establish a 100-foot buffer between suitable beetle habitat and mechanical treatments (except mowing of grasses/ground cover) and treatments using domestic animals. Suitable beetle habitat is defined as any area containing elderberry stems measuring I inch or more in diameter at ground level.
- Mow grasses/ground cover only between July and April.
- Do not mow within 5 feet of elderberry plant stems, and do not mow in a manner that damages plants.
- Protect all elderberry shrubs with evidence of beetle exit holes from prescribed fire using water or by removing fuels surrounding the plants.
- To protect host elderberry plants from herbicide treatments, follow recommended buffer zones and other conservation measures for TEP plants species, as listed on pages 4-129 through 4-134, when conducting herbicide treatments in areas where populations of elderberry occur.
- Do not broadcast spray herbicides in suitable beetle habitat; do not broadcast spray herbicides in areas adjacent to suitable beetle habitat under conditions when spray drift onto the habitat is likely.
- Do not use 2,4-D in valley elderberry longhorn beetle habitat.
- When conducting herbicide treatments in or near habitat used by TEP butterflies or moths, avoid use of the following herbicides, where feasible: bromacil, clopyralid, diquat, diuron, glyphosate, hexazinone, imazapyr, picloram, tebuthiuron, and triclopyr.
- If conducting manual spot applications of diquat, diuron, glyphosate, hexazinone, tebuthiuron, or triclopyr to vegetation in valley elderberry longhorn beetle habitat, utilize the typical, rather than the maximum, application rate.

G.4.3. Conservation Measures - Amphibians and Reptiles

Many local BLM offices already have management plans in place that ensure the protection of these species during activities on public lands. In addition, the following conservation measures are the minimum steps required of the BLM to ensure that treatment methods would be unlikely to negatively affect TEP species.

- Survey all areas that may support TEP amphibians and/or reptiles prior to treatments.
- Conduct bums during periods when the animals are in aquatic habitats or are hibernating in burrows.

- For species with extremely limited habitat, such as the desert slender salamander, avoid prescribed burning in known habitat.
- Do not use water from aquatic habitats that support TEP amphibians and/or reptiles for fire abatement.
- Install sediment traps upstream of aquatic habitats to minimize the amount of ash and sediment entering aquatic habitats that support TEP species.
- Do not conduct prescribed burns in desert tortoise habitat.
- In habitats where aquatic herpetofauna occur, implement all conservation measures identified for aquatic organisms in Chapter 4.
- Within riparian areas, wetlands, and aquatic habitats, conduct herbicide treatments only with herbicides that are approved for use in those areas.
- Do not broadcast spray herbicides in riparian areas or wetlands that provide habitat for TEP herpetofauna.
- Do not use diquat, fluridone, glyphosate, or triclopyr BEE to treat aquatic vegetation in habitats where TEP amphibians occur or may potentially occur.
- In desert tortoise habitat, conduct herbicide treatments during the period when desert tortoises are less active.
- To the greatest extent possible, avoid desert tortoise burrows during herbicide treatments.
- When conducting herbicide treatments in upland areas adjacent to aquatic or wetland habitats that support TEP herpetofauna, do not broadcast spray during conditions under which off-site drift is likely.
- In watersheds where TEP amphibians occur, do not apply bromacil, diuron, or triclopyr BEE in upland habitats upslope of aquatic habitats that support (or may potentially support) TEP amphibians under conditions that would likely result in surface runoff.
- Follow all instructions and SOPs to avoid spill and direct spray scenarios into aquatic habitats that support TEP herpetofauna.
- Do not use 2,4-D in terrestrial habitats occupied by TEP herpetofauna; do not broadcast spray 2,4-D within ¼ mile of terrestrial habitat occupied by TEP herpetofauna.
- When conducting herbicide treatments in or near terrestrial habitat occupied by TEP herpetofauna, avoid using the following herbicides, where feasible: clopyralid, glyphosate, hexazinone, imazapyr, metsulfuron methyl, picloram, and triclopyr.
- When conducting herbicide treatments in upland habitats occupied by TEP herpetofauna, do not broadcast spray 2,4-D, clopyralid, glyphosate, hexazinone, picloram or triclopyr; do not broadcast spray these herbicides in areas adjacent to habitats occupied by TEP herpetofauna under conditions when spray drift onto the habitat is likely.

- If conducting manual spot applications of glyphosate, hexazinone, or triclopyr to vegetation in upland habitats occupied by TEP herpetofauna, utilize the typical, rather than the maximum, application rate.
- If spraying imazapyr or metsulfuron methyl in or adjacent to upland habitats occupied by TEP herpetofauna, apply at the typical, rather than the maximum, application rate
- If conducting herbicide treatments in or near upland habitats occupied by TEP herpetofauna, consult Table 6-3 on a species by species basis to determine additional conservation measures that should be enacted to avoid negative effects via ingestion of contaminated prey.

G.4.4. Conservation Measures - Bird Species

The following conservation measures are required to ensure that **cactus ferruginous pygmy-owls** would not be negatively affected by vegetation treatments:

- Prior to treatments, conduct surveys for cactus ferruginous pygmy-owls in all suitable habitat where treatments are proposed to take place.
- Limit vegetation treatments within ¼ mile of any site occupied by a cactus ferruginous pygmy-owl, or any unsurveyed suitable habitat within the project area.
- Avoid conducting vegetation treatments in pygmy-owl habitat during the nesting period (as determined by a qualified wildlife biologist).
- Do not use 2,4-D in cactus ferruginous pygmy-owl habitat; do not broadcast spray 2,4-D within ¼ mile of cactus ferruginous pygmy-owl habitat.
- Where feasible, avoid use of the following herbicides in cactus ferruginous pygmy-owl habitat: bromacil, clopyralid, diquat, diuron, glyphosate, hexazinone, imazapyr, metsulfuron methyl, picloram, and triclopyr.
- Avoid broadcast spraying herbicides in areas where future nesting cacti and trees occur.
- Do not broadcast spray clopyralid, diuron, glyphosate, hexazinone. Picloram, or triclopyr in cactus ferruginous pygmy-owl habitat; do not broadcast spray these herbicides in areas adjacent to pygmy owl habitat under conditions when spray drift onto the habitat is likely.
- If broadcast spraying bromacil, diquat, imazapyr, or metsulfuron methyl in or adjacent to pygmy-owl habitat, apply at the typical, rather than the maximum, application rate.
- If conducting manual spot applications of glyphosate, hexazinone, or triclopyr to vegetation in pygmy-owl habitat, utilize the typical, rather than the maximum, application rate.

Additional conservation measures would be developed at the local level during the completion of project-specific BAs and management plans.

The following conservation measures are the minimum steps required to protect the northern

aplomado falcon from being negatively affected by the proposed vegetation treatments. Additional conservation measures would also be developed at the local level.

- Prior to conducting vegetation treatments, survey the project area for northern aplomado falcon nests.
- Do not burn or cut trees within % mile of northern aplomado falcon nests.
- Avoid conducting vegetation treatments in northern aplomado falcon habitat during the nesting period.
- Avoid cutting mesquite trees, yuccas, and other trees that may support aplomado nests in the future.
- Do not use 2,4-D in northern aplomado falcon habitats; do not broadcast spray 2,4-D within % mile of northern aplomado falcon habitat.
- Where feasible, avoid use of the following herbicides in northern aplomado falcon habitat: bromacil, clopyralid, diquat, diuron, glyphosate, hexazinone, imazapyr, metsulfuron methyl, picloram, and triclopyr.
- Avoid broadcast spraying herbicides in areas where future falcon nesting trees occur.
- Do not broadcast spray clopyralid, diuron, glyphosate, hexazinone, picloram, or triclopyr in northern aplomado falcon habitat; do not broadcast spray these herbicides in areas adjacent to northern aplomado falcon habitat under conditions when spray drift onto the habitat is likely.
- If broadcast spraying bromacil, diquat, imazapyr, or metsulfuron methyl in or adjacent to northern aplomado falcon habitat, apply at the typical, rather than the maximum, application rate.
- If conducting manual spot applications of glyphosate, hexazinone, or triclopyr to vegetation in northern aplomado falcon habitat, utilize the typical, rather than the maximum, application rate.

To avoid negative impacts to the **Yuma clapper rail** during treatments, the following programmatic level conservation measures are required:

- Conduct surveys prior to vegetation treatments within potential or suitable habitat.
- Where surveys detect birds, do not implement treatments during the breeding season.
- In habitats where Yuma clapper rails occur, follow the riparian/aquatic habitat protection measures discussed in Chapter 5.
- Do not conduct prescribed bums in Yuma clapper rail habitat.
- Closely follow all application instructions and use restrictions on herbicide labels; in wetland habitats use only those herbicides that are approved for use in wetlands.
- Do not use 2,4-D in Yuma clapper rail habitats; do not broadcast spray 2,4-D within 1;" mile of Yuma clapper rail habitat.
- Where feasible, avoid use of the following herbicides in Yuma clapper rail habitat: clopyralid, diquat, diuron, glyphosate, hexazinone, imazapyr, metsulfuron methyl, picloram, and triclopyr.

- Do not broadcast spray clopyralid, diquat, diuron, glyphosate, hexazinone, picloram, or triclopyr in Yuma clapper rail habitat; do not broadcast spray these herbicides in areas adjacent to Yuma clapper rail habitat under conditions when spray drift onto the habitat is likely.
- If broadcast spraying imazapyr or metsulfuron methyl in or adjacent to Yuma clapper rail habitat, apply at the typical, rather than the maximum, application rate.
- If conducting manual spot applications of glyphosate, hexazinone, or triclopyr to vegetation in Yuma clapper rail habitat, utilize the typical, rather than the maximum, application rate.

Additional conservation measures would be identified at the local level, as necessary.

The following conservation measures are the minimum steps required of the BLM to ensure that treatment methods would be unlikely to negatively affect **Sand Nesters** species:

- Survey for western snowy plovers, piping plovers, and interior least terns (and their nests) in suitable areas on proposed treatment areas, prior to developing treatment plans.
- Do not treat vegetation in nesting areas during the breeding season (as determined by a qualified biologist).
- Do not allow human (or domestic animal) disturbance within ¼ mile of nest sites during the nesting period.
- Ensure that nest sites are at least I mile from downwind smoke effects during the nesting period.
- Conduct beachgrass treatments during the plant's flowering stage, during periods of active growth.
- Closely follow all application instructions and use restrictions on herbicide labels; in wetland habitats use only those herbicides that are approved for use in wetlands.
- Do not use 2,4-D in western snowy plover, piping plover, or interior least tern habitats; do not broadcast spray 2,4-D within. ¼ mile of western snowy plover, piping plover, or interior least tern habitat.
- Where feasible, avoid use of the following herbicides in western snowy plover and piping plover habitat: clopyralid, diquat, diuron, glyphosate, hexazinone, imazapyr, metsulfuron methyl, picloram, and triclopyr; in interior least tern habitat avoid the use of clopyralid, glyphosate, hexazinone, imazapyr, metsulfuron methyl, picloram, and triclopyr.
- Do not broadcast spray clopyralid, diquat, diuron, glyphosate, hexazinone, picloram, or triclopyr in western snowy plover or piping plover habitat; do not broadcast spray these herbicides in areas adjacent to western snowy plover or piping plover habitat under conditions when spray drift onto the habitat is likely.
- Do not broadcast spray clopyralid, glyphosate, hexazinone, picloram, or triclopyr in interior least tern habitat; do not broadcast spray these herbicides in areas adjacent least tern habitat under conditions when spray drift onto the habitat is likely.
- If broadcast spraying imazapyr or metsulfuron methyl in or adjacent to western snowy plover, piping plover, or interior least tern habitat, apply at the typical, rather than the maximum, application rate.

- If conducting manual spot applications of glyphosate, hexazinone, or triclopyr to vegetation in western snowy plover, piping plover, or interior least tern habitat, utilize the typical, rather than the maximum, application rate.

Additional, project-specific conservation measures would be developed at the local level, as appropriate.

Conservation Measures - Riparian bird species

To minimize or avoid negative effects to the **least Bell's vireo, Inyo California towhee, and southwestern willow flycatcher**, the BLM would be required to implement the following programmatic-level conservation measures in habitats utilized by these three species.

- Conduct surveys prior to vegetation treatments within potential or suitable habitat.

- Where surveys detect birds, do not bum, broadcast spray herbicides, use domestic animals to control weeds, or conduct mechanical treatments.

- Do not conduct vegetation treatments within ½ mile (or further if deemed necessary to prevent smoke from inundating the nest area) of known nest sites or unsurveyed suitable habitat during the breeding season (as determined by a qualified wildlife biologist).

- Adjust spatial and temporal scales of treatments to that not all suitable habitat is affected in any given year.

- Following treatments, replant or reseed treated areas with native species, if needed.

- Closely follow all application instructions and use restrictions on herbicide labels; in wetland habitats use only those herbicides that are approved for use in wetlands.

- Do not use 2,4-D in least Bell's vireo, Inyo California towhee, or southwestern willow flycatcher habitats; do not broadcast spray 2,4-D within 'A mile of least Bell's vireo, Inyo California towhee, or southwestern willow flycatcher habitat.

- Where feasible, avoid use of the following herbicides in least Bell's vireo, Inyo California towhee, and southwestern willow flycatcher habitat: bromacil, clopyralid, diquat, diuron, glyphosate, hexazinone, imazapyr, metsulfuron methyl, picloram, tebuthiuron, and triclopyr.

- Do not broadcast spray clopyralid, diquat, diuron, glyphosate, hexazinone, picloram, or triclopyr in least Bell's vireo or southwestern willow flycatcher habitat; do not broadcast spray these herbicides in areas adjacent to least Bell's vireo or southwestern willow flycatcher habitat under conditions when spray drift onto the habitat is likely.

- Do not broadcast spray clopyralid, diquat, glyphosate, hexazinone, picloram, or triclopyr in Inyo California towhee habitat; do not broadcast spray these herbicides in areas adjacent to Inyo California towhee habitat under conditions when spray drift onto the habitat is likely.

- If broadcast spraying imazapyr or metsulfuron methyl in or adjacent to least Bell's vireo or southwestern willow flycatcher habitat, apply at the typical, rather than the maximum, application rate.

- If broadcast spraying bromacil, diuron, imazapyr, metsulfuron methyl, or tebuthiuron in or adjacent to Inyo California towhee habitat, apply at the typical, rather than the maximum, application rate.

- If conducting manual spot applications of glyphosate, hexazinone, or triclopyr to vegetation in least Bell's vireo, Inyo California towhee, or southwestern willow flycatcher habitat, utilize the typical, rather than the maximum, application rate.

In order to avoid or minimize potential effects to the **coastal California gnatcatcher**, the BLM would be required to implement, at a minimum, the programmatic-level conservation measures listed below:

- Prior to implementing vegetation treatments, survey areas in which treatments would occur for coastal California gnatcatchers.

- Where gnatcatchers occur, do not conduct treatments during the breeding season (as determined by a qualified wildlife biologist).

- Do not conduct treatments with domestic animals in habitats utilized by coastal California gnatcatchers, or in coastal sage scrub areas not dominated by non-native species.

- Ensure that prescribed bums and mechanical treatments are of minimal size and intensity, and do not affect greater than 30% of the coastal sage scrub habitat in a given area.

- Revegetate coastal sage habitats with native species.

- Do not broadcast spray herbicides in areas where coastal California gnatcatchers occur.

- Do not use 2.4-D in coastal California gnatcatcher habitats; do not broadcast spray 2,4-D within ¼ mile of coastal California gnatcatcher habitat.

- Where feasible, avoid use of the following herbicides in coastal California gnatcatcher habitat: clopyralid, diquat, diuron, glyphosate, hexazinone, imazapyr, metsulfuron methyl, picloram, and triclopyr.

- Do not broadcast spray clopyralid, diquat, diuron, glyphosate, hexazinone, picloram, or triclopyr in areas adjacent to coastal California gnatcatcher habitat under conditions when spray drift onto the habitat is likely.

- If broadcast spraying imazapyr or metsulfuron methyl in areas adjacent to coastal California gnatcatcher habitat, apply at the typical, rather than the maximum, application rate.

- If conducting manual spot applications of glyphosate, hexazinone, or triclopyr to vegetation in coastal California gnatcatcher habitat, utilize the typical, rather than the maximum, application rate.

Additional conservation measures would be developed, as appropriate, during the preparation of project-level NEPA documents and management plans.

If herbicide treatments in **brown pelican** habitats must be conducted during the wintering period:

- Do not use 2,4-D in pelican wintering habitat.

- Prior to conducting herbicide treatments on pelican wintering habitat, survey the area for pelicans. Wait for pelicans to leave the area before spraying.
- Do not broadcast spray clopyralid, glyphosate, hexazinone, picloram, or triclopyr in pelican wintering habitats.
- If broadcast spraying imazapyr or metsulfuron methyl in pelican wintering habitats, use the typical rather than the maximum application rate.
- If conducting manual spot applications of glyphosate, hexazinone, or triclopyr to vegetation in brown pelican wintering habitat, utilize the typical, rather than the maximum, application rate.

In order to avoid or minimize negative effects to the **California condor**, the BLM would be required to implement the programmatic level conservation measures listed below.

- In areas where effects to breeding California condors may occur, do not bum until nesting is completed (Dodd 1986).
- Restrict human activity within 1.5 miles of California condor nest sites (Snyder et al. 1986).
- Do not use 2,4-D in California condor habitats; do not broadcast spray 2,4-D within ¼ mile of California condor habitat.
- Where feasible, avoid use of the following herbicides in California condor habitat: bromacil, clopyralid, diquat, diuron, glyphosate, hexazinone, imazapyr, metsulfuron methyl, picloram, and triclopyr.
- Do not broadcast spray clopyralid, diuron, glyphosate, hexazinone, picloram, or triclopyr in
- California condor habitat; do not broadcast spray these herbicides in areas adjacent to California condor habitat under conditions when spray drift onto the habitat is likely.
- If broadcast spraying bromacil, diquat, imazapyr, or metsulfuron methyl in or adjacent to California condor habitat, apply at the typical, rather than the maximum, application rate.
- If conducting manual spot applications of glyphosate, hexazinone, or triclopyr to vegetation in
- California condor habitat, utilize the typical, rather than the maximum, application rate.

The following programmatic-level conservation measures are the minimum steps required of the BLM to ensure that treatment methods would be unlikely to negatively affect **mature forest nesters (marbled murrelet, northern spotted owl, or Mexican spotted owl)**:

- Survey for marbled murrelets, northern spotted owls, and Mexican spotted owls (and their nests) on suitable proposed treatment areas, prior to developing treatment plans.
- Delineate a 100-acre buffer around nests prior to mechanical treatments or prescribed bums.
- Do not allow human disturbance within ¼ mile of nest sites during the nesting period (as determined by a local biologist).
- Ensure that nest sites are at least I mile from downwind smoke effects during the nesting period.

- Protect and retain the structural components of known or suspected nest sites during treatments; evaluate each nest site prior to treatment and protect it in the most appropriate manner.
- Maintain sufficient dead and down material during treatments to support spotted owl prey species (minimums would depend on forest types, and should be determined by a wildlife biologist).
- Do not conduct treatments that alter forest structure in old-growth stands.
- Do not use 2,4-D in marbled murrelet, northern spotted owl, or Mexican spotted owl habitats; do not broadcast spray 2,4-D within ¼ mile of marbled murrelet, northern spotted owl, or Mexican spotted owl habitat.
- Where feasible, avoid use of the following herbicides in northern spotted owl and Mexican spotted owl habitat: bromacil, clopyralid, diquat, diuron, glyphosate, hexazinone, imazapyr, metsulfuron methyl, picloram, and triclopyr.
- Where feasible, avoid use of the following herbicides in marbled murrelet habitat: clopyralid, glyphosate, hexazinone, imazapyr, metsulfuron methyl, picloram, and triclopyr.
- Do not broadcast spray clopyralid, glyphosate, hexazinone, picloram, or triclopyr in marbled
- murrelet, northern spotted owl, or Mexican spotted owl habitat; do not broadcast spray these herbicides in areas adjacent to marbled murrelet, northern spotted owl, or Mexican spotted owl habitat under conditions when spray drift onto the habitat is likely.
- Do not broadcast spray diuron in Mexican or northern spotted owl habitat; do not broadcast spray these herbicides in areas adjacent to Mexican or northern spotted owl habitat under conditions when spray drift onto the habitat is likely.
- If broadcast spraying imazapyr or metsulfuron methyl in or adjacent to marbled murrelet, northern spotted owl, or Mexican spotted owl habitat, apply at the typical, rather than the maximum, application rate.
- If broadcast spraying bromacil or diquat in or adjacent to Mexican or northern spotted owl habitat, apply at the typical, rather than the maximum, application rate.
- If conducting manual spot applications of glyphosate, hexazinone, or triclopyr to vegetation in marbled murrelet, northern spotted owl, or Mexican spotted owl habitat, utilize the typical, rather than the maximum, application rate.
- Follow all instructions and SOPs to avoid spill and direct spray scenarios into aquatic habitats, particularly marine habitats where murrelets forage for prey.

Additional conservation measures would be developed, as necessary, at the project level to fine-tune protection of these species.

The following conservation measures are the minimum steps required of the BLM to ensure that treatment methods would not affect the **whooping crane**. Additional, site-specific conservation measures would also be developed at the local level, as appropriate.

- Burn whooping crane wintering grounds in late winter, when the food supply is low.

- Avoid prescribed fire activities in whooping crane breeding areas.
- Do not allow human disturbance within I mile occupied whooping crane habitat (nesting, roosting foraging) or potential nesting habitat where whooping cranes have been observed within the past 3 years during periods when cranes may be present (as determined by a qualified biologist).
- During prescribed bums, ensure that nest sites or occupied habitat are greater than I mile from downwind smoke effects during periods when cranes may be present.
- Do not conduct herbicide treatments in whooping crane habitat during the breeding season.
- Closely follow all application instructions and use restrictions on herbicide labels; in wetlands and riparian habitats use only those herbicides that are approved for use in those areas.
- Do not use 2,4-D in whooping crane habitats; do not broadcast spray 2,4-D within ¼ mile of whooping crane habitat.
- Where feasible, avoid use of the following herbicides in whooping crane habitat: bromacil, clopyralid, diquat, diuron, glyphosate, hexazinone, imazapyr, metsulfuron methyl, picloram, tebuthiuron, and triclopyr.
- Do not broadcast spray clopyralid, diquat, diuron, glyphosate, hexazinone, picloram, or triclopyr in whooping crane habitat; do not broadcast spray these herbicides in areas adjacent to whooping crane habitat under conditions when spray drift onto the habitat is likely.
- If broadcast spraying bromacil, imazapyr, or metsulfuron methyl in or adjacent to whooping crane habitat, apply at the typical, rather than the maximum, application rate.
- If conducting manual spot applications of glyphosate, hexazinone, or triclopyr to vegetation in whooping crane habitat, utilize the typical, rather than the maximum, application rate.

The following programmatic level conservation measures are the minimum steps required of the BLM to ensure that treatment methods would not negatively affect the **bald eagle** or its habitat. Additional, site-specific conservation measures would also be developed at the local level, as appropriate.

- Do not allow human disturbance within a suitable buffer distance of known bald eagle nest sites during the breeding season (as determined by a qualified wildlife biologist). For active bald eagle nests in open country, buffer distances should be I mile. In other habitats, with a shorter line-of-site distance, buffer distances may be reduced, based on consultation with the USFWS.
- Do not allow ground disturbing activities within *V2* mile of active roost sites year round.
- Avoid human disturbance within I mile of a winter roost during the wintering period (as determined by a qualified wildlife biologist).
- Complete treatment activities that must occur within I mile of a winter roost within the hours of 9 a.m. to 3 p.m., during the winter roosting period.
- Do not allow helicopter/aircraft activity within I mile of bald eagle nest sites or winter roost sites during the breeding or roosting period.

- Conduct prescribed burn activities in a manner that ensures that nest and winter roost sites are greater than I mile from downwind smoke effects.
- Do not cut trees within 'A mile of any known nest trees.
- Do not use 2,4-D in bald eagle habitats; do not broadcast spray 2,4-D within ¼ mile of bald eagle habitat.
- Where feasible, avoid use of the following herbicides in bald eagle habitat: bromacil, clopyralid, diquat, diuron, glyphosate, hexazinone, imazapyr, metsulfuron methyl, picloram, and triclopyr.
- Do not broadcast spray clopyralid, diuron, glyphosate, hexazinone, picloram, or triclopyr in bald eagle habitat; do not broadcast spray these herbicides in areas adjacent to bald eagle habitat under conditions when spray drift onto the habitat is likely.
- If broadcast spraying bromacil, diquat, imazapyr, or metsulfuron methyl in or adjacent to bald eagle habitat, apply at the typical, rather than the maximum, application rate.
- If conducting manual spot applications of glyphosate, hexazinone, or triclopyr to vegetation in bald eagle habitat, utilize the typical, rather than the maximum, application rate.

G.4.5. Conservation Measures - Mammals

In order to avoid or minimize potential effects to the **pygmy rabbit** resulting from the proposed vegetation treatments, the BLM would be required to implement the conservation measures listed below. Although only the Columbia Basin Distinct Population Segment of the pygmy rabbit is currently listed, these mitigation measures should be considered for treatments throughout the species' entire range, and implemented as appropriate.

- Prior to treatments, survey all suitable habitat for pygmy rabbits.
- Address pygmy rabbits in all management plans prepared for treatments within the range of the species' historical habitat.
- Do not burn, graze, or conduct mechanical treatments within I mile of known pygmy rabbit habitat.
- Do not use 2,4-D, diquat, or diuron in pygmy rabbit habitats; do not broadcast spray these herbicides within ¼ mile of pygmy rabbit habitat.
- Where feasible, avoid use of the following herbicides in pygmy rabbit habitat: bromacil, clopyralid, fluridone, glyphosate, hexazinone, imazapyr, metsulfuron methyl, picloram, tebuthiuron, and triclopyr.
- Where feasible, spot treat vegetation in pygmy rabbit habitat rather than broadcast spraying.
- Do not broadcast spray clopyralid, glyphosate, hexazinone, picloram, or triclopyr in pygmy rabbit habitat; do not broadcast spray these herbicides in areas adjacent to pygmy rabbit habitat under conditions when spray drift onto the habitat is likely.
- If broadcast spraying bromacil, imazapyr, fluridone, metsulfuron methyl, or tebuthiuron in or near pygmy rabbit habitat, apply at the typical, rather than the maximum, application rate.

- If conducting manual spot applications of bromacil, glyphosate, hexazinone, tebuthiuron, or triclopyr to vegetation in pygmy rabbit habitat, utilize the typical. rather than the maximum, application rate.

In addition, project-level conservation measures would also be developed by local BLM offices during the development of NEPA documents for site-specific treatment projects. The projected short-term negative effects of vegetation treatments on the **Columbian white-tailed deer** could be avoided by implementing the following programmatic-level conservation measures.

- Prior to treatments, survey for evidence of white-tailed deer use of areas in which treatments are proposed to occur.
- Address the protection of Columbian white-tailed deer in local management plans developed in association with treatment programs.
- In areas that are likely to support Columbian white-tailed deer, protect riparian areas from degradation by avoiding them altogether, or utilizing SOPs. Consult Chapter 5 for appropriate conservation measures to be used in protected riparian areas.
- In habitats used by deer, conduct treatments that use domestic animals during the plant growing season, and remove the animals after clearing has been achieved.
- Do not use domestic animals to control weeds in woodland habitats utilized by Columbian whitetailed deer.
- In areas where Columbian white-tailed deer occur, or may possibly occur, avoid the use of fences to keep domestic animals out of sensitive habitats or to otherwise restrict their movement (fence accidents are associated with deer mortality).
- Avoid burning in deer habitats during the fawning season.
- Closely follow all application instructions and use restrictions on herbicide labels; in riparian habitats use only those herbicides that are approved for use in riparian areas.
- Avoid broadcast spray treatments in areas where Columbian white-tailed deer are known to forage.
- Do not use 2,4-D in Columbian white-tailed deer habitats; do not broadcast spray 2,4-D within ¼ mile of Columbian white-tailed deer habitat.
- Where feasible, avoid use of the following herbicides in Columbian white-tailed deer habitat: bromacil, clopyralid, diquat, diuron, glyphosate, hexazinone, imazapyr, metsulfuron methyl, Overdrive®, picloram, tebuthiuron, and triclopyr.
- Do not broadcast spray bromacil, clopyralid, diquat, diuron, glyphosate, hexazinone, Overdrive®, picloram, or triclopyr in Columbian white-tailed deer habitat; do not broadcast spray these herbicides in areas adjacent to Columbian white-tailed deer habitat under conditions when spray drift onto the habitat is likely.
- If broadcast spraying imazapyr, metsulfuron methyl, or tebuthiuron in or near Columbian whitetailed deer habitat, apply at the typical, rather than the maximum, application rate.

- ·If conducting manual spot applications of glyphosate, hexazinone, imazapyr, metsulfuron methyl, tebuthiuron, or triclopyr to vegetation in Columbian white-tailed deer habitat, utilize the typical, rather than the maximum, application rate.

In addition, site-specific and project specific conservation measures would need to be developed by local BLM offices to ensure complete protection of the Columbian white-tailed deer.

In order to prevent or minimize the potential effects to **lesser and Mexican long-nosed bats** from vegetation treatments, the following conservation measures should be followed:

- Prior to treatments, survey all potentially suitable habitat for the presence of bats or their nectar plants.
- At the local level, incorporate protection of lesser and Mexican long-nosed bats into management plans developed for proposed treatment programs.
- Instruct all field personnel on the identification of bat nectar plants and the importance of their protection.
- Protect nectar plants from modification by treatment activities to the greatest extent possible. Do not remove nectar plants during treatments. Avoid driving over plants, piling slash on top of plants, burning, and using domestic animals to control weeds.
- Do not burn within a mile upwind of known bat roosts.
- To protect nectar plants and roost trees from herbicide treatments, follow recommended buffer zones and other conservation measures for TEP plant species in areas where populations of nectar plants and roost trees occur.
- Do not use 2,4-D, diquat, or diuron, in lesser or Mexican long-nosed bat habitats; do not broadcast spray these herbicides within ¼ mile of lesser or Mexican long-nosed bat habitat.
- Where feasible, avoid use of the following herbicides in lesser and Mexican long-nosed bat habitat: bromacil, clopyralid, fluridone, glyphosate, hexazinone, imazapyr, metsulfuron methyl, picloram, tebuthiuron, and triclopyr.
- Do not broadcast spray clopyralid, glyphosate, hexazinone, picloram, or triclopyr in lesser or
- Mexican long-nosed bat habitat; do not broadcast spray these herbicides in areas adjacent to lesser or Mexican long-nosed bat habitat under conditions when spray drift onto the habitat is likely.
- If broadcast spraying bromacil, imazapyr, or metsulfuron methyl, or tebuthiuron in or near lesser or Mexican long-nosed bat habitat, apply at the typical, rather than the maximum, application rate.
- If conducting manual spot applications of bromacil, diuron, glyphosate, hexazinone, tebuthiuron, or triclopyr to vegetation in lesser or Mexican long-nosed bat habitat, utilize the typical, rather than the maximum, application rate .
- If conducting spot treatments of herbicides in lesser or Mexican long-nosed bat habitats, avoid potential roost sites.

In addition, local BLM offices would be required to prepare site-specific conservation measures to protect these species prior to conducting treatments. In order to prevent negative effects to the **Sonoran pronghorn**, the following conservation measures are required by the BLM:

- Prior to treatments, survey all suitable habitat in areas proposed for treatment for Sonoran pronghorns.
- Avoid biological treatment by domestic animals in areas used as forage by Sonoran pronghorns.
- Avoid fawning areas during treatments.
- Closely follow all application instructions and use restrictions on herbicide labels; in riparian habitats use only those herbicides that are approved for use in riparian areas.
- Avoid broadcast spraying herbicides in key pronghorn foraging areas.
- Do not use 2.4-0 in Sonoran pronghorn habitats; do not broadcast spray 2.4-0 within Y<l mile of Sonoran pronghorn habitat.
- Where feasible, avoid use of the following herbicides in Sonoran pronghorn habitat: bromacil, clopyralid, diquat, diuron, glyphosate, hexazinone, imazapyr, metsulfuron methyl, Overdrive®, picloram, tebuthiuron, and triclopyr.
- Do not broadcast spray bromacil, clopyralid, diquat, diuron, glyphosate, hexazinone, Overdrive®, picloram, or triclopyr in Sonoran pronghorn habitat; do not broadcast spray these herbicides in areas adjacent to Sonoran pronghorn habitat under conditions when spray drift onto the habitat is likely.
- If broadcast spraying imazapyr, metsulfuron methyl, or tebuthiuron in or near Sonoran pronghorn habitat, apply at the typical, rather than the maximum, application rate.
- If conducting manual spot applications of glyphosate, hexazinone, imazapyr, metsulfuron methyl, tebuthiuron, or triclopyr to vegetation in Sonoran pronghorn habitat, utilize the typical, rather than the maximum, application rate.
- In addition, project-specific conservation measures will be applied at the local level, as necessary, to minimize effects to the species.

In order to avert or minimize potential negative effects to **rodents (Hualapai Mexican vole, the Amargosa vole, the Preble's meadow jumping mouse, the riparian woodrat and the Buena Vista Lake ornate shrew)**, the following conservation measures would be required:

- Survey suitable habitat for these species prior to developing treatment programs at the local level. In areas where the Hualapai Mexican vole, Amargosa vole, Preble's meadow jumping mouse, riparian woodrat, or Buena Vista Lake ornate shrew occur:
- Address Hualapai Mexican voles, Amargosa voles, Preble's meadow jumping mice, riparian woodrats, and Buena Vista Lake ornate shrews in all management plans prepared for treatments within areas that contain habitat for these species.
- Do not bum, graze, or conduct mechanical treatments within wetlands and/or riparian areas that support these species.

- Do not bum in areas where woodrat homes are present.
- Use manual spot application of herbicides rather than broadcast treatments.
- Closely follow all application instructions and use restrictions on herbicide labels; in wetland and riparian habitats use only herbicides that are approved for use in those areas.
- Do not use 2,4-D, diquat, or diuron in Hualapai Mexican vole, Amargosa vole, Preble's meadow jumping mouse, or riparian woodrat habitats; do not broadcast spray these herbicides within ¼ mile of Hualapai Mexican vole, Amargosa vole. Preble's meadow jumping mouse, riparian woodrat, or Buena Vista Lake ornate shrew habitat.
- Do not broadcast spray herbicides within Hualapai Mexican vole, Amargosa vole, Preble's meadow jumping mouse, riparian woodrat, or Buena Vista Lake ornate shrew habitat.
- Where feasible, avoid use of the following herbicides in Hualapai Mexican vole, Amargosa vole, Preble's meadow jumping mouse, riparian woodrat, and Buena Vista Lake ornate shrew habitat: clopyralid, fluridone, glyphosate, hexazinone, imazapyr, metsulfuron methyl, picloram, tebuthiuron, and triclopyr.
- Do not broadcast spray c1opyraJid, glyphosate, hexazinone, imazapyr, picloram, or triclopyr in areas adjacent to Hualapai Mexican vole, Amargosa vole, Preble's meadow jumping mouse, riparian woodrat, or Buena Vista Lake ornate shrew habitat under conditions when spray drift onto the habitat is likely.
- If broadcast spraying bromacil, fluridone, metsulfuron methyl, or tebuthiuron near Hualapai
- Mexican vole, Amargosa vole, riparian woodrat, Preble's meadow jumping mouse, or Buena Vista Lake ornate shrew habitat, apply at the typical, rather than the maximum, application rate.
- If conducting manual spot applications of bromacil, glyphosate, hexazinone, tebuthiuron, or triclopyr to vegetation in Hualapai Mexican vole, Amargosa vole, Preble's meadow jumping mouse, riparian woodrat, or Buena Vista Lake ornate shrew habitat, utilize the typical, rather than the maximum, application rate.

These measures represent the minimum that is required of the BLM to protect these species from negative impacts during vegetation treatments. Additional project-specific conservation measures would also need to be developed at the local level, as appropriate.

Implementation of the following conservation measures would ensure that the BLM's activities would not negatively affect the **Northern Idaho ground squirrel**.

- Prior to conducting treatments, survey the area to be treated for northern Idaho ground squirrels.
- At the local level, address northern Idaho ground squirrels and their habitat when developing management plans for proposed treatments.
- Where squirrels are detected, conduct vegetation treatments during the hibernation season, where feasible.
- Prohibit or minimize use of domestic animals in squirrel habitats.

- Design treatments so that only a portion of northern Idaho ground squirrel habitat is in a state of recovery at any one time.
- Design treatments to avoid injury to native bunchgrasses in northern Idaho ground squirrel habitat; consult plant buffer distances and other conservation measures for sensitive plants in Chapter 4 for guidance.
- Do not use 2,4-D, diquat, or diuron in northern Idaho ground squirrel habitats outside of the hibernation period; do not broadcast spray these herbicides within ¼ mile of northern Idaho ground squirrel habitat outside the hibernation period.
- Where feasible, avoid use of the following herbicides in northern ground Idaho squirrel habitat: bromacil, clopyralid, fluridone, glyphosate, hexazinone, imazapyr, metsulfuron methyl, picloram, tebuthiuron, and triclopyr.
- Do not broadcast spray c1opyraJid, glyphosate, hexazinone, picloram, or triclopyr in northern Idaho ground squirrel habitat outside of the hibernation period; do not broadcast spray these herbicides in areas adjacent to northern Idaho ground squirrel habitat outside of the hibernation period under conditions when spray drift onto the habitat is likely.
- If broadcast spraying bromacil, imazapyr, fluridone, metsulfuron methyl, or tebuthiuron in or near northern Idaho ground squirrel habitat outside of the hibernation period, apply at the typical, rather than the maximum, application rate.
- If conducting manual spot applications of bromacil, glyphosate, hexazinone, tebuthiuron, or triclopyr to vegetation in northern Idaho ground squirrel habitat outside of the hibernation period, utilize the typical, rather than the maximum, application rate.

In addition, at the time of project-level NEP A review, local BLM offices would need to include additional conservation measures, specific to both the project and the site, for protecting the Northern Idaho ground squirrel.

In order to minimize or avoid impacts to the **woodland caribou**, the BLM would be required to follow, at a minimum, the programmatic-level conservation measures listed below.

- At the local level, prepare a management plan for all proposed treatment activities that could potentially occur on land utilized by woodland caribou. This management plan must be completed with the assistance of a wildlife biologist and a forest ecologist, and must specifically address caribou and caribou habitat.
- Design prescribed bums and mechanical treatments so that no more than 10% of caribou habitat is affected at any one time.
- Time major herbicide treatments in woodland caribou habitats such that they do not occur during the season when caribou rely on the treatment area for forage.
- Do not use 2,4-D in woodland caribou habitats; do not broadcast spray 2,4-D within ¼ mile of woodland caribou habitat.
- Where feasible, avoid use of the following herbicides in woodland caribou habitat: bromacil, clopyralid, diquat, diuron, glyphosate, hexazinone, imazapyr, metsulfuron methyl, Overdrive®, picloram, tebuthiuron, and triclopyr.

- Do not broadcast spray bromacil, clopyralid, diquat, diuron, glyphosate, hexazinone, Overdrive®, picloram, or triclopyr in woodland caribou habitat; do not broadcast spray these herbicides in areas adjacent to woodland caribou habitat under conditions when spray drift onto the habitat is likely.

- If broadcast spraying imazapyr, metsulfuron methyl, or tebuthiuron in or near woodland caribou habitat, apply at the typical, rather than the maximum, application rate.

- If conducting manual spot applications of glyphosate, hexazinone, imazapyr, metsulfuron methyl, tebuthiuron, or triclopyr to vegetation in woodland caribou habitat, utilize the typical, rather than the maximum, application rate.

Local offices would also be required to develop and implement any additional project- and site specific conservation measures deemed necessary during the preparation of project-level NEPA documentation.

Potential effects to **grizzly bears** from vegetation treatments could be avoided or minimized by following a number of conservation measures:

- Within the Recovery Zone, ensure that all treatment activities comply with the *Interagency Grizzly Bear Guidelines* (Interagency Grizzly Bear Committee 1987) and the *Final Conservation Strategy for the Grizzly Bear in the Yellowstone Ecosystem* (Interagency Conservation Strategy Team 2003) To minimize the potential for displacement/mortality risk during treatments:

- Within the Recovery Zone (defined in *Grizzly Bear Recovery Plan,* USFWS 1993), ensure that any vehicular travel off highway or on restricted roads adheres to access standards/directions as provided in local or regional interagency agreements, biological opinions, or local land use plans.

- Limit all activities requiring overnight stays or establishment of a base camp to less than 20 individuals and less than 5 days within the Grizzly Bear Recovery Zone.

- Limit firewood collection within the Recovery Zone to roadside hazard tree removal, road maintenance, or campground maintenance activities.

- Within the Recovery Zone, do not conduct vegetation treatment activities in riparian meadows and stream corridors between April I and July I, or complete these activities in I day.

- Within the Recovery Zone, do not implement vegetative treatments that would substantially change the vegetative community in huckleberry producing sites.

To minimize the potential for habituation/human conflict:

- Within the Recovery Zone, ensure that all treatment activities adhere to interagency grizzly bear guidelines and standards for sanitation measures and storage of potential attractants, and enforce food storage and garbage disposal stipulations.

- Ensure all workers at treatment sites are aware of appropriate personal safety measures and behavior in grizzly bear habitat.

- Within the Recovery Zone, do not use domestic animals to control weeds.

- Within the Recovery Zone. do not plant or seed highly palatable forage species near roads or facilities used by humans.

To minimize the likelihood that grizzly bears would suffer negative health effects as a result of exposure to herbicides:

- Do not use 2,4-D in the Recovery Zone; do not broadcast spray 2,4-D within ¼ mile of the Recovery Zone
- Where feasible, avoid use of the following herbicides in the Recovery Zone: bromacil, clopyralid, diquat, diuron, glyphosate, hexazinone, imazapyr, metsulfuron methyl, Overdrive®, picloram, tebuthiuron, and triclopyr.
- Do not broadcast spray bromacil, clopyralid, diquat, diuron, glyphosate, hexazinone, Overdrive®, picloram, or triclopyr in the Recovery Zone; do not broadcast spray these herbicides in areas adjacent to the Recovery Zone under conditions when spray drift into the Recovery Zone is likely.
- If broadcast spraying imazapyr, metsulfuron methyl, or tebuthiuron in or near the Recovery Zone, apply at the typical, rather than the maximum, application rate.
- If conducting manual spot applications of glyphosate, hexazinone, imazapyr, metsulfuron methyl, tebuthiuron, or triclopyr to vegetation in the Recovery Zone, utilize the typical, rather than the maximum, application rate.

In addition, analysis of potential site-specific impacts to grizzly bears would occur at the project level, and any additional conservation measures deemed necessary would also need to be applied to ensure that potential effects were minimized or avoided.

In order to minimize or avoid impacts to **lynx**, the BLM must follow, at a minimum, the conservation measures listed below:

- Prior to vegetation treatments, map lynx habitat within areas in which treatments are proposed to occur. Identify potential denning and foraging habitat, and topographic features that may be important for lynx movement (major ridge systems, prominent saddles, and riparian corridors).
- Design vegetation treatments in lynx habitat to approximate historical landscape patterns and disturbance processes.
- Avoid the construction of permanent firebreaks on ridges or saddles in lynx habitat.
- Where possible, keep linear openings out of mapped potential habitat and away from key habitat components, such as denning areas.
- When planning vegetation treatments, minimize the creation of linear openings (fire lines. Access routes, and escape routes) that could result in permanent travel ways for competitors and humans.
- Obliterate any linear openings constructed within lynx habitat in order to deter future uses by humans and competitive species.
- Design bum prescriptions to regenerate or create snowshoe hare habitat (e.g., regeneration of aspen and lodgepole pine).

- Ensure that no more than 30% of lynx habitat within a Lynx Analysis Unit (as defined in Ruediger *et al.* 2(00) would be in an unsuitable condition at any time.

- If deemed necessary, defer livestock grazing following vegetation treatments to ensure the reestablishment of key plant species. Bureau of Land Management personnel should use resource goals and objectives to determine the need for this restriction and the length of deferment on a case by case basis.

- Give particular consideration to amounts of denning habitat, condition of summer and winter foraging habitat, as well as habitat linkages, to ensure that that treatments do not negatively impact lynx. If there is less than 10% lynx habitat in a Lynx Analysis Unit, defer vegetation treatments that would delay development of denning habitat structure. Protect habitat connectivity within and between Lynx Analysis Units.

- Do not use 2,4-D in Canada lynx habitat; do not broadcast spray 2,4-D within ¼ mile of Canada lynx habitat.

- Where feasible, avoid use of the following herbicides in Canada lynx habitat: bromacil, clopyralid, diquat, diuron, glyphosate, hexazinone, imazapyr, metsulfuron methyl, picloram, and triclopyr.

- Do not broadcast spray clopyralid, diuron, glyphosate, hexazinone, picloram, or triclopyr in Canada lynx habitat; do not broadcast spray these herbicides in areas adjacent to Canada lynx habitat under conditions when spray drift onto the habitat is likely.

- If broadcast spraying bromacil, diquat, imazapyr, or metsulfuron methyl in or near Canada lynx habitat, apply at the typical, rather than the maximum, application rate.

- If conducting manual spot applications of glyphosate, hexazinone, or triclopyr to vegetation in

- Canada lynx habitat, utilize the typical, rather than the maximum, application rate.

In addition, the BLM must develop and implement additional conservation measures, as necessary, during project-level analysis at the local level.

In order to minimize or avoid impacts to **San Joaquin kit foxes** from herbicide treatments, the BLM must follow, at a minimum, the programmatic conservation measures listed below:

- Do not use 2,4-D in San Joaquin kit fox habitat; do not broadcast spray 2,4-D within ¼ mile of San Joaquin fox habitat.

- Where feasible, avoid use of the following herbicides in San Joaquin kit fox habitat: bromacil, clopyralid, diquat, diuron, glyphosate, hexazinone, imazapyr, metsulfuron methyl, picloram, tebuthiuron, and triclopyr.

- Do not broadcast spray clopyralid, diuron, glyphosate, hexazinone, picloram, or triclopyr in San Joaquin kit fox habitat; do not broadcast spray these herbicides in areas adjacent to San Joaquin kit fox habitat under conditions when spray drift onto the habitat is likely.

- If broadcast spraying bromacil, diquat, imazapyr, metsulfuron methyl, or tebuthiuron in or near northern San Joaquin kit fox habitat, apply at the typical, rather than the maximum, application rate.

- If conducting manual spot applications of diuron, glyphosate, hexazinone, tebuthiuron, or triclopyr to vegetation in San Joaquin kit fox habitat, utilize the typical, rather than the maximum, application rate.

In addition, the BLM must develop and implement additional conservation measures, as necessary, during project-level analysis at the local level.

The following programmatic-level conservation measures would be required to ensure that the proposed vegetation treatments did not negatively affect **listed kangaroo rat species, the Utah prairie dog, or the black-footed ferret**, or their habitats:

- Prior to conducting vegetation treatments, survey areas scheduled to receive treatments for listed kangaroo rats, Utah prairie dogs. and black-footed ferrets.
- Incorporate these species and their habitat into management plans developed for treatment activities.
- Avoid vegetation treatments during drought conditions.
- Where possible, perform treatments during the hibernation period.
- Do not use 2,4-D in listed kangaroo rat, Utah prairie dog, or black-footed ferret habitats; do not broadcast spray 2,4-D within ¼ mile of listed kangaroo rat, Utah prairie dog, or black-footed ferret habitat.
- Do not use diquat or diuron in listed kangaroo rat or Utah prairie dog habitats; do not broadcast spray these herbicides within ¼ mile of listed kangaroo rat or Utah prairie dog habitat.

Additional conservation measures for **kangaroo rats** and the **Utah prairie dog**:

- Where feasible, avoid use of the following herbicides in listed kangaroo rat and Utah prairie dog habitat: bromacil, clopyralid, fluridone, glyphosate, hexazinone, imazapyr, metsulfuron methyl, picloram, tebuthiuron, and triclopyr.
- Do not broadcast spray clopyralid, glyphosate, hexazinone, picloram, or triclopyr in listed kangaroo rat or Utah prairie dog habitat; do not broadcast spray these herbicides in areas adjacent to listed kangaroo rat or Utah prairie dog habitat under conditions when spray drift onto the habitat is likely.
- If broadcast spraying bromacil, imazapyr, fluridone, metsulfuron methyl, or tebuthiuron in or near listed kangaroo rat or Utah prairie dog habitat, apply at the typical, rather than the maximum, application rate.
- If conducting manual spot applications of bromacil, glyphosate, hexazinone, tebuthiuron, or triclopyr to vegetation in listed kangaroo rat or Utah prairie dog habitat, utilize the typical, rather than the maximum, application rate.

Additional conservation measures for the **black-footed ferret**:

- Where feasible, avoid use of the following herbicides in black-footed ferret habitat: bromacil, clopyralid, diquat, diuron, glyphosate, hexazinone, imazapyr, metsulfuron methyl, picloram, and triclopyr.

- Do not broadcast spray clopyralid, diuron, glyphosate, hexazinone, picloram, or triclopyr in black-footed ferret habitat; do not broadcast spray these herbicides in areas adjacent to black-footed ferret habitat under conditions when spray drift onto the habitat is likely.

- If broadcast spraying bromacil, diquat, imazapyr, or metsulfuron methyl in or near black-footed ferret habitat, apply at the typical, rather than the maximum, application rate.

- If conducting manual spot applications of glyphosate, hexazinone. or triclopyr to vegetation in black-footed ferret habitat, utilize the typical, rather than the maximum, application rate.

- Individual projects would be subject to review at the local level, during which additional conservation measures could be identified as necessary to protect these species.

The following programmatic-level conservation measures are the minimum steps required of the BLM to ensure that **bighorn** sheep and their habitats would not be impacted by vegetation treatment activities. Additional project-specific conservation measures would be identified at the local level, as appropriate.

- Prior to treatment activities, survey suitable habitat for evidence of use by bighorn sheep.

- Do not use domestic animals as a vegetation treatment in bighorn sheep habitat.

- When planning vegetation treatments, minimize the creation of linear openings that could result in permanent travel ways for competitors and humans.

- Obliterate any linear openings constructed within bighorn sheep habitat in order to deter future uses by humans and competitive species.

- Where feasible, time vegetation treatments such that they do not coincide with seasonal use of the treatment area by bighorn sheep.

- Do not broadcast spray herbicides in key bighorn sheep foraging habitats.

- Do not use 2,4-D in bighorn sheep habitat; do not broadcast spray 2,4-D within ¼ mile of bighorn sheep habitat.

- Where feasible, avoid use of the following herbicides in bighorn sheep habitat: bromacil, clopyralid, diquat, diuron, glyphosate, hexazinone, imazapyr, metsulfuron methyl, Overdrive®, picloram, and tebuthiuron, and triclopyr.

- Do not broadcast spray bromacil, clopyralid, diquat, diuron, glyphosate, hexazinone, Overdrive®, picloram, or triclopyr in bighorn sheep habitat; do not broadcast spray these herbicides in areas adjacent to bighorn sheep habitat under conditions when spray drift onto the habitat is likely.

- If broadcast spraying imazapyr, metsulfuron methyl, or tebuthiuron in or near bighorn sheep habitat, apply at the typical, rather than the maximum, application rate.

- If conducting manual spot applications of glyphosate, hexazinone, imazapyr, metsulfuron methyl, tebuthiuron, or triclopyr to vegetation in bighorn sheep habitat, utilize the typical, rather than the maximum, application rate.

Although the proposed vegetation treatments would not be likely to have negative effects on **wolves** or their habitat, the following programmatic-level conservation measures are recommended to ensure protection of the species. Additional or more specific guidance would also be provided at the project level, as appropriate.

- Avoid human disturbance and/or associated activities within I mile of a den site during the breeding period (as determined by a qualified biologist).
- Avoid human disturbance and/or associated activities within I mile of a rendezvous site during the breeding period (as determined by a qualified biologist).
- Do not use 2,4-D in areas where gray wolves are known to occur; do not broadcast spray within ¼ mile of areas where gray wolves are known to occur.
- Where feasible, avoid use of the following herbicides in gray wolf habitat: bromacil, clopyralid, diquat, diuron, glyphosate, hexazinone, imazapyr, metsulfuron methyl, picloram, and triclopyr.
- Do not broadcast spray clopyralid, diuron, glyphosate, hexazinone, picloram, or triclopyr in gray wolf habitat; do not broadcast spray these herbicides in areas adjacent to gray wolf habitat under conditions when spray drift onto the habitat is likely.
- If broadcast spraying bromacil, diquat, imazapyr, or metsulfuron methyl in or near gray wolf habitat, apply at the typical, rather than the maximum, application rate.
- If conducting manual spot applications of glyphosate, hexazinone, or triclopyr to vegetation in gray wolf habitat, utilize the typical, rather than the maximum, application rate.

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Appendix H. SOPs for Applying Herbicides from PEIS

Table H.1. Standard Operating Procedures for Applying Herbicides

Resource Element	Standard Operating Procedure
Guidance Documents	BLM Handbook H-9011-l *(Chemical Pest Control)*; and manuals 1112 *(Safety)*, 9011 *(Chemical Pest Control)*, 9012 *(Expenditure of Rangeland Insect Pest Control Funds)*, 9015 *(Integrated Weed Management)*, and 9220 *(Integrated Pest Management)*.
General	● Prepare operational and spill contingency plan in advance of treatment. ● Conduct a pretreatment survey before applying herbicides. ● Select herbicide that is least damaging to the environment while providing the desired results. ● Select herbicide products carefully to minimize additional impacts from degradates, adjuvants, inert ingredients, and tank mixtures. ● Apply the least amount of herbicide needed to achieve the desired result. ● Follow herbicide product label for use and storage. ● Have licensed applicators apply herbicides. ● Use only USEPA-approved herbicides and follow product label directions and "advisory" statements. ● Review, understand, and conform to the "Environmental Hazards" section on the herbicide product label. This section warns of known pesticide risks to the environment and provides practical ways to avoid harm to organisms or to the environment. ● Consider surrounding land use before assigning aerial spraying as a treatment method and avoid aerial spraying near agricultural or densely populated areas. ● Minimize the size of application area, when feasible. ● Comply with herbicide-free buffer zones to ensure that drift will not affect crops or nearby residents and owners. ● Post treated areas and specify reentry or rest times, if appropriate. ● Notify adjacent landowners prior to treatment. ● Keep a copy of Material Safety Data Sheets (MSDSs) at work sites. MSDSs are available for review at http://www.cdms.netl. ● Keep records of each application, including the active ingredient, formulation, application rate, date, time, and location. ● Avoid accidental direct spray and spill conditions to minimize risks to resources. ● Consider surrounding land uses before aerial spraying. ● Avoid aerial spraying during periods of adverse weather conditions (snow or rain imminent, fog, or air turbulence).

Resource Element	Standard Operating Procedure
	● Make helicopter applications at a target airspeed of 40 to 50 miles per hour (mph), and at about 30 to 45 feet above ground. ● Take precautions to minimize drift by not applying herbicides when winds exceed >10 mph (>6 mph for aerial applications), or a serious rainfall event is imminent. ● Use drift control agents and low volatile formulations. ● Conduct pre-treatment surveys for sensitive habitat and special status species within or adjacent to proposed treatment areas. ● Consider site characteristics, environmental conditions, and application equipment in order to minimize damage to non-target vegetation. ● Use drift reduction agents, as appropriate, to reduce the drift hazard to non-target species. ● Tum off applied treatments at the completion of spray runs and during turns to start another spray run. ● Refer to the herbicide product label when planning revegetation to ensure that subsequent vegetation would not be injured following application of the herbicide. Clean OHVs to remove seeds.
Air Quality See Manual 7000 *(Soil. Water. and Air Management)*	● Consider the effects of wind, humidity, temperature inversions, and heavy rainfall on herbicide effectiveness and risks. ● Apply herbicides in favorable weather conditions to minimize drift. For example, do not treat when winds exceed 10 mph (>6 mph for aerial applications) or rainfall is imminent. ● Use drift reduction agents, as appropriate, to reduce the drift hazard. ● Select proper application equipment (e.g., spray equipment that produces 200- to 800-micron diameter droplets (spray droplets of 100 microns and less are most prone to drift]). ● Select proper application methods (e.g., set maximum spray heights, use appropriate buffer distances between spray sites and non-target resources).
Soil See Manual 7000 *(Soil, Water, and Air Management)*	● Minimize treatments in areas where herbicide runoff is likely, such as steep slopes when heavy rainfall is expected. ● Minimize use of herbicides that have high soil mobility, particularly in areas where soil properties increase the potential for mobility. ● Do not apply granular herbicides on slopes of more than 15% where there is the possibility of runoff carrying the granules into non-target areas.

Resource Element	Standard Operating Procedure
Water Resources See Manual 7000 *(Soil, Water, and Air Management)*	● Consider climate, soil type, slope, and vegetation type when developing herbicide treatment programs. ● Select herbicide products to minimize impacts to water. This is especially important for application scenarios that involve risk from active ingredients in a particular herbicide, as predicted by risk assessments. ● Use local historical weather data to choose the month of treatment. Considering the phenology of the target species, schedule treatments based on the condition of the water body and existing water quality conditions. ● Plan to treat between weather fronts (calms) and at appropriate time of day to avoid high winds that increase water movements, and to avoid potential stormwater runoff and water turbidity. ● Review hydrogeologic maps of proposed treatment areas. Note depths to groundwater and areas of shallow groundwater and areas of surface water and groundwater interaction. ● Minimize treating areas with high risk for groundwater contamination. ● Conduct mixing and loading operations in an area where an accidental spill would not contaminate an aquatic body. ● Do not rinse spray tanks in or near water bodies. Do not broadcast pellets where there is danger of contaminating water supplies. ● Maintain buffers between treatment areas and water bodies. Buffer widths should be developed based on herbicide- and site-specific criteria to minimize impacts to water bodies. ● Minimize the potential effects to surface water quality and quantity by stabilizing terrestrial areas as quickly as possible following treatment.
Wetlands and Riparian Areas	● Use a selective herbicide and a wick or backpack sprayer. ● Use appropriate herbicide-free buffer zones for herbicides not labeled for aquatic use based on risk assessment guidance, with minimum widths of 100 feet for aerial, 25 feet for vehicle, and 10 feet for hand spray applications.
Vegetation See Handbook H-4410-1 *(National Range Handbook)*, and manuals 5000 *(Forest Management)* and 9015 *(Integrated Weed Management)*	● Refer to the herbicide label when planning revegetation to ensure that subsequent vegetation would not be injured following application of the herbicide. ● Use native or sterile species for revegetation and restoration projects to compete with invasive species until desired vegetation establishes. ● Use weed-free feed for horses and pack animals. Use weed-free straw and mulch for revegetation and other activities. ● Identify and implement any temporary domestic livestock grazing and/or supplemental feeding restrictions needed to enhance desirable vegetation recovery following treatment. Consider adjustments in the existing grazing permit, to maintain desirable vegetation on the treatment site.

Resource Element	Standard Operating Procedure
Pollinators	● Complete vegetation treatments seasonally before pollinator foraging plants bloom. ● Time vegetation treatments to take place when foraging pollinators are least active both seasonally and daily. ● Design vegetation treatment projects so that nectar and pollen sources for important pollinators and resources are treated in patches rather than in one single treatment. ● Minimize herbicide application rates. Use typical rather than maximum rates where there are important pollinator resources. ● Maintain herbicide free buffer zones around patches of important pollinator nectar and pollen sources. ● Maintain herbicide free buffer zones around patches of important pollinator nesting habitat and hibernacula. ● Make special note of pollinators that have single host plant species, and minimize herbicide spraying on those plants (if invasive species) and in their habitats.
Fish and Other Aquatic Organisms See manuals 6500 *(Wildlife and Fisheries Management)* and 6780 *(Habitat Management Plans)*	● Use appropriate buffer zones based on label and risk assessment guidance. ● Minimize treatments near fish-bearing water bodies during periods when fish are in life stages most sensitive to the herbicide(s) used, and use spot rather than broadcast or aerial treatments. ● Use appropriate application equipment/method near water bodies if the potential for off-site drift exists. ● For treatment of aquatic vegetation, I) treat only that portion of the aquatic system necessary to achieve acceptable vegetation management, 2) use the appropriate application method to minimize the potential for injury to desirable vegetation and aquatic organisms, and 3) follow water use restrictions presented on the herbicide label.
Wildlife See manuals 6500 *(Wildlife and Fisheries Management)* and 6780 *(Habitat Management Plans)*	● Use herbicides of low toxicity to wildlife, where feasible. ● Use spot applications or low-boom broadcast operations where possible to limit the probability of contaminating non-target food and water sources, especially non-target vegetation over areas larger than the treatment area. ● Use timing restrictions (e.g., do not treat during critical wildlife breeding or staging periods) to minimize impacts to wildlife.
Threatened, Endangered, and Sensitive Species See Manual 6840 *(Special Status Species)*	● Survey for special status species before treating an area. Consider effects to special status species when designing herbicide treatment programs. ● Use a selective herbicide and a wick or backpack sprayer to minimize risks to special status plants. ● Avoid treating vegetation during time-sensitive periods (e.g., nesting and migration, sensitive life stages) for special status species in area to be treated.

Resource Element	Standard Operating Procedure
Livestock See Handbook H-4120-1*(Grazing Management)*	● Whenever possible and whenever needed, schedule treatments when livestock are not present in the treatment area. Design treatments to take advantage of normal livestock grazing rest periods, when possible. ● As directed by the herbicide product label, remove livestock from treatment sites prior to herbicide application, where applicable. ● Use herbicides of low toxicity to livestock, where feasible. ● Take into account the different types of application equipment and methods, where possible, to reduce the probability of contamination of non-target food and water sources. ● Avoid use of diquat in riparian pasture while pasture is being used by livestock. ● Notify permittees of the herbicide treatment project to improve coordination and avoid potential conflicts and safety concerns during implementation of the treatment. ● Notify permittees of livestock grazing, feeding, or slaughter restrictions, if necessary. ● Provide alternative forage sites for livestock, if possible.
Wild Horses and Burros	● Minimize using herbicides in areas grazed by wild horses and burros. ● Use herbicides of low toxicity to wild horses and burros, where feasible. ● Remove wild horses and burros from identified treatment areas prior to herbicide application, in accordance with herbicide product label directions for livestock. ● Take into account the different types of application equipment and methods, where possible, to reduce the probability of contaminating non-target food and water sources.
Cultural Resources and Paleontological Resources See handbooks H-8120-1 *(Guidelines/or Conducting Tribal Consultation)* and H-8270-1 *(General Procedural Guidance for Paleontological Resource Management),* and manuals 8100 *(The Foundations for Managing Cultural Resources), 8120 (Tribal Consultation Under Cultural Resource Authorities),* and 8270 *(Paleontological Resource Management* See also: *Programmatic Agreement among the Bureau of Land Management, the Advisory Council on Historic Preservation. and the National*	● Follow standard procedures for compliance with Section 106 of the National Historic Preservation Act as implemented through the *Programmatic Agreement among the Bureau of Land Management. the Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Officers Regarding the Manner in Which BLM Will Meet Its Responsibilities UI/der the National Historic Preservation Act* and state protocols or 36 Code of Federal Regulations Part 800, including necessary consultations with State Historic Preservation Officers and interested tribes. ● Follow BLM Handbook H-8270-1 *(General Procedural Guidance/or Paleontological Resource Management)* to determine known Condition I and Condition 2 paleontological areas, or collect information through inventory to establish Condition I and Condition 2 areas, determine resource types at risk from the proposed treatment, and develop appropriate measures to minimize or mitigate adverse impacts. ● Consult with tribes to locate any areas of vegetation that are of significance to the tribe and that might be affected by herbicide treatments. ● Work with tribes to minimize impact to these resources. ● Follow guidance under Human Health and Safety in the PElS in areas that may be visited by Native peoples after treatments.

Resource Element	Standard Operating Procedure
Conference of State Historic Preservation Officers Regarding the Manner in Which BLM Will Meet Its Responsibilities Under the National Historic Preservation Act	
Visual Resources See handbooks H-8410-1*(Visual Resource Inventory)* and H-8431-1 *(Visual Resource Contrast Rating)*, and manual 8400 *(Visual Resource Management)*	● Minimize the use of broadcast foliar applications in sensitive watersheds to avoid creating large areas of browned vegetation. ● Consider the surrounding land use before assigning aerial spraying as an application method. ● Minimize off-site drift and mobility of herbicides (e.g., do not treat when winds exceed 10 mph; minimize treatment in areas where herbicide runoff is likely; establish appropriate buffer widths between treatment areas and residences) to contain visual changes to the intended treatment area ● If the area is a Class I or II visual resource, ensure that the change to the characteristic landscape is low and does not attract attention (Class I), or if seen, does not attract the attention of the casual viewer (Class II). ● Lessen visual impacts by: I) designing projects to blend in with topographic forms; 2) leaving area to screen short-term effects; and 3) revegetating the site following treatment. ● When restoring treated areas, design activities to repeat the form, line, color, and texture of the natural landscape character conditions to meet established Visual Resource Management (VRM) objectives.
Wilderness and Other Special Areas See handbooks H-8550-1 *(Management of Wilderness Study Areas (WSAs),* and H-8560-1 *(Management of Designated Wilderness Study Areas,.* and Manual 8351 *(Wild and Scenic Rivers)*	● Encourage backcountry pack and saddle stock users to feed their livestock only weed-free feed for several days before entering a wilderness area. ● Encourage stock users to tie and/or hold stock in such a way as to minimize soil disturbance and loss of native vegetation. ● Revegetate disturbed sites with native species if there is no reasonable expectation of natural regeneration. ● Provide educational materials at trailheads and other wilderness entry points to educate the public on the need to prevent the spread of weeds. ● Use the "minimum tool" to treat noxious and invasive vegetation, relying primarily on the use of ground-based tools, including backpack pumps, hand sprayers. and pumps mounted on pack and saddle stock. ● Use chemicals only when they are the minimum method necessary to control weeds that are spreading within the wilderness or threaten lands outside the wilderness. ● Give preference to herbicides that have the least impact on non-target species and the wilderness environment. ● Implement herbicide treatments during periods of low human use, where feasible. ● Address wilderness and special areas in management plans. ● Maintain adequate buffers for Wild and Scenic Rivers (1/4 mile on either side of river, 1/2 mile in Alaska).

Resource Element	Standard Operating Procedure
Recreation See Handbook H-1601I-1*(Land Use Planning Handbook. Appendix* C)	● Schedule treatments to avoid peak recreational use times, while taking into account the optimum management period for the targeted species. ● Notify the public of treatment methods, hazards, times, and nearby alternative recreation areas. ● Adhere to entry restrictions identified on the herbicide product label for public and worker access. ● Post signs noting exclusion areas and the duration of exclusion, if necessary. ● Use herbicides during periods of low human use, where feasible.
Social and Economic Values	● Consider surrounding land use before selecting aerial spraying as a method, and avoid aerial spraying near agricultural or densely-populated areas. ● Post treated areas and specify reentry or rest times, if appropriate. ● Notify grazing permittees of livestock feeding restrictions in treated areas, if necessary, as per herbicide product label instructions. ● Notify the public of the project to improve coordination and avoid potential conflicts and safety concerns during implementation of the treatment. ● Control public access until potential treatment hazards no longer exist, per herbicide product label instructions. ● Observe restricted entry intervals specified by the herbicide product label. ● Notify local emergency personnel of proposed treatments. ● Use spot applications or low-boom broadcast applications where possible to limit the probability of contaminating non-target food and water sources, especially vegetation over areas larger than the treatment area. ● Consult with Native American tribes and Alaska Native groups to locate any areas of vegetation that are of significance to the tribes and Native groups and that might be affected by herbicide treatments. ● To the degree possible within the law, hire local contractors and workers to assist with herbicide application projects and purchase materials and supplies, including chemicals, for herbicide treatment projects through local suppliers. ● To minimize fears based on lack of information, provide public educational information on the need for vegetation treatments and the use of herbicides in an integrated pest management program for projects proposing local use of herbicides.
Rights-of-way	● Coordinate vegetation management activities where joint or multiple use of a ROW exists. ● Notify other public land users within or adjacent to the ROW proposed for treatment. ● Use only herbicides that are a roved for use in ROW areas.
Human Health and Safety	● Establish a buffer between treatment areas and human residences based on guidance given in the HHRA, with a minimum buffer of 1/4 mile for aerial applications and 100 feet for ground applications, unless a written waiver is granted. ● Use protective equipment as directed by the herbicide product label. ● Post treated areas with appropriate signs at common public access areas. ● Observe restricted entry intervals specified by the herbicide product label.

Resource Element	Standard Operating Procedure
	● Provide public notification in newspapers or other media where the potential exists for public exposure. ● Have a copy of MSDSs at work site. ● Notify local emergency personnel of proposed treatments. ● Contain and clean up spills and request help as needed. ● Secure containers during transport. ● Follow label directions for use and storage. ● Dispose of unwanted herbicides promptly and correctly.

Appendix I. Rock Collecting

General information: A wide variety of rocks, minerals, and semi-precious gemstones are available for collecting on lands managed by the Bureau of Land Management (BLM). Most BLM lands are open to rock collecting. Collectors should note that there are some restrictions, and a BLM permit may be needed depending on the amount of material you collect, how you collect it, where or when you collect, and whether or not it is used commercially. The following information is provided for the public to be used as a general guide for collecting on public lands.

Collecting limits & permits: You can collect a reasonable amount of rocks and minerals from BLM lands, but a permit or fee may be needed if you exceed certain amounts as described below. Permits can be obtained by contacting a Geologist at the Las Vegas Field Office.

Table I.1. Rock Collecting Guidelines

A Reasonable Daily Collecting Amount: ● fits into the trunk of a car or, ● is a partial pickup truck load and, ● the material is for non-commercial use and, ● material weighs less than 250 lbs. and, ● only hand tools are used.	No fee or BLM permit required.
More Than a Reasonable Daily Collecting Amount: ● is a full pickup truck load or, ● involves more than one trip (or partial load) and, ● weighs more than 250 lbs. or, ● the material is for a commercial use or, ● explosives or power equipment is used.	Fee and BLM permit required.

Petrified Wood: Collecting petrified wood is free up to 25 pounds per day, plus one piece, but no more than 250 pounds per year. Pooling of quotas among two or more people to obtain pieces over 250 pounds is prohibited. A permit is needed for amounts over these limits.

Mining claims: Collecting on mining claims is not advised without the mining claimant's consent because the claimant has a legal right to the minerals on the claim, including gemstones. Although mining claims should be marked with posts or markers, not all mining claims can be easily identified in the field. Check with the Las Vegas Field Office to find out if there are any mining claims in the area you want to collect. Many commonly collected rocks such as chert, petrified wood, obsidian, and cinders are not subject to mining claim location, even though people sometimes mistakenly stake mining claims for these minerals.

Rock stockpiles: Some rock quarries on lands managed by the BLM have stock piles of crushed rock in them that have been established by BLM specifically for road maintenance work or by a local government agency (such as city, state, or county) or a company or individual under permit. Removing this stockpiled material is prohibited and considered theft of federal property.

Closed or restricted areas: Although most BLM lands are open to collecting, some areas such as campgrounds, cultural and historic sites, and natural areas are off limits to collecting. Red Rock Canyon National Conservation Area, Sloan Canyon National Conservation Area, national parks and monuments, including BLM-managed monuments are closed to collection. Collection in designated Wilderness and Wilderness Study Areas must be done in a way that doesn't compromise wilderness characteristics. In designated Wilderness; motor vehicles, motorized equipment and mechanical transport, are prohibited and collection equipment is limited to hand tools. In Wilderness Study Areas; motor vehicle travel can occur but only on designated routes and both hand tools and motorized tools can be used for collection. Other types of closures or restrictions, some of which are seasonal, include fire, wildlife and special recreational events. You should check with the local BLM office for more detailed information before starting out on your collecting excursion. In many Areas of Critical Environmental Concern collecting is not permitted to protect cultural sites.

Remains, Artifacts, and Fossils: The excavation, collection or destruction of any human remains and archaeological or historical materials located on federal land is illegal and prohibited by federal and state laws. This includes arrowheads, flakes, pottery, rock art, old bottles and pieces of equipment or buildings. Any human remains should be left intact and reported to Las Vegas Field Office immediately. A permit is needed for collecting vertebrate fossils, but not for common invertebrate fossils.

Other things to remember when collecting:

1. Know whose property you are on.
2. Get permission to collect on private property.
3. Limit your excavation to using hand tools only.
4. Fill in any holes that you have dug.
5. Leave the area and all gates as you found them.
6. Find out if there are any fire restrictions in effect.
7. Stay out of old mines.

Maps and other information: You should contact the Las Vegas Field Office for more detailed information about restricted areas or use restrictions. Many bookstores and rock shops may also have information or sell books and maps that can help you find other, privately-owned collecting areas.

You Can Help! Please help to preserve our heritage. Report any suspicious activity that may involve the theft or vandalism of any remains, artifacts, or fossils to any BLM office.

Appendix J. Wild and Scenic River Suitability Study

J.1. Wild and Scenic River – Suitability Study

BLM Las Vegas and Pahrump Field Offices

Suitability Factors and Guidelines

J.1.1. Eligible River / Segment: Virgin River Segments 1-3

Table J.1. Virgin River Segments 1-3

Suitability Study is designed to answer:	Pro Discussion	Con Discussion
1. Characteristics that do or do not make the area a worthy addition to the National Wild and Scenic Rivers System. These characteristics are described in the WSR Act (see factors 2-7) and may include additional suitability factors (8-14)	Consistency with upstream suitable stretch. Possible funding sources possible from Fish and Wildlife for both segments. May have socio-economic benefit by having a designated river in Mesquite. ID team vote=5	ACEC to protect river corridor. Flexibility for future needs such as flood control. Enforcement of protection may be difficult, as it is now. Mesquite has done bulldozing along the river to protect from flooding. ID team vote=4
2. The current status of land ownership and use in the area. Jurisdictional (or administrative role and/or presence) consideration must be taken into account to the extent that management would be affected.	ACEC compatible with Wild and Scenic River to manage critical habitat. If ACEC dissolved there would be no protections along the river corridor.	Significant non federal land ownership makes it difficult for BLM to manage. Mesquite plans for flood control.
3. The reasonably foreseeable potential uses of the land and water which would be enhanced, foreclosed, or curtailed if the area were included in the NWSRS.		City of Mesquite flood control berms and Clark County plans for flood control.
4. The federal agency or State agency that will administer the area should it be added to the NWSRS.	BLM would manage the river. Possible support from Fish and Wildlife.	BLM would have no additional funding to protect the river.
5. The extent to which the agency proposes that administration of the river, including the costs thereof, are shared by state, local or other agencies and individuals.	Potential funding source would be the Virgin River HCP. SNPLMA	No support expected. Costs may be high.

6. The estimated cost to the United States of acquiring necessary lands and interests in lands and of administering the area should it be added to the NWSRS. Section 6 of the Act outlines policies and limitations on acquiring lands or interest in land, by donation, exchange, consent of owners, easement, transfer, assignment or rights, or condemnation within and outside established river boundaries.	Exchanges may be possible. (No cost estimates available.)	No funding for purchase of lands, or land exchanges. (No cost estimate available.)
7. A determination of the degree to which the state or its political subdivisions might participate in the preservation and administration of the river should it be proposed for inclusion in the NWSRS.	Virgin River Partnership for recovery of fish, and SWFL habitat.	No group has come forward to actively support designation for the protection of the Virgin River in Nevada.
8. The federal agency's ability or other mechanisms (existing or potential) to protect and manage the identified river related values other than WSR designation. The state/local government's ability to manage and protect the ORVs on nonfederal lands. This factor requires an evaluation of the river protection mechanisms available through the authority of state and local governments. Such mechanisms may include, for example, statewide programs related to population growth management, vegetation management, water quantity or quality, or protection of river-related values such and open space and historic areas.	Current ACEC does not include all of segments 1, 2, and 3. If ACECs are dropped, there will be little or no protection for the fish and wildlife.	Visual ORVs may be protected by VRM classes set in the RMP. ACEC for Critical Habitat may protect fish and wildlife. Cultural resource may be protected by the ARPA. NDOW has protections for fish and wildlife.
9. The consistency of designation with other agency plans, programs or policies. For example, designation of a river may contribute to state or regional protection objectives for fish and wildlife resources. Similarly, adding a river which includes a limited recreation activity or setting to the National System may help meet statewide recreation goals. Designation might, however, limit irrigation and/or flood control measures in a manner inconsistent with regional socioeconomic goals.	Consistency with County flood control.	Consistency with HCP.

10. Support or opposition to designation. Assessment of this factor will define the political context. The interest in designation or nondesignation by federal, state, local, and tribal governments and national and local publics should be considered, as well as the state's political delegation.	From public scoping, there was no interest. The state and county did not express an interest.	SNWA may support but they did not make a comment on this.
11. Historical or existing rights which could be adversely affected. In determining suitability, consideration of any valid existing rights must be afforded under applicable laws (including the WSRA), regulations, and/or policies.	Grand fathered uses such as mining would still occur with approved plan of operations.	Water rights may be affected if River is managed for instream flows for fish and wildlife. Recreational OHV use may be affected. Minerals would be withdrawn.
12. The contribution to river system or basin integrity. This factor reflects the benefits of a "systems" approach, i.e., expanding the designated portion of a river in the National System or developing a legislative proposal for an entire river system (headwaters to mouth) or watershed. Numerous benefits are likely to result from managing an entire river or watershed, including the ability to design a holistic protection strategy in partnership with other agencies and the public.	Would contribute to upstream suitable segments. Lower end protection would complement NPS management of the National Recreation Area.	
13. The potential for water resources development. The intent of the Act is to preserve selected rivers from the harmful effects of water resources projects. Designation will limit development of water resources projects as diverse as irrigation and flood control measures, hydropower facilities, dredging, diversion and channelization.	Water development could be beneficial. The flood control areas needing protection are small and may not affect Wild and Scenic designation. There is interest in sending more water to Lake Mead and having no more diversions.	

J.1.2. Eligible River / Segment: Meadow Valley Wash

Table J.2. Meadow Valley Wash

Suitability Study is designed to answer:	Pro Discussion	Con Discussion
1. Characteristics that do or do not make the area a worthy addition to the National Wild and Scenic Rivers System.	Suitable to protect water. ID team vote = 7	ID team vote = 2

These characteristics are described in the WSR Act (see factors 2-7) and may include additional suitability factors (8-14)		
2. The current status of land ownership and use in the area. Jurisdictional (or administrative role and/or presence) consideration must be taken into account to the extent that management would be affected.	Most of the wash is under federal ownership would simplify management.	Railroad ROW in corridor. Wash outs and maintenance issue may impact river corridor.
3. The reasonably foreseeable potential uses of the land and water which would be enhanced, foreclosed, or curtailed if the area were included in the NWSRS.	Stuart Ranch Restoration would enhance management of a designated river. ACEC conservation activities would enhance area.	Jeeps and 4wd routes to Lincoln county. Withdrawn from future mineral development.
4. The federal agency or State agency that will administer the area should it be added to the NWSRS.	BLM Army corps of engineers - Restoration	BLM
5. The extent to which the agency proposes that administration of the river, including the costs thereof, are shared by state, local or other agencies and individuals.		Minimum sharing of costs.
6. The estimated cost to the United States of acquiring necessary lands and interests in lands and of administering the area should it be added to the NWSRS. Section 6 of the Act outlines policies and limitations on acquiring lands or interest in land, by donation, exchange, consent of owners, easement, transfer, assignment or rights, or condemnation within and outside established river boundaries.	None	
7. A determination of the degree to which the state or its political subdivisions might participate in the preservation and administration of the river should it be proposed for inclusion in the NWSRS.		No interest expressed during scoping.
8. The federal agency's ability or other mechanisms (existing or potential) to protect and manage the identified river related values other than WSR designation. The state/local government's ability to manage and protect the ORVs on nonfederal lands. This factor requires an evaluation of the river protection mechanisms available through the authority of state and local governments.	If ACECs would be dropped, much protection along Meadow Valley wash would be lost. ACEC protection is limited because it is for Tortoise.	Could be affected by Railroad easement. Stuart Ranch restoration area would help provide protection. Current ACECs also provide protection. Cultural values are protected by ARPA.

Such mechanisms may include, for example, statewide programs related to population growth management, vegetation management, water quantity or quality, or protection of river-related values such and open space and historic areas.		
9. The consistency of designation with other agency plans, programs or policies. For example, designation of a river may contribute to state or regional protection objectives for fish and wildlife resources. Similarly, adding a river which includes a limited recreation activity or setting to the National System may help meet statewide recreation goals. Designation might, however, limit irrigation and/or flood control measures in a manner inconsistent with regional socioeconomic goals.	Designation would assist in protecting critical habitat with adjacent ACECs.	Lincoln county section of Meadow Valley wash that is eligible does not reach Clark County line.
10. Support or opposition to designation. Assessment of this factor will define the political context. The interest in designation or nondesignation by federal, state, local, and tribal governments and national and local publics should be considered, as well as the state's political delegation.		Railroad would not be happy with designation.
11. Historical or existing rights which could be adversely affected. In determining suitability, consideration of any valid existing rights must be afforded under applicable laws (including the WSRA), regulations, and/or policies.	Stuart Ranch would not be adversely impacted.	Railroad not consistent (ownership challenges)
12. The contribution to river system or basin integrity. This factor reflects the benefits of a "systems" approach, i.e., expanding the designated portion of a river in the National System or developing a legislative proposal for an entire river system (headwaters to mouth) or watershed. Numerous benefits are likely to result from managing an entire river or watershed, including the ability to design a holistic protection strategy in partnership with other agencies and the public.	Protection of habitat by designation due to proposal to withdraw groundwater.	Adjacent portion of Meadow Valley Wash in Lincoln County is not eligible.
13. The potential for water resources development.	No dams or diversions are proposed.	Energy Proposals.

The intent of the Act is to preserve selected rivers from the harmful effects of water resources projects. Designation will limit development of water resources projects as diverse as irrigation and flood control measures, hydropower facilities, dredging, diversion and channelization.		

J.1.3. Eligible River / Segment: Muddy River

Table J.3. Muddy River

Suitability Study is designed to answer:	Pro Discussion	Con Discussion
1. Characteristics that do or do not make the area a worthy addition to the National Wild and Scenic Rivers System. These characteristics are described in the WSR Act (see factors 2-7) and may include additional suitability factors (8-14)		ID team concurrence. Not suitable.
2. The current status of land ownership and use in the area. Jurisdictional (or administrative role and/or presence) consideration must be taken into account to the extent that management would be affected.		Huge land ownership issues. Checker board ownership would be a nightmare to manage.
3. The reasonably foreseeable potential uses of the land and water which would be enhanced, foreclosed, or curtailed if the area were included in the NWSRS.	Tribal water rights protected.	Irrigation and other water developments are common.
4. The federal agency or State agency that will administer the area should it be added to the NWSRS.		BLM
5. The extent to which the agency proposes that administration of the river, including the costs thereof, are shared by state, local or other agencies and individuals.		None

6. The estimated cost to the United States of acquiring necessary lands and interests in lands and of administering the area should it be added to the NWSRS. Section 6 of the Act outlines policies and limitations on acquiring lands or interest in land, by donation, exchange, consent of owners, easement, transfer, assignment or rights, or condemnation within and outside established river boundaries.		No estimates done.
7. A determination of the degree to which the state or its political subdivisions might participate in the preservation and administration of the river should it be proposed for inclusion in the NWSRS.		None
8. The federal agency's ability or other mechanisms (existing or potential) to protect and manage the identified river related values other than WSR designation. The state/local government's ability to manage and protect the ORVs on nonfederal lands. This factor requires an evaluation of the river protection mechanisms available through the authority of state and local governments. Such mechanisms may include, for example, statewide programs related to population growth management, vegetation management, water quantity or quality, or protection of river-related values such and open space and historic areas.		Mixed ownership makes management difficult.
9. The consistency of designation with other agency plans, programs or policies. For example, designation of a river may contribute to state or regional protection objectives for fish and wildlife resources. Similarly, adding a river which includes a limited recreation activity or setting to the National System may help meet statewide recreation goals. Designation might, however, limit irrigation and/or flood control measures in a manner inconsistent with regional socioeconomic goals.		None

10. Support or opposition to designation. Assessment of this factor will define the political context. The interest in designation or nondesignation by federal, state, local, and tribal governments and national and local publics should be considered, as well as the state's political delegation.		None
11. Historical or existing rights which could be adversely affected. In determining suitability, consideration of any valid existing rights must be afforded under applicable laws (including the WSRA), regulations, and/or policies.		A lot of development including roads, diversions etc.
12. The contribution to river system or basin integrity. This factor reflects the benefits of a "systems" approach, i.e., expanding the designated portion of a river in the National System or developing a legislative proposal for an entire river system (headwaters to mouth) or watershed. Numerous benefits are likely to result from managing an entire river or watershed, including the ability to design a holistic protection strategy in partnership with other agencies and the public.		Mixed ownership and current development makes this nearly impossible.
13. The potential for water resources development. The intent of the Act is to preserve selected rivers from the harmful effects of water resources projects. Designation will limit development of water resources projects as diverse as irrigation and flood control measures, hydropower facilities, dredging, diversion and channelization.		Small diversions and development already in place.

J.1.4. Eligible River / Segment: Hiko Spring

Table J.4. Hiko Spring

Suitability Study is designed to answer:	Pro Discussion	Con Discussion
1. Characteristics that do or do not make the area a worthy addition to the National Wild and Scenic Rivers System.	ID team team vote = 2	ID team vote = 7 Not suitable.

These characteristics are described in the WSR Act (see factors 2-7) and may include additional suitability factors (8-14)		
2. The current status of land ownership and use in the area. Jurisdictional (or administrative role and/or presence) consideration must be taken into account to the extent that management would be affected.	BLM	BLM
3. The reasonably foreseeable potential uses of the land and water which would be enhanced, foreclosed, or curtailed if the area were included in the NWSRS.	Upland bird hunting	OHV incursions
4. The federal agency or State agency that will administer the area should it be added to the NWSRS.	BLM	BLM
5. The extent to which the agency proposes that administration of the river, including the costs thereof, are shared by state, local or other agencies and individuals.	None	NDOW minimal
6. The estimated cost to the United States of acquiring necessary lands and interests in lands and of administering the area should it be added to the NWSRS. Section 6 of the Act outlines policies and limitations on acquiring lands or interest in land, by donation, exchange, consent of owners, easement, transfer, assignment or rights, or condemnation within and outside established river boundaries.	None	None
7. A determination of the degree to which the state or its political subdivisions might participate in the preservation and administration of the river should it be proposed for inclusion in the NWSRS.	None	None
8. The federal agency's ability or other mechanisms (existing or potential) to protect and manage the identified river related values other than WSR designation. The state/local government's ability to manage and protect the ORVs on nonfederal lands. This factor requires an evaluation of the river protection mechanisms available through the authority of state and local governments. Such mechanisms may include, for		Adequate protections for this riparian area can be provided by the RMP and ACEC protections may be given. No threats from diversions or damming.

example, statewide programs related to population growth management, vegetation management, water quantity or quality, or protection of river-related values such and open space and historic areas.		
9. The consistency of designation with other agency plans, programs or policies. For example, designation of a river may contribute to state or regional protection objectives for fish and wildlife resources. Similarly, adding a river which includes a limited recreation activity or setting to the National System may help meet statewide recreation goals. Designation might, however, limit irrigation and/or flood control measures in a manner inconsistent with regional socioeconomic goals.	No conflicts.	No conflicts.
10. Support or opposition to designation. Assessment of this factor will define the political context. The interest in designation or nondesignation by federal, state, local, and tribal governments and national and local publics should be considered, as well as the state's political delegation.		No support.
11. Historical or existing rights which could be adversely affected. In determining suitability, consideration of any valid existing rights must be afforded under applicable laws (including the WSRA), regulations, and/or policies.	None	None
12. The contribution to river system or basin integrity. This factor reflects the benefits of a "systems" approach, i.e., expanding the designated portion of a river in the National System or developing a legislative proposal for an entire river system (headwaters to mouth) or watershed. Numerous benefits are likely to result from managing an entire river or watershed, including the ability to design a holistic protection strategy in partnership with other agencies and the public.		Stand alone.
13. The potential for water resources development.		Low to none.

The intent of the Act is to preserve selected rivers from the harmful effects of water resources projects. Designation will limit development of water resources projects as diverse as irrigation and flood control measures, hydropower facilities, dredging, diversion and channelization.		

J.1.5. Eligible River / Segment: Carson Slough

Table J.5. Carson Slough

Suitability Study is designed to answer:	Pro Discussion	Con Discussion
1. Characteristics that do or do not make the area a worthy addition to the National Wild and Scenic Rivers System. These characteristics are described in the WSR Act (see factors 2-7) and may include additional suitability factors (8-14)	ID team vote = 1	ID team vote = 8 Not suitable
2. The current status of land ownership and use in the area. Jurisdictional (or administrative role and/or presence) consideration must be taken into account to the extent that management would be affected.	BLM	BLM
3. The reasonably foreseeable potential uses of the land and water which would be enhanced, foreclosed, or curtailed if the area were included in the NWSRS.		Possible mining. Increased access of nearby road improved, possible private land development.
4. The federal agency or State agency that will administer the area should it be added to the NWSRS.	BLM	BLM
5. The extent to which the agency proposes that administration of the river, including the costs thereof, are shared by state, local or other agencies and individuals.	Fish and Wildlife may share costs for future restoration.	None

6. The estimated cost to the United States of acquiring necessary lands and interests in lands and of administering the area should it be added to the NWSRS. Section 6 of the Act outlines policies and limitations on acquiring lands or interest in land, by donation, exchange, consent of owners, easement, transfer, assignment or rights, or condemnation within and outside established river boundaries.	NA	NA
7. A determination of the degree to which the state or its political subdivisions might participate in the preservation and administration of the river should it be proposed for inclusion in the NWSRS.		Low, Nye County will not be supportive.
8. The federal agency's ability or other mechanisms (existing or potential) to protect and manage the identified river related values other than WSR designation. The state/local government's ability to manage and protect the ORVs on nonfederal lands. This factor requires an evaluation of the river protection mechanisms available through the authority of state and local governments. Such mechanisms may include, for example, statewide programs related to population growth management, vegetation management, water quantity or quality, or protection of river-related values such and open space and historic areas.		An ACEC can protect the area, and it is adjacent to Ash Meadows Wildlife refuge.
9. The consistency of designation with other agency plans, programs or policies. For example, designation of a river may contribute to state or regional protection objectives for fish and wildlife resources. Similarly, adding a river which includes a limited recreation activity or setting to the National System may help meet statewide recreation goals. Designation might, however, limit irrigation and/or flood control measures in a manner inconsistent with regional socioeconomic goals.	Next to wildlife refuge. Ash Meadows has not done Wild and Scenic Rivers studies yet. No conflicts.	

10. Support or opposition to designation. Assessment of this factor will define the political context. The interest in designation or nondesignation by federal, state, local, and tribal governments and national and local publics should be considered, as well as the state's political delegation.		Nye County expressed concern about Wild and Scenic designation.
11. Historical or existing rights which could be adversely affected. In determining suitability, consideration of any valid existing rights must be afforded under applicable laws (including the WSRA), regulations, and/or policies.	NA	NA
12. The contribution to river system or basin integrity. This factor reflects the benefits of a "systems" approach, i.e., expanding the designated portion of a river in the National System or developing a legislative proposal for an entire river system (headwaters to mouth) or watershed. Numerous benefits are likely to result from managing an entire river or watershed, including the ability to design a holistic protection strategy in partnership with other agencies and the public.	Low probability, unknown at this time.	
13. The potential for water resources development. The intent of the Act is to preserve selected rivers from the harmful effects of water resources projects. Designation will limit development of water resources projects as diverse as irrigation and flood control measures, hydropower facilities, dredging, diversion and channelization.		Protected by ACEC, and riparian regulations.

J.2. BLM Management Recommendations for the preferred alternative:

Virgin River Segments 1, 2, and 3 – Not Suitable (Mixed land ownership, and no support from local communities, and flood control issues would interfere with managing as a Wild and Scenic River.)

Meadow Valley Wash – Suitable from the Lincoln County line, approximately three miles to the first section of privately owned land. The remainder of Meadow Valley Wash would not be suitable, due to mixed land ownership and difficulties in management due to the railroad ROW and utility corridor.

Muddy River – Not Suitable – Mixed land ownership makes it impossible to manage as a Wild and Scenic River. (The majority of the Muddy River is adjacent to private land and there is no local support for designation.)

Hiko Spring – Not Suitable – No current threats aside from OHV incursions. The riparian area can be protected through measures in the RMP, and with a possible ACEC designation.

Carson Slough – Not Suitable – There would be not support from Nye County. The riparian area is protected by measures in the RMP, and is an ACEC.

Appendix K. Wild and Scenic Rivers Review Eligibility Determination

K.1. Wild and Scenic Rivers Review Eligibility Determination

Southern Nevada District Office (SNDO) — Las Vegas Field Office And Pahrump Field Offices — Bureau Of Land Management

BLM

Wild and Scenic Rivers Review Eligibility Determination

United States Department of the Interior

Bureau of Land Management

Southern Nevada District
Las Vegas and Pahrump Field Offices
October, 2010

Public Lands USA: Use, Share, Appreciate

NATIONAL SYSTEM OF PUBLIC LANDS

Wild and Scenic Rivers Review
Eligibility Determination

United States Department of Interior

Bureau of Land Management

Southern Nevada District

Las Vegas and Pahrump Field Offices

4701 N. Torrey Pines Drive

Las Vegas, NV 89130-2301

Phone: 702-515-5000

Prepared by: Marilyn E Peterson 12-17-10
Outdoor Recreation Planner Date

Approved by: 1/7/11
Southern Nevada District Office Manager Date

Concurrence by: 12/17/10
Las Vegas Field Office Manager Date

Concurrence by: 12/17/10
Pahrump Field Office Manager Date

K.1.1. Introduction –Wild and Scenic Rivers Act (WSRA)

The Wild and Scenic Rivers Act, P.L. 90-542, became law on October 2, 1968. It preserves "certain selected rivers" that "possess outstandingly remarkable scenic, recreational, geologic, fish, wildlife, historic, cultural, or other similar values… in their free-flowing condition… for the benefit and enjoyment of present and future generations." Eight rivers or river segments were included as initial components in the National Wild and Scenic Rivers System (National System). Congress and /or the Secretary of the Interior have added 195 rivers or river segments to the National System since then.

Section 5(d)(1) of the Wild and Scenic Rivers Act directs federal agencies to consider the potential for national wild, scenic, and recreational river areas in all planning for the use and development of water and related resources. This eligibility review is being conducted for the Southern Nevada District Office, Las Vegas Field Office (LVFO) and Pahrump Field Office (PFO) as part of the Resource Management Plan Revision (RMP revision).

K.1.2. Authorities and Guidelines

The following documents were utilized in guiding the WSR planning process through the Eligibility/Tentative Classification phase:

- Interagency Wild and Scenic Rivers Coordination Council, 1982. Contains various technical papers relating to evaluation of Wild and Scenic Rivers. (See website at: http://www.rivers.gov/publications.html)

- *Wild and Scenic Rivers Act*, P.L. 90-542, as amended. Congressional legislative direction for Wild and Scenic River planning.

- *Wild and Scenic Rivers – Policy and Program Direction for Identification, Evaluation, and Management, Bureau of Land Management Manual – 8351*, 1992 and changes as of 1993. Establishes BLM policy, program direction, and procedural standards for fulfilling requirements of the Wild and Scenic Rivers Act.

K.1.3. History of Wild and Scenic River Process – Southern Nevada District Office, Las Vegas and Pahrump Field Offices

The Arizona Statewide Wild & Scenic Rivers Final Legislative Environmental Impact Statement (USDI BLM 1994), the Arizona Strip District Resource Management Plan/Environmental Impact Statement (USDI BLM 1990), and the Virgin River Habitat Management Plan (USDI BLM 1984) identified the Virgin River in Arizona as eligible and suitable for designation in the National Wild and Scenic System for possessing remarkable scenic, geologic, fisheries, and wildlife values. The Las Vegas Resource Management Plan and Final Environmental Impact Statement (October 1998), provided interim management protection for the Virgin River in Nevada, as an eligible river with a tentative classification of recreational. No further study has been completed to date in Nevada.

K.1.4. Eligibility Review by Interdisciplinary Team

Summary of the Review Process

A team of specialists from the Southern Nevada District Office began the Wild and Scenic review process in April of 2010. Team members agreed to use the *Ecological Subregions* (USFS ECOMAP, 1993; as adapted from Ecoregions of the United States, R.G. Bailey, 1994). The data was organized according to 4th level of Hydrologic Unit Codes (HUC). The review was restricted to streams adjacent to BLM managed lands found on 1:100,000 scale maps with at least one mile of surface flows. (See Attachment A, Streams Having Less Than One Mile of Surface Flows)

Team members used the *Wild and Scenic Rivers – Policy and Program Direction for Identification, Evaluation, and Management, Bureau of Land Management Manual – 8351*, 1992 and changes as of 1993, to guide them through the eligibility process.

Streams were grouped by drainage within each HUC, and evaluated to see if they were free-flowing, or not. The next step was to analyze free-flowing drainages for significant river-related resource values or features. These values were compared with values present in similar streams within the Ecological Subregion/sections. Streams or portions of streams with the most significant values, and those with multiple significant values rated the highest for "outstandingly remarkable values" (ORVs). Free-flowing streams with ORVs were given a tentative classification based on the criteria listed on the Classification Table in Attachment B.

Steps in the Eligibility Review Process

A. **Identification of Potentially Eligible Rivers**

Rivers to consider were identified from the following sources:

a. Nationwide Rivers Inventory (NRI) list, NPS 1995, (Utah modified Oct. 5, 2001) (listed the Virgin River, see Attachment C)

b. No rivers were identified in public scoping during RMP process (February 2-28, 2010)

c. Identified by Federal Agencies, State of Nevada, Indian Tribes, local governments, and professional specialists within the BLM Southern Nevada District Office (SNDO). The SNDO ID Team reviewed all streams with at least one mile of above ground flows found on 1:100,000 maps. A list of the streams reviewed is shown in Attachment D.

B. **Consideration of Free-flowing**

Five rivers in the Las Vegas and Pahrump Field Offices have been determined to be free-flowing. The five rivers are the Virgin River, the Muddy River, Meadow Valley Wash, Hiko Spring, and Carson Slough. Free-flowing is defined [in the Wild and Scenic Rivers Act Section 16(b)] "as applied to any river or section of a river, means existing or flowing in natural condition without impoundment, diversion, straightening, rip-rapping, or other modification of the waterway. The existence, however, of low dams, diversion works, and other minor structures at the time any river is proposed for inclusion in the national wild and scenic rivers system shall not automatically bar its consideration for such inclusion: *Provided*, That this shall not be construed to authorize, intend, or encourage future construction of such structures within the components of the national wild and scenic rivers system."

C. Identification of Outstandingly Remarkable Values (ORVs)

For a river to be eligible for inclusion in the National System it must possess one or more Outstandingly Remarkable Values (ORVs). To be determined outstandingly remarkable, resources should be river-related and at least regional in significance. Rare, unique, or exemplary river-related resources are considered. Criteria to use are discussed in BLM Manual 8351 section .3, and can be summarized as follows:

Scenery – Diversity of view, Special Features, Seasonal Variations, Cultural Modifications

Fish – Habitat Quality, Diversity of Species, Value of Species, Abundance of fish, Natural Reproduction, Size and Vigor of Fish, Cultural/Historic Importance, Recreational Importance, Access

Recreation – Water Oriented – Length of Season, Diversity of Use, Flow, Character of Run, Scenery/Naturalness, Access, Level of Use, Associated Opportunities, and Attraction.

Recreation – General – Length of Season, Diversity of Use, Experience Quality, Scenery/Naturalness, Access, Level of Use, Associated Opportunities, Attraction, Sites and Facilities

Wildlife – Habitat Quality, Diversity of Species, Abundance of Species, Natural Reproduction, Size and Vigor of Species, Cultural/Historic Importance, Recreational Importance, Access

Geologic – Feature Abundance, Diversity of Features, Educational/Scientific

Historic – Significance, Site Integrity, Educational/Interpretation, Listing/Eligibility

Cultural – Significance, Current Uses, Number of Cultures, Site Integrity, Education/Interpretation, Listing/Eligibility

Ecological – Species Diversity, Ecological Function, Rare Communities, Education/Scientific

The Interdisciplinary (ID) Team subject matter specialists evaluated and found ORVs for all five free-flowing rivers. The portion of the Virgin River in Nevada with adjacent BLM lands was split into two segments making a total five rivers with six river segments having ORVs. Attachment E provides the specific ORV descriptions prepared by the ID team specialists for the seven eligible segments.

D. Region of Comparison

To be determined outstandingly remarkable, resources should be at least regionally significant. The Basin and Range, and the Mojave Desert Regions were used as the regions of comparison for Southern Nevada. Each resource was compared by the interdisciplinary team to other such resources within the region of comparison, and considering the exemplary, rare or unique qualities of each resource, in order to determine regional (or national) significance. Those river segments deemed to have insufficient value were dropped from further consideration.

E. Tentative Classification

A “Tentative Classification” of Wild, Scenic, or Recreational is determined for all eligible rivers/segments. Tentative classifications are based on the type and degree of human

development associated with the river and adjacent land, as they exist at the time of the evaluation. The four key elements are:

1. Water Resources Development

2. Shoreline Development

3. Accessibility

4. Water Quality

Eligible rivers are classified Wild, Scenic, or Recreational based on man's activities. A Wild river is free of impoundments, with shorelines or watersheds essentially primitive, and having unpolluted waters. A Scenic river may have some development, and may be accessible in places by roads. A Recreational river is a river or segment of river accessible by road or railroad; it may have more extensive development along its shoreline, and may have undergone some impoundment or diversion in the past. (See Attachment B, *Classification Criteria for Wild, Scenic, and Recreational River Areas*)

F. **Eligibility of River(s)/Segments Evaluated**The BLM Las Vegas and Pahrump Field Offices ID team found the Virgin River, the Muddy River, Meadow Valley Wash, Hiko Spring, and Carson Slough to be eligible for inclusion in the National System. The preliminary boundaries include ¼ mile from the ordinary high water mark on both sides of the rivers. The table below provides summary information about the river(s)/segments found to be eligible. They are illustrated on Map 1. Details of the Outstandingly Remarkable Values for these segments are in Attachment E, *Outstandingly Remarkable Values of Eligible Rivers*.

Table K.1. BLM Las Vegas and Pahrump Field Offices – Wild and Scenic Rivers Eligibility Determination

Watercourse, Segment Description and Approximate Length in Free-Flowing BLM River Miles (BLMRM), Total River Miles (TRM)*	Outstandingly Remarkable Values	Tentative Classification
Virgin River :		
Segment 1 Arizona/Nevada Stateline (Mile 0) to the bridge at Riverside (Mile 14) (BLMRM 10)(TRM 14)	Scenery, cultural, fish, wildlife	Recreational
Segment 2 Riverside Bridge(Mile 14) to the Overton State Wildlife Management Area (Mile 24) (BLMRM 5)(TRM 10)	Scenery, cultural, fish, wildlife	Recreational
Segment 3 Overton State Wildlife Management Area (Mile 24) to Lake Mead National Recreation Area (Mile 30) (BLMRM 3)(TRM 6)	Scenery, cultural, fish, wildlife	Recreational

Muddy River: All portions of the Muddy River that are adjacent to BLM managed lands from Reed-Gardner power plant to private land just north of Logandale **(BLMRM 1.5)(TRM 11)**	Wildlife, cultural, fish	Recreational
Meadow Valley Wash: Stuart Ranch to Glendale **(BLMRM 6)(TRM 11)**	Wildlife, cultural, fish	Scenic
Hiko Spring: Segment begins where Highway 163 curves north in Section 12, to ¼ mile downstream from lower waterfall **(BLMRM 2) (TRM 2)**	Wildlife, geology, cultural, scenery, recreation	Wild
Carson Slough: Ash Meadows boundary to approximately 1 mile downstream **(BLMRM 1) (TRM 1)**	Wildlife, cultural	Wild

K.1.5. Input from Local Governments, Agencies, Tribes, Organizations, and the Public

Preliminary eligibility findings for the Las Vegas and Pahrump Field Offices were made available for public review and comment in August and September, 2010. State and local governments, Native American Tribes, organizations, cooperating federal agencies, and members of the public were asked to review the preliminary findings, provide comments related to the findings, and to identify any potentially eligible rivers or information that had been overlooked.

All comments received were carefully reviewed. Documentation of the BLM response to comments is on file at the Southern Nevada District Office.

K.1.6. Suitability Study

The seven eligible segments will be further reviewed as to their suitability for congressional designation into the National System. This will be done within the framework of the ongoing planning process for the Las Vegas and Pahrump Field Office Resource Management Plan (RMP) revision, including the development of an Environmental Impact Statement.

K.1.7. Interface with Agencies with Contiguous Boundaries

A. **Spring Mountains National Recreation Area, Humboldt-Toiyabe National Forest**

The Humboldt-Toiyabe National Forest did not find any eligible or suitable rivers or streams contiguous to the planning area. A copy of the Las Vegas and Pahrump Field Office's eligibility findings has been provided to the Humboldt-Toiyabe National Forest.

B. **Red Rock Canyon and Sloan Canyon National Conservation Areas (NCA) – BLM**

Red Rock Canyon and Sloan Canyon NCAs have not completed eligibility or suitability studies at this time. A copy of the Las Vegas and Pahrump Field Office's eligibility findings has been provided to Red Rock and Sloan NCAs.

C. Arizona Strip Field Office – BLM

The Arizona Statewide Wild & Scenic Rivers Final Legislative Environmental Impact Statement (USDI BLM 1994), the Arizona Strip District Resource Management Plan/Environmental Impact Statement (USDI BLM 1990), and the Virgin River Habitat Management Plan (USDI BLM 1984) identified the Virgin River in Arizona as eligible and suitable for designation in the National Wild and Scenic Rivers System for possessing remarkable scenic, geologic, fisheries, and wildlife values. Segments and classifications in Arizona are shown in the table below.

Watercourse & Segments	Outstandingly Remarkable Values	Tentative Classification
Virgin River:		
Segment 1 Utah state line to I-15	Scenery, Recreational, Wildlife, Fish, Geologic, Aquatic	Wild
Segment 2 I-15 to Virgin River Campground	Same as above	Scenic
Segment 3 Virgin River Campground to the mouth of the Virgin River Gorge	Same as above	Recreational
Segment 4 Mouth of the Virgin River Gorge to the Nevada Stateline	Same as above	Recreational

D. Barstow Field Office – BLM

In March of 2009, several segments of the Amargosa River in California were added to the National Wild and Scenic Rivers System. The designated segments of the Amargosa River in California are not contiguous with the Amargosa River in Nevada.

E. Needles Field Office – BLM

There have been no eligibility or suitability studies completed in the Needles Field Office. A copy of the Las Vegas and Pahrump Field Office's eligibility findings has been provided to Needles Field Office.

F. Caliente Field Office - BLM

There are no eligible rivers/segments between the Las Vegas and Caliente Field Offices. Meadow Valley Wash was found to be eligible during Caliente RMP 2008, but none of the eligible segments are contiguous with Las Vegas Field Office. A copy of the Las Vegas and Pahrump Field Office's eligibility findings has been provided to Caliente BLM.

G. Tonapah Field Office – BLM

There have been no eligibility or suitability studies completed in the Tonapah Field Office. A copy of the Las Vegas and Pahrump Field Office's eligibility findings has been provided to Tonapah Field Office.

H. **US Fish and Wildlife Service**

Desert National Wildlife Refuge and Ash Meadows have not completed eligibility or suitability studies. A copy of the Las Vegas and Pahrump Field Office's eligibility findings has been provided to the US Fish and Wildlife Service.

I. **National Park Service**

Wild and Scenic River studies have not been completed for Lake Mead National Recreation Area. Death Valley National Park did not identify any eligible or suitable rivers or streams adjacent to the planning area. A copy of the Las Vegas and Pahrump Field Office's eligibility findings has been provided to Lake Mead National Recreation Area and Death Valley National Park.

J. **Valley of Fire State Park**

There have been no Wild and Scenic Rivers eligibility or suitability studies completed in the Valley of Fire State Park. A copy of the Las Vegas and Pahrump Field Office's eligibility findings has been provided to Valley of Fire State Park.

K.1.8. ID Team

Table K.2. Southern Nevada District Office Interdisciplinary Team Members

Name	Title	Team Responsibility
Marilyn Peterson	Outdoor Recreation Planner	Team Coordinator
John Evans	Planning & Environmental Coordinator	Planning Coordinator
Susan Farkas	Planning & Environmental Coordinator	Planning Coordinator
Robert Dieli	Supervisory, Outdoor Recreation Planner	Scenery, Recreation
Chris Linehan	Outdoor Recreation Planner	Scenery, Recreation
Kathy August	Outdoor Recreation Planner	Scenery, Recreation
Lee Kirk	Outdoor Recreation Planner	Scenery, Recreation
Mark Sanchez	Outdoor Recreation Planner	Scenery, Recreation
Lauren Brown	Visual Resources Management	Scenery
George Varhalmi	Geologist	Geology
Evan Allen	Geologist	Geology
Fred Edwards	Botanist	Ecology, native plants, riparian
Sarah Peterson	Hydrologist	Hydrology, riparian
Meghan Magill	Hydrologist	Hydrology, riparian
Susanne Rowe	Archaeologist	Historic, Cultural
Nora Caplette	Invasives Specialist	Plants, Ecology
Jessie Stegmeier	Wildlife Biologist	Fish , Wildlife
Amelia Savage	Wildlife Biologist	Fish , Wildlife
Mark Slaughter	Wildlife Biologist	Fish , Wildlife
Carrie Ronning	MSHCP Coordinator	Endangered Species, ecology
Brenda Warner	Realty Specialist	Knowledge of Resource Area

K.1.9. References

BLM, State of Utah, *Wild and Scenic River Review in the State of Utah, Process and Criteria for Interagency Use*, July 1996

BLM. Wild and Scenic Rivers – *Policy and Program Direction for Identification, Evaluation, and Management – 8351*, updated Dec. 22 1993

Interagency Wild and Scenic Rivers Coordination Council, 1982 (www.rivers.gov/publications.html)

National Park Service, National Rivers Inventory (NRI) List, 1995, (Utah list modified October 5, 2001)

K.1.10. Attachment A: Streams Having Less Than One Mile of Surface Flows

The study was restricted to streams with at least one mile of surface flows. The following list of streams was not included in the Wild and Scenic Eligibility Review. They are dry or have less than one contiguous mile of flow.

Stream Name	HUC Number and Name
Amargosa River	18090202
Grapevine Springs	Amargosa River
Willow Creek	16060014
Cold Creek	Cold Creek
Trout Canyon	16060015
Lovell Wash	Trout Canyon
Carpenter Canyon	
Wheeler Wash	
Red Rock Spring (Mud Wash)	15010005
Red Bluff Spring (Mud Wash)	Red Rock Spring
Nichol Creek	
Juanita spring	
Cabon Creek	

K.1.11. Attachment B: Classification Criteria for Wild, Scenic, and Recreational River Areas

ATTRIBUTE	WILD	SCENIC	RECREATIONAL
Water Resources Development	Free of impoundment.	Free of impoundment.	Some existing impoundment or diversion. The existence of low dams, diversions, or other modifications of the waterway is acceptable, provided the waterway remains generally natural and riverine in appearance.

Shoreline Development	Essentially primitive. Little or no evidence of human activity. The presence of a few inconspicuous structures, particularly those of historic or cultural value, is acceptable. A limited amount of domestic livestock grazing or hay production is acceptable. Little or no evidence of past timber harvest. No ongoing timber harvest.	Largely primitive and undeveloped. No substantial evidence of human activity. The presence of small communities or dispersed dwellings or farm structures is acceptable. The presence of grazing, hay production, or row crops is acceptable. Evidence of past or ongoing timber harvest is acceptable, provided the forest appears natural from the riverbank.	Some development. Substantial evidence of human activity. The presence of extensive residential development and a few commercial structures is acceptable. Lands may have been developed for the full range of agricultural and forestry uses. May show evidence of past and ongoing timber harvest.
Accessibility	Generally inaccessible except by trail. No roads, railroads or other provision for vehicular travel within the river area. A few existing roads leading to the boundary of the river area is acceptable.	Accessible in places by road. Roads may occasionally reach or bridge the river. The existence of short stretches of conspicuous or longer stretches of inconspicuous roads or railroads is acceptable.	Readily accessible by road or railroad. The existence of parallel roads or railroads on one or both banks as well as bridge crossings and other river access points is acceptable.
Water Quality	Meets or exceeds federal criteria for federally approved state standards for aesthetics, for propagation of fish and wildlife normally adapted to the habitat of the river, and for primary contact recreation (swimming), except where exceeded by natural conditions.	No criteria prescribed by the Act. The Federal Water Pollution Control Act Amendments of 1972 have made it a national goal that all waters of the United States be made fishable and swimmable. Therefore, rivers will not be precluded from scenic or recreational classification because of poor water quality at the time of their study, provided a water quality improvement plan exists or is being developed in compliance with applicable federal and state laws.	

K.1.12. Attachment C: River Lists Considered in Wild and Scenic Rivers Eligibility Review

Bureau of Land Management, Southern Nevada District Office — Las Vegas Field Office and Pahrump Field Office

Table K.3. River Lists Considered in Wild and Scenic Rivers Eligibility Review

Source	River	Segment Description	Total River Miles	Recommended Classification	Outstandingly Remarkable Values (ORVs)
Nationwide Rivers Inventory List	Virgin River	Arizona-Nevada State border to Lake Mead	30	Recreational	Scenery, Geology, Fish, Wildlife
American Whitewater Affiliation Nationwide Whitewater Inventory	None	None in Southern Nevada District	N/A	N/A	N/A

K.1.13. Attachment D: Major Streams Reviewed, Las Vegas and Pahrump Field Offices

Stream Name	HUC Number and Name
	18090202
Carson Slough	Amargosa River
	15030101
Hiko Springs	Hiko Springs
Meadow Valley Wash	15010012 & 15010013
Muddy River	Meadow Valley Wash and Muddy River
	15010016
Virgin River (segments 1-3 in Nevada)	Virgin River
Mile 0-14	15010005
Mile 14-24	Red Rock Spring
Mile 24-30	

K.1.14. Attachment E: Outstandingly Remarkable Values of Eligible Rivers

Table K.4. Outstandingly Remarkable Values of Eligible Rivers

River/Segment Name and Other Information	Description Of Values Present
Virgin River: Segment (1) Arizona/Nevada Stateline (Mile 0) to the bridge at Riverside (Mile 14) Tentative Classification: Segment (1): Recreational	**Scenery** The Virgin River provides stark visual contrast with the surrounding desert landscape. Since water is a scarce resource, this large flowing river provides unique scenic values. Lush riparian vegetation provides many shades of green which contrast with the browns, yellows, and grays of surrounding desert vegetation. Riparian plants also create a contrast in form and texture with the surrounding vegetation, providing vertical structure which differs from the low desert shrubs. The motion of flowing water is known to contribute to the visual complexity or a landscape. Highly complex landscapes are generally perceived as more visually appealing by humans. The meandering nature of sections of the river also creates interesting patterns that add complexity to the landscape.

River/Segment Name and Other Information	Description Of Values Present
Reason for Tentative Classification: Segment (1): Substantial evidence of human activity, houses, roads, farm and ranch development present. BLM Free-flowing River Miles: Segment (1): 10 Reason for Free-flowing Determination: Segment (1): Natural Flow	**Wildlife** The Virgin River provides a variety of habitat for many types of wildlife species, both avian and terrestrial. Large mammals, such as desert bighorn sheep, rely on the river for water during drought and winter months. The Virgin River is important habitat for Southwestern willow flycatcher, Yuma clapper rail and other BLM sensitive species. Critical habitat for Southwestern willow flycatcher is located along the Virgin River. Many raptors utilize this river and rocky outcrops associated with it, during winter and breeding seasons. Shorebirds and songbirds, such as the phainopepla also depend on the river for habitat and forage. **Fish** This segment of the river is also home to two federally listed fish species, Virgin River chub and woundfin. A BLM sensitive species, the Virgin River spinedace, also historically inhabited this segment. Within the Mojave Desert, river habitats are uncommon and extremely important to the ecosystem. **Cultural** The remains of numerous pithouses and pueblos are found on both sides of the Virgin River. The Basketmaker and Anasazi peoples lived on the river terraces and farmed the floodplain. No important studies have been conducted since the late 1980s.
Virgin River: Segment (2) Riverside Bridge(Mile 14) to the Overton State Wildlife Management Area (Mile 24) Tentative Classification: Segment (2): Recreational Reason for Tentative Classification: Segment (2): Substantial evidence of human activity, houses, roads, farm and ranch development present. BLM Free-flowing River Miles: Segment (2): 5 Reason for Free-flowing Determination: Segment (2): Natural Flow	**Scenery** The Virgin River provides stark visual contrast with the surrounding desert landscape. Since water is a scarce resource, this large flowing river provides unique scenic values. Lush riparian vegetation provides many shades of green which contrast with the browns, yellows, and grays of surrounding desert vegetation. Riparian plants also create a contrast in form and texture with the surrounding vegetation, providing vertical structure which differs from the low desert shrubs. The motion of flowing water is known to contribute to the visual complexity or a landscape. Highly complex landscapes are generally perceived as more visually appealing by humans. The meandering nature of sections of the river also creates interesting patterns that add complexity to the landscape. **Wildlife** The Virgin River provides a variety of habitat for many types of wildlife species, both avian and terrestrial. Large mammals, such as desert bighorn sheep, rely on the river for water during drought and winter months. The Virgin River is important habitat for Southwestern willow flycatcher, Yuma clapper rail and other BLM sensitive species. Critical habitat for Southwestern willow flycatcher is located along the Virgin River. Many raptors utilize this river and rocky outcrops associated with it, during winter and breeding seasons. Shorebirds and songbirds, such as the phainopepla also depend on the river for habitat and forage. **Fish** This segment of the river is also home to two federally listed fish species, Virgin River chub and woundfin. A BLM sensitive species, the Virgin River spinedace, also historically inhabited this segment. Within the Mojave Desert, river habitats are uncommon and extremely important to the ecosystem. **Cultural** The remains of numerous pithouses and pueblos are found on both sides of the Virgin River. The Basketmaker and Anasazi peoples lived on the river terraces and farmed the floodplain. No important studies have been conducted since the late 1980s.

River/Segment Name and Other Information	Description Of Values Present
Virgin River: Segment (3) Overton State Wildlife Management Area (Mile 24) to Lake Mead National Recreation Area (Mile 30) Tentative Classification: Segment (3): Recreational Reason for Tentative Classification: Segment (3): Substantial evidence of human activity, houses, roads, farm and ranch development present. BLM Free-flowing River Miles: Segment (3): 3 Reason for Free-flowing Determination: Segment (3): Natural Flow	**Scenery** The Virgin River provides stark visual contrast with the surrounding desert landscape. Since water is a scarce resource, this large flowing river provides unique scenic values. Lush riparian vegetation provides many shades of green which contrast with the browns, yellows, and grays of surrounding desert vegetation. Riparian plants also create a contrast in form and texture with the surrounding vegetation, providing vertical structure which differs from the low desert shrubs. The motion of flowing water is known to contribute to the visual complexity or a landscape. Highly complex landscapes are generally perceived as more visually appealing by humans. The meandering nature of sections of the river also creates interesting patterns that add complexity to the landscape. **Wildlife** The Virgin River provides a variety of habitat for many types of wildlife species, both avian and terrestrial. Large mammals, such as desert bighorn sheep, rely on the river for water during drought and winter months. The Virgin River is important habitat for Southwestern willow flycatcher, Yuma clapper rail and other BLM sensitive species. Critical habitat for Southwestern willow flycatcher is located along the Virgin River. Many raptors utilize this river and rocky outcrops associated with it, during winter and breeding seasons. Shorebirds and songbirds, such as the phainopepla also depend on the river for habitat and forage. **Fish** This segment of the river is also home to two federally listed fish species, Virgin River chub and woundfin. A BLM sensitive species, the Virgin River spinedace, also historically inhabited this segment. Within the Mojave Desert, river habitats are uncommon and extremely important to the ecosystem. **Cultural** The remains of numerous pithouses and pueblos are found on both sides of the Virgin River. The Basketmaker and Anasazi peoples lived on the river terraces and farmed the floodplain. No important studies have been conducted since the late 1980s.
Meadow Valley Wash: Segment (1) Stuart Ranch to Glendale Tentative Classification: Segment (1): Scenic Reason for Tentative Classification: Segment (1): Road near portions of stream, and minor ranching development are present. BLM Free-flowing River Miles: Segment (1): 6	**Wildlife** Meadow Valley wash is a richly riparian system that supports a network of beaver ponds, which create habitat for many other species of wildlife. Shorebirds and songbirds, such as the phainopepla, also depend on the wash for habitat and forage. Ducks and other waterbirds depend on high spring flows for stopping points during migration. Raptors utilize rocky outcrops associated with this wash, during winter and breeding seasons. **Fish** Meadow Valley wash was historically habitat for BLM sensitive fish including Meadow Valley Wash desert sucker and Meadow Valley speckled dace. **Cultural**

River/Segment Name and Other Information	Description Of Values Present
Reason for Free-flowing Determination: Segment (1): Natural Flow	Petroglyphs line both sides of the canyon near Stuart Ranch. Lithics and milling equipment are often found as well as enigmatic rock alignments. The Huntsman Cabin, which dates to the late 1800s, is located on the ranch. Located to the south midway between Stuart Ranch and Glendale is Stuart Rockshelter. Although the shelter is on private land it is an important cultural site in southern Nevada. The shelter was excavated in the 1960s and artifacts document prehistoric use and occupation from the Paleoindians to the Paiutes.
Muddy River: Segment (1) All portions of the Muddy River in Nevada adjacent to BLM managed lands. Tentative Classification: Segment (1): Recreational Reason for Tentative Classification: Segment (1): Substantial evidence of human activity is present. This includes structures, roads, and fish barriers. BLM Free-flowing River Miles: Segment (1): 1.5 Reason for Free-flowing Determination: Segment (1): Natural Flow	**Wildlife** The Muddy River provides a variety of habitat for many types of wildlife species, both avian and terrestrial. Large mammals, such as desert bighorn sheep, rely on the river for water during drought and winter months. The Muddy River is important habitat for Southwestern willow flycatcher, Yuma clapper rail and other BLM sensitive species. Shorebirds and songbirds, such as the phainopepla, also depend on the river for habitat and forage. **Fish** This segment of the river is also important habitat for federally listed Moapa dace and BLM sensitive Moapa speckled dace and the Muddy River population of the Virgin River chub. The Muddy River is habitat for rare invertebrate species. Within the Mojave Desert, river habitats are uncommon and extremely important to the ecosystem. **Cultural** The remains of numerous prehistoric pithouses and pueblos are found on both sides of the Muddy River. The Basketmaker and Anasazi people lived on the river terraces and farmed the floodplain. Black Dog Mesa Archaeological Complex, which includes Black Dog Cave, is eligible for listing on the National Register of Historic Places. The mesa contains the remains of more than 20 pithouses—some have been excavated—and researchers have documented occupation as early as A.D. 90.
Hiko Spring: Segment (1) Segment begins where Hwy 163 curves north in Section 12, to ¼ mile downstream from lower waterfall. Tentative Classification: Segment (1): Wild	**Wildlife** Hiko Spring provides a variety of habitat for many types of wildlife species, both avian and terrestrial. Hiko Spring has dense riparian vegetation at the headwaters. This is important habitat for many migratory bird species. Steep canyon walls may also be important habitat for breeding and wintering raptors. Rocky habitat surrounding Hiko Spring is also important habitat for large mammals, such as desert bighorn sheep. Amphibians also utilize portions of the spring and associated flow.

K.1.15. Map 1 Southern Nevada District Office Eligible Rivers

K.2. Amendment To: Wild and Scenic Rivers Review Eligibility Determination

Amendment to:
Wild and Scenic Rivers Review
Eligibility Determination

United States Department of Interior
Bureau of Land Management
Southern Nevada District
Las Vegas and Pahrump Field Offices
4701 N. Torrey Pines Drive
Las Vegas, NV 89130-2301
Phone: 702-515-5000

Prepared by: Marilyn E Peterson 1/13/2014
Outdoor Recreation Planner Date

Approved by: E. L. C. Lee 1/13/2014
Southern Nevada District Office Manager Date

Concurrence by: [illegible] 1/13/2014
Las Vegas Field Office Manager Date

I. History of Wild and Scenic River Review for the Virgin River in Nevada

The Virgin River, segments one and two were included in the original study completed October, 2010. The Virgin River, segment three was dropped during that process since the map showed no Bureau of Land Management (BLM) parcels of land adjacent to the segment.Updated maps show recent acquisition of land parcels adjacent to segment three, therefore the eligibility review needs to be completed for the segment.

II. Eligibility Study Virgin River Segment Three

The eligibility study of segment three of the Virgin River followed the same process described in the original 2010 study. (See the October, 2010 Wild and Scenic Rivers Review Eligibility Determination for a description of the process followed.)

III. Findings for the Virgin River Segment Three

The BLM Las Vegas and Pahrump Field Offices ID team found the Virgin River segment three to be eligible for inclusion in the National System. The preliminary boundaries include ¼ miles from the ordinary high water mark on both sides of the river. The tentative classification is "Recreational", and the outstandingly remarkable values include; scenery, cultural, fish, and wildlife. Details of the outstandingly remarkable values are in the following table, Outstandingly Remarkable Values of Eligible Rivers.

Table K.5. Outstandingly Remarkable Values of Eligible Rivers

River/Segment Name and Other Information Description Of Values Present	River/Segment Name and Other Information Description Of Values Present
Virgin River: Segment (3) Overton State Wildlife Management Area (Mile 24) to Lake Mead National Recreation Area (Mile 30) Tentative Classification: Segment (3): Recreational Reason for Tentative Classification: Segment (3): Substantial evidence of human activity, houses, roads, farm and ranch development present.	**Scenery** The Virgin River provides stark visual contrast with the surrounding desert landscape. Since water is a scarce resource, this large flowing river provides unique scenic values. Lush riparian vegetation provides many shades of green which contrast with the browns, yellows, and grays of surrounding desert vegetation. Riparian plants also create a contrast in form and texture with the surrounding vegetation, providing vertical structure which differs from the low desert shrubs. The motion of flowing water is known to contribute to the visual complexity or a landscape. Highly complex landscapes are generally perceived as more visually appealing by humans. The meandering nature of sections of the river also creates interesting patterns that add complexity to the landscape. **Wildlife** The Virgin River provides a variety of habitat for many types of wildlife species, both avian and terrestrial. Large mammals, such as desert bighorn sheep, rely on the river for water during drought and winter months. The Virgin River is important habitat for Southwestern willow flycatcher, Yuma clapper rail and other BLM sensitive species. Critical habitat for Southwestern willow flycatcher is located along the Virgin River. Many raptors utilize this river and rocky outcrops associated with it, during winter and breeding seasons. Shorebirds and songbirds, such as the phainopepla also depend on the river for habitat and forage.

River/Segment Name and Other Information Description Of Values Present	River/Segment Name and Other Information Description Of Values Present
BLM Free-flowing River Miles: Segment (3): 3 Reason for Free-flowing Determination: Segment (3): Natural Flow	**Fish** This segment of the river is also home to two federally listed fish species, Virgin River chub and woundfin. A BLM sensitive species, the Virgin River spinedace, also historically inhabited this segment. Within the Mojave Desert, river habitats are uncommon and extremely important to the ecosystem. **Cultural** The remains of numerous pithouses and pueblos are found on both sides of the Virgin River. The Basketmaker and Anasazi peoples lived on the river terraces and farmed the floodplain. No important studies have been conducted since the late 1980s.

IV. Suitability Study

Segment three of the Virgin River will be further reviewed as to its suitability for congressional designation into the National System. This will be done within the framework of the ongoing planning process for the Las Vegas and Pahrump Field Office Resource Management Plan (RMP) revision, including the development of an Environmental Impact Statement.

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Appendix L. Consolidated Conservation Measures from Herbicide PEIS

Consolidated Conservation Measures from Biological Assessment for the Vegetation Treatments Using Herbicides in 17 States EIS

L.1. General

- The BLM will identify appropriate application methods, including rate, time, and mode of application (source characterization) for projects involving the use of herbicides.

- The BLM will use interactive spreadsheets developed during preparation of the Forest Service and BLM ERAs to determine estimates of chemical exposure for species of interest for herbicide applications in the action area. First, the TEP species will be sorted into the ERA surrogate classes based on food and shelter requirements and taxonomic similarity. Information on the chemical characteristics of the herbicide, mode and rate of application, and local environmental conditions (e.g., soil type, rainfall) are also entered into the spreadsheet to calculate the exposure value. These values can then be compared to a table listing risk levels to determine the potential for an acute or chronic risk to the species of interest. Risk levels for TEP species are provided in the ERA and in the following chapters.

- The BLM will incorporate mitigation and conservation measures identified in the ERAs and BA, and from analysis of exposure levels based on modeling, to eliminate or reduce risks to TEP species. It is possible that conservation measures would be less restrictive than those listed in subsequent sections of this BA if local site conditions were evaluated using the ERAs when developing project-level conservation measures.

- The BLM will use herbicides in a manner that is consistent with labeling instructions, design criteria, and any issued reasonable and prudent measures with terms and conditions to ensure that unlawful taking of an ESA-listed species does not occur. In the event incidental take is likely as a result of the action, the Biological Opinion (BO) will include an incidental take statement that exempts the BLM from the prohibitions of take under Section 9 of the ESA.

L.2. Plants

- A survey of all proposed action areas within potential habitat by a botanically qualified biologist, botanist, or ecologist to determine the presence/absence of the species.

- Establishment of site-specific no activity buffers by a qualified botanist, biologist, or ecologist in areas of occupied habitat within the proposed project area. To protect occupied habitat, treatment activities would not occur within these buffers.

- Collection of baseline information on the existing condition of TEP plant species and their habitats in the proposed project area.

- Establishment of pre-treatment monitoring programs to track the size and vigor of TEP populations and the state of their habitats. These monitoring programs would help in anticipating the future effects of vegetation treatments on TEP plant species.

- Assessment of the need for site revegetation post treatment to minimize the opportunity for noxious weed invasion and establishment.

At a minimum, the following must be included in all management plans:

- Given the high risk for damage to TEP plants and their habitat from burning, mechanical treatments, and use of domestic animals to contain weeds, none of these treatment methods should be utilized within 330 feet of sensitive plant populations UNLESS the treatments are specifically designed to maintain or improve the existing population.
- Off-highway use of motorized vehicles associated with treatments should be avoided in suitable or occupied habitat.
- Biological control agents (except for domestic animals) that affect target plants in the same genus as TEP species must not be used to control target species occurring within the dispersal distance of the agent.
- Prior to use of biological control agents that affect target plants in the same family as TEP species, the specificity of the agent with respect to factors such as physiology and morphology should be evaluated, and a determination as to risks to the TEP species made.
- Post-treatment monitoring should be conducted to determine the effectiveness of the project.

In addition, the following guidance must be considered in all management plans in which herbicide treatments are proposed to minimize or avoid risks to TEP species. The exact conservation measures to be included in management plans would depend on the herbicide that would be used, the desired mode of application, and the conditions of the site. Given the potential for off-site drift and surface runoff, populations of TEP species on lands not administered by the BLM would need to be considered if they are located near proposed herbicide treatment sites.

- Herbicide treatments should not be conducted in areas where TEP plant species may be subject to direct spray by herbicides during treatments.
- Applicators should review understand, and conform to the "Environmental Hazards" section on herbicide labels (this section warns of known pesticide risks and provides practical ways to avoid harm to organisms or the environment).
- To avoid negative effects to TEP plant species from off-site drift, surface runoff, and/or wind erosion, suitable buffer zones should be established between treatment sites and populations (confirmed or suspected) of TEP plant species, and site-specific precautions should be taken (refer to the guidance provided below).
- Follow all instructions and Standard Operating Procedures (SOPs) to avoid spill and direct spray scenarios into aquatic habitats that support TEP plant species.
- Follow all BLM operating procedures for avoiding herbicide treatments during climatic conditions that would increase the likelihood of spray drift or surface runoff.

The following conservation measures refer to sites where broadcast spraying of herbicides, either by ground or aerial methods, is desired. Manual spot treatment of undesirable vegetation can occur within the listed buffer zones if it is determined by local biologists that this method of herbicide application would not pose risks to TEP plant species in the vicinity. Additional precautions during spot treatments of vegetation within habitats where TEP plant species occur

should be considered while planning local treatment programs, and should be included as conservation measures in local-level NEPA documentation.

The buffer distances provided below are conservative estimates, based on the information provided by ERAs, and are designed to provide protection to TEP plants. Some ERAs used regression analysis to predict the smallest buffer distance to ensure no risks to TEP plants. In most cases, where regression analyses were not performed, suggested buffers extend out to the first modeled distance from the application site for which no risks were predicted. In some instances the jump between modeled distances was quite large (e.g., 100 feet to 900 feet). Regression analyses could be completed at the local level using the interactive spreadsheets developed for the ERAs, using information in ERAs and for local site conditions (e.g., soil type, annual precipitation, vegetation type, and treatment method), to calculate more precise, and possibly smaller buffers for some herbicides.

2,4-D

- Because the risks associated with this herbicide were not assessed, do not spray within ½ mile of terrestrial plant species or aquatic habitats where TEP aquatic plant species occur.
- Do not use aquatic formulations in aquatic habitats where TEP aquatic plant species occur.
- Assess local site conditions when evaluating the risks from surface water runoff to TEP plants located within ½ mile downgradient from the treatment area.
- In areas where wind erosion is likely, do not apply within ½ mile of TEP plant species.

Bromacil

- Do not apply within 1,200 feet of terrestrial TEP plant species.
- If using a low boom at the typical application rate, do not apply within 100 feet of an aquatic habitat in which TEP plant species occur.
- If using a low boom at the maximum application rate or a high boom, do not apply within 900 feet of an aquatic habitat in which TEP plant species occur.
- In areas where wind erosion is likely, do not apply within ½ mile ofTEP plant species.

Chlorsulfuron

- Do not apply by ground methods within 1,200 feet of terrestrial TEP species.
- Do not apply by aerial methods within 1,500 feet of terrestrial TEP species.
- Do not apply by ground methods within 25 feet of aquatic habitats where TEP plant species occur.
- Do not apply by aerial methods at the maximum application rate within 300 feet of aquatic habitats where TEP plant species occur.
- Do not apply by aerial methods at the typical application rate within 100 feet of aquatic habitats where TEP plant species occur.
- In areas where wind erosion is likely, do not apply within ½ mile of TEP plant species.

Clopyralid

- Since the risks associated with using a high boom are unknown, use only a low boom during ground applications of this herbicide within ½ mile of terrestrial TEP plant species or aquatic habitats in which TEP plant species occur.
- Do not apply by ground methods at the typical application rate within 900 of terrestrial TEP species.
- Do not apply by ground methods at the typical application rate within ½ mile of terrestrial TEP species.
- Do not apply by aerial methods within ½ mile of terrestrial TEP species.
- In areas where wind erosion is likely, do not apply within ½ mile of TEP plant species.

Dicamba

- If using a low boom at the typical application rate, do not apply within 1,050 feet of terrestrial TEP plant species.
- If using a low boom at the maximum application rate, do not apply within 1,050 feet of terrestrial TEP plant species.
- If using a high boom, do not apply within 1,050 feet of terrestrial TEP plant species.
- Do not apply within 25 feet of aquatic habitats where TEP plant species occur.
- In areas where wind erosion is likely, do not apply within ½ mile of TEP plant species.

Diflufenzopyr

- If using a low boom at the typical application rate, do not apply within 100 feet of terrestrial TEP plant species.
- If using a high boom, or a low boom at the maximum application rate, do not apply within 900 feet of terrestrial TEP plant species.
- If using a high boom, do not apply within 500 feet of terrestrial TEP plant species.
- Do not apply within 25 feet of aquatic habitats where TEP plant species occur.
- In areas where wind erosion is likely, do not apply within ½ mile of TEP plant species.

Diquat

- Do not use in aquatic habitats where TEP aquatic plant species occur.
- Do not apply by ground methods within 1,000 feet of terrestrial TEP species at the maximum application rate.
- Do not apply by ground methods within 900 feet of terrestrial TEP species at the typical application rate.
- Do not apply by aerial methods within 1,200 feet of terrestrial TEP species.

Diuron

- Do not apply within J, 100 feet of terrestrial TEP species.
- If using a low boom at the typical application rate, do not apply within 900 feet of aquatic habitats where TEP aquatic plant species occur.
- If using a high boom, or a low boom at the maximum application rate, do not apply within 1,1000 feet of aquatic habitats where TEP aquatic plant species occur.
- In areas where wind erosion is likely. do not apply within ½ mile of TEP plant species.

Fluridone

- Since effects on terrestrial TEP plant species are unknown, do not apply within ½ mile of terrestrial TEP species.

Glyphosate

- Since the risks associated with using a high boom are unknown, use only a low boom during ground applications of this herbicide within ½ mile of terrestrial TEP plant species.
- Do not apply by ground methods at the typical application rate within 50 feet of terrestrial TEP plant species.
- Do not apply by ground methods at the maximum application rate within 300 feet of terrestrial TEP plant species.
- Do not apply by aerial methods within 300 feet of terrestrial TEP plant species.

Hexazinone

- Since the risks associated with using a high boom or an aerial application are unknown, only apply this herbicide by ground methods using a low boom within ½ mile of terrestrial TEP plant species and aquatic habitats that support aquatic TEP species.
- Do not apply by ground methods at the typical application rate within 300 feet of terrestrial TEP plant species or aquatic habitats that support aquatic TEP plant species.
- Do not apply by ground methods at the maximum application rate within 900 feet of terrestrial TEP plant species or aquatic habitats that support aquatic TEP plant species.
- In areas where wind erosion is likely, do not apply within ½ mile of TEP plant species.

Imazapic

- Do not apply by ground methods within 25 feet of terrestrial TEP species or aquatic habitats where
- TEP plant species occur.
- Do not apply by helicopter at the typical application rate within 25 feet of terrestrial TEP plant species.

- Do not apply by helicopter at the maximum application rate, or by plane at the typical application rate, within 300 feet of terrestrial TEP plant species.
- Do not apply by plane at the maximum application rate within 900 feet of terrestrial TEP species.
- Do not apply by aerial methods at the maximum application rate within 300 feet of aquatic TEP species.
- Do not apply by aerial methods at the typical application rate within 100 feet of aquatic TEP species.
- In areas where wind erosion is likely, do not apply within ½ mile of TEP plant species.

Imazapyr

- Since the risks associated with using a high boom are unknown, use only a low boom for ground applications of this herbicide within ½ mile of terrestrial TEP plant species or aquatic habitats in which TEP plant species occur.
- Do not apply at the typical application rate, by ground or aerial methods, within 900 feet of terrestrial TEP plant species or aquatic habitats in which aquatic TEP species occur.
- Do not apply at the maximum application rate, by ground or aerial methods, within ½ mile of terrestrial TEP plant species or aquatic habitats in which aquatic TEP species occur.
- Do not use aquatic formulations in aquatic habitats where TEP aquatic plant species occur.
- In areas where wind erosion is likely, do not apply within ½ mile of TEP plant species.

Metsulfuron Methyl

- Since the risks associated with using a high boom are unknown, use only a low boom for ground applications of this herbicide within ½ mile of terrestrial TEP plant species or aquatic habitats in which TEP plant species occur.
- Do not apply at the typical application rate, by ground or aerial methods, within 900 feet of terrestrial TEP plant species or aquatic habitats in which aquatic TEP species occur.
- Do not apply at the maximum application rate, by ground or aerial methods, within ½ mile of terrestrial TEP plant species or aquatic habitats in which aquatic TEP species occur.
- In areas where wind erosion is likely, do not apply within ½ mile of TEP plant species.

Overdrive®

- If using a low boom at the typical application rate, do not apply within 100 feet of terrestrial TEP plant species.
- If using a low boom at the maximum application rate, do not apply within 900 feet of terrestrial TEP plant species.
- If using a high boom, do not apply within 900 feet of terrestrial TEP plant species.

- Do not apply within 25 feet of aquatic habitats where TEP plant species occur.
- In areas where wind erosion is likely, do not apply within ½ mile of TEP plant species.

Picloram

- Do not apply by ground or aerial methods, at any application rate, within ½ mile of terrestrial TEP plant species.
- Assess local site conditions when evaluating the risks from surface water runoff to TEP plants located within ½ mile downgradient from the treatment area.
- In areas where wind erosion is likely, do not apply within ½ mile of TEP plant species.

Sulrometuron Methyl

- Do not apply by ground or aerial methods within 1,500 feet of terrestrial TEP species.
- Do not apply by ground methods within 900 feet of aquatic habitats where TEP plant species occur, or by aerial methods within 1,500 feet of aquatic habitats where TEP plant species occur.
- In areas where wind erosion is likely, do not apply within ½ mile of TEP plant species.

Tebuthiuron

- If using a low boom at the typical application rate, do not apply within 25 feet of terrestrial TEP plant species.
- If using a low boom at the maximum application rate or a high boom at the typical application rate, do not apply within 50 feet of terrestrial TEP plant species.
- If using a high boom at the maximum application rate, do not apply within 900 feet of terrestrial TEP plant species.
- Do not apply within 25 feet of aquatic habitats where TEP plant species occur.
- In areas where wind erosion is likely, do not apply within ½ mile of TEP plant species.

Triclopyr Acid

- Since the risks associated with using a high boom are unknown, use only a low boom during ground applications of this herbicide within ½ mile of terrestrial TEP plant species.
- Since the risks associated with using a high boom are unknown, use only a low boom during ground applications at the maximum application rate of this herbicide within ½ mile of aquatic habitats in which TEP plant species occur.
- Do not apply by ground methods at the typical application rate within 300 feet of terrestrial TEP plant species.
- Do not apply by aerial methods at the typical application rate within 500 feet of terrestrial TEP plant species.
- Do not apply by ground or aerial methods at the maximum application rate within ½ mile of terrestrial TEP plant species or aquatic habitats in which TEP plant species occur.

- If applying to aquatic habitats in which aquatic TEP plant species occur, do not exceed the targeted water concentration on the product label.
- In areas where wind erosion is likely, do not apply within ½ mile of TEP plant species.

Triclopyr BEE

- Since the risks associated with using a high boom are unknown, use only a low boom for ground applications of this herbicide within ½ mile of terrestrial TEP plant species or aquatic habitats in which TEP plant species occur.
- Do not apply by ground methods at the typical application rate within 300 feet of terrestrial TEP plant species or aquatic habitats in which TEP plant species occur.
- Do not apply by aerial methods at the typical application rate within 500 feet of terrestrial TEP plant species or aquatic habitats in which TEP plant species occur.
- Do not apply by ground or aerial methods at the maximum application rate within ½ mile of terrestrial TEP plant species or aquatic habitats in which TEP plant species occur.
- Do not use aquatic formulations in aquatic habitats where TEP aquatic plant species occur.
- In areas where wind erosion is likely, do not apply within ½ mile of TEP plant species.

Treatment plans must also address the presence of and expected impacts on noxious weeds on the project site. These plans must be coordinated with BLM weed experts and/or appropriate county weed supervisors to minimize the spread of weeds. In order to prevent the spread of noxious weeds and other unwanted vegetation in occupied or suitable habitat, the following precautions should be taken:

- Cleared areas that are prone to downy brome or other noxious weed invasions should be seeded with an appropriate seed mixture to reduce the probability of noxious weeds or other undesirable plants becoming established on the site.
- Where seeding is warranted, bare sites should be seeded as soon as appropriate after treatment, and at a time of year when it is likely to be successful.
- In suitable habitat for TEP species, non-native species should not be used for revegetation.
- Certified noxious weed seed free seed must be used in suitable habitat, and preference should be given to seeding appropriate plant species when rehabilitation is appropriate.
- Straw and hay bales used for erosion control in suitable habitat must be certified weed- and seed-free.
- Vehicles and heavy equipment used during treatment activities should be washed prior to arriving at a new location to avoid the transfer of noxious weeds.

When BAs are drafted at the local level for treatment programs, additional conservation measures may be added to this list. Where BLM plans that consider the effects of vegetation treatments on TEP plant species already exist, these plans should be consulted, and incorporated (e.g . any guidance or conservation measures they provide) into local level BAs for vegetation treatments.

L.3. Aquatic Animals (Most of these are included in the NMFS Biological Opinion unless noted)

Conservation Measures for Site Access and Fueling/Equipment Maintenance

For treatments occurring in watersheds with TEP species or designated or undesignated critical habitat (i.e., unoccupied habitat critical to species recovery):

- Where feasible, access work site only on existing roads, and limit all travel on roads when damage to the road surface will result or is occurring.
- Where TEP aquatic species occur, consider ground-disturbing activities on a case by case basis, and implement SOPs to ensure minimal erosion or impact to the aquatic habitat.
- **Within riparian areas**, do not use vehicle equipment off of established roads.
- **Outside of riparian areas**, allow driving off of established roads only on slopes of 20% or less.
- Except in emergencies, land helicopters outside of riparian areas.
- **Within 150 feet of wetlands or riparian areas**, do not fuel/refuel equipment, store fuel, or perform equipment maintenance (locate all fueling and fuel storage areas, as well as service landings outside of protected riparian areas).
- Prior to helicopter fueling operations prepare a transportation, storage, and emergency spill plan and obtain the appropriate approvals; for other heavy equipment fueling operations use a slip-tank not greater than 250 gallons; Prepare spill containment and cleanup provisions for maintenance operations.
- Do not conduct biomass removal (harvest) activities that will alter the timing, magnitude, duration, and spatial distribution of peak, high, and low flows outside the range of natural variability.

Conservation Measures Related to Revegetation Treatments

Outside riparian areas, avoid hydro-mulching within buffer zones established at the local level.

- This precaution will limit adding sediments and nutrients and increasing water turbidity.
- Within riparian areas, engage in consultation at the local level to ensure that revegetation activities incorporate knowledge of site-specific conditions and project design (not in the BO).

Conservation Measures Related to Herbicide Treatments

The complexity of this action within riparian areas requires local consultation, which will be based on herbicide risk assessments.

- Maintain equipment used for transportation, storage, or application of chemicals in a leak proof condition.
- Do not store or mix herbicides. or conduct post-application cleaning within riparian areas.
- Ensure that trained personnel monitor weather conditions at spray times during application.

- Strictly enforce all herbicide labels.
- Do not broadcast spray within 100 feet of open water when wind velocity exceeds 5 mph.
- Do not broadcast spray when wind velocity exceeds 10 mph.
- Do not spray if precipitation is occurring or is imminent (within 24 hours).
- Do not spray if air turbulence is sufficient to affect the normal spray pattern.
- Do not broadcast spray herbicides in riparian areas that provide habitat for TEP aquatic species.

Appropriate buffer distances should be determined at the local level to ensure that overhanging vegetation that provides habitat for TEP species is not removed from the site. Buffer distances provided as conservation measures in the assessment of effects to plants (Chapter 4 of this BA) and fish and aquatic invertebrates should be consulted as guidance (Table 5-5). (Note: the Forest Service did not determine appropriate buffer distances for TEP fish and aquatic invertebrates when evaluating herbicides in Forest Service ERAs; buffer distances were only determined for non-TEP species). (not in the BO).

- Do not use diquat, fluridone, terrestrial formulations of glyphosate, or triclopyr BEE, to treat aquatic vegetation in habitats where aquatic TEP species occur or may potentially occur.
- Avoid using glyphosate formulations that include R-11 in the future, and either avoid using any formulations with POEA, or seek to use the formulation with the lowest amount of POEA available, to reduce risks to aquatic organisms.
- Follow all instructions and SOPs to avoid spill and direct spray scenarios into aquatic habitats. Special care should be followed when transporting and applying 2,4-0. bromacil, c1opyralid, Diuron, glyphosate, hexazinone, imazapyr, metsulfuron methyl, picloram, tebuthiuron, and triclopyr.
- Do not broadcast spray diuron, glyphosate, picloram, or triclopyr BEE in upland habitats adjacent to aquatic habitats that support (or may potentially support) aquatic TEP species under conditions that would likely result in off-site drift.
- In watersheds that support TEP species or their habitat, do not apply bromacil, diuron, tebuthiuron, or triclopyr BEE in upland habitats within ½ mile upslope of aquatic habitats that support aquatic TEP species under conditions that would likely result in surface runoff.
- Avoid accidental direct spray and spill conditions to reduce the largest potential impacts. Use the typical application rate, rather than the maximum application rate to reduce risk for most herbicides, where practical (derived from EIS Mitigating Measures - covers most herbicides rather than the specific ones listed in the EIS).
- Reduce the size of the application area, when possible (derived from EIS SOPs - used 'minimize ' in the EIS).
- Establish appropriate (herbicide specific) buffer zones to downstream waterbodies, habitats, or species/populations of interest (in EIS Mitigating Measures). Buffer distances presented in Table 4 below should be consulted as guidance for all site-specific treatments. Local BLM offices will have to determine buffer zones for active ingredients not listed below in Table

4 (2,4-0, clopyralid, glyphosate, hexazinone, imazapyr, metsulfuron methyl, picloram and triclopyr) on a site-specific basis (not in BA, SOPs or Mitigating Measures, but okay to include).

Table L.1. Butler Distances to Minimize Risks to Threatened, Endangered, and Proposed Fish and Aquatic Invertebrates from Off-site Drift of BLM-Evaluated Herbicides from Broadcast and Aerial Treatments[a]

Application Method	BROM	CHLR	DICA	DIFLU	DIQT	DIUR	FLUR	IMAZ	OVER	SULF	TEBU
Minimum Buffer Distance (feet) from TEP Fish and Aquatic Invertebrates											
Typical Application Rate											
Aerial	NA	0	NA	NA	NA	NA	NA	0	NA	0	NA
Low boom	0	0	0	0	NA	0	NA	0	0	0	0
High boom	0	0	0	0	NA	100	NA	0	0	0	0
Maximum Application Rate											
Aerial	NA	0	NA	NA	NA	NA	NA	0	NA	0	NA
Low boom	0	0	0	0	NA	100	NA	0	0	0	0
High boom	0	0	0	0	NA	900	NA	0	0	0	0

[a]BROM = Bromacil; CHLR = Chlorsulfuron; OICA = Oicamba; OIFLU = Oiflufenzopyr; D1QT = Oiquat; OIUR - Oiuron; FLUR = Fluridone; IMAZ = Imazapic; OVER = Overdrive ; SULFM = Sulfometuron methyl; and TEBU = Tebuthiuron. Boom height = The Tier I ground application model allows selection of a low (20 inches) or a high (50 inches) boom height. NA = Not applicable. Sources: Ecological risk assessments for herbicides (Syracuse Environmental Research Associates. Inc. 200 I; ENSR 2005a-j).

Wetland and Riparian Areas

- Minimize the use of terrestrial herbicides (especially bromacil, diuron, and suflometuron methyl) in watersheds with downgradient ponds and streams if potential impacts to aquatic plants exist (from EIS Mitigating Measures).

Fish and Other Aquatic Organisms

- Regulate the use of diquat in waterbodies that have native fish and aquatic resources (from EIS Mitigating Measures).
- Regulate the use of terrestrial herbicides in watersheds, which have characteristics suitable for potential surface runoff, with fish-bearing streams during periods when fish are in life stages most sensitive to the herbicide(s) use (from EIS Mitigating Measures).
- Establish appropriate herbicide-specific buffer zones to waterbodies, habitats, or fish or other aquatic species of interest (from EIS Mitigating Measures).
- At the field level, consider effects to listed species, otherwise special status fish and other aquatic organisms when designing treatment programs (not in BA. SOPs or Mitigating Measures, but okay to include).

Numerous conservation measures were developed from information provided in ERAs. The measures listed below would apply to TEP fish and other aquatic species at the programmatic level in all 17 western states. However, local BLM field offices could use interactive spreadsheets

and other information contained in the ERAs to develop more site-specific conservation measures and management plans based on local conditions (soil type, rainfall, vegetation type, and herbicide treatment method). It is possible that conservation measures would be less restrictive than those listed below if local site conditions were evaluated using the ERAs when developing project-level conservation measures.

Conservation Measures Related to Prescribed Fire

Within riparian areas, in watersheds with TEP species or their habitats:

- Conduct prescribed burning only when long-term maintenance of the riparian area is the primary objective, and where low intensity fires can be maintained.
- Do not construct black lines, except by non-mechanized methods.
- Utilize/create only the following firelines: natural barriers; hand-built lines parallel to the stream channel and outside of buffer zones established at the local level; or hand built lines perpendicular to the stream channel with waterbars and the same distance requirement.
- Do not ignite fires using aerial methods.
- In forested riparian areas, keep fires to low severity levels to ensure that excessive vegetation removal does not occur.
- Do not camp, unless allowed by local consultation.
- Have a fisheries biologist determine whether pumping activity can occur in streams with TEP species.
- During water drafting/pumping, maintain a continuous surface flow of the stream that does not alter original wetted stream width.
- Do not alter dams or channels in order to pump in streams occupied by TEP species.
- Do not allow helicopter dipping from waters occupied by TEP species, except in lakes outside of the spawning period.
- Consult with a local fisheries biologist prior to helicopter dipping in order to avoid entrainment and harassment of TEP species.

Conservation Measures Related to Mechanical Treatments

Note: these measures apply only to treatments occurring in watersheds that support TEP species or in unoccupied habitat critical to species recovery (including but not limited to critical habitat, a designated by USFWS).

Outside riparian areas in watersheds with TEP species or designated or undesignated critical habitat (i.e., unoccupied habitat critical to species recovery):

- Conduct soil-disturbing treatments only on slopes of 20% or less, where feasible.
- Do not conduct log hauling activities on native surface roads prone to erosion, where feasible.

Within riparian areas in these watersheds, more protective measures will be required to avoid negatively affecting TEP species or their habitat:

- Do not use vehicles or heavy equipment, except when crossing at established crossings.
- Do not remove large woody debris or snags during mechanical treatment activities.
- Do not conduct ground disturbing activities (e.g., disking, drilling, chaining, and plowing).
- Ensure that all mowing follows guidance to avoid negative effects to streambanks and riparian vegetation and major effects to streamside shade.
- Do not use equipment in perennial channels or in intermittent channels with water, except at crossings that already exist.
- Leave suitable quantities (to be determined at the local level) of excess vegetation and slash on site.
- Do not apply fertilizers or seed mixtures that contain chemicals by aerial methods.
- Do not apply fertilizer within 25 feet of streams and supersaturated soils; apply fertilizer following labeling instructions.
- Do not apply fertilizer in desert habitats.
- Do not completely remove trees and shrubs.

Conservation Measures Related to Biological Control Treatments using Livestock

For treatments occurring in watersheds that support TEP species or in critical habitat:

- Where terrain permits, locate stock handling facilities, camp facilities, and improvements at least 300 feet from lakes, streams, and springs.
- Educate stock handlers about at-risk fish species and how to minimize negative effects to the species and their associated habitat.
- Employ appropriate dispersion techniques to range management, including judicial placement of saltblocks, troughs, and fencing, to prevent damage to riparian areas but increase weed control.
- Equip each watering trough with a float valve.

Within riparian areas of these watersheds, more protective measures are required.

- Do not conduct weed treatments involving domestic animal, except where it is determined that these treatments will not damage the riparian system, or will provide long-term benefits to riparian and adjacent aquatic habitats.
- Do not locate troughs, storage tanks, or guzzlers near streams with TEP species, unless their placement will enhance weed-control effectiveness without damaging the riparian system.

Local BLM offices should design conservation measures for treatment plans using the above conservation measures as guidance, but altering it as needed based on local conditions and the

habitat needs of the particular TEP aquatic species that could be affected by the treatments. Locally-focused conservation measures would be necessary to reduce or avoid potential impacts such that a Not Likely to Adversely Affect determination would be reached during the local-level NEPA process. BLM offices that are responsible for the protection of Northwest salmonids are directed to the guidance document: *Criteria/or At-Risk Sall1wnids: National Fire Plan Activities,* Version 2.1 (National Fire Plan Technical Team 2002), which contains detailed instructions for developing suitable conservation measures for these TEP species in conjunction with vegetation treatment programs, and from which many of the above-listed conservation measures were taken.

NMFS Conservation Recommendation

We recommend that BLM make efforts to establish or join regional monitoring programs. Such an effort is underway for Oregon and Washington led by the US Forest Service. These efforts will relieve the burden of duplicative monitoring, make more efficient use of increasingly scarce funds and possibly monitor more sites for trends in water quality due to vegetation treatment activities.

L.4. Wildlife

The following conservation measures are the minimum steps required of the BLM to ensure that treatment methods would be unlikely to negatively affect the **Morro shoulderband snail**:

- Survey treatment sites within the range of the Morro shoulderband snail for the presence of the snail, prior to formulating treatment programs (should be conducted by a qualified biologist).
- Do not bum, conduct mechanical treatments, or use broad-spectrum herbicides in habitats occupied by snails.
- Do not perform herbicide treatments in habitats occupied by snails that will result in a substantial reduction of plant (and especially native plant) cover; where feasible, spot treat vegetation rather than spraying.
- Do not apply 2,4-D in Morro shoulderbrand snail habitat, and do not broadcast spray 2,4-D within ¼ mile of Morro shoulderbrand snail habitat.
- When conducting herbicide treatments in or near Morro shoulderbrand snail habitat, avoid use of the following herbicides, where feasible: bromacil, clopyralid, diquat, diuron, glyphosate, hexazinone, imazapyr, picloram, tebuthiuron, and triclopyr.
- Do not broadcast spray bromacil, diquat, diuron, glyphosate, hexazinone, tebuthiuron, or triclopyr in habitats occupied by Morro shoulderbrand snails; and do not broadcast spray these herbicides in areas adjacent to Morro shoulderbrand snail habitat under conditions when spray drift onto the habitat is likely.
- If spraying clopyralid, imazapyr or picloram in habitats occupied by Morro shoulderbrand snails, use the typical, rather than the maximum, application rate.
- If conducting manual spot applications of diquat, diuron, glyphosate, hexazinone, tebuthiuron, or triclopyr to vegetation in Morro shoulderbrand snail habitat, utilize the typical, rather than the, maximum, application rate.

L.4.1. Conservation Measures for Butterflies and Moths

Management plans should, at a minimum, follow this general guidance:

- Use an integrated pest management approach when designing programs for managing pest outbreaks.
- Survey treatment areas for TEP butterflies/moths and their host/nectar plants (suitable habitat) at the appropriate times of year.
- Minimize the disturbance area with a pre-treatment survey to determine the best access routes. Areas with butterfly/moth host plants and/or nectar plants should be avoided.
- Minimize mechanical treatments and OHV activities on sites that support host and/or nectar plants.
- Carry out vegetation removal in small areas, creating openings of 5 acres or less in size.
- Avoid burning all of a species' habitat in any 1 year. Limit area burned in butterfly/moth habitat in such a manner that the unburned units are of sufficient size to provide a refuge for the population until the burned unit is suitable for re-colonization. Bum only a small portion of the habitat at any one time, and stagger timing so that there is a minimum 2-year recovery period before an adjacent parcel is burned.
- Where feasible, mow or wet around patches of larval host plants within the bum unit to reduce impacts to larvae.
- In TEP butterfly/moth habitat, bum while butterflies and/or moths of concern are in the larval stage, when the organisms would receive some thermal protection.
- Wash equipment before it is brought into the treatment area.
- Use a seed mix that contains host and/or nectar plant seeds for road/site reclamation.
- To protect host and nectar plants from herbicide treatments, follow recommended buffer zones and other conservation measures for TEP plants species when conducting herbicide treatments in areas where populations of host and nectar plants occur.
- Do not broadcast spray herbicides in habitats occupied by TEP butterflies or moths; do not broadcast spray herbicides in areas adjacent to TEP butterfly/moth habitat under conditions when spray drift onto the habitat is likely.
- Do not use 2,4-D in TEP butterfly/moth habitat.
- When conducting herbicide treatments in or near habitat used by TEP butterflies or moths, avoid use of the following herbicides, where feasible: bromacil, clopyralid, diquat, diuron, glyphosate, hexazinone, imazapyr, picloram, tebuthiuron, and triclopyr.
- If conducting manual spot applications of diquat, diuron, glyphosate, hexazinone. tebuthiuron, or triclopyr to vegetation in TEP butterfly or moth habitat, utilize the typical, rather than the maximum, application rate.

L.4.2. Conservation Measures - Beetles

The following conservation measures are the minimum steps required of the BLM to ensure that treatment methods would be unlikely to negatively affect TEP species. These measures should be implemented in habitats where beetles are known to occur or are likely to occur.

- Survey proposed treatment sites within the range of the valley elderberry longhorn beetle for the presence of the beetle and its elderberry host plant (should be conducted by a qualified biologist).
- Establish a 100-foot buffer between suitable beetle habitat and mechanical treatments (except mowing of grasses/ground cover) and treatments using domestic animals. Suitable beetle habitat is defined as any area containing elderberry stems measuring I inch or more in diameter at ground level.
- Mow grasses/ground cover only between July and April.
- Do not mow within 5 feet of elderberry plant stems, and do not mow in a manner that damages plants.
- Protect all elderberry shrubs with evidence of beetle exit holes from prescribed fire using water or by removing fuels surrounding the plants.
- To protect host elderberry plants from herbicide treatments, follow recommended buffer zones and other conservation measures for TEP plants species, as listed on pages 4-129 through 4-134, when conducting herbicide treatments in areas where populations of elderberry occur.
- Do not broadcast spray herbicides in suitable beetle habitat; do not broadcast spray herbicides in areas adjacent to suitable beetle habitat under conditions when spray drift onto the habitat is likely.
- Do not use 2,4-D in valley elderberry longhorn beetle habitat.
- When conducting herbicide treatments in or near habitat used by TEP butterflies or moths, avoid use of the following herbicides, where feasible: bromacil, clopyralid, diquat, diuron, glyphosate, hexazinone, imazapyr, picloram, tebuthiuron, and triclopyr.
- If conducting manual spot applications of diquat, diuron, glyphosate, hexazinone, tebuthiuron, or triclopyr to vegetation in valley elderberry longhorn beetle habitat, utilize the typical, rather than the maximum, application rate.

L.4.3. Conservation Measures - Amphibians and Reptiles

Many local BLM offices already have management plans in place that ensure the protection of these species during activities on public lands. In addition, the following conservation measures are the minimum steps required of the BLM to ensure that treatment methods would be unlikely to negatively affect TEP species.

- Survey all areas that may support TEP amphibians and/or reptiles prior to treatments.
- Conduct bums during periods when the animals are in aquatic habitats or are hibernating in burrows.

- For species with extremely limited habitat, such as the desert slender salamander, avoid prescribed burning in known habitat.
- Do not use water from aquatic habitats that support TEP amphibians and/or reptiles for fire abatement.
- Install sediment traps upstream of aquatic habitats to minimize the amount of ash and sediment entering aquatic habitats that support TEP species.
- Do not conduct prescribed burns in desert tortoise habitat.
- In habitats where aquatic herpetofauna occur, implement all conservation measures identified for aquatic organisms in Chapter 4.
- Within riparian areas, wetlands, and aquatic habitats, conduct herbicide treatments only with herbicides that are approved for use in those areas.
- Do not broadcast spray herbicides in riparian areas or wetlands that provide habitat for TEP herpetofauna.
- Do not use diquat, fluridone, glyphosate, or triclopyr BEE to treat aquatic vegetation in habitats where TEP amphibians occur or may potentially occur.
- In desert tortoise habitat, conduct herbicide treatments during the period when desert tortoises are less active.
- To the greatest extent possible, avoid desert tortoise burrows during herbicide treatments.
- When conducting herbicide treatments in upland areas adjacent to aquatic or wetland habitats that support TEP herpetofauna, do not broadcast spray during conditions under which off-site drift is likely.
- In watersheds where TEP amphibians occur, do not apply bromacil, diuron, or triclopyr BEE in upland habitats upslope of aquatic habitats that support (or may potentially support) TEP amphibians under conditions that would likely result in surface runoff.
- Follow all instructions and SOPs to avoid spill and direct spray scenarios into aquatic habitats that support TEP herpetofauna.
- Do not use 2,4-D in terrestrial habitats occupied by TEP herpetofauna; do not broadcast spray 2,4-D within ¼ mile of terrestrial habitat occupied by TEP herpetofauna.
- When conducting herbicide treatments in or near terrestrial habitat occupied by TEP herpetofauna, avoid using the following herbicides, where feasible: clopyralid, glyphosate, hexazinone, imazapyr, metsulfuron methyl, picloram, and triclopyr.
- When conducting herbicide treatments in upland habitats occupied by TEP herpetofauna, do not broadcast spray 2,4-D, clopyralid, glyphosate, hexazinone, picloram or triclopyr; do not broadcast spray these herbicides in areas adjacent to habitats occupied by TEP herpetofauna under conditions when spray drift onto the habitat is likely.

- If conducting manual spot applications of glyphosate, hexazinone, or triclopyr to vegetation in upland habitats occupied by TEP herpetofauna, utilize the typical, rather than the maximum, application rate.
- If spraying imazapyr or metsulfuron methyl in or adjacent to upland habitats occupied by TEP herpetofauna, apply at the typical, rather than the maximum, application rate
- If conducting herbicide treatments in or near upland habitats occupied by TEP herpetofauna, consult Table 6-3 on a species by species basis to determine additional conservation measures that should be enacted to avoid negative effects via ingestion of contaminated prey.

L.4.4. Conservation Measures - Bird Species

The following conservation measures are required to ensure that **cactus ferruginous pygmy-owls** would not be negatively affected by vegetation treatments:

- Prior to treatments, conduct surveys for cactus ferruginous pygmy-owls in all suitable habitat where treatments are proposed to take place.
- Limit vegetation treatments within ¼ mile of any site occupied by a cactus ferruginous pygmy-owl, or any unsurveyed suitable habitat within the project area.
- Avoid conducting vegetation treatments in pygmy-owl habitat during the nesting period (as determined by a qualified wildlife biologist).
- Do not use 2,4-D in cactus ferruginous pygmy-owl habitat; do not broadcast spray 2,4-D within ¼ mile of cactus ferruginous pygmy-owl habitat.
- Where feasible, avoid use of the following herbicides in cactus ferruginous pygmy-owl habitat: bromacil, clopyralid, diquat, diuron, glyphosate, hexazinone, imazapyr, metsulfuron methyl, picloram, and triclopyr.
- Avoid broadcast spraying herbicides in areas where future nesting cacti and trees occur.
- Do not broadcast spray clopyralid, diuron, glyphosate, hexazinone. Picloram, or triclopyr in cactus ferruginous pygmy-owl habitat; do not broadcast spray these herbicides in areas adjacent to pygmy owl habitat under conditions when spray drift onto the habitat is likely.
- If broadcast spraying bromacil, diquat, imazapyr, or metsulfuron methyl in or adjacent to pygmy-owl habitat, apply at the typical, rather than the maximum, application rate.
- If conducting manual spot applications of glyphosate, hexazinone, or triclopyr to vegetation in pygmy-owl habitat, utilize the typical, rather than the maximum, application rate.

Additional conservation measures would be developed at the local level during the completion of project-specific BAs and management plans.

The following conservation measures are the minimum steps required to protect the northern

aplomado falcon from being negatively affected by the proposed vegetation treatments. Additional conservation measures would also be developed at the local level.

- Prior to conducting vegetation treatments, survey the project area for northern aplomado falcon nests.
- Do not burn or cut trees within % mile of northern aplomado falcon nests.
- Avoid conducting vegetation treatments in northern aplomado falcon habitat during the nesting period.
- Avoid cutting mesquite trees, yuccas, and other trees that may support aplomado nests in the future.
- Do not use 2,4-D in northern aplomado falcon habitats; do not broadcast spray 2,4-D within % mile of northern aplomado falcon habitat.
- Where feasible, avoid use of the following herbicides in northern aplomado falcon habitat: bromacil, clopyralid, diquat, diuron, glyphosate, hexazinone, imazapyr, metsulfuron methyl, picloram, and triclopyr.
- Avoid broadcast spraying herbicides in areas where future falcon nesting trees occur.
- Do not broadcast spray clopyralid, diuron, glyphosate, hexazinone, picloram, or triclopyr in northern aplomado falcon habitat; do not broadcast spray these herbicides in areas adjacent to northern aplomado falcon habitat under conditions when spray drift onto the habitat is likely.
- If broadcast spraying bromacil, diquat, imazapyr, or metsulfuron methyl in or adjacent to northern aplomado falcon habitat, apply at the typical, rather than the maximum, application rate.
- If conducting manual spot applications of glyphosate, hexazinone, or triclopyr to vegetation in northern aplomado falcon habitat, utilize the typical, rather than the maximum, application rate.

To avoid negative impacts to the **Yuma clapper rail** during treatments, the following programmatic level conservation measures are required:

- Conduct surveys prior to vegetation treatments within potential or suitable habitat.
- Where surveys detect birds, do not implement treatments during the breeding season.
- In habitats where Yuma clapper rails occur, follow the riparian/aquatic habitat protection measures discussed in Chapter 5.
- Do not conduct prescribed bums in Yuma clapper rail habitat.
- Closely follow all application instructions and use restrictions on herbicide labels; in wetland habitats use only those herbicides that are approved for use in wetlands.
- Do not use 2,4-D in Yuma clapper rail habitats; do not broadcast spray 2,4-D within 1;" mile of Yuma clapper rail habitat.
- Where feasible, avoid use of the following herbicides in Yuma clapper rail habitat: clopyralid, diquat, diuron, glyphosate, hexazinone, imazapyr, metsulfuron methyl, picloram, and triclopyr.

- Do not broadcast spray clopyralid, diquat, diuron, glyphosate, hexazinone, picloram, or triclopyr in Yuma clapper rail habitat; do not broadcast spray these herbicides in areas adjacent to Yuma clapper rail habitat under conditions when spray drift onto the habitat is likely.
- If broadcast spraying imazapyr or metsulfuron methyl in or adjacent to Yuma clapper rail habitat, apply at the typical, rather than the maximum, application rate.
- If conducting manual spot applications of glyphosate, hexazinone, or triclopyr to vegetation in Yuma clapper rail habitat, utilize the typical, rather than the maximum, application rate.

Additional conservation measures would be identified at the local level, as necessary.

The following conservation measures are the minimum steps required of the BLM to ensure that treatment methods would be unlikely to negatively affect **Sand Nesters** species:

- Survey for western snowy plovers, piping plovers, and interior least terns (and their nests) in suitable areas on proposed treatment areas, prior to developing treatment plans.
- Do not treat vegetation in nesting areas during the breeding season (as determined by a qualified biologist).
- Do not allow human (or domestic animal) disturbance within ¼ mile of nest sites during the nesting period.
- Ensure that nest sites are at least I mile from downwind smoke effects during the nesting period.
- Conduct beachgrass treatments during the plant's flowering stage, during periods of active growth.
- Closely follow all application instructions and use restrictions on herbicide labels; in wetland habitats use only those herbicides that are approved for use in wetlands.
- Do not use 2,4-D in western snowy plover, piping plover, or interior least tern habitats; do not broadcast spray 2,4-D within. ¼ mile of western snowy plover, piping plover, or interior least tern habitat.
- Where feasible, avoid use of the following herbicides in western snowy plover and piping plover habitat: clopyralid, diquat, diuron, glyphosate, hexazinone, imazapyr, metsulfuron methyl, picloram, and triclopyr; in interior least tern habitat avoid the use of clopyralid, glyphosate, hexazinone, imazapyr, metsulfuron methyl, picloram, and triclopyr.
- Do not broadcast spray clopyralid, diquat, diuron, glyphosate, hexazinone, picloram, or triclopyr in western snowy plover or piping plover habitat; do not broadcast spray these herbicides in areas adjacent to western snowy plover or piping plover habitat under conditions when spray drift onto the habitat is likely.
- Do not broadcast spray clopyralid, glyphosate, hexazinone, picloram, or triclopyr in interior least tern habitat; do not broadcast spray these herbicides in areas adjacent least tern habitat under conditions when spray drift onto the habitat is likely.
- If broadcast spraying imazapyr or metsulfuron methyl in or adjacent to western snowy plover, piping plover, or interior least tern habitat, apply at the typical, rather than the maximum, application rate.

- If conducting manual spot applications of glyphosate, hexazinone, or triclopyr to vegetation in western snowy plover, piping plover, or interior least tern habitat, utilize the typical, rather than the maximum, application rate.

Additional, project-specific conservation measures would be developed at the local level, as appropriate.

Conservation Measures - Riparian bird species

To minimize or avoid negative effects to the **least Bell's vireo, Inyo California towhee, and southwestern willow flycatcher**, the BLM would be required to implement the following programmatic-level conservation measures in habitats utilized by these three species.

- Conduct surveys prior to vegetation treatments within potential or suitable habitat.

- Where surveys detect birds, do not bum, broadcast spray herbicides, use domestic animals to control weeds, or conduct mechanical treatments.

- Do not conduct vegetation treatments within ½ mile (or further if deemed necessary to prevent smoke from inundating the nest area) of known nest sites or unsurveyed suitable habitat during the breeding season (as determined by a qualified wildlife biologist).

- Adjust spatial and temporal scales of treatments to that not all suitable habitat is affected in any given year.

- Following treatments, replant or reseed treated areas with native species, if needed.

- Closely follow all application instructions and use restrictions on herbicide labels; in wetland habitats use only those herbicides that are approved for use in wetlands.

- Do not use 2,4-D in least Bell's vireo, Inyo California towhee, or southwestern willow flycatcher habitats; do not broadcast spray 2,4-D within 'A mile of least Bell's vireo, Inyo California towhee, or southwestern willow flycatcher habitat.

- Where feasible, avoid use of the following herbicides in least Bell's vireo, Inyo California towhee, and southwestern willow flycatcher habitat: bromacil, clopyralid, diquat, diuron, glyphosate, hexazinone, imazapyr, metsulfuron methyl, picloram, tebuthiuron, and triclopyr.

- Do not broadcast spray clopyralid, diquat, diuron, glyphosate, hexazinone, picloram, or triclopyr in least Bell's vireo or southwestern willow flycatcher habitat; do not broadcast spray these herbicides in areas adjacent to least Bell's vireo or southwestern willow flycatcher habitat under conditions when spray drift onto the habitat is likely.

- Do not broadcast spray clopyralid, diquat, glyphosate, hexazinone, picloram, or triclopyr in Inyo California towhee habitat; do not broadcast spray these herbicides in areas adjacent to Inyo California towhee habitat under conditions when spray drift onto the habitat is likely.

- If broadcast spraying imazapyr or metsulfuron methyl in or adjacent to least Bell's vireo or southwestern willow flycatcher habitat, apply at the typical, rather than the maximum, application rate.

- If broadcast spraying bromacil, diuron, imazapyr, metsulfuron methyl, or tebuthiuron in or adjacent to Inyo California towhee habitat, apply at the typical, rather than the maximum, application rate.

- If conducting manual spot applications of glyphosate, hexazinone, or triclopyr to vegetation in least Bell's vireo, Inyo California towhee, or southwestern willow flycatcher habitat, utilize the typical, rather than the maximum, application rate.

In order to avoid or minimize potential effects to the **coastal California gnatcatcher**, the BLM would be required to implement, at a minimum, the programmatic-level conservation measures listed below:

- Prior to implementing vegetation treatments, survey areas in which treatments would occur for coastal California gnatcatchers.

- Where gnatcatchers occur, do not conduct treatments during the breeding season (as determined by a qualified wildlife biologist).

- Do not conduct treatments with domestic animals in habitats utilized by coastal California gnatcatchers, or in coastal sage scrub areas not dominated by non-native species.

- Ensure that prescribed bums and mechanical treatments are of minimal size and intensity, and do not affect greater than 30% of the coastal sage scrub habitat in a given area.

- Revegetate coastal sage habitats with native species.

- Do not broadcast spray herbicides in areas where coastal California gnatcatchers occur.

- Do not use 2.4-D in coastal California gnatcatcher habitats; do not broadcast spray 2,4-D within ¼ mile of coastal California gnatcatcher habitat.

- Where feasible, avoid use of the following herbicides in coastal California gnatcatcher habitat: clopyralid, diquat, diuron, glyphosate, hexazinone, imazapyr, metsulfuron methyl, picloram, and triclopyr.

- Do not broadcast spray clopyralid, diquat, diuron, glyphosate, hexazinone, picloram, or triclopyr in areas adjacent to coastal California gnatcatcher habitat under conditions when spray drift onto the habitat is likely.

- If broadcast spraying imazapyr or metsulfuron methyl in areas adjacent to coastal California gnatcatcher habitat, apply at the typical, rather than the maximum, application rate.

- If conducting manual spot applications of glyphosate, hexazinone, or triclopyr to vegetation in coastal California gnatcatcher habitat, utilize the typical, rather than the maximum, application rate.

Additional conservation measures would be developed, as appropriate, during the preparation of project-level NEPA documents and management plans.

If herbicide treatments in **brown pelican** habitats must be conducted during the wintering period:

- Do not use 2,4-D in pelican wintering habitat.

- Prior to conducting herbicide treatments on pelican wintering habitat, survey the area for pelicans. Wait for pelicans to leave the area before spraying.
- Do not broadcast spray clopyralid, glyphosate, hexazinone, picloram, or triclopyr in pelican wintering habitats.
- If broadcast spraying imazapyr or metsulfuron methyl in pelican wintering habitats, use the typical rather than the maximum application rate.
- If conducting manual spot applications of glyphosate, hexazinone, or triclopyr to vegetation in brown pelican wintering habitat, utilize the typical, rather than the maximum, application rate.

In order to avoid or minimize negative effects to the **California condor**, the BLM would be required to implement the programmatic level conservation measures listed below.

- In areas where effects to breeding California condors may occur, do not bum until nesting is completed (Dodd 1986).
- Restrict human activity within 1.5 miles of California condor nest sites (Snyder et al. 1986).
- Do not use 2,4-D in California condor habitats; do not broadcast spray 2,4-D within ¼ mile of California condor habitat.
- Where feasible, avoid use of the following herbicides in California condor habitat: bromacil, clopyralid, diquat, diuron, glyphosate, hexazinone, imazapyr, metsulfuron methyl, picloram, and triclopyr.
- Do not broadcast spray clopyralid, diuron, glyphosate, hexazinone, picloram, or triclopyr in
- California condor habitat; do not broadcast spray these herbicides in areas adjacent to California condor habitat under conditions when spray drift onto the habitat is likely.
- If broadcast spraying bromacil, diquat, imazapyr, or metsulfuron methyl in or adjacent to California condor habitat, apply at the typical, rather than the maximum, application rate.
- If conducting manual spot applications of glyphosate, hexazinone, or triclopyr to vegetation in
- California condor habitat, utilize the typical, rather than the maximum, application rate.

The following programmatic-level conservation measures are the minimum steps required of the BLM to ensure that treatment methods would be unlikely to negatively affect **mature forest nesters (marbled murrelet, northern spotted owl, or Mexican spotted owl)**:

- Survey for marbled murrelets, northern spotted owls, and Mexican spotted owls (and their nests) on suitable proposed treatment areas, prior to developing treatment plans.
- Delineate a 100-acre buffer around nests prior to mechanical treatments or prescribed bums.
- Do not allow human disturbance within ¼ mile of nest sites during the nesting period (as determined by a local biologist).
- Ensure that nest sites are at least I mile from downwind smoke effects during the nesting period.

- Protect and retain the structural components of known or suspected nest sites during treatments; evaluate each nest site prior to treatment and protect it in the most appropriate manner.
- Maintain sufficient dead and down material during treatments to support spotted owl prey species (minimums would depend on forest types, and should be determined by a wildlife biologist).
- Do not conduct treatments that alter forest structure in old-growth stands.
- Do not use 2,4-D in marbled murrelet, northern spotted owl, or Mexican spotted owl habitats; do not broadcast spray 2,4-D within ¼ mile of marbled murrelet, northern spotted owl, or Mexican spotted owl habitat.
- Where feasible, avoid use of the following herbicides in northern spotted owl and Mexican spotted owl habitat: bromacil, clopyralid, diquat, diuron, glyphosate, hexazinone, imazapyr, metsulfuron methyl, picloram, and triclopyr.
- Where feasible, avoid use of the following herbicides in marbled murrelet habitat: clopyralid, glyphosate, hexazinone, imazapyr, metsulfuron methyl, picloram, and triclopyr.
- Do not broadcast spray clopyralid, glyphosate, hexazinone, picloram, or triclopyr in marbled
- murrelet, northern spotted owl, or Mexican spotted owl habitat; do not broadcast spray these herbicides in areas adjacent to marbled murrelet, northern spotted owl, or Mexican spotted owl habitat under conditions when spray drift onto the habitat is likely.
- Do not broadcast spray diuron in Mexican or northern spotted owl habitat; do not broadcast spray these herbicides in areas adjacent to Mexican or northern spotted owl habitat under conditions when spray drift onto the habitat is likely.
- If broadcast spraying imazapyr or metsulfuron methyl in or adjacent to marbled murrelet, northern spotted owl, or Mexican spotted owl habitat, apply at the typical, rather than the maximum, application rate.
- If broadcast spraying bromacil or diquat in or adjacent to Mexican or northern spotted owl habitat, apply at the typical, rather than the maximum, application rate.
- If conducting manual spot applications of glyphosate, hexazinone, or triclopyr to vegetation in marbled murrelet, northern spotted owl, or Mexican spotted owl habitat, utilize the typical, rather than the maximum, application rate.
- Follow all instructions and SOPs to avoid spill and direct spray scenarios into aquatic habitats, particularly marine habitats where murrelets forage for prey.

Additional conservation measures would be developed, as necessary, at the project level to fine-tune protection of these species.

The following conservation measures are the minimum steps required of the BLM to ensure that treatment methods would not affect the **whooping crane**. Additional, site-specific conservation measures would also be developed at the local level, as appropriate.

- Burn whooping crane wintering grounds in late winter, when the food supply is low.

- Avoid prescribed fire activities in whooping crane breeding areas.
- Do not allow human disturbance within I mile occupied whooping crane habitat (nesting, roosting foraging) or potential nesting habitat where whooping cranes have been observed within the past 3 years during periods when cranes may be present (as determined by a qualified biologist).
- During prescribed bums, ensure that nest sites or occupied habitat are greater than I mile from downwind smoke effects during periods when cranes may be present.
- Do not conduct herbicide treatments in whooping crane habitat during the breeding season.
- Closely follow all application instructions and use restrictions on herbicide labels; in wetlands and riparian habitats use only those herbicides that are approved for use in those areas.
- Do not use 2,4-D in whooping crane habitats; do not broadcast spray 2,4-D within ¼ mile of whooping crane habitat.
- Where feasible, avoid use of the following herbicides in whooping crane habitat: bromacil, clopyralid, diquat, diuron, glyphosate, hexazinone, imazapyr, metsulfuron methyl, picloram, tebuthiuron, and triclopyr.
- Do not broadcast spray clopyralid, diquat, diuron, glyphosate, hexazinone, picloram, or triclopyr in whooping crane habitat; do not broadcast spray these herbicides in areas adjacent to whooping crane habitat under conditions when spray drift onto the habitat is likely.
- If broadcast spraying bromacil, imazapyr, or metsulfuron methyl in or adjacent to whooping crane habitat, apply at the typical, rather than the maximum, application rate.
- If conducting manual spot applications of glyphosate, hexazinone, or triclopyr to vegetation in whooping crane habitat, utilize the typical, rather than the maximum, application rate.

The following programmatic level conservation measures are the minimum steps required of the BLM to ensure that treatment methods would not negatively affect the **bald eagle** or its habitat. Additional, site-specific conservation measures would also be developed at the local level, as appropriate.

- Do not allow human disturbance within a suitable buffer distance of known bald eagle nest sites during the breeding season (as determined by a qualified wildlife biologist). For active bald eagle nests in open country, buffer distances should be I mile. In other habitats, with a shorter line-of-site distance, buffer distances may be reduced, based on consultation with the USFWS.
- Do not allow ground disturbing activities within *V2* mile of active roost sites year round.
- Avoid human disturbance within I mile of a winter roost during the wintering period (as determined by a qualified wildlife biologist).
- Complete treatment activities that must occur within I mile of a winter roost within the hours of 9 a.m. to 3 p.m., during the winter roosting period.
- Do not allow helicopter/aircraft activity within I mile of bald eagle nest sites or winter roost sites during the breeding or roosting period.

- Conduct prescribed burn activities in a manner that ensures that nest and winter roost sites are greater than I mile from downwind smoke effects.
- Do not cut trees within 'A mile of any known nest trees.
- Do not use 2,4-D in bald eagle habitats; do not broadcast spray 2,4-D within ¼ mile of bald eagle habitat.
- Where feasible, avoid use of the following herbicides in bald eagle habitat: bromacil, clopyralid, diquat, diuron, glyphosate, hexazinone, imazapyr, metsulfuron methyl, picloram, and triclopyr.
- Do not broadcast spray clopyralid, diuron, glyphosate, hexazinone, picloram, or triclopyr in bald eagle habitat; do not broadcast spray these herbicides in areas adjacent to bald eagle habitat under conditions when spray drift onto the habitat is likely.
- If broadcast spraying bromacil, diquat, imazapyr, or metsulfuron methyl in or adjacent to bald eagle habitat, apply at the typical, rather than the maximum, application rate.
- If conducting manual spot applications of glyphosate, hexazinone, or triclopyr to vegetation in bald eagle habitat, utilize the typical, rather than the maximum, application rate.

L.4.5. Conservation Measures - Mammals

In order to avoid or minimize potential effects to the **pygmy rabbit** resulting from the proposed vegetation treatments, the BLM would be required to implement the conservation measures listed below. Although only the Columbia Basin Distinct Population Segment of the pygmy rabbit is currently listed, these mitigation measures should be considered for treatments throughout the species' entire range, and implemented as appropriate.

- Prior to treatments, survey all suitable habitat for pygmy rabbits.
- Address pygmy rabbits in all management plans prepared for treatments within the range of the species' historical habitat.
- Do not burn, graze, or conduct mechanical treatments within I mile of known pygmy rabbit habitat.
- Do not use 2,4-D, diquat, or diuron in pygmy rabbit habitats; do not broadcast spray these herbicides within ¼ mile of pygmy rabbit habitat.
- Where feasible, avoid use of the following herbicides in pygmy rabbit habitat: bromacil, clopyralid, fluridone, glyphosate, hexazinone, imazapyr, metsulfuron methyl, picloram, tebuthiuron, and triclopyr.
- Where feasible, spot treat vegetation in pygmy rabbit habitat rather than broadcast spraying.
- Do not broadcast spray clopyralid, glyphosate, hexazinone, picloram, or triclopyr in pygmy rabbit habitat; do not broadcast spray these herbicides in areas adjacent to pygmy rabbit habitat under conditions when spray drift onto the habitat is likely.
- If broadcast spraying bromacil, imazapyr, fluridone, metsulfuron methyl, or tebuthiuron in or near pygmy rabbit habitat, apply at the typical, rather than the maximum, application rate.

- If conducting manual spot applications of bromacil, glyphosate, hexazinone, tebuthiuron, or triclopyr to vegetation in pygmy rabbit habitat, utilize the typical. rather than the maximum, application rate.

In addition, project-level conservation measures would also be developed by local BLM offices during the development of NEPA documents for site-specific treatment projects. The projected short-term negative effects of vegetation treatments on the **Columbian white-tailed deer** could be avoided by implementing the following programmatic-level conservation measures.

- Prior to treatments, survey for evidence of white-tailed deer use of areas in which treatments are proposed to occur.
- Address the protection of Columbian white-tailed deer in local management plans developed in association with treatment programs.
- In areas that are likely to support Columbian white-tailed deer, protect riparian areas from degradation by avoiding them altogether, or utilizing SOPs. Consult Chapter 5 for appropriate conservation measures to be used in protected riparian areas.
- In habitats used by deer, conduct treatments that use domestic animals during the plant growing season, and remove the animals after clearing has been achieved.
- Do not use domestic animals to control weeds in woodland habitats utilized by Columbian whitetailed deer.
- In areas where Columbian white-tailed deer occur, or may possibly occur, avoid the use of fences to keep domestic animals out of sensitive habitats or to otherwise restrict their movement (fence accidents are associated with deer mortality).
- Avoid burning in deer habitats during the fawning season.
- Closely follow all application instructions and use restrictions on herbicide labels; in riparian habitats use only those herbicides that are approved for use in riparian areas.
- Avoid broadcast spray treatments in areas where Columbian white-tailed deer are known to forage.
- Do not use 2,4-D in Columbian white-tailed deer habitats; do not broadcast spray 2,4-D within ¼ mile of Columbian white-tailed deer habitat.
- Where feasible, avoid use of the following herbicides in Columbian white-tailed deer habitat: bromacil, clopyralid, diquat, diuron, glyphosate, hexazinone, imazapyr, metsulfuron methyl, Overdrive®, picloram, tebuthiuron, and triclopyr.
- Do not broadcast spray bromacil, clopyralid, diquat, diuron, glyphosate, hexazinone, Overdrive®, picloram, or triclopyr in Columbian white-tailed deer habitat; do not broadcast spray these herbicides in areas adjacent to Columbian white-tailed deer habitat under conditions when spray drift onto the habitat is likely.
- If broadcast spraying imazapyr, metsulfuron methyl, or tebuthiuron in or near Columbian whitetailed deer habitat, apply at the typical, rather than the maximum, application rate.

- ·If conducting manual spot applications of glyphosate, hexazinone, imazapyr, metsulfuron methyl, tebuthiuron, or triclopyr to vegetation in Columbian white-tailed deer habitat, utilize the typical, rather than the maximum, application rate.

In addition, site-specific and project specific conservation measures would need to be developed by local BLM offices to ensure complete protection of the Columbian white-tailed deer.

In order to prevent or minimize the potential effects to **lesser and Mexican long-nosed bats** from vegetation treatments, the following conservation measures should be followed:

- Prior to treatments, survey all potentially suitable habitat for the presence of bats or their nectar plants.
- At the local level, incorporate protection of lesser and Mexican long-nosed bats into management plans developed for proposed treatment programs.
- Instruct all field personnel on the identification of bat nectar plants and the importance of their protection.
- Protect nectar plants from modification by treatment activities to the greatest extent possible. Do not remove nectar plants during treatments. Avoid driving over plants, piling slash on top of plants, burning, and using domestic animals to control weeds.
- Do not burn within a mile upwind of known bat roosts.
- To protect nectar plants and roost trees from herbicide treatments, follow recommended buffer zones and other conservation measures for TEP plant species in areas where populations of nectar plants and roost trees occur.
- Do not use 2,4-D, diquat, or diuron, in lesser or Mexican long-nosed bat habitats; do not broadcast spray these herbicides within ¼ mile of lesser or Mexican long-nosed bat habitat.
- Where feasible, avoid use of the following herbicides in lesser and Mexican long-nosed bat habitat: bromacil, clopyralid, fluridone, glyphosate, hexazinone, imazapyr, metsulfuron methyl, picloram, tebuthiuron, and triclopyr.
- Do not broadcast spray clopyralid, glyphosate, hexazinone, picloram, or triclopyr in lesser or
- Mexican long-nosed bat habitat; do not broadcast spray these herbicides in areas adjacent to lesser or Mexican long-nosed bat habitat under conditions when spray drift onto the habitat is likely.
- If broadcast spraying bromacil, imazapyr, or metsulfuron methyl, or tebuthiuron in or near lesser or Mexican long-nosed bat habitat, apply at the typical, rather than the maximum, application rate.
- If conducting manual spot applications of bromacil, diuron, glyphosate, hexazinone, tebuthiuron, or triclopyr to vegetation in lesser or Mexican long-nosed bat habitat, utilize the typical, rather than the maximum, application rate .
- If conducting spot treatments of herbicides in lesser or Mexican long-nosed bat habitats, avoid potential roost sites.

In addition, local BLM offices would be required to prepare site-specific conservation measures to protect these species prior to conducting treatments. In order to prevent negative effects to the **Sonoran pronghorn**, the following conservation measures are required by the BLM:

- Prior to treatments, survey all suitable habitat in areas proposed for treatment for Sonoran pronghorns.
- Avoid biological treatment by domestic animals in areas used as forage by Sonoran pronghorns.
- Avoid fawning areas during treatments.
- Closely follow all application instructions and use restrictions on herbicide labels; in riparian habitats use only those herbicides that are approved for use in riparian areas.
- Avoid broadcast spraying herbicides in key pronghorn foraging areas.
- Do not use 2.4-0 in Sonoran pronghorn habitats; do not broadcast spray 2.4-0 within Y<l mile of Sonoran pronghorn habitat.
- Where feasible, avoid use of the following herbicides in Sonoran pronghorn habitat: bromacil, clopyralid, diquat, diuron, glyphosate, hexazinone, imazapyr, metsulfuron methyl, Overdrive®, picloram, tebuthiuron, and triclopyr.
- Do not broadcast spray bromacil, clopyralid, diquat, diuron, glyphosate, hexazinone, Overdrive®, picloram, or triclopyr in Sonoran pronghorn habitat; do not broadcast spray these herbicides in areas adjacent to Sonoran pronghorn habitat under conditions when spray drift onto the habitat is likely.
- If broadcast spraying imazapyr, metsulfuron methyl, or tebuthiuron in or near Sonoran pronghorn habitat, apply at the typical, rather than the maximum, application rate.
- If conducting manual spot applications of glyphosate, hexazinone, imazapyr, metsulfuron methyl, tebuthiuron, or triclopyr to vegetation in Sonoran pronghorn habitat, utilize the typical, rather than the maximum, application rate.
- In addition, project-specific conservation measures will be applied at the local level, as necessary, to minimize effects to the species.

In order to avert or minimize potential negative effects to **rodents (Hualapai Mexican vole, the Amargosa vole, the Preble's meadow jumping mouse, the riparian woodrat and the Buena Vista Lake ornate shrew)**, the following conservation measures would be required:

- Survey suitable habitat for these species prior to developing treatment programs at the local level. In areas where the Hualapai Mexican vole, Amargosa vole, Preble's meadow jumping mouse, riparian woodrat, or Buena Vista Lake ornate shrew occur:
- Address Hualapai Mexican voles, Amargosa voles, Preble's meadow jumping mice, riparian woodrats, and Buena Vista Lake ornate shrews in all management plans prepared for treatments within areas that contain habitat for these species.
- Do not bum, graze, or conduct mechanical treatments within wetlands and/or riparian areas that support these species.

- Do not bum in areas where woodrat homes are present.
- Use manual spot application of herbicides rather than broadcast treatments.
- Closely follow all application instructions and use restrictions on herbicide labels; in wetland and riparian habitats use only herbicides that are approved for use in those areas.
- Do not use 2,4-D, diquat, or diuron in Hualapai Mexican vole, Amargosa vole, Preble's meadow jumping mouse, or riparian woodrat habitats; do not broadcast spray these herbicides within ¼ mile of Hualapai Mexican vole, Amargosa vole. Preble's meadow jumping mouse, riparian woodrat, or Buena Vista Lake ornate shrew habitat.
- Do not broadcast spray herbicides within Hualapai Mexican vole, Amargosa vole, Preble's meadow jumping mouse, riparian woodrat, or Buena Vista Lake ornate shrew habitat.
- Where feasible, avoid use of the following herbicides in Hualapai Mexican vole, Amargosa vole, Preble's meadow jumping mouse, riparian woodrat, and Buena Vista Lake ornate shrew habitat: clopyralid, fluridone, glyphosate, hexazinone, imazapyr, metsulfuron methyl, picloram, tebuthiuron, and triclopyr.
- Do not broadcast spray c1opyraJid, glyphosate, hexazinone, imazapyr, picloram, or triclopyr in areas adjacent to Hualapai Mexican vole, Amargosa vole, Preble's meadow jumping mouse, riparian woodrat, or Buena Vista Lake ornate shrew habitat under conditions when spray drift onto the habitat is likely.
- If broadcast spraying bromacil, fluridone, metsulfuron methyl, or tebuthiuron near Hualapai
- Mexican vole, Amargosa vole, riparian woodrat, Preble's meadow jumping mouse, or Buena Vista Lake ornate shrew habitat, apply at the typical, rather than the maximum, application rate.
- If conducting manual spot applications of bromacil, glyphosate, hexazinone, tebuthiuron, or triclopyr to vegetation in Hualapai Mexican vole, Amargosa vole, Preble's meadow jumping mouse, riparian woodrat, or Buena Vista Lake ornate shrew habitat, utilize the typical, rather than the maximum, application rate.

These measures represent the minimum that is required of the BLM to protect these species from negative impacts during vegetation treatments. Additional project-specific conservation measures would also need to be developed at the local level, as appropriate.

Implementation of the following conservation measures would ensure that the BLM's activities would not negatively affect the **Northern Idaho ground squirrel**.

- Prior to conducting treatments, survey the area to be treated for northern Idaho ground squirrels.
- At the local level, address northern Idaho ground squirrels and their habitat when developing management plans for proposed treatments.
- Where squirrels are detected, conduct vegetation treatments during the hibernation season, where feasible.
- Prohibit or minimize use of domestic animals in squirrel habitats.

- Design treatments so that only a portion of northern Idaho ground squirrel habitat is in a state of recovery at any one time.
- Design treatments to avoid injury to native bunchgrasses in northern Idaho ground squirrel habitat; consult plant buffer distances and other conservation measures for sensitive plants in Chapter 4 for guidance.
- Do not use 2,4-D, diquat, or diuron in northern Idaho ground squirrel habitats outside of the hibernation period; do not broadcast spray these herbicides within ¼ mile of northern Idaho ground squirrel habitat outside the hibernation period.
- Where feasible, avoid use of the following herbicides in northern ground Idaho squirrel habitat: bromacil, clopyralid, fluridone, glyphosate, hexazinone, imazapyr, metsulfuron methyl, picloram, tebuthiuron, and triclopyr.
- Do not broadcast spray c1opyraJid, glyphosate, hexazinone, picloram, or triclopyr in northern Idaho ground squirrel habitat outside of the hibernation period; do not broadcast spray these herbicides in areas adjacent to northern Idaho ground squirrel habitat outside of the hibernation period under conditions when spray drift onto the habitat is likely.
- If broadcast spraying bromacil, imazapyr, fluridone, metsulfuron methyl, or tebuthiuron in or near northern Idaho ground squirrel habitat outside of the hibernation period, apply at the typical, rather than the maximum, application rate.
- If conducting manual spot applications of bromacil, glyphosate, hexazinone, tebuthiuron, or triclopyr to vegetation in northern Idaho ground squirrel habitat outside of the hibernation period, utilize the typical, rather than the maximum, application rate.

In addition, at the time of project-level NEP A review, local BLM offices would need to include additional conservation measures, specific to both the project and the site, for protecting the Northern Idaho ground squirrel.

In order to minimize or avoid impacts to the **woodland caribou**, the BLM would be required to follow, at a minimum, the programmatic-level conservation measures listed below.

- At the local level, prepare a management plan for all proposed treatment activities that could potentially occur on land utilized by woodland caribou. This management plan must be completed with the assistance of a wildlife biologist and a forest ecologist, and must specifically address caribou and caribou habitat.
- Design prescribed bums and mechanical treatments so that no more than 10% of caribou habitat is affected at any one time.
- Time major herbicide treatments in woodland caribou habitats such that they do not occur during the season when caribou rely on the treatment area for forage.
- Do not use 2,4-D in woodland caribou habitats; do not broadcast spray 2,4-D within ¼ mile of woodland caribou habitat.
- Where feasible, avoid use of the following herbicides in woodland caribou habitat: bromacil, clopyralid, diquat, diuron, glyphosate, hexazinone, imazapyr, metsulfuron methyl, Overdrive®, picloram, tebuthiuron, and triclopyr.

- Do not broadcast spray bromacil, clopyralid, diquat, diuron, glyphosate, hexazinone, Overdrive®, picloram, or triclopyr in woodland caribou habitat; do not broadcast spray these herbicides in areas adjacent to woodland caribou habitat under conditions when spray drift onto the habitat is likely.

- If broadcast spraying imazapyr, metsulfuron methyl, or tebuthiuron in or near woodland caribou habitat, apply at the typical, rather than the maximum, application rate.

- If conducting manual spot applications of glyphosate, hexazinone, imazapyr, metsulfuron methyl, tebuthiuron, or triclopyr to vegetation in woodland caribou habitat, utilize the typical, rather than the maximum, application rate.

Local offices would also be required to develop and implement any additional project- and site specific conservation measures deemed necessary during the preparation of project-level NEPA documentation.

Potential effects to **grizzly bears** from vegetation treatments could be avoided or minimized by following a number of conservation measures:

- Within the Recovery Zone, ensure that all treatment activities comply with the *Interagency Grizzly Bear Guidelines* (Interagency Grizzly Bear Committee 1987) and the *Final Conservation Strategy for the Grizzly Bear in the Yellowstone Ecosystem* (Interagency Conservation Strategy Team 2003) To minimize the potential for displacement/mortality risk during treatments:

- Within the Recovery Zone (defined in *Grizzly Bear Recovery Plan,* USFWS 1993), ensure that any vehicular travel off highway or on restricted roads adheres to access standards/directions as provided in local or regional interagency agreements, biological opinions, or local land use plans.

- Limit all activities requiring overnight stays or establishment of a base camp to less than 20 individuals and less than 5 days within the Grizzly Bear Recovery Zone.

- Limit firewood collection within the Recovery Zone to roadside hazard tree removal, road maintenance, or campground maintenance activities.

- Within the Recovery Zone, do not conduct vegetation treatment activities in riparian meadows and stream corridors between April I and July I, or complete these activities in I day.

- Within the Recovery Zone, do not implement vegetative treatments that would substantially change the vegetative community in huckleberry producing sites.

To minimize the potential for habituation/human conflict:

- Within the Recovery Zone, ensure that all treatment activities adhere to interagency grizzly bear guidelines and standards for sanitation measures and storage of potential attractants, and enforce food storage and garbage disposal stipulations.

- Ensure all workers at treatment sites are aware of appropriate personal safety measures and behavior in grizzly bear habitat.

- Within the Recovery Zone, do not use domestic animals to control weeds.

- Within the Recovery Zone. do not plant or seed highly palatable forage species near roads or facilities used by humans.

To minimize the likelihood that grizzly bears would suffer negative health effects as a result of exposure to herbicides:

- Do not use 2,4-D in the Recovery Zone; do not broadcast spray 2,4-D within ¼ mile of the Recovery Zone
- Where feasible, avoid use of the following herbicides in the Recovery Zone: bromacil, clopyralid, diquat, diuron, glyphosate, hexazinone, imazapyr, metsulfuron methyl, Overdrive®, picloram, tebuthiuron, and triclopyr.
- Do not broadcast spray bromacil, clopyralid, diquat, diuron, glyphosate, hexazinone, Overdrive®, picloram, or triclopyr in the Recovery Zone; do not broadcast spray these herbicides in areas adjacent to the Recovery Zone under conditions when spray drift into the Recovery Zone is likely.
- If broadcast spraying imazapyr, metsulfuron methyl, or tebuthiuron in or near the Recovery Zone, apply at the typical, rather than the maximum, application rate.
- If conducting manual spot applications of glyphosate, hexazinone, imazapyr, metsulfuron methyl, tebuthiuron, or triclopyr to vegetation in the Recovery Zone, utilize the typical, rather than the maximum, application rate.

In addition, analysis of potential site-specific impacts to grizzly bears would occur at the project level, and any additional conservation measures deemed necessary would also need to be applied to ensure that potential effects were minimized or avoided.

In order to minimize or avoid impacts to **lynx**, the BLM must follow, at a minimum, the conservation measures listed below:

- Prior to vegetation treatments, map lynx habitat within areas in which treatments are proposed to occur. Identify potential denning and foraging habitat, and topographic features that may be important for lynx movement (major ridge systems, prominent saddles, and riparian corridors).
- Design vegetation treatments in lynx habitat to approximate historical landscape patterns and disturbance processes.
- Avoid the construction of permanent firebreaks on ridges or saddles in lynx habitat.
- Where possible, keep linear openings out of mapped potential habitat and away from key habitat components, such as denning areas.
- When planning vegetation treatments, minimize the creation of linear openings (fire lines. Access routes, and escape routes) that could result in permanent travel ways for competitors and humans.
- Obliterate any linear openings constructed within lynx habitat in order to deter future uses by humans and competitive species.
- Design bum prescriptions to regenerate or create snowshoe hare habitat (e.g., regeneration of aspen and lodgepole pine).

- Ensure that no more than 30% of lynx habitat within a Lynx Analysis Unit (as defined in Ruediger *et al.* 2(00) would be in an unsuitable condition at any time.

- If deemed necessary, defer livestock grazing following vegetation treatments to ensure the reestablishment of key plant species. Bureau of Land Management personnel should use resource goals and objectives to determine the need for this restriction and the length of deferment on a case by case basis.

- Give particular consideration to amounts of denning habitat, condition of summer and winter foraging habitat, as well as habitat linkages, to ensure that that treatments do not negatively impact lynx. If there is less than 10% lynx habitat in a Lynx Analysis Unit, defer vegetation treatments that would delay development of denning habitat structure. Protect habitat connectivity within and between Lynx Analysis Units.

- Do not use 2,4-D in Canada lynx habitat; do not broadcast spray 2,4-D within ¼ mile of Canada lynx habitat.

- Where feasible, avoid use of the following herbicides in Canada lynx habitat: bromacil, clopyralid, diquat, diuron, glyphosate, hexazinone, imazapyr, metsulfuron methyl, picloram, and triclopyr.

- Do not broadcast spray clopyralid, diuron, glyphosate, hexazinone, picloram, or triclopyr in Canada lynx habitat; do not broadcast spray these herbicides in areas adjacent to Canada lynx habitat under conditions when spray drift onto the habitat is likely.

- If broadcast spraying bromacil, diquat, imazapyr, or metsulfuron methyl in or near Canada lynx habitat, apply at the typical, rather than the maximum, application rate.

- If conducting manual spot applications of glyphosate, hexazinone, or triclopyr to vegetation in

- Canada lynx habitat, utilize the typical, rather than the maximum, application rate.

In addition, the BLM must develop and implement additional conservation measures, as necessary, during project-level analysis at the local level.

In order to minimize or avoid impacts to **San Joaquin kit foxes** from herbicide treatments, the BLM must follow, at a minimum, the programmatic conservation measures listed below:

- Do not use 2,4-D in San Joaquin kit fox habitat; do not broadcast spray 2,4-D within ¼ mile of San Joaquin fox habitat.

- Where feasible, avoid use of the following herbicides in San Joaquin kit fox habitat: bromacil, clopyralid, diquat, diuron, glyphosate, hexazinone, imazapyr, metsulfuron methyl, picloram, tebuthiuron, and triclopyr.

- Do not broadcast spray clopyralid, diuron, glyphosate, hexazinone, picloram, or triclopyr in San Joaquin kit fox habitat; do not broadcast spray these herbicides in areas adjacent to San Joaquin kit fox habitat under conditions when spray drift onto the habitat is likely.

- If broadcast spraying bromacil, diquat, imazapyr, metsulfuron methyl, or tebuthiuron in or near northern San Joaquin kit fox habitat, apply at the typical, rather than the maximum, application rate.

- If conducting manual spot applications of diuron, glyphosate, hexazinone, tebuthiuron, or triclopyr to vegetation in San Joaquin kit fox habitat, utilize the typical, rather than the maximum, application rate.

In addition, the BLM must develop and implement additional conservation measures, as necessary, during project-level analysis at the local level.

The following programmatic-level conservation measures would be required to ensure that the proposed vegetation treatments did not negatively affect **listed kangaroo rat species, the Utah prairie dog, or the black-footed ferret**, or their habitats:

- Prior to conducting vegetation treatments, survey areas scheduled to receive treatments for listed kangaroo rats, Utah prairie dogs. and black-footed ferrets.
- Incorporate these species and their habitat into management plans developed for treatment activities.
- Avoid vegetation treatments during drought conditions.
- Where possible, perform treatments during the hibernation period.
- Do not use 2,4-D in listed kangaroo rat, Utah prairie dog, or black-footed ferret habitats; do not broadcast spray 2,4-D within ¼ mile of listed kangaroo rat, Utah prairie dog, or black-footed ferret habitat.
- Do not use diquat or diuron in listed kangaroo rat or Utah prairie dog habitats; do not broadcast spray these herbicides within ¼ mile of listed kangaroo rat or Utah prairie dog habitat.

Additional conservation measures for **kangaroo rats** and the **Utah prairie dog**:

- Where feasible, avoid use of the following herbicides in listed kangaroo rat and Utah prairie dog habitat: bromacil, clopyralid, fluridone, glyphosate, hexazinone, imazapyr, metsulfuron methyl, picloram, tebuthiuron, and triclopyr.
- Do not broadcast spray clopyralid, glyphosate, hexazinone, picloram, or triclopyr in listed kangaroo rat or Utah prairie dog habitat; do not broadcast spray these herbicides in areas adjacent to listed kangaroo rat or Utah prairie dog habitat under conditions when spray drift onto the habitat is likely.
- If broadcast spraying bromacil, imazapyr, fluridone, metsulfuron methyl, or tebuthiuron in or near listed kangaroo rat or Utah prairie dog habitat, apply at the typical, rather than the maximum, application rate.
- If conducting manual spot applications of bromacil, glyphosate, hexazinone, tebuthiuron, or triclopyr to vegetation in listed kangaroo rat or Utah prairie dog habitat, utilize the typical, rather than the maximum, application rate.

Additional conservation measures for the **black-footed ferret**:

- Where feasible, avoid use of the following herbicides in black-footed ferret habitat: bromacil, clopyralid, diquat, diuron, glyphosate, hexazinone, imazapyr, metsulfuron methyl, picloram, and triclopyr.

- Do not broadcast spray clopyralid, diuron, glyphosate, hexazinone, picloram, or triclopyr in black-footed ferret habitat; do not broadcast spray these herbicides in areas adjacent to black-footed ferret habitat under conditions when spray drift onto the habitat is likely.

- If broadcast spraying bromacil, diquat, imazapyr, or metsulfuron methyl in or near black-footed ferret habitat, apply at the typical, rather than the maximum, application rate.

- If conducting manual spot applications of glyphosate, hexazinone. or triclopyr to vegetation in black-footed ferret habitat, utilize the typical, rather than the maximum, application rate.

- Individual projects would be subject to review at the local level, during which additional conservation measures could be identified as necessary to protect these species.

The following programmatic-level conservation measures are the minimum steps required of the BLM to ensure that **bighorn** sheep and their habitats would not be impacted by vegetation treatment activities. Additional project-specific conservation measures would be identified at the local level, as appropriate.

- Prior to treatment activities, survey suitable habitat for evidence of use by bighorn sheep.

- Do not use domestic animals as a vegetation treatment in bighorn sheep habitat.

- When planning vegetation treatments, minimize the creation of linear openings that could result in permanent travel ways for competitors and humans.

- Obliterate any linear openings constructed within bighorn sheep habitat in order to deter future uses by humans and competitive species.

- Where feasible, time vegetation treatments such that they do not coincide with seasonal use of the treatment area by bighorn sheep.

- Do not broadcast spray herbicides in key bighorn sheep foraging habitats.

- Do not use 2,4-D in bighorn sheep habitat; do not broadcast spray 2,4-D within ¼ mile of bighorn sheep habitat.

- Where feasible, avoid use of the following herbicides in bighorn sheep habitat: bromacil, clopyralid, diquat, diuron, glyphosate, hexazinone, imazapyr, metsulfuron methyl, Overdrive®, picloram, and tebuthiuron, and triclopyr.

- Do not broadcast spray bromacil, clopyralid, diquat, diuron, glyphosate, hexazinone, Overdrive®, picloram, or triclopyr in bighorn sheep habitat; do not broadcast spray these herbicides in areas adjacent to bighorn sheep habitat under conditions when spray drift onto the habitat is likely.

- If broadcast spraying imazapyr, metsulfuron methyl, or tebuthiuron in or near bighorn sheep habitat, apply at the typical, rather than the maximum, application rate.

- If conducting manual spot applications of glyphosate, hexazinone, imazapyr, metsulfuron methyl, tebuthiuron, or triclopyr to vegetation in bighorn sheep habitat, utilize the typical, rather than the maximum, application rate.

Although the proposed vegetation treatments would not be likely to have negative effects on **wolves** or their habitat, the following programmatic-level conservation measures are recommended to ensure protection of the species. Additional or more specific guidance would also be provided at the project level, as appropriate.

- Avoid human disturbance and/or associated activities within I mile of a den site during the breeding period (as determined by a qualified biologist).
- Avoid human disturbance and/or associated activities within I mile of a rendezvous site during the breeding period (as determined by a qualified biologist).
- Do not use 2,4-D in areas where gray wolves are known to occur; do not broadcast spray within ¼ mile of areas where gray wolves are known to occur.
- Where feasible, avoid use of the following herbicides in gray wolf habitat: bromacil, clopyralid, diquat, diuron, glyphosate, hexazinone, imazapyr, metsulfuron methyl, picloram, and triclopyr.
- Do not broadcast spray clopyralid, diuron, glyphosate, hexazinone, picloram, or triclopyr in gray wolf habitat; do not broadcast spray these herbicides in areas adjacent to gray wolf habitat under conditions when spray drift onto the habitat is likely.
- If broadcast spraying bromacil, diquat, imazapyr, or metsulfuron methyl in or near gray wolf habitat, apply at the typical, rather than the maximum, application rate.
- If conducting manual spot applications of glyphosate, hexazinone, or triclopyr to vegetation in gray wolf habitat, utilize the typical, rather than the maximum, application rate.

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Appendix M. Best Management Practices for Communication Sites

Lands and Realty

Facility owners and facility managers are not required to lease facility space to others if they can prove to the BLM authorized officer that:

1. Space is not available;
2. The use is incompatible with the existing facilities;
3. Additional space is needed by the facility owner/manager;
4. Additional users would violate system security needs; or
5. Potential interference is not resolvable.

   Maximum Allowable Occupancy: Buildings/facilities have to be 3/4 full before allowing new buildings.

Standardize and streamline the authorization process for renewable energy development on BLM-administered lands.

For communication sites, governmental agencies may be authorized by a right-of-way grant. [Needs better description]

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Appendix N. ACEC Evaluation Report

Evaluation Report for Areas of Critical Environmental Concern for the Las Vegas and Pahrump Field Offices Resource Management Plan Revision and Environmental Impact Statement

N.1. Introduction

This report documents the process used to evaluate nominations for areas of critical environmental concern (ACEC) considered by the Bureau of Land Management (BLM) in revising the Las Vegas Resource Management Plan (RMP). BLM is directed by law, regulation, and policy to consider designating ACECs when developing land use plans. The Federal Land Policy and Management Act (FLPMA) directs the BLM to "give priority to the designation and protection of areas of critical environmental concern" through the "development and revision of land use plans" (FLPMA Title II, Sec 202(c) 3). "The term 'areas of critical environmental concern' means areas within the public lands where special management attention is required (when such areas are developed or used or where no development is required) to protect and prevent irreparable damage to important historic, cultural, or scenic values, fish and wildlife resources or other natural systems or processes, or to protect life and safety from natural hazards" (FLPMA, Title I, Sec 103(a)). As FLPMA is specific to the management of lands under BLM administration, the ACEC is unique to BLM, and no other agency uses this form of designation. Additionally, private lands and lands administered by other agencies are not included in the boundaries of ACECs.

As required by BLM policy, the BLM interdisciplinary team re-evaluated existing ACECs were as part of the RMP Revision to determine if they still contain relevant and important values within in the current boundaries. Of the 22 ACECs in the 1998 RMP, 20 were found to still meet relevance and importance criteria.

The BLM interdisciplinary team also evaluated 33 nominations for ACECs within the Las Vegas and Pahrump Field Office decision areas. Of these, 28 areas met the criteria for relevant and important values, resources, natural systems or processes, or hazards/safety/public welfare (all of which are referred to collectively as values in this report) and were identified as areas to be considered further for locations of ACECs. The Ivanpah Valley 2 ACEC nomination has been addressed in a separate NEPA process as part of the Silver State South solar project. The Record of Decision for that project created the Ivanpah ACEC, thus bringing the total of existing ACECs to 23. Of the other 27 areas the met criteria for relevant and important values, it was decided to not further analyze one of the areas because it is in a legislative disposal boundary (Ivanpah Valley 1). In addition, it was decided to combine the Highland Range nomination with the existing Piute Eldorado ACEC, combine the Pahrump Valley to McCullough Mountains nomination with the Bird Spring Valley nomination, and combine the Valley of Fire nomination with the California Wash nomination. Thus a total of 23 areas were chosen to further analyze as potential new ACECs within the RMP.

N.1.1. Designating ACECs

N.1.1.1. Relevance and Importance Criteria

To be eligible for designation as an ACEC, an area must meet the relevance and importance criteria described in 43 Code of Federal Regulations (CFR) 1610.7-2 and BLM Manual 1613, *Areas of Critical Environmental Concern.*

Relevance and importance are defined as follows:

Relevance: There shall be present a significant historic, cultural, or scenic value, a fish or wildlife resource or other natural system or process, or natural hazard.

Importance: The above described value, resource, system, process, or hazard shall have substantial significance and value, which generally requires qualities of more than local significance and special worth, consequence, meaning, distinctiveness, or cause for concern. A natural hazard can be important if it is a significant threat to life or property.

Relevance

An area meets the relevance criterion if it contains one or more of the following:

1. A significant historic, cultural, or scenic value (including but not limited to rare or sensitive archeological resources and religious or cultural resources important to Native Americans)

2. A fish and wildlife resource (including but not limited to habitat for endangered, sensitive, or threatened species or habitat essential for maintaining species diversity)

3. A natural process or system (including but not limited to endangered, nonsensitive, or threatened plant species; rare, endemic, or relic plants or plant communities that are terrestrial, aquatic, or riparian; or rare geological features)

4. Natural hazards (including but not limited to areas of avalanche, dangerous flooding, landslides, unstable soils, seismic activity, or dangerous cliffs). A hazard caused by human action might meet the relevance criteria if it is determined through the resource management planning process to have become part of a natural process.

Importance

An area meets the importance criterion if it meets one or more of the following:

1. Has more than locally significant qualities that give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared to any similar resource

2. Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change

3. Has been recognized as warranting protection to satisfy national priority concerns or to carry out the mandates of the Federal Land Policy and Management Act (FLPMA)

4. Has qualities that warrant highlighting to satisfy public or management concerns about safety and public welfare

5. Poses a significant threat to human life and safety or to property.

There are several steps in the identification and evaluation of ACECs. These steps include:

- Nomination of areas that may meet the relevance and importance criteria

- Evaluation of the nominated areas to determine if they meet the relevance and importance criteria

- Consideration of the potential ACECs in alternative management scenarios which are formulated and effects analyzed in the Draft RMP/EIS.

ACECs can be nominated at any time, but are only designated through the BLM's land-use planning process. Nominations from the public are generally solicited as part of the scoping process during development of a land-use plan for a particular area. Nominations are evaluated to determine whether they meet the relevance and importance criteria. A nomination must meet one or more of both relevance and importance criteria to be considered a potential ACEC. Potential ACECs are considered as RMP alternatives are developed. Each potential ACEC is proposed for designation in at least one of the management alternatives. The need for special management and the resulting effects from applying such management are assessed in the associated environmental analysis. The Preferred Alternative identifies which potential ACECs are proposed by BLM for designation.

A notice of any areas proposed for ACEC designation is published in the Federal Register along with a Notice of Availability of the Draft RMP/EIS requesting public comment. The public may comment on any aspect of the ACEC analysis at this point in the process. These comments are then considered in preparation of the Proposed RMP/Final EIS.

N.2. Evaluation Process

N.2.1. Evaluate nominations

The BLM land use planning interdisciplinary team evaluated the ACEC nominations. The team's job was to:

- Existing ACECs:
  - Analyze existing ACECs to determine if relevant and important values are present. This includes determining if additional values that meet the standard for relevance and importance are present.
  - Determine if changes to boundaries or management should be considered during the planning effort
- Nominated areas:
  - Identify the potentially relevant values, resources, processes, systems, and hazards/safety/public welfare (referred to collectively as values)
  - Evaluate the potentially relevant values to determine which, if any, meet the relevance criteria
  - Evaluate relevant values to determine which, if any, meet the importance criteria
- Map the area(s) of relevance and importance.

Potentially relevant values were evaluated based on guidance in 43 CFR 1610.7-2, *Designation of Areas of Critical Environmental Concern*, and BLM Manual 1613, *Areas of Critical Environmental Concern*. Only one value had to meet one of the relevance criteria for the area to be considered further and then evaluated for importance. If the evaluation concluded that none of

the values for a nominated area met any of the relevance and importance criteria, the area will not be carried forward into one or more of the alternatives in the draft RMP/EIS.

There are 22 existing ACECs in the two field offices, totaling 974,531 acres (not counting the recently designated Ivanpah ACEC). Table N.1, "Existing ACECs" (p. 1992) shows all existing ACECs within the Las Vegas and Pahrump Field Offices, the acres of the existing ACECs, and the county where they are located. Their locations are shown on Figure N.1, "Map — Existing ACECs" (p. 1993).

Table N.1. Existing ACECs

Existing ACEC	Acres	County
Amargosa Mesquite	6,785	Nye
Arden Historic Sites	1,442	Clark
Arrow Canyon	2,070	Clark
Ash Meadows	27,673	Nye
Big Dune	1,916	Nye
Coyote Springs	51,528	Clark
Crescent Townsites	435	Clark
Devils Throat	639	Clark
Gold Butte, Part A	185,128	Clark
Gold Butte, Part B	122,540	Clark
Gold Butte, Part C (Virgin Mountains)	35,706	Clark
Gold Butte Townsites	159	Clark
Hidden Valley	3,356	Clark
Keyhole Canyon	240	Clark
Mormon Mesa	149,254	Clark
Piute/Eldorado	328,235	Clark
Rainbow Gardens	38,766	Clark
Red Rock Spring	638	Clark
River Mountains	11,029	Clark
Stump Spring	646	Clark
Virgin River	6,186	Clark
Whitney Pocket	160	Clark

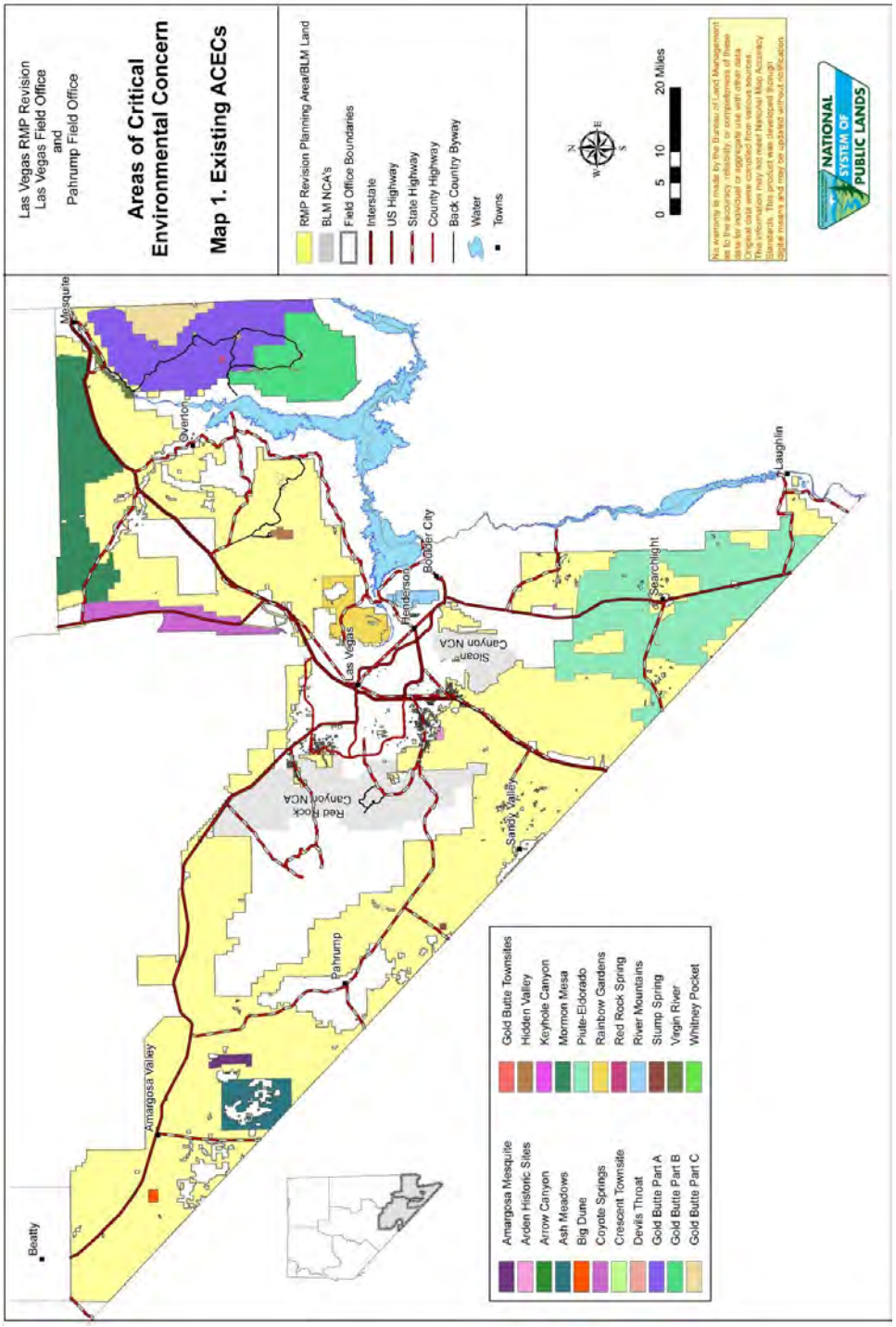

Figure N.1. Map — Existing ACECs

Nominations were submitted during the scoping process by City of Henderson, Desert Conservation Program (DCP), Nevada Department of Wildlife (NDOW), National Park Service (NPS), and Basin and Range Watch.

- City of Henderson – 2 areas totaling 3,110 acres for the following value: white margined penstemon.

- Clark County Desert Conservation Program — 4 areas totaling 282,361 acres for the following values: Mojave desert tortoise, western burrowing owl, desert kangaroo rat, desert pocket mouse, yellow two-toned beardtongue, Las Vegas bearpoppy, Las Vegas buckwheat, sticky buckwheat, and threecorner milkvetch.

- Basin and Range Watch — 1 area totaling 89,599 acres for the following values: cultural resources, Mojave desert tortoise, Gila Monster, desert bighorn sheep, Western burrowing owl, golden eagle, Golden eagle, loggerhead shrike, Le Conte's thrasher, Crissal Thrasher, Vaux's swift, Brewer's sparrow, Gray vireo, hepatic tanager, sage thrasher, northern goshawk, northern harrier, long-eared owl, short-eared owl, black swift, Lucy's warbler, yellow warbler, whip-poor-will, Costa's hummingbird, Calliope hummingbird, Williamson's sapsucker, willow flycatcher, mountain plover, cactus wren, ferruginous hawk, peregrine falcon, Lewis's woodpecker, mule deer, Nevada agave, Wright's beebrush, small-flowered androstephium, desert bearpoppy, Mojave milkweed, borrego milkvetch, Tidestrom's milkvetch, Chihuahua scaly cloakfern, , black grama, red grama, revolute spurge, purple bird's beak, desert pincushion, Gilman's springparsley, Utah vine milkweed, nine-awned pappus grass, Utah fleabane ,hairy woollygrass, Clark Mountain spurge ,limestone bedstraw, Parish's chollaCalifornia false pennyroyal, polished blazingstar, wingseed blazingstar, Utah mortonia, crowned muilla, cavedwelling evening primrose, pinto beardtongue, Aven Nelson's phacelia, skyblue phacelia, Goodding's phacelia, Chinese lantern, desert portulaca, Abert's sanvitalia, Rusby's desert-mallow, Branched noseburn, Aven Nelson phacelia, rosy twotone beardtongue, yellow twotone penstemon, Death Valley ephedra, New York Mountains catseye, Spring Mountains milk-vetch, Nye milk-vetch, Mojave milk-vetch,white bear poppy, white-marginned penstemon, and biological soil crusts.

- NDOW — 9 areas totaling 1,019,917 acres for the following values: Mojave desert tortoise, banded Gila monster, chuckwalla, golden eagle, peregrine falcon, burrowing owl, phainopepla, Le Conte's thrasher, Crissal thrasher, Lucy's warbler, desert bighorn sheep, Mojave desert sidewinder, Panamint rattlesnake, Smith's black-headed snake, Nevad shovel-nosed snake desert glossy snake, Utah banded gecko, desert night lizard, Bendire's thrasher, Arizona Bell's vireo, black-chinned sparrow, desert kangaroo rat, desert pocket mouse, and desert kit fox.

- NPS — 1 area totaling 9,488 acres for the following values: cultural, visual, bighorn sheep.

BLM made 21 ACEC nominations during preparation of the *Analysis of Management Situation* report. Changes to existing ACECs were also proposed in the *Analysis of Management Situation* and identified during the evaluation process.

Table N.2, "Areas Nominated for Consideration as ACECs " (p. 1995) shows all areas nominated for ACEC designation within the Las Vegas and Pahrump Field Offices, the size of the area evaluated, and the county where they are located.

Nominations were evaluated in accordance with *BLM Manual 1613, Areas of Critical Environmental Concern.* Many of the areas and resources nominated overlapped; some nominations were for a resource in a specific location and others included many resources over a broad landscape. Following initial evaluation and preparation of the evaluation worksheets below, the locations which met the relevance and importance criteria were carried forward for

consideration as potential ACECs in the Draft RMP/EIS alternative. The boundaries were refined to develop the range of alternatives that are proposed in the Draft RMP/EIS.

Table N.2. Areas Nominated for Consideration as ACECs

Nominated ACEC	Acres	County
Bird Spring Valley (nominated—BLM and DCP)	78,958 (BLM) 27,931 (DCP)	Clark
Bitter Springs (nominated—BLM, NDOW)	61,840	Clark
California Wash (nominated—BLM, NDOW)	11,998	Clark
Gale Hills (nominated—BLM)	4,788	Clark
Grapevine Springs Watershed (nominated—BLM)	202	Nye
Highland Range (nominated—NDOW)	53,015	Clark
Hiko Wash (nominated—BLM)	708	Clark
Ivanpah Valley 1 (nominated—BLM)	3,134	Clark
Ivanpah Valley 2 (nominated—Basin and Range Watch)	89,599	Clark
Jean Lake (nominated—BLM) Hidden Valley – Jean Lake (nominated – City of Henderson and DCP)	12,692 (BLM); 3,109 (DCP)	Clark
La Madre (North and South) (nominated—NDOW)	2,431	Clark
Lava Dune (nominated—BLM)	623	Nye
Logandale (nominated—BLM)	8,118	Clark
Lower Mormon Mesa (nominated—BLM)	66,353	Clark
Mesa Milkvetch (nominated—BLM)	9,183	Clark
Moapa Mesquite (nominated—BLM)	2,219	Clark
Mt. Schader (nominated—BLM)	285	Nye
Muddy Mountains (nominated—NDOW)	228,297	Clark
Old Spanish Trail (nominated—BLM)	51,449	Clark
Opal Mountains (nominated—NDOW)	77,410	Clark
Pahrump Valley to McCullough Mountains (nominated—NDOW)	274,060	Nye and Clark
Pahrump Valley Mesquite (nominated—BLM)	41,770	Nye and Clark
Perkins Ranch (nominated—BLM)	408	Clark
South Bare Mountains (Crater Flat) (nominated—NDOW)	87,692	Nye
South Newbury Mountains (nominated—NDOW)	26,877	Clark
Specter Hills (nominated—BLM)	6,603	Nye
Specter Range to Devil's Hole (nominated—NDOW)	238,538	Nye
Spirit Mountain (nominated — NPS)	9,488	Clark

Nominated ACEC	Acres	County
Stewart Valley (nominated—BLM)	5,204	Clark
Stuart Ranch (nominated—BLM)	278	Clark
Stump Spring 2 (nominated—DCP)	119,943	Clark
Upper Las Vegas Wash (nominated—BLM) Corn Creek (nominated—NDOW)	22,244 (BLM); 31,590 (NDOW)	Clark
Valley of Fire (nominated—DCP)	131,378	Clark

Table N.3, "Proposed additions to existing ACECs" (p. 1996) lists changes to existing ACECs that were nominated by BLM due to land acquisitions, new information about location of relevant and important values, and changed in the importance of values.

Table N.3. Proposed additions to existing ACECs

Nominated areas	Acres	County
Amargosa Mesquite (proposed boundary change—BLM)	2,865	Nye
Ash Meadows (proposed boundary change—BLM)	529	Nye
Big Dune (proposed boundary change—BLM)	540	Nye
Devils Throat (proposed boundary change—BLM)	206	Clark
Gold Butte, Part A (proposed boundary change – BLM)	2500	Clark
Gold Butte, Part B (proposed boundary change – BLM)	862	Clark
Keyhole Canyon (proposed boundary change—BLM)	339	Clark
Mormon Mesa (proposed boundary changes—BLM)	1) 7,712 2) 10,628	Clark
Piute/Eldorado (proposed boundary changes—BLM)	1) 14,093 2) 826 3) 8,844 4) 160	Clark
Rainbow Gardens	600	Clark
Virgin River (proposed boundary adjustments—BLM)	2,314	Clark

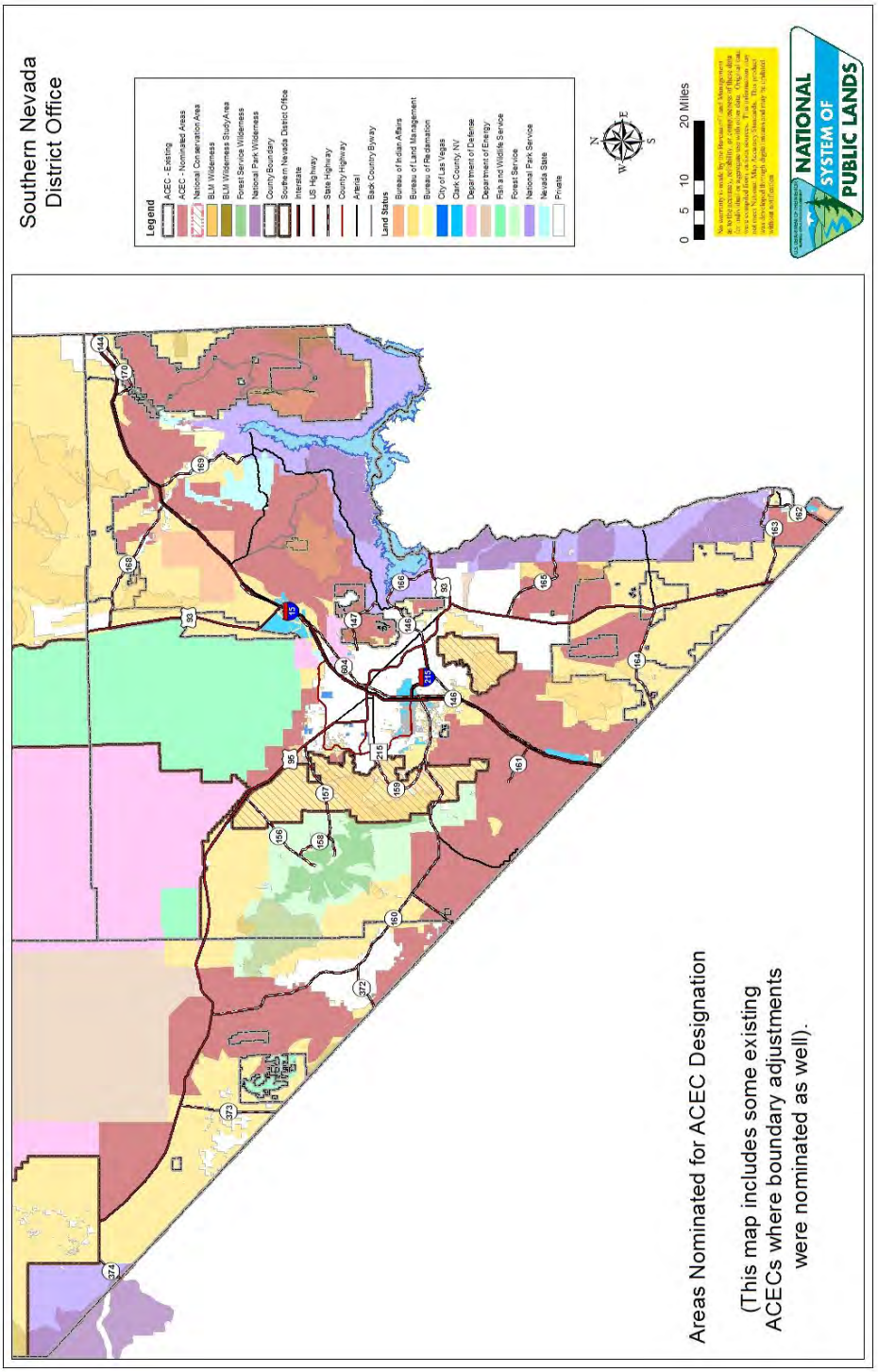

Figure N.2. Areas Nominated for ACEC Designation

N.2.1.1. Development of Alternatives to be Considered in the Draft RMP/EIS

Following the evaluation summarized in Section 3.1.3 and discussed in detail in Sections 3.1.1 and 3.1.2 below, the interdisciplinary team used the best available information to further refine

the boundaries and management of existing ACECs and nominated areas meeting relevance and importance. A range of alternatives was developed that included various boundaries, sizes, and management prescriptions. These are found in the Draft RMP/EIS. Boundaries were determined using aliquot parts where possible and may differ in size than the acres analyzed during the evaluation summarized in this report due to more specific analysis of resource location and refinement of boundaries to remove degraded areas and roads that do not contain values and may result in future management conflicts.

N.3. Evaluations of ACEC Nominations

N.3.1. Existing ACECs

N.3.1.1. Amargosa Mesquite ACEC

General Location:	Nye County south of State Highway 95 west of Lathrop Wells.
General Description:	Mesquite woodland important for neotropical bird species.
Existing Acreage:	6,785 acres
Nominated Acreage:	Proposed expansion of an additional 2,865 acres.
Values Considered:	Neotropical bird habitat, mesquite woodland, cultural resources.

Relevance:

An area meets the "relevance" criterion if it contains one or more of the following:

Relevance Value	Yes/No	Rationale for Determination
A significant historic, cultural, or scenic value (including rare or sensitive archeological resources and religious or cultural resources important to Native Americans).	Yes	The edge of the dry lakebed contains prehistoric habitation and associated cultural resources.
A fish and wildlife resource (including habitat for endangered, sensitive or threatened species, or habitat essential for maintaining species diversity).	Yes	Neotropical bird habitat.
A natural process or system (including endangered, sensitive, or threatened plant species; rare, endemic, or relic plants or plant communities that are terrestrial, aquatic, or riparian; or rare geological features).	Yes	Relic plant community (mesquite)—Single stem trees over 10 meters.
Natural hazards (including areas of avalanche, dangerous flooding, landslides, unstable soils, seismic activity, or dangerous if it is determined through the resource management planning process that it has become part of a natural process).	No	Area was not nominated for this value. None known to be present.

Importance

The value, resource, system, process, or hazard described above must have substantial significance and values to satisfy the "importance" criteria. This generally means that the value, resource, system, process, or hazard is characterized by one or more of the following:

Importance Value	Yes/No	Rationale for Determination
Has more than locally significant qualities that give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared with any similar resource.	Yes	Neotropical bird habitat—The large unfragmented mesquite area is unique, includes dune habitats, and is not adjacent to existing a large populated area.
	Yes	Relic plant community (mesquite)—Single stem trees up to 10 meters, growing as trees, not thickets.
Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.	Yes	Cultural—The area's resources are fragile and have experienced high levels of use. Use over time could continue to result in adverse change.
	Yes	Neotropical bird habitat—OHV use on the dunes disturbs nesting success.
	Yes	Relic plant community (mesquite)—This area is based on a perched water table, making its continued presence dependent on the continued availability of the water resources.There is a public demand for using the mesquite for firewood.This area is also located in hydrographic basin that has been over-appropriated.OHV use on the dunes fragments and degrades the mesquite, and affects recruitment.
Has been recognized as warranting protection to satisfy national priority concerns or to carry out the mandates of FLPMA.	No	Neotropical bird habitat—phainopepla and Lucy's warbler are BLM sensitive species, not federally listed species.
	No	Relic plant community (mesquite)—No national priority, except as habitat (see above)
Has qualities that warrant highlighting to satisfy public or management concerns about safety and public welfare.	No	Area was not nominated for this value. None known to be present.
Poses a significant threat to human life and safety or to property.	No	Area was not nominated for this value. Not present.

Summary of Relevant and Important Values: The BLM interdisciplinary team determined that 9,646 of the existing ACEC and the proposed expansion meet at least one criterion for both relevance and importance and will be considered for incorporation in the Draft RMP/EIS. Specifically, the following values meet at least one criterion for both relevance and importance:

- Relic plant community (mesquite)
- Neotropical bird habitat
- Cultural resources

N.3.1.2. Arden Historic Sites ACEC

General Location:	Southwestern corner of the Las Vegas Valley in Clark County.
General Description:	Cultural and historic area.
Existing Acreage:	1,142 acres
Nominated Acreage:	N/A
Values Considered:	Historic railroad construction and mining.

Relevance

An area meets the "relevance" criterion if it contains one or more of the following:

Relevance Value	Yes/No	Rationale for Determination
A significant historic, cultural, or scenic value (including rare or sensitive archeological resources and religious or cultural resources important to Native Americans).	No	Cultural—Closure/barricades of the mine and resulting vandalism have eliminated the integrity of the historic features. Water system associated with the mining site has been fragmented and lost the unique nature protecting a complete system.
A fish and wildlife resource (including habitat for endangered, sensitive or threatened species, or habitat essential for maintaining species diversity).	No	Area was not nominated for this value.
A natural process or system (including endangered, sensitive, or threatened plant species; rare, endemic, or relic plants or plant communities that are terrestrial, aquatic, or riparian; or rare geological features).	No	Area was not nominated for this value.
Natural hazards (including areas of avalanche, dangerous flooding, landslides, unstable soils, seismic activity, or dangerous if it is determined through the resource management planning process that it has become part of a natural process).	No	Area was not nominated for this value. None known to be present.

Summary of Relevant and Important Values: The BLM interdisciplinary team determined that the ACEC did not meet at least one criterion for both relevance and importance and will be considered for release from ACEC designation in the Draft RMP/EIS alternatives.

N.3.1.3. Arrow Canyon ACEC

General Location:	Northern end of the Arrow Canyon Mountains northwest of Moapa and south of Pahranagat Wash within the Arrow Canyon Wilderness.
General Description:	The ACEC features a canyon measuring 20 feet across at its narrowest, 200 to 400 feet deep and several miles long with sheer walls that hosts prehistoric rock art. The canyon is also significant for paleontological resources, including Miocene aged fossilized bird tracks, coral, brachiopods, and fossilized mollusks in limestone sediment. Vegetation consists predominantly of creosote-bursage scrub with mesquite and acacia in the washes.
Existing Acreage:	2,070 acres (1,270-acre overlap with Mormon Mesa ACEC).
Nominated Acreage:	N/A
Values Considered:	Cultural (Prehistoric rock art), scenic, paleontological (Miocene bird tracks), geologic (candidate for the mid carboniferous boundary stratotype section).

Relevance

An area meets the “relevance” criterion if it contains one or more of the following:

Relevance Value	Yes/No	Rationale for Determination
A significant historic, cultural, or scenic value (including rare or sensitive archeological resources and religious or cultural resources important to Native Americans).	Yes	Scenic— Geologic formations create topographic contrast with the surrounding desert, creating striking vistas, valleys, and uniquely scenic small, steep-walled canyons. Rugged topography and diverse vegetation provide visual contrast. Elevated viewing locations provide vistas of the surrounding deserts.Steep canyon and narrows with riparian vegetation.
	Yes	Cultural—A wide diversity of cultural sites and site types. Historic rock walls.

Relevance Value	Yes/No	Rationale for Determination
A fish and wildlife resource (including habitat for endangered, sensitive or threatened species, or habitat essential for maintaining species diversity).	No	Area was not nominated for this value.
A natural process or system (including endangered, sensitive, or threatened plant species; rare, endemic, or relic plants or plant communities that are terrestrial, aquatic, or riparian; or rare geological features).	Yes	Paleontological—Miocene bird and mammal trackways.
	Yes	Geologic—Candidate for the mid carboniferous boundary stratotype section.
Natural hazards (including areas of avalanche, dangerous flooding, landslides, unstable soils, seismic activity, or dangerous if it is determined through the resource management planning process that it has become part of a natural process).	No	Area was not nominated for this value. None known to be present.

Importance

The value, resource, system, process, or hazard described above must have substantial significance and values to satisfy the "importance" criteria. This generally means that the value, resource, system, process, or hazard is characterized by one or more of the following:

Importance Value	Yes/No	Rationale for Determination
Has more than locally significant qualities that give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared with any similar resource.	Yes	Scenic— Geologic formations create outstanding contrast with color, form, line, texture with the surrounding desert. The contrast and scenic quality is greater than others in the region.
	Yes	Cultural—A wide diversity of cultural sites and site types. Combination of prehistoric types and historic types, including mining and CCC structures.
	Yes	Paleontological—Trackways tend to be uncommon, especially of the more recent ages.
	Yes	Geologic—Candidate for the mid carboniferous boundary stratotype section.
Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.	No	Scenic—The Wilderness Act protects the scenic nature from human caused change.
	Yes	Cultural—The documentation of use over time, including the diversity of sites in this area is exemplary for the region.
	Yes	Paleontological—Trackways tend to be uncommon, especially of the more recent ages. The biggest threat is individuals vandalizing them.
	No	Geologic—Candidate for the mid carboniferous boundary stratotype section.

Importance Value	Yes/No	Rationale for Determination
Has been recognized as warranting protection to satisfy national priority concerns or to carry out the mandates of FLPMA.	Yes	Scenic—Scenic values were identified as supplementary values features under wilderness designation. The ridgeline offers excellent vistas of the area in all directions.
	Yes	Cultural—Cultural resources were identified as supplementary values under wilderness designation.
	No	Paleontological—Nothing has been identified as associated with a specific national priority, other than the Paleontological Resources Protection portion of the Omnibus Public Land Management Act of 2009 (Subtitle D).
	No	Geologic—Candidate for the mid carboniferous boundary stratotype section.
Has qualities that warrant highlighting to satisfy public or management concerns about safety and public welfare.	No	Area was not nominated for this value. None known to be present.
Poses a significant threat to human life and safety or to property.	No	Area was not nominated for this value. Not present.

Summary of Relevant and Important Values: The BLM interdisciplinary team determined that the existing ACEC, 2,070 acres, meets at least one criterion for both relevance and importance and will be considered for incorporation in the Draft RMP/EIS. Specifically, the following values meet at least one criterion for both relevance and importance:

- Scenic values
- Cultural resources
- Paleontological resources (Miocene bird tracks)
- Geologic resources (mid carboniferous boundary stratotype section).

N.3.1.4. Ash Meadows

General Location:	Amargosa Valley in Nye County between Death Valley National Park and the town of Pahrump.
General Description:	Ash Meadows is a desert wetland ecosystem containing spring-fed wetlands and alkaline desert uplands that provide habitat for at least 25 species found nowhere else in the world. Thirteen species are endangered or threatened and most depend on the isolated springs and wetlands found there. The 36,910-acre Ash Meadows ACEC surrounds the 23,000 acre Ash Meadows National Wildlife Refuge, including all lands identified in the Recovery Plan for the Endangered and Threatened Species of Ash Meadows, Nevada as essential habitat for the recovery of the listed species. The 36,910-acre Ash Meadows ACEC surrounds the 23,000 acre Ash Meadows National Wildlife Refuge, including all lands identified in the Recovery Plan for the Endangered and Threatened Species of Ash Meadows, Nevada as essential habitat for the recovery of the listed species.
Existing Acreage:	27,673 (acreage reduced from 37,152 acres due to withdrawal to US Fish and Wildlife Service for addition to Ash Meadows National Wildlife Refuge).
Nominated Acreage:	Proposed expansion of 529 additional acres.
Values Considered:	Special status species habitat.

Relevance

An area meets the “relevance” criterion if it contains one or more of the following:

Relevance Value	Yes/No	Rationale for Determination
A significant historic, cultural, or scenic value (including rare or sensitive archeological resources and religious or cultural resources important to Native Americans).	No	Cultural sites are located in this area. It was not nominated for this value.
A fish and wildlife resource (including habitat for endangered, sensitive or threatened species, or habitat essential for maintaining species diversity).	Yes	Species associated with the Ash Meadows Recovery Plan: Devil's Hole pupfish (*Cyprinodon diabolis*), Ash Meadows Amargosa pupfish (*Cyprinodon nevadensis mionectes*), Warm Springs pupfish (*Cyprinodon nevadensis pectoralis*), Ash Meadows speckled dace (*Rhinichthys osculus nevadensis*), Ash Meadows naucorid (*Ambrysus amargosus*).
A natural process or system (including endangered, sensitive, or threatened plant species; rare, endemic, or relic plants or plant communities that are terrestrial, aquatic, or riparian; or rare geological features).	Yes	Species associated with the Ash Meadows Recovery Plan: Ash Meadows gumplant (*Grindelia fraxino-pratensis*), Amargosa niterwort (*Nitrophila mohavensis*), Ash Meadows milk-vetch (*Astragalus phoenix*), spring-loving centaury plant (*Centaurium namophilum*), Ash Meadows sunray (*Enceliopsis nudicaulis* var. *corrugate*), Ash Meadows ivesia (*Ivesia kingii* var. *eremica*), Ash Meadows blazing star (*Mentzelia leucophylla*), and Ash Meadows gumplant (*Grindelia fraxinipratensis*).
Natural hazards (including areas of avalanche, dangerous flooding, landslides, unstable soils, seismic activity, or dangerous if it is determined through the resource management planning process that it has become part of a natural process).	No	Area was not nominated for this value. None known to be present.

Importance

The value, resource, system, process, or hazard described above must have substantial significance and values to satisfy the "importance" criteria. This generally means that the value, resource, system, process, or hazard is characterized by one or more of the following:

Importance Value	Yes/No	Rationale for Determination
Has more than locally significant qualities that give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared with any similar resource.	Yes	The Ash Meadows area supports 24 plant and animal species found nowhere else in the world.
Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.	Yes	This area is based on a perched water table, making its continued presence dependent on the continued availability of the water resources.This area is also located in hydrographic basin that has been over-appropriated.
Has been recognized as warranting protection to satisfy national priority concerns or to carry out the mandates of FLPMA.	No	Species associated with the Ash Meadows Recovery Plan (1 endangered plant: Amargosa niterwort; 6 threatened plants: Ash Meadows gumplant, Ash Meadows milk-vetch, spring-loving centaury plant, Ash Meadows sunray, Ash Meadows ivesia, Ash Meadows blazing star; a threatened aquatic beetle: Ash Meadows naucorid; and 4 endangered fish: Devil's Hole pupfish, Ash Meadows Amargosa pupfish, Warm Springs pupfish, Ash Meadows speckled dace).

Importance Value	Yes/No	Rationale for Determination
Has qualities that warrant highlighting to satisfy public or management concerns about safety and public welfare.	No	Area was not nominated for this value. None known to be present.
Poses a significant threat to human life and safety or to property.	No	Area was not nominated for this value. Not present.

Summary of Relevant and Important Values: The BLM interdisciplinary team determined that the 28,202 acres of the existing ACEC and the proposed expansion meet at least one criterion for both relevance and importance and will be considered for incorporation in the Draft RMP/EIS. Specifically, the following values meet at least one criterion for both relevance and importance:

- Devil's Hole pupfish
- Ash Meadows Amargosa pupfish
- Warm Springs pupfish
- Ash Meadows speckled dace
- Ash Meadows naucorid
- Ash Meadows gumplant
- Amargosa niterwort
- Ash Meadows milk-vetch
- Spring-loving centaury plant
- Ash Meadows sunray
- Ash Meadows ivesia
- Ash Meadows blazing star

N.3.1.5. Big Dune ACEC

General Location:	Amargosa Valley of Nye County off Valley View Road south of State Highway 95.
General Description:	A 1.5 square mile complex star sand dune that reaches 2,731 feet above sea level.
Existing Acreage:	1,916 acres.
Nominated Acreage:	Proposed expansion of an additional 540 acres for an increase in species range.
Values Considered:	Special status species habitat - Rare, endemic beetle species habitat.

Relevance

An area meets the "relevance" criterion if it contains one or more of the following:

Relevance Value	Yes/No	Rationale for Determination
A significant historic, cultural, or scenic value (including rare or sensitive archeological resources and religious or cultural resources important to Native Americans).	No	Area was not nominated for this value.
A fish and wildlife resource (including habitat for endangered, sensitive or threatened species, or habitat essential for maintaining species diversity).	Yes	Giuliani's big dune scarab (*Pseudocotalpa giulianii*)—BLM sensitive species.
	Yes	Big Dune aphodius scarab (*Aphodius sp.*)—BLM sensitive species.
	Yes	Large aegialian scarab (*Aegialia magnifica*)—BLM sensitive species.
	Yes	Rulien's miloderes weevil (*Miloseres rulieni*)—BLM sensitive species.
A natural process or system (including endangered, sensitive, or threatened plant species; rare, endemic, or relic plants or plant communities that are terrestrial, aquatic, or riparian; or rare geological features).	No	Area was not nominated for this value.
Natural hazards (including areas of avalanche, dangerous flooding, landslides, unstable soils, seismic activity, or dangerous if it is determined through the resource management planning process that it has become part of a natural process).	No	Area was not nominated for this value. None known to be present.

Importance

The value, resource, system, process, or hazard described above must have substantial significance and values to satisfy the "importance" criteria. This generally means that the value, resource, system, process, or hazard is characterized by one or more of the following:

Importance Value	Yes/No	Rationale for Determination
Has more than locally significant qualities that give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared with any similar resource.	Yes	Giuliani's Big Dune scarab—BLM sensitive species. Proposed for federal listing in 1978. Determination was that listing was warranted (FR Vol. 76, No. 150), but actions were taken to avoid listing by protecting habitat and removing threats. Threats have changed since that time and now need to be addressed again through management. Species is endemic to Big Dune and Lava Dune.
	Yes	Big Dune aphodius scarab—BLM sensitive species. Species is endemic to Big Dune and Lava Dune.
	Yes	Large aegialian scarab—BLM sensitive species. Species is endemic to Big Dune and Lava Dune.
	Yes	Rulien's miloderes weevil—BLM sensitive species. Species is endemic to Big Dune and Lava Dune.

Importance Value	Yes/No	Rationale for Determination
Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.	Yes	Giuliani's Big Dune Scarab—BLM sensitive species. Species is endemic to Big Dune and Lava Dune. Species is vulnerable to adverse change in its habitat.
	Yes	Big Dune aphodius scarab—BLM sensitive species. Species is endemic to Big Dune and Lava Dune. Species is vulnerable to adverse change in its habitat.
	Yes	Large aegialian scarab—BLM sensitive species. Species is endemic to Big Dune and Lava Dune. Species is vulnerable to adverse change in its habitat.
	Yes	Rulien's miloderes weevil—BLM sensitive species. Species is endemic to Big Dune and Lava Dune. Species is vulnerable to adverse change in its habitat.
Has been recognized as warranting protection to satisfy national priority concerns or to carry out the mandates of FLPMA.	No	Species are not federally listed at this time.
Has qualities that warrant highlighting to satisfy public or management concerns about safety and public welfare.	No	Area was not nominated for this value. None known to be present.
Poses a significant threat to human life and safety or to property.	No	Area was not nominated for this value. Not present.

Summary of Relevant and Important Values: The BLM interdisciplinary team determined that 2,456 acres of the dune system within the existing ACEC and the proposed expansion meet at least one criterion for both relevance and importance and will be considered for incorporation in the Draft RMP/EIS. Habitat requirements of the species partnered with management prescriptions addressing threats may allow for a range of areas to be considered for ACEC designation. Specifically, the following values meet at least one criterion for both relevance and importance within the evaluated area:

- Giuliani's Big Dune scarab
- Big Dune aphodius scarab
- Large aegialian scarab
- Rulien's miloderes weevil

N.3.1.6. Coyote Springs ACEC

General Location:	North of Las Vegas along US 93.
General Description:	A broad alluvial valley between the Sheep Range, Arrow Canyon and Meadow Valley Ranges. The area contains designated critical habitat and provides habitat corridors between Mojave desert tortoise recovery units.
Existing Acreage:	51,528 acres (acreage reduced from 75,500 acres due to legislative actions that included transfer of land to US Fish and Wildlife Service for addition to Desert National Wildlife Refuge).
Nominated Acreage:	N/A
Values Considered:	Mojave desert tortoise habitat.

Relevance

An area meets the "relevance" criterion if it contains one or more of the following:

Relevance Value	Yes/No	Rationale for Determination
A significant historic, cultural, or scenic value (including rare or sensitive archeological resources and religious or cultural resources important to Native Americans).	No	Area was not nominated for this value.
A fish and wildlife resource (including habitat for endangered, sensitive or threatened species, or habitat essential for maintaining species diversity).	Yes	Mojave desert tortoise (*Gopherus agassizii*)—federally listed (threatened), downward trend; critical habitat. The species was an 8c (moderate degree of threat, high potential for recovery), but is now a 6c (high degree of threat, low potential for recovery).
A natural process or system (including endangered, sensitive, or threatened plant species; rare, endemic, or relic plants or plant communities that are terrestrial, aquatic, or riparian; or rare geological features).	No	Area was not nominated for this value.
Natural hazards (including areas of avalanche, dangerous flooding, landslides, unstable soils, seismic activity, or dangerous if it is determined through the resource management planning process that it has become part of a natural process).	No	Area was not nominated for this value.

Importance

The value, resource, system, process, or hazard described above must have substantial significance and values to satisfy the "importance" criteria. This generally means that the value, resource, system, process, or hazard is characterized by one or more of the following:

Importance Value	Yes/No	Rationale for Determination
Has more than locally significant qualities that give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared with any similar resource.	Yes	Mojave desert tortoise—federally listed (threatened).
Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.	Yes	Mojave desert tortoise—federally listed (threatened), downward trend; critical habitat.
Has been recognized as warranting protection to satisfy national priority concerns or to carry out the mandates of FLPMA.	Yes	Mojave desert tortoise—federally listed (threatened), downward trend; critical habitat.
Has qualities that warrant highlighting to satisfy public or management concerns about safety and public welfare.	No	Area was not nominated for this value. None known to be present.
Poses a significant threat to human life and safety or to property.	No	Area was not nominated for this value. Not present.

Summary of Relevant and Important Values: The BLM interdisciplinary team determined that the existing ACEC, 51,529 acres, meets at least one criterion for both relevance and importance and

will be considered for incorporation in the Draft RMP/EIS. Specifically, the following values meet at least one criterion for both relevance and importance:

- Mojave desert tortoise

N.3.1.7. Crescent Townsites ACEC

Area Considered	Crescent Townsites ACEC
General Location	East of the town of Nipton, CA on Crescent Pass.
General Description	Historic railroad construction and mining sites.
Existing Acreage:	435 acres.
Nominated Acreage:	N/A
Values Considered	Historic railroad construction and mining.

Relevance

An area meets the "relevance" criterion if it contains one or more of the following:

Relevance Value	Yes/No	Rationale for Determination
A significant historic, cultural, or scenic value (including rare or sensitive archeological resources and religious or cultural resources important to Native Americans).	No	Cultural—The Townsites is on patented land and is not managed by the BLM. The existing ACEC is opposite the Townsites across a wash, and has some tent platforms and other minor historical objects, but no significant historic or cultural values or archeological resources.
A fish and wildlife resource (including habitat for endangered, sensitive or threatened species, or habitat essential for maintaining species diversity).	No	Area was not nominated for this value.
A natural process or system (including endangered, sensitive, or threatened plant species; rare, endemic, or relic plants or plant communities that are terrestrial, aquatic, or riparian; or rare geological features).	No	Area was not nominated for this value.
Natural hazards (including areas of avalanche, dangerous flooding, landslides, unstable soils, seismic activity, or dangerous if it is determined through the resource management planning process that it has become part of a natural process).	No	Area was not nominated for this value. None known to be present.

Importance

No relevant values exist to evaluate for importance.

Summary of Relevant and Important Values: The BLM interdisciplinary team determined that the existing ACEC, 436 acres does not meet at least one criterion for both relevance and importance and will be considered for release from ACEC designation in the Draft RMP/EIS alternatives.

N.3.1.8. Devils Throat ACEC

General Location:	7.25 miles south of Whitney Pockets off the Gold Butte Backcountry Byway.
General Description:	A 100-foot wide by 100-foot deep sinkhole.
Existing Acreage:	639 acres (overlaps with Gold Butte, Part A ACEC).
Nominated Acreage:	Proposed expansion of an additional 206 acres.
Values Considered:	Natural hazard area.

Relevance

An area meets the "relevance" criterion if it contains one or more of the following:

Relevance Value	Yes/No	Rationale for Determination
A significant historic, cultural, or scenic value (including rare or sensitive archeological resources and religious or cultural resources important to Native Americans).	No	Area was not nominated for this value.
A fish and wildlife resource (including habitat for endangered, sensitive or threatened species, or habitat essential for maintaining species diversity).	No	Area was not nominated for this value.
A natural process or system (including endangered, sensitive, or threatened plant species; rare, endemic, or relic plants or plant communities that are terrestrial, aquatic, or riparian; or rare geological features).	No	Area was not nominated for this value.
Natural hazards (including areas of avalanche, dangerous flooding, landslides, unstable soils, seismic activity, or dangerous if it is determined through the resource management planning process that it has become part of a natural process).	Yes	Sinkhole—100 feet wide and 100 feet deep. Unstable at the rim.

Importance

The value, resource, system, process, or hazard described above must have substantial significance and values to satisfy the "importance" criteria. This generally means that the value, resource, system, process, or hazard is characterized by one or more of the following:

Importance Value	Yes/No	Rationale for Determination
Has more than locally significant qualities that give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared with any similar resource.	No	Area was not nominated for this value.
Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.	No	Area was not nominated for this value.

Importance Value	Yes/No	Rationale for Determination
Has been recognized as warranting protection to satisfy national priority concerns or to carry out the mandates of FLPMA.	No	Area was not nominated for this value.
Has qualities that warrant highlighting to satisfy public or management concerns about safety and public welfare.	Yes	Hazard due to depth and very unstable edges and walls. The sinkhole is undercut, so walking on the edge is dangerous and a threat to human life. Very small in locale, compared to the surrounding landscape, but does pose a significant threat in the specific area.
Poses a significant threat to human life and safety or to property.	Yes	

Summary of Relevant and Important Values: The BLM interdisciplinary team determined that the existing ACEC, 639 acres, meets at least one criterion for both relevance and importance and will be considered for incorporation in the Draft RMP/EIS. The additional area was considered but does not meet relevance and importance. Specifically, the following values meet at least one criterion for both relevance and importance:

- Natural hazard area - sinkhole

N.3.1.9. Gold Butte, Part A

General Location:	South of Mesquite along the Arizona border between Grand Canyon-Parashant National Monument and Lake Mead National Recreation Area.
General Description:	Isolated, rugged terrain and an extensive network of braided shallow washes. In addition, it has several well developed springs.
Existing Acreage:	185,128 acres
Nominated Acreage:	Proposed expansion of an additional 2,500 acres.
Values Considered:	Mojave desert tortoise, prehistoric habitation and rock art, scenic.

Relevance

An area meets the "relevance" criterion if it contains one or more of the following:

Relevance Value	Yes/No	Rationale for Determination
A significant historic, cultural, or scenic value (including rare or sensitive archeological resources and religious or cultural resources important to Native Americans).	Yes	Scenic—Aztec sandstone formations create outstanding contrast with color, form, line, texture with the surrounding desert.
	Yes	Cultural—Prehistoric and historic features.
A fish and wildlife resource (including habitat for endangered, sensitive or threatened species, or habitat essential for maintaining species diversity).	Yes	Mojave desert tortoise (*Gopherus agassizii*)—federally listed (threatened), downward trend; critical habitat. The species was an 8c (moderate degree of threat, high potential for recovery), but is now a 6c (high degree of threat, low potential for recovery).
	Yes	Relict leopard frog (*Rana onca*) was reintroduced in a spring within its historic range. This species is a BLM sensitive species.

Relevance Value	Yes/No	Rationale for Determination
A natural process or system (including endangered, sensitive, or threatened plant species; rare, endemic, or relic plants or plant communities that are terrestrial, aquatic, or riparian; or rare geological features).	No	Area was not nominated for this value.
Natural hazards (including areas of avalanche, dangerous flooding, landslides, unstable soils, seismic activity, or dangerous if it is determined through the resource management planning process that it has become part of a natural process).	No	Area was not nominated for this value. None known to be present.

Importance

The value, resource, system, process, or hazard described above must have substantial significance and values to satisfy the "importance" criteria. This generally means that the value, resource, system, process, or hazard is characterized by one or more of the following:

Importance Value	Yes/No	Rationale for Determination
Has more than locally significant qualities that give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared with any similar resource.	Yes	Scenic—Aztec sandstone formations create outstanding contrast with color, form, line, texture with the surrounding desert. The contrast and scenic quality is greater than others in the region.
	Yes	Cultural—Outstanding cultural resources for this area. Diverse temporal representation, cultural diversity, and unique association of site types.
	Yes	Mojave desert tortoise—federally listed (threatened).
	Yes	Relict leopard frog was reintroduced in a spring within its historic range. This species is a BLM sensitive species. This is one of fewer than 10 areas where this species exists in the world.
Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.	Yes	Scenic—The contrast and scenic quality is greater than others in the region. The region is well known for its scenic resources. Heavy recreation, especially illegal off-trail use, could threaten the scenic values.
	Yes	Cultural—Recreational OHV and motorcycle use in this area could impact the fragile, irreplaceable cultural resources, as well as looting and vandalism. The area has the potential to yield significant cultural information.
	Yes	Mojave desert tortoise—federally listed (threatened), downward trend; critical habitat. Surface disturbances and recreational OHV use could degrade habitat.
	Yes	Reintroduced relict leopard frog in this spring, within its historic range. Recreational OHV and motorcycle use in this area could impact the fragile habitat and the unique species. The limited distribution and small spatial extent of its habitat makes this species vulnerable to adverse change.

Importance Value	Yes/No	Rationale for Determination
Has been recognized as warranting protection to satisfy national priority concerns or to carry out the mandates of FLPMA.	No	Scenic—The area is widely recognized as having scenic values, but it has not yet been recognized as a national priority.
	No	Cultural—Beyond requirements to address cultural resources in the National Historic Preservation Act, section 106, the area is not recognized as a national priority.
	Yes	Mojave desert tortoise—federally listed (threatened), downward trend; critical habitat.
	Yes	Relict leopard frog—Is a federally designated Candidate species, so is a national priority for protection under the ESA.
Has qualities that warrant highlighting to satisfy public or management concerns about safety and public welfare.	No	Area was not nominated for this value. None known to be present.
Poses a significant threat to human life and safety or to property.	No	Area was not nominated for this value. Not present.

Summary of Relevant and Important Values: The BLM interdisciplinary team determined that the 186,063 acres of the existing ACEC and the proposed expansion area meets at least one criterion for both relevance and importance and will be considered for incorporation in the Draft RMP/EIS. Specifically, the following values meet at least one criterion for both relevance and importance:

- Scenic values
- Cultural/historic values
- Mojave desert tortoise
- Relict leopard frog

N.3.1.10. Gold Butte, Part B

General Location:	South of Mesquite along the Arizona border between Grand Canyon-Parashant National Monument and Lake Mead National Recreation Area.
General Description:	Isolated, rugged terrain and an extensive network of braided shallow washes. In addition, it has several well developed springs.
Existing acreage:	122,540 acres
Nominated Acreage:	Proposed expansion of an additional 862 acres in acquired inholdings.
Values Considered:	Cultural resources, scenic, wildlife habitat, sensitive species.

Relevance

An area meets the “relevance” criterion if it contains one or more of the following:

Relevance Value	Yes/No	Rationale for Determination
A significant historic, cultural, or scenic value (including rare or sensitive archeological resources and religious or cultural resources important to Native Americans).	Yes	Scenic—Geologic formations create topographic and color contrast with the surrounding desert, creating striking vistas, valleys, and uniquely scenic small, steep-walled canyons.
	Yes	Cultural—Historic and prehistoric features, with historic mining features.

Relevance Value	Yes/No	Rationale for Determination
A fish and wildlife resource (including habitat for endangered, sensitive or threatened species, or habitat essential for maintaining species diversity).	Yes	Mojave desert tortoise (*Gopherus agassizii*)—federally listed (threatened), downward trend. Not critical habitat, but there is suitable habitat that could benefit the species conservation.
	Yes	Desert bighorn sheep (*Ovis canadensis nelson)*—BLM sensitive species, area contains both crucial and winter habitat.
	Yes	Reintroduced relict leopard frog (*Rana onca*) in a spring, within its historic range. This species is a BLM sensitive species.
A natural process or system (including endangered, sensitive, or threatened plant species; rare, endemic, or relic plants or plant communities that are terrestrial, aquatic, or riparian; or rare geological features).	Yes	Las Vegas bearpoppy (*Arctomecon californica*)—BLM sensitive species
	Yes	Las Vegas buckwheat (*Eriogonum corymbosum* var.*nilesii*)—BLM sensitive species, federal Candidate
Natural hazards (including areas of avalanche, dangerous flooding, landslides, unstable soils, seismic activity, or dangerous if it is determined through the resource management planning process that it has become part of a natural process).	No	Area was not nominated for this value. None known to be present.

Importance

The value, resource, system, process, or hazard described above must have substantial significance and values to satisfy the "importance" criteria. This generally means that the value, resource, system, process, or hazard is characterized by one or more of the following:

Importance Value	Yes/No	Rationale for Determination
Has more than locally significant qualities that give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared with any similar resource.	Yes	Scenic—Geologic formations create outstanding contrast with color, form, line, texture with the surrounding desert. The contrast and scenic quality is greater than others in the region.
	No	Cultural—Similar to resources found elsewhere in the region, although there is higher site integrity.
	Yes	Mojave desert tortoise—federally listed (threatened)
	Yes	Reintroduced relict leopard frog in this spring, within its historic range. This species is a BLM sensitive species. This is one of fewer than 10 areas where this species exists in the world.
	No	Desert bighorn sheep—Species occurs throughout the region.
	Yes	Las Vegas buckwheat—BLM sensitive species, federal Candidate, endemic to the planning area.
	Yes	Las Vegas bearpoppy—BLM sensitive species, endemic to the planning area.

Importance Value	Yes/No	Rationale for Determination
Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.	Yes	Scenic—The contrast and scenic quality is greater than others in the region. The region is well known for its scenic resources. Recreation, especially illegal off-trail use, could threaten the scenic values.
	Yes	Cultural—Recreational OHV and motorcycle use in this area could allow access to sensitive cultural values, allowing looting and vandalism. The area has the potential to yield significant cultural information.
	Yes	Mojave desert tortoise—federally listed (threatened), downward trend. Surface disturbances and recreational OHV use could degrade habitat. The area provides large patches of unfragmented habitat, although not designated critical.
	Yes	Reintroduced relict leopard frog in this spring, within its historic range. Recreational OHV and motorcycle use in this area could impact the fragile habitat and the unique species. The limited distribution and small spatial extent of its habitat makes this species vulnerable to adverse change.
	Yes	Desert bighorn sheep—Within the region, this habitat provides an undeveloped area comprised of unfragmented habitat and minimal human interaction. This isolated nature of the herd is unique in the region. The isolated nature also makes it vulnerable to adverse change.
	Yes	Las Vegas buckwheat—BLM sensitive species, federal Candidate. Habitat type (gypsum soils) is sensitive to disturbance from recreation and other surface disturbing activities.
	Yes	Las Vegas bearpoppy—BLM sensitive species, State Listed. Habitat type (gypsum soils) is sensitive to disturbance from recreation and other surface disturbing activities.
Has been recognized as warranting protection to satisfy national priority concerns or to carry out the mandates of FLPMA.	No	Scenic—The area is widely recognized as having scenic values, but it has not yet been recognized as a national priority.
	No	Cultural—Beyond requirements to address cultural resources in the National Historic Preservation Act, section 106, the area is not recognized as a national priority.
	No	Mojave desert tortoise—federally listed (threatened), downward trend; but not designated critical habitat.
	Yes	Relict leopard frog—Is a federally designated Candidate species, so is a national priority for protection under the ESA.
	No	Desert bighorn sheep—BLM sensitive species for the State of Nevada, not a national priority.
	Yes	Las Vegas buckwheat—Is a federally designated Candidate species, so is a national priority for protection under the ESA.
	No	Las Vegas bearpoppy—Not federally designated, so therefore not a national priority.
Has qualities that warrant highlighting to satisfy public or management concerns about safety and public welfare.	No	Area was not nominated for this value. None known to be present.
Poses a significant threat to human life and safety or to property.	No	Area was not nominated for this value. Not present.

Summary of Relevant and Important Values: The BLM interdisciplinary team determined that 116,762 acres of the existing ACEC and proposed expansion area meets at least one criterion for both relevance and importance and will be considered for incorporation in the Draft RMP/EIS. Specifically, the following values meet at least one criterion for both relevance and importance:

- Scenic values
- Cultural and historic values
- Mojave desert tortoise
- Relict leopard frog
- Desert bighorn sheep
- Las Vegas buckwheat
- Las Vegas bearpoppy

N.3.1.11. Gold Butte, Part C (Virgin Mountains)

General Location:	South of Mesquite along the Arizona border between Grand Canyon-Parashant National Monument and Lake Mead National Recreation Area.
General Description:	Isolated, rugged terrain and an extensive network of braided shallow washes. In addition, it has several well developed springs.
Existing Acreage:	35,706 acres.
Nominated Acreage:	N/A.
Values Considered:	Wildlife habitat, scenic, botanical, cultural.

Relevance

An area meets the "relevance" criterion if it contains one or more of the following:

Relevance Value	Yes/No	Rationale for Determination
A significant historic, cultural, or scenic value (including rare or sensitive archeological resources and religious or cultural resources important to Native Americans).	Yes	Scenic—Rugged topography and diverse vegetation provide visual contrast. Elevated viewing locations provide vistas of the surrounding deserts.
	Yes	Cultural—Prehistoric rock shelters and agave roasting pits at lower elevations, hunting campsites, etc.
A fish and wildlife resource (including habitat for endangered, sensitive or threatened species, or habitat essential for maintaining species diversity).	Yes	Desert bighorn sheep (*Ovis canadensis nelson)*—BLM sensitive species, area contains both crucial and winter habitat.
A natural process or system (including endangered, sensitive, or threatened plant species; rare, endemic, or relic plants or plant communities that are terrestrial, aquatic, or riparian; or rare geological features).	Yes	Relict Forest Stands—Sky island of isolated vegetation communities that are rare in the southern Nevada region.
Natural hazards (including areas of avalanche, dangerous flooding, landslides, unstable soils, seismic activity, or dangerous if it is determined through the resource management planning process that it has become part of a natural process).	No	Area was not nominated for this value. None known to be present.

Importance

The value, resource, system, process, or hazard described above must have substantial significance and values to satisfy the "importance" criteria. This generally means that the value, resource, system, process, or hazard is characterized by one or more of the following:

Importance Value	Yes/No	Rationale for Determination
Has more than locally significant qualities that give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared with any similar resource.	Yes	Scenic—Geologic formations create outstanding contrast with color, form, line, texture with the surrounding desert. The contrast and scenic quality is greater than others in the region.
	No	Cultural—Similar to resources found elsewhere in the region.
	No	Desert bighorn sheep—Species occurs throughout the region.
	No	Relict Forest Stands—This type of vegetation and geology occur throughout the Colorado Plateau region.
Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.	Yes	Scenic—The contrast and scenic quality is greater than others in the region. The region is well known for its scenic resources. Recreation, especially illegal off-trail use, could threaten the scenic values.
	Yes	Cultural—Recreational OHV and motorcycle use in this area could allow access to sensitive cultural values, allowing looting and vandalism. The area has the potential to yield significant cultural information.
	Yes	Desert bighorn sheep—Within the region, the area provides exemplary high mountain habitat.
	Yes	Relict Forest Stands—Rare vegetation community within the region.
Has been recognized as warranting protection to satisfy national priority concerns or to carry out the mandates of FLPMA.	No	Scenic—The area is widely recognized as having scenic values, but it has not yet been recognized as a national priority.
	No	Cultural—Beyond requirements to address cultural resources in the National Historic Preservation Act, section 106, the area is not recognized as a national priority.
	No	Desert bighorn sheep—BLM sensitive species for the State of Nevada, not a national priority.
	Yes	Relict forest stands—Vegetation values were identified as supplementary values features under wilderness designation. Specifically, the Arizona cypress component of the vegetation community.
Has qualities that warrant highlighting to satisfy public or management concerns about safety and public welfare.	No	Area was not nominated for this value. None known to be present.
Poses a significant threat to human life and safety or to property.	No	Area was not nominated for this value. Not present.

Summary of Relevant and Important Values: The BLM interdisciplinary team determined that the existing ACEC, 35,706 acres, meets at least one criterion for both relevance and importance and will be considered for incorporation in the Draft RMP/EIS. Specifically, the following values meet at least one criterion for both relevance and importance:

- Scenic values
- Cultural and historic values
- Relict forest stands
- Desert bighorn sheep

N.3.1.12. Gold Butte Townsites ACEC

General Location:	On the Gold Butte Backcountry Byway north of Cedar Basin in the Gold Butte (Part B) ACEC.
General Description:	This is the location of the historic mining town of Gold Butte.
Existing Acreage:	159 acres (overlaps with Gold Butte, Part B ACEC)
Nominated Acreage:	N/A
Values Considered:	Historic mining.

Relevance

An area meets the "relevance" criterion if it contains one or more of the following:

Relevance Value	Yes/No	Rationale for Determination
A significant historic, cultural, or scenic value (including rare or sensitive archeological resources and religious or cultural resources important to Native Americans).	Yes	Cultural—Includes an arrastra, and remains of historic Gold Butte mining camp.
A fish and wildlife resource (including habitat for endangered, sensitive or threatened species, or habitat essential for maintaining species diversity).	No	Area was not nominated for this value.
A natural process or system (including endangered, sensitive, or threatened plant species; rare, endemic, or relic plants or plant communities that are terrestrial, aquatic, or riparian; or rare geological features).	No	Area was not nominated for this value.
Natural hazards (including areas of avalanche, dangerous flooding, landslides, unstable soils, seismic activity, or dangerous if it is determined through the resource management planning process that it has become part of a natural process).	No	Area was not nominated for this value. None known to be present.

Importance

The value, resource, system, process, or hazard described above must have substantial significance and values to satisfy the "importance" criteria. This generally means that the value, resource, system, process, or hazard is characterized by one or more of the following:

Importance Value	Yes/No	Rationale for Determination
Has more than locally significant qualities that give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared with any similar resource.	No	Cultural—While locally significant, the area is not especially significant compared to similar resources in the area.
Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.	Yes	Cultural—The area's resources are fragile and have experienced high levels of use. Use over time could continue to result in adverse change. In addition, the area is unique due to the presence of two graves of historic residents of the area.

Importance Value	Yes/No	Rationale for Determination
Has been recognized as warranting protection to satisfy national priority concerns or to carry out the mandates of FLPMA.	No	Cultural—Beyond requirements to address cultural resources in the National Historic Preservation Act, section 106, the area is not recognized as a national priority.
Has qualities that warrant highlighting to satisfy public or management concerns about safety and public welfare.	No	Area was not nominated for this value. None known to be present.
Poses a significant threat to human life and safety or to property.	No	Area was not nominated for this value. Not present.

Summary of Relevant and Important Values: The BLM interdisciplinary team determined that the existing ACEC, 159 acres, meets at least one criterion for both relevance and importance and will be considered for incorporation in the Draft RMP/EIS. Specifically, the following values meet at least one criterion for both relevance and importance:

- Cultural/historic values

N.3.1.13. Hidden Valley ACEC

General Location:	Located within the Muddy Mountains Wilderness.
General Description:	The valley contains prehistoric habitation sites and rock art.
Existing Acreage:	3,356 acres.
Nominated Acreage:	N/A
Values Considered:	Scenic, prehistoric habitation and rock art.

Relevance

An area meets the “relevance” criterion if it contains one or more of the following:

Relevance Value	Yes/No	Rationale for Determination
A significant historic, cultural, or scenic value (including rare or sensitive archeological resources and religious or cultural resources important to Native Americans).	Yes	Scenic—Sandstone formations create topographic and color contrast with the surrounding desert, creating striking vistas and valleys.
	Yes	Cultural—Prehistoric habitation and rock art, as well as some minor historic mining and ranching features.
A fish and wildlife resource (including habitat for endangered, sensitive or threatened species, or habitat essential for maintaining species diversity).	No	Area was not nominated for this value.

Relevance Value	Yes/No	Rationale for Determination
A natural process or system (including endangered, sensitive, or threatened plant species; rare, endemic, or relic plants or plant communities that are terrestrial, aquatic, or riparian; or rare geological features).	No	Area was not nominated for this value.
Natural hazards (including areas of avalanche, dangerous flooding, landslides, unstable soils, seismic activity, or dangerous if it is determined through the resource management planning process that it has become part of a natural process).	No	Area was not nominated for this value. None known to be present.

Importance

The value, resource, system, process, or hazard described above must have substantial significance and values to satisfy the "importance" criteria. This generally means that the value, resource, system, process, or hazard is characterized by one or more of the following:

Importance Value	Yes/No	Rationale for Determination
Has more than locally significant qualities that give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared with any similar resource.	No	Scenic—High scenic quality, but it is similar to other areas in the planning area that also have high scenic quality.
	Yes	Cultural—A wide diversity of cultural sites and site types. Predominantly prehistoric in nature.
Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.	No	Scenic—The area is mostly within a designated wilderness area, eliminating potential circumstances that would threaten the scenic values.
	Yes	Cultural—Several sites types are sensitive and could be vulnerable to adverse change.
Has been recognized as warranting protection to satisfy national priority concerns or to carry out the mandates of FLPMA.	Yes	Scenic—Scenic values were identified as supplementary values features under wilderness designation.
	Yes	Cultural—Cultural resources were identified as supplementary values under wilderness designation.
Has qualities that warrant highlighting to satisfy public or management concerns about safety and public welfare.	No	Area was not nominated for this value. None known to be present.
Poses a significant threat to human life and safety or to property.	No	Area was not nominated for this value. Not present.

Summary of Relevant and Important Values: The BLM interdisciplinary team determined that the existing ACEC, 3,356 acres, meets at least one criterion for both relevance and importance and will be considered for incorporation in the Draft RMP/EIS. Specifically, the following values meet at least one criterion for both relevance and importance:

- Cultural/historic values
- Scenic values

N.3.1.14. Keyhole Canyon ACEC

General Location:	On the east side of the Eldorado Valley in the Nelson Hills.
General Description:	The canyon contains prehistoric habitation sites and rock art.
Existing Acreage:	240 acres.
Nominated Acreage:	Proposed expansion of an additional 206 acres.
Values Considered:	Scenic, prehistoric habitation and rock art, Mojave desert tortoise habitat.

ACEC acreage will be adjusted to better reflect the location of the values, including the updated knowledge on the cultural, scenic and tortoise values.

Relevance

An area meets the "relevance" criterion if it contains one or more of the following:

Relevance Value	Yes/No	Rationale for Determination
A significant historic, cultural, or scenic value (including rare or sensitive archeological resources and religious or cultural resources important to Native Americans).	Yes	Scenic—Localized to the canyon, but the canyon/rock formations create topographic relief when inside the small canyon.
	Yes	Cultural—Large amount of rock art, with some associated features.
A fish and wildlife resource (including habitat for endangered, sensitive or threatened species, or habitat essential for maintaining species diversity).	Yes	Mojave desert tortoise (*Gopherus agassizii*)—The area contains designated critical habitat.
A natural process or system (including endangered, sensitive, or threatened plant species; rare, endemic, or relic plants or plant communities that are terrestrial, aquatic, or riparian; or rare geological features).	No	Area was not nominated for this value.
Natural hazards (including areas of avalanche, dangerous flooding, landslides, unstable soils, seismic activity, or dangerous if it is determined through the resource management planning process that it has become part of a natural process).	No	Area was not nominated for this value. None known to be present.

Importance

The value, resource, system, process, or hazard described above must have substantial significance and values to satisfy the "importance" criteria. This generally means that the value, resource, system, process, or hazard is characterized by one or more of the following:

Importance Value	Yes/No	Rationale for Determination
Has more than locally significant qualities that give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared with any similar resource.	No	Scenic—Scenic, but there are other similar small canyons in the region.
	Yes	Cultural—Rock art that is representative to a particular style in a unique setting.
	Yes	Mojave desert tortoise—Designated critical habitat includes the high density habitat.

Importance Value	Yes/No	Rationale for Determination
Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.	Yes	Scenic—The shape of the canyon is rare, resulting in unique acoustic properties in the small canyon.
	Yes	Cultural—The rock art is spalling from the rock face. With the amount of use in the canyon there are threats to the cultural resources, which are vulnerable to adverse change.
	Yes	Mojave desert tortoise—Designated critical habitat includes the high density habitat. Surface disturbance directly affects habitat quality.
Has been recognized as warranting protection to satisfy national priority concerns or to carry out the mandates of FLPMA.	No	Scenic—Scenery is not associated with any national priorities.
	No	Cultural—Beyond requirements to address cultural resources in the National Historic Preservation Act, section 106, the area is not recognized as a national priority.
	Yes	Mojave desert tortoise—federally listed (threatened), downward trend; critical habitat
Has qualities that warrant highlighting to satisfy public or management concerns about safety and public welfare.	No	Area was not nominated for this value. None known to be present.
Poses a significant threat to human life and safety or to property.	No	Area was not nominated for this value. Not present.

Summary of Relevant and Important Values: The BLM interdisciplinary team determined that 639 acres of the existing ACEC and the proposed expansion area meet at least one criterion for both relevance and importance and will be considered for incorporation in the Draft RMP/EIS. Specifically, the following values meet at least one criterion for both relevance and importance:

- Cultural prehistoric values
- Scenic values
- Mojave desert tortoise

N.3.1.15. Mormon Mesa ACEC

General Location:	Located along the Clark and Lincoln county line.
General Description:	The ACEC is composed primarily of creosote-bursage scrub and mixed Mojave shrub communities. Mormon Mesa has expansive bajadas considered to be prime tortoise habitat as well as steep mountain ranges located in the Mormon Mountains and Meadow Valley Mountain Wilderness Areas.
Existing Acreage:	149,254 acres.
Nominated Acreage:	Proposed expansion of two parcels 7,712 and 10,628 acres, respectively.
Values Considered:	Mojave desert tortoise.

The area of this ACEC is proposed to be expanded to include designated critical habitat adjacent to the existing ACEC, and areas of very high Mojave desert tortoise density (based both on transect points and the USGS habitat model that have been developed since the previous RMP).

Relevance

An area meets the “relevance” criterion if it contains one or more of the following:

Relevance Value	Yes/No	Rationale for Determination
A significant historic, cultural, or scenic value (including rare or sensitive archeological resources and religious or cultural resources important to Native Americans).	No	Area was not nominated for this value.
A fish and wildlife resource (including habitat for endangered, sensitive or threatened species, or habitat essential for maintaining species diversity).	Yes	Mojave desert tortoise (*Gopherus agassizii*)—federally listed (threatened), downward trend; critical habitat. The species was an 8c (moderate degree of threat, high potential for recovery), but is now a 6c (high degree of threat, low potential for recovery).
A natural process or system (including endangered, sensitive, or threatened plant species; rare, endemic, or relic plants or plant communities that are terrestrial, aquatic, or riparian; or rare geological features).	No	Area was not nominated for this value.
Natural hazards (including areas of avalanche, dangerous flooding, landslides, unstable soils, seismic activity, or dangerous if it is determined through the resource management planning process that it has become part of a natural process).	No	Area was not nominated for this value. None known to be present.

Importance

The value, resource, system, process, or hazard described above must have substantial significance and values to satisfy the "importance" criteria. This generally means that the value, resource, system, process, or hazard is characterized by one or more of the following:

Importance Value	Yes/No	Rationale for Determination
Has more than locally significant qualities that give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared with any similar resource.	Yes	Mojave desert tortoise—federally listed (threatened)
Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.	Yes	Mojave desert tortoise—federally listed (threatened), downward trend; critical habitat. Surface disturbances and recreational OHV use could degrade habitat.
Has been recognized as warranting protection to satisfy national priority concerns or to carry out the mandates of FLPMA.	Yes	Mojave desert tortoise—federally listed (threatened), downward trend; critical habitat
Has qualities that warrant highlighting to satisfy public or management concerns about safety and public welfare.	No	Area was not nominated for this value. None known to be present.
Poses a significant threat to human life and safety or to property.	No	Area was not nominated for this value. Not present.

Summary of Relevant and Important Values: The BLM interdisciplinary team determined that 167,888 acres of the existing ACEC and the proposed expansion area meet at least one criterion

for both relevance and importance and will be considered for incorporation in the Draft RMP/EIS. Specifically, the following values meet at least one criterion for both relevance and importance:

- Mojave desert tortoise

N.3.1.16. Piute/Eldorado ACEC

General Location:	In the Piute and Eldorado Valleys between Boulder City and the Nevada-California state line and surrounds the communities of Searchlight and Cal Nev Ari.
General Description:	Primarily rolling valleys and bajadas with creosote-bursage scrub, shadscale scrub, blackbrush and pinyon-juniper woodland. It marks the transition between Mojave and Sonoran desert vegetation.
Existing Acreage:	328,235 acres.
Nominated Acreage:	Proposed boundary changes of 14,093, 826, 8,844 and 160 additional acres.
Values Considered:	Mojave desert tortoise habitat (existing), bighorn sheep and scenic (additional).

Relevance

An area meets the "relevance" criterion if it contains one or more of the following:

Relevance Value	Yes/No	Rationale for Determination
A significant historic, cultural, or scenic value (including rare or sensitive archeological resources and religious or cultural resources important to Native Americans).	Yes	The Highland Range located in the proposed expansion area of the ACEC and the portions of the ACEC in McCullough Mountains contain significant scenic qualities due to dramatic relief, rugged nature of the landscape and variation in color and texture.
A fish and wildlife resource (including habitat for endangered, sensitive or threatened species, or habitat essential for maintaining species diversity).	Yes	Mojave desert tortoise (*Gopherus agassizii*)—federally listed (threatened), downward trend; critical habitat. The species was an 8c (moderate degree of threat, high potential for recovery), but is now a 6c (high degree of threat, low potential for recovery).
	Yes	Desert bighorn sheep (*Ovis canadensis nelson)*—BLM sensitive species. The area includes crucial habitat and winter range, and the area also provides migratory connections between the Mojave National Preserve and habitat in Lake Mead National Recreation Area.
A natural process or system (including endangered, sensitive, or threatened plant species; rare, endemic, or relic plants or plant communities that are terrestrial, aquatic, or riparian; or rare geological features).	No	Area was not nominated for this value.
Natural hazards (including areas of avalanche, dangerous flooding, landslides, unstable soils, seismic activity, or dangerous if it is determined through the resource management planning process that it has become part of a natural process).	No	Area was not nominated for this value. None known to be present.

Importance

The value, resource, system, process, or hazard described above must have substantial significance and values to satisfy the "importance" criteria. This generally means that the value, resource, system, process, or hazard is characterized by one or more of the following:

Importance Value	Yes/No	Rationale for Determination
Has more than locally significant qualities that give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared with any similar resource.	No	Scenic: The Highland Range and the portions of the ACEC in McCullough Mountains are scenic, but not determined to be more than locally significant in quality.
	Yes	Existing ACEC: Mojave desert tortoise—federally listed (threatened).
	No	Addition #1 - Highland Range (14,093 acres): Mojave desert tortoise—Designated critical habitat for Mojave desert tortoise on the east. Density from transect model and USGS model each have better habitat potential in the eastern portions of the nominated area only.
	No	Addition #2 –Small Square (826 acres): Mojave desert tortoise—Designated critical habitat for Mojave desert tortoise. Not contiguous with the rest of the ACEC, but it is contiguous with the Boulder City Conservation Easement. Moderate density from transects model, and about half as the higher range of suitable from the USGS Mojave desert tortoise model.
	No	Addition #3 - McCullough pass (8,844 acres): Mojave desert tortoise—Designated critical habitat for Mojave desert tortoise. Heavily impacted by existing development by power lines. Density from transect model and USGS model each have better habitat potential in the eastern portions of the nominated area only.
	Yes	Addition #4 - Walking Box Ranch (160 acres): Walking Box Ranch acquisition. Mojave desert tortoise—Designated critical habitat for Mojave desert tortoise. Contiguous with surrounding habitat.
	No	Desert bighorn sheep—Species occurs throughout the region.
Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.	Yes	Scenic: The Highland Range and the portions of the ACEC in McCullough Mountains contain exemplary scenic qualities due to dramatic relief, rugged nature of the landscape and variation in color and texture. Development would degrade these scenic values.
	Yes	Existing ACEC: Mojave desert tortoise—federally listed (threatened), downward trend; critical habitat. Surface disturbances and recreational OHV use could degrade habitat.
	Yes (east)	Addition #1 - Highland Range (14,093 acres): Mojave desert tortoise—Designated critical habitat on the east. Tortoise habitat is threatened and is vulnerable to adverse change.
	Yes	Addition #2 –Small Square (826 acres): Mojave desert tortoise—designated critical habitat. Not contiguous with the rest of the ACEC, but it is contiguous with the Boulder City Conservation Easement. Tortoise habitat is threatened and is vulnerable to adverse change.
	Yes	Addition #3 - McCullough Pass (8,844 acres): Mojave desert tortoise—Designated critical habitat. Heavily impacted by existing development by power lines. Tortoise habitat is threatened and is vulnerable to further adverse change.
	Yes	Existing ACEC: Desert bighorn sheep—Within the region, this habitat provides a large, relatively undeveloped area for migration between various mountain ranges. Development within the valleys would hinder such movement and would be an adverse change to the viability of the metapopulations.
	Yes	Addition #1 - Highland Range (14,093 acres): Desert bighorn sheep inhabiting the McCullough and Highland ranges comprise the second largest population in BLM's Southern Nevada District. The Highland Range was designated as a crucial bighorn sheep habitat area in 1969 and continues to serve a

Importance Value	Yes/No	Rationale for Determination
		vital role in maintaining the health and population size of this bighorn herd. Large-scale development within this range would adversely affect herd size and viability.
	No	Addition #2 –Small Square (826 acres): Desert bighorn sheep—Not within crucial or winter habitat.
	Yes	Addition #3 - McCullough Pass (8,844 acres): Desert bighorn sheep—This pass is an important bighorn movement corridor that is also an important corridor for interstate energy transmission. Large-scale development and increase of recreation use within this pass may adversely affect herd size and viability within the Sloan Canyon National Conservation Area and McCullough Wilderness.
	No	Addition #4 - Walking Box Ranch (160 acres): Desert bighorn sheep. Not within Desert bighorn sheep habitat.
Has been recognized as warranting protection to satisfy national priority concerns or to carry out the mandates of FLPMA.	Yes	Scenic: The portions of the ACEC within Wilderness have been designated by Congress for their wilderness character including scenic qualities.
	Yes (all)	Mojave desert tortoise—federally listed (threatened), downward trend; critical habitat.
	No	Desert bighorn sheep—BLM sensitive species for the State of Nevada, not a national priority.
Has qualities that warrant highlighting to satisfy public or management concerns about safety and public welfare.	No	Area was not nominated for this value. None known to be present.
Poses a significant threat to human life and safety or to property.	No	Area was not nominated for this value. Not present.

Summary of Relevant and Important Values: The BLM interdisciplinary team determined that 352,159 acres of the existing ACEC and the proposed expansions areas meet at least one criterion for both relevance and importance and will be considered for incorporation in the Draft RMP/EIS. Specifically, the following values meet at least one criterion for both relevance and importance:

- Scenic
- Mojave desert tortoise
- Bighorn sheep

N.3.1.17. Rainbow Gardens ACEC

General Location:	On the east side of the Las Vegas Valley next to the Sunrise Mountain Township.
General Description:	Rainbow Gardens ACEC contains a scenic mountain and canyon landscape similar to those found in more remote locations of southern Nevada, but unique in its close proximity to the city, allowing people a wilderness experience within a few miles of their homes.
Existing Acreage:	38,766 acres.
Nominated Acreage:	Proposed expansion of an additional 600 acres in acquired inholdings.
Values Considered:	Scenic, cultural, geologic, sensitive plants.

Relevance

An area meets the “relevance” criterion if it contains one or more of the following:

Relevance Value	Yes/No	Rationale for Determination
A significant historic, cultural, or scenic value (including rare or sensitive archeological resources and religious or cultural resources important to Native Americans).	Yes	Scenic—a mountain and canyon landscape similar to those found in more remote locations of southern Nevada, but unique in its close proximity to the city. Upturned beds expose multi-colored sedimentary bands.
	Yes	Cultural—The area includes Gypsum Cave, which is listed on the National Register of Historic Places. Includes a variety of temporal and artifact types. It was occupied sporadically, but over a long period time.
A fish and wildlife resource (including habitat for endangered, sensitive or threatened species, or habitat essential for maintaining species diversity).	No	Area was not nominated for this value.
A natural process or system (including endangered, sensitive, or threatened plant species; rare, endemic, or relic plants or plant communities that are terrestrial, aquatic, or riparian; or rare geological features).	Yes	Las Vegas buckwheat (*Eriogonum corymbosum* var.*nilesii*)—BLM sensitive species, federal Candidate.
	Yes	Las Vegas bearpoppy (*Arctomecon californica*)—BLM sensitive species.
	Yes	Paleontological—Pleistocene megafauna in Gypsum Cave.
	Yes	Rare geologic feature—Great Unconformity. A surface of rock was exposed and then covered with a much younger layer of rock so there is approximately 1.2 billion years of geologic time missing in the local geologic record.
Natural hazards (including areas of avalanche, dangerous flooding, landslides, unstable soils, seismic activity, or dangerous if it is determined through the resource management planning process that it has become part of a natural process).	No	Area was not nominated for this value. None known to be present.

Importance

The value, resource, system, process, or hazard described above must have substantial significance and values to satisfy the "importance" criteria. This generally means that the value, resource, system, process, or hazard is characterized by one or more of the following:

Importance Value	Yes/No	Rationale for Determination
Has more than locally significant qualities that give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared with any similar resource.	Yes	Scenic—The colors and bed tilting provide unique visual contrast that is not present in the area.
	Yes	Cultural—A regionally significant site for cultural values.
	Yes	Las Vegas buckwheat—BLM sensitive species, federal Candidate, endemic to the planning area.
	Yes	Las Vegas bearpoppy—BLM sensitive species, endemic to the planning area.
	Yes	Paleontological—Remains of Pleistocene megafauna were recovered from Gypsum cave. Presence of well-preserved ice-age wildlife is rare, and therefore the occurrence is more than locally significant.
	Yes	Rare Geologic Feature—Great Unconformity. Documents approximately 1.2 billion years missing between sediment deposition events.

Importance Value	Yes/No	Rationale for Determination
Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.	Yes	Scenic—Close proximity to a major urban area has resulted in a major amount and diverse type of recreational use, as well as vandalism and illegal activities. Infrastructure to support urban development also results in high degree of visual contrast that is not consistent with the line, color, form and texture of the area.
	Yes	Cultural—Close proximity to a major urban area has resulted in a major amount and diverse type of recreational use, as well as vandalism and illegal activities. These have degraded the sensitive and irreplaceable resources. Further local abuse threatens the cultural site and values.
	Yes	Las Vegas buckwheat—BLM sensitive species, federal Candidate. Close proximity to a major urban area has resulted in a major amount and diverse type of recreational use, as well as vandalism and illegal activities. Increases in use and illegal trail development have resulted in a loss of habitat.
	Yes	Las Vegas bearpoppy—BLM sensitive species, State Listed. Close proximity to a major urban area has resulted in a major amount and diverse type of recreational use, as well as vandalism and illegal activities. Increases in use and illegal trail development have resulted in a loss of habitat.
	Yes	Paleontological—Close proximity to a major urban area has resulted in a major amount and diverse type of recreational use, as well as vandalism and illegal activities. These have degraded the sensitive and irreplaceable resources. Further local abuse threatens the paleontological resources.
	Yes	Rare geologic feature—Great unconformity. This site is visited regularly by a wide variety of academic institutions, viewing this exemplary resource.
Has been recognized as warranting protection to satisfy national priority concerns or to carry out the mandates of FLPMA.	No	Scenic—The area was not inventoried for WSA designation and therefore did not have supplementary features identified.
	No	Cultural—Beyond requirements to address cultural resources in the National Historic Preservation Act, section 106, the area is not recognized as a national priority.
	Yes	Las Vegas buckwheat—Is a federally designated Candidate species, and is a national priority for protection under the ESA.
	No	Las Vegas bearpoppy—Not federally designated, so therefore not a national priority.
	Yes	Paleontological—The presence of significant paleontological resources in this cave make it a significant cave according to the National Cave Resource Protection Act.
	No	Rare geologic feature—Great Unconformity. No formal protection or recognition of this area nationally.
Has qualities that warrant highlighting to satisfy public or management concerns about safety and public welfare.	No	Area was not nominated for this value. None known to be present.
Poses a significant threat to human life and safety or to property.	No	Area was not nominated for this value. Not present.

Summary of Relevant and Important Values: The BLM interdisciplinary team determined that 35,353 acres of the existing ACEC and the proposed expansion areas meet at least one criterion for both relevance and importance and will be considered for incorporation in the Draft RMP/EIS. Portions of the ACEC within the East Community Pit and the Sunrise Landfill will be considered for removal from the ACEC. Specifically, the following values meet at least one criterion for both relevance and importance:

- Cultural/historic values
- Scenic values
- Las Vegas buckwheat
- Las Vegas bearpoppy
- Paleontological (Pleistocene megafauna)
- Geologic feature (Great Unconformity)

N.3.1.18. Red Rock Spring ACEC

General Location:	Located in a drainage north of the Gold Butte Backcountry Byway, within Gold Butte, Part A.
General Description:	The area contains prehistoric habitation sites and rock art.
Existing Acreage:	638 acres (overlaps with Gold Butte, Part A ACEC).
Nominated Acreage:	N/A
Values Considered:	Prehistoric habitation and rock art.

Relevance

An area meets the "relevance" criterion if it contains one or more of the following:

Relevance Value	Yes/No	Rationale for Determination
A significant historic, cultural, or scenic value (including rare or sensitive archeological resources and religious or cultural resources important to Native Americans).	Yes	Cultural—Prehistoric and historic features associated with human use of the spring and its resources.
A fish and wildlife resource (including habitat for endangered, sensitive or threatened species, or habitat essential for maintaining species diversity).	Yes	Relict leopard frog (*Rana onca*) was reintroduced in this spring, within its historic range. This species is a BLM sensitive species.
A natural process or system (including endangered, sensitive, or threatened plant species; rare, endemic, or relic plants or plant communities that are terrestrial, aquatic, or riparian; or rare geological features).	No	Area was not nominated for this value.
Natural hazards (including areas of avalanche, dangerous flooding, landslides, unstable soils, seismic activity, or dangerous if it is determined through the resource management planning process that it has become part of a natural process).	No	Area was not nominated for this value. None known to be present.

Importance

The value, resource, system, process, or hazard described above must have substantial significance and values to satisfy the "importance" criteria. This generally means that the value, resource, system, process, or hazard is characterized by one or more of the following:

Importance Value	Yes/No	Rationale for Determination
Has more than locally significant qualities that give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared with any similar resource.	Yes	Cultural—the area includes a campsite of the Old Spanish National Historic Trail (OST). This area is listed on the National Register of Historic Places for its association with the OST. The area also has extensive open prehistoric campsites.
Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.	Yes	Cultural—The area is heavily used by recreational shooting, vandalism, looting, and general dispersed recreation use. Increasing recreation and associated OHV use has adversely changed several cultural features.
Has been recognized as warranting protection to satisfy national priority concerns or to carry out the mandates of FLPMA.	Yes	Cultural—The area includes a campsite of the Old Spanish National Historic Trail (OST). This area is listed on the National Register of Historic Places for its association with the OST. The area also has extensive open prehistoric campsites.
Has qualities that warrant highlighting to satisfy public or management concerns about safety and public welfare.	No	Area was not nominated for this value. None known to be present.
Poses a significant threat to human life and safety or to property.	No	Area was not nominated for this value. Not present.

Summary of Relevant and Important Values: The BLM interdisciplinary team determined that the existing ACEC, 646 acres, meets at least one criterion for both relevance and importance and will be considered for incorporation in the Draft RMP/EIS. Specifically, the following values meet at least one criterion for both relevance and importance:

- Cultural/historic values

N.3.1.19. River Mountains ACEC

General Location:	East side of the Las Vegas Valley east of the City of Henderson.
General Description:	Rough, rocky, and steep terrain, broken up by canyons and washes.
Existing Acreage:	11,029 acres
Nominated Acreage:	N/A
Values Considered:	Bighorn sheep habitat, scenic viewshed for Henderson and Boulder City.

Relevance

An area meets the "relevance" criterion if it contains one or more of the following:

Relevance Value	Yes/No	Rationale for Determination
A significant historic, cultural, or scenic value (including rare or sensitive archeological resources and religious or cultural resources important to Native Americans).	Yes	Scenic—Contains rough, rocky and steep terrain, broken up by canyons and washes, providing a high degree of topographic contrast compared to the surrounding desert. Viewshed for Boulder City and Henderson.
A fish and wildlife resource (including habitat for endangered, sensitive or threatened species, or habitat essential for maintaining species diversity).	Yes	Desert bighorn sheep (*Ovis canadensis nelson)*—BLM sensitive species, the rough, rocky and steep terrain where the bighorn sheep can escape from predators. This herd has suffered from loss of habitat due to increasing urban development from expansion of Boulder City and Henderson and widening of State Highway 95.

Relevance Value	Yes/No	Rationale for Determination
A natural process or system (including endangered, sensitive, or threatened plant species; rare, endemic, or relic plants or plant communities that are terrestrial, aquatic, or riparian; or rare geological features).	No	Area was not nominated for this value.
Natural hazards (including areas of avalanche, dangerous flooding, landslides, unstable soils, seismic activity, or dangerous if it is determined through the resource management planning process that it has become part of a natural process).	No	Area was not nominated for this value. None known to be present.

Importance

The value, resource, system, process, or hazard described above must have substantial significance and values to satisfy the "importance" criteria. This generally means that the value, resource, system, process, or hazard is characterized by one or more of the following:

Importance Value	Yes/No	Rationale for Determination
Has more than locally significant qualities that give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared with any similar resource.	No	Scenic—While scenic and sensitive, the scenic values are not more than locally significant compared to the other scenic values in the area.
	Yes	Desert bighorn sheep—This range supports one of the highest density herds of bighorn sheep in southern Nevada. Several hundred of bighorn sheep from this herd have been transplanted into 18 different mountain ranges in four states. Habitat for two other special status species.
Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.	Yes	Scenic—Close proximity to a major urban area has resulted in diverse types of recreational use. Infrastructure to support urban development also results in a high degree of visual contrast that is not consistent with the line, color, form and texture of the area.
	Yes	Desert bighorn sheep—Population pressures from Henderson, Boulder City, and Las Vegas are placing an increasing demand on the area. There is potential for adverse impacts to the River Mountain bighorn sheep herd and its habitat from increased human use of the area.
Has been recognized as warranting protection to satisfy national priority concerns or to carry out the mandates of FLPMA.	No	Scenic—The area has not yet been recognized as a national priority.
	No	Desert bighorn sheep—BLM sensitive species for the State of Nevada, not a national priority.
Has qualities that warrant highlighting to satisfy public or management concerns about safety and public welfare.	No	Area was not nominated for this value. None known to be present.
Poses a significant threat to human life and safety or to property.	No	Area was not nominated for this value. Not present.

Summary of Relevant and Important Values: The BLM interdisciplinary team determined that 6,697 acres of the existing ACEC meets at least one criterion for both relevance and importance and will be considered for incorporation in the Draft RMP/EIS. The lands withdrawn to US Bureau of Reclamation will be considered for removal. Specifically, the following values meet at least one criterion for both relevance and importance:

- Scenic values
- Desert bighorn sheep

N.3.1.20. Stump Spring ACEC

General Location:	In Pahrump Valley just east of the Nye County line.
General Description:	A spring with a prehistoric camp site and historic camp site along the Old Spanish National Historic Trail.
Existing Acreage:	646 acres.
Nominated Acreage:	N/A
Values Considered:	Prehistoric camp and historic trail.

Relevance

An area meets the "relevance" criterion if it contains one or more of the following:

Relevance Value	Yes/No	Rationale for Determination
A significant historic, cultural, or scenic value (including rare or sensitive archeological resources and religious or cultural resources important to Native Americans).	Yes	Cultural—Spring site is the location of a prehistoric camp and historic trail and camp.
A fish and wildlife resource (including habitat for endangered, sensitive or threatened species, or habitat essential for maintaining species diversity).	No	Area was not nominated for this value.
A natural process or system (including endangered, sensitive, or threatened plant species; rare, endemic, or relic plants or plant communities that are terrestrial, aquatic, or riparian; or rare geological features).	No	Area was not nominated for this value.
Natural hazards (including areas of avalanche, dangerous flooding, landslides, unstable soils, seismic activity, or dangerous if it is determined through the resource management planning process that it has become part of a natural process).	No	Area was not nominated for this value. None known to be present.

Importance

The value, resource, system, process, or hazard described above must have substantial significance and values to satisfy the "importance" criteria. This generally means that the value, resource, system, process, or hazard is characterized by one or more of the following:

Importance Value	Yes/No	Rationale for Determination
Has more than locally significant qualities that give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared with any similar resource.	Yes	Cultural—the area includes a campsite of the Old Spanish National Historic Trail (OST). This area is listed on the National Register of Historic Places for its association with the OST. The area also has extensive open prehistoric campsites.
Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.	Yes	Cultural—The area is heavily used by recreational shooting, vandalism, looting, and general dispersed recreation use. Increasing recreation and associated OHV use has adversely changed several cultural features.
Has been recognized as warranting protection to satisfy national priority concerns or to carry out the mandates of FLPMA.	Yes	Cultural—The area includes a campsite of the Old Spanish National Historic Trail (OST). This area is listed on the National Register of Historic Places for its association with the OST. The area also has extensive open prehistoric campsites.
Has qualities that warrant highlighting to satisfy public or management concerns about safety and public welfare.	No	Area was not nominated for this value. None known to be present.
Poses a significant threat to human life and safety or to property.	No	Area was not nominated for this value. Not present.

Summary of Relevant and Important Values: The BLM interdisciplinary team determined that the existing ACEC, 646 acres, meets at least one criterion for both relevance and importance and will be considered for incorporation in the Draft RMP/EIS. Specifically, the following values meet at least one criterion for both relevance and importance:

- Cultural/historic values

N.3.1.21. Virgin River ACEC

General Location:	Northwest Clark County just south of the City of Mesquite.
General Description:	Riparian and river corridor for the Virgin River.
Existing Acreage:	6,186 acres.
Nominated Acreage:	Proposed boundary adjustments of 2,314 acres.
Values Considered:	Listed species, riparian habitat, cultural resources.

Relevance

An area meets the "relevance" criterion if it contains one or more of the following:

Relevance Value	Yes/No	Rationale for Determination
A significant historic, cultural, or scenic value (including rare or sensitive archeological resources and religious or cultural resources important to Native Americans).	Yes	Cultural—Prehistoric habitation sites.
A fish and wildlife resource (including habitat for endangered, sensitive or threatened species, or habitat essential for maintaining species diversity).	Yes	Virgin River chub (*Gila seminude*)—federally listed (endangered), designated critical habitat.
	Yes	Woundfin (*Plagopterus argentissimus*)—federally listed (endangered), designated critical habitat.
	Yes	Southwestern willow flycatcher (*Empidonax traillii extimus*)—federally listed (endangered); designated critical habitat.

Relevance Value	Yes/No	Rationale for Determination
A natural process or system (including endangered, sensitive, or threatened plant species; rare, endemic, or relic plants or plant communities that are terrestrial, aquatic, or riparian; or rare geological features).	Yes	Riparian—Riparian habitat type is extremely limited in this ecoregion, making this habitat important to maintain species diversity and to support bird migration.
Natural hazards (including areas of avalanche, dangerous flooding, landslides, unstable soils, seismic activity, or dangerous if it is determined through the resource management planning process that it has become part of a natural process).	No	Area was not nominated for this value. None known to be present.

Importance

The value, resource, system, process, or hazard described above must have substantial significance and values to satisfy the "importance" criteria. This generally means that the value, resource, system, process, or hazard is characterized by one or more of the following:

Importance Value	Yes/No	Rationale for Determination
Has more than locally significant qualities that give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared with any similar resource.	Yes	Cultural—Western most concentration of Ancestral Puebloan/Anasazi occupation.
	Yes	Virgin River chub—federally listed (endangered), designated critical habitat.
	Yes	Woundfin—federally listed (endangered), designated critical habitat.
	Yes	Southwestern willow flycatcher—federally listed (endangered); designated critical habitat.
	Yes	Riparian—Riparian habitat type is extremely limited in this ecoregion, making this habitat important to maintain species diversity and to support bird migration.
Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.	Yes	Cultural—The area has a potential to yield significant cultural information. The area is threatened by development (urban and rights-of-way). The location adjacent to a major community has resulted in high levels of recreation use, with threats of adverse changes from recreation and OHV use.
	Yes	Virgin River chub—The species are highly threatened by non-native introduced fish coming up from Lake Mead.
	Yes	Woundfin—The species are highly threatened by non-native introduced fish coming up from Lake Mead.
	Yes	Southwestern willow flycatcher—Habitat along the river is highly restricted by the abundance of invasive tamarisk, threatening the species with adverse changes. Tamarisk crowds out the native willow habitats. Development of riparian habitats along the Virgin River also reduces the amount and quality of habitat.
	Yes	Riparian—Riparian habitat type is extremely limited in this ecoregion, making this habitat important to maintain species diversity and to support bird migration. Native riparian vegetation is threatened with adverse changes by the invasion and abundance of tamarisk. Tamarisk crowds out the native willows and other understory vegetation. Development of riparian habitats along the Virgin River also reduces the amount and quality of riparian vegetation.

Importance Value	Yes/No	Rationale for Determination
Has been recognized as warranting protection to satisfy national priority concerns or to carry out the mandates of FLPMA.	No	Cultural—Beyond requirements to address cultural resources in the National Historic Preservation Act, section 106, the area is not recognized as a national priority.
	Yes	Virgin River chub—federally listed (endangered), designated critical habitat.
	Yes	Woundfin—federally listed (endangered), designated critical habitat.
	Yes	Southwestern willow flycatcher—federally listed (endangered); designated critical habitat.
	No	Riparian—While riparian habitat type is extremely limited in this ecoregion, it has not been recognized as a national priority for protection, beyond providing habitat for the Southwestern willow flycatcher.
Has qualities that warrant highlighting to satisfy public or management concerns about safety and public welfare.	No	Area was not nominated for this value. None known to be present.
Poses a significant threat to human life and safety or to property.	No	Area was not nominated for this value. Not present.

Summary of Relevant and Important Values: The BLM interdisciplinary team determined that 8,500 acres of the existing ACEC and the proposed expansion area meet at least one criterion for both relevance and importance and will be considered for incorporation in the Draft RMP/EIS. Specifically, the following values meet at least one criterion for both relevance and importance:

- Cultural/historic values
- Virgin River chub
- Woundfin
- Southwestern willow flycatcher
- Riparian habitat

N.3.1.22. Whitney Pocket ACEC

General Location:	In Gold Butte Part A ACEC at the intersection of the Gold Butte Backcountry Byway and the Whitney Pass Road.
General Description:	A cluster of sandstone outcrops.
Existing Acreage:	160 acres (overlaps with Gold Butte, Part A ACEC).
Nominated Acreage:	N/A
Values Considered:	Prehistoric habitation and rock art.

Relevance

An area meets the “relevance” criterion if it contains one or more of the following:

Relevance Value	Yes/No	Rationale for Determination
A significant historic, cultural, or scenic value (including rare or sensitive archeological resources and religious or cultural resources important to Native Americans).	Yes	Cultural—Historic structures and prehistoric habitation and rock art features.
A fish and wildlife resource (including habitat for endangered, sensitive or threatened species, or habitat essential for maintaining species diversity).	No	Area was not nominated for this value.
A natural process or system (including endangered, sensitive, or threatened plant species; rare, endemic, or relic plants or plant communities that are terrestrial, aquatic, or riparian; or rare geological features).	No	Area was not nominated for this value.
Natural hazards (including areas of avalanche, dangerous flooding, landslides, unstable soils, seismic activity, or dangerous if it is determined through the resource management planning process that it has become part of a natural process).	No	Area was not nominated for this value.

Importance

The value, resource, system, process, or hazard described above must have substantial significance and values to satisfy the "importance" criteria. This generally means that the value, resource, system, process, or hazard is characterized by one or more of the following:

Importance Value	Yes/No	Rationale for Determination
Has more than locally significant qualities that give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared with any similar resource.	No	Cultural—These resources are not more than locally significant. While eligible for the National Register of Historic Places, the area contains similar resources to others in the region.
Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.	Yes	Cultural—The area receives heavy recreational use that threatens the cultural resources in this area. These are vulnerable to adverse change from surface disturbing activities and unmitigated use and vandalism.CCC Dam is and good example of the work done at the time, especially the amount of work invested to protect the resources present.
Has been recognized as warranting protection to satisfy national priority concerns or to carry out the mandates of FLPMA.	No	Cultural—Historic structures and prehistoric habitation and rock art features.
Has qualities that warrant highlighting to satisfy public or management concerns about safety and public welfare.	No	Area was not nominated for this value. None known to be present.
Poses a significant threat to human life and safety or to property.	No	Area was not nominated for this value. Not present.

Summary of Relevant and Important Values: The BLM interdisciplinary team determined that the existing ACEC, 160 acres, meets at least one criterion for both relevance and importance and will be considered for incorporation in the Draft RMP/EIS. Specifically, the following values meet at least one criterion for both relevance and importance:

- Cultural/historic values

N.3.2. Areas Nominated for ACEC Designation

N.3.2.1. Bird Spring Valley Nominated ACEC

General Location:	Southwest portion of the Las Vegas Valley, Bird Spring Valley and the eastern bajada of the Southern Spring Mountains west of Interstate-15 to Primm, Nevada.
General Description:	The nominated area contains high quality Mojave desert tortoise habitat (as modeled by the U.S.G.S) combined with a moderate to high density of Mojave desert tortoises important to maintain genetic and population connectivity. The area is contiguous with Red Rock Canyon NCA to the west, the Mojave desert tortoise Conservation Center Management Area to the north and includes the Large Scale Translocation Site.
Nominated By:	BLM and Desert Conservation Program.
Nominated Acreage:	79,958 acres (BLM nomination); 27,931 acres (DCP nomination).
Values Considered:	Mojave desert tortoise, western burrowing owl, desert kangaroo rat, desert pocket mouse, yellow two-toned beardtongue, Las Vegas bearpoppy, Las Vegas buckwheat, sticky buckwheat, threecorner milkvetch.

Relevance

An area meets the "relevance" criterion if it contains one or more of the following:

Relevance Value	Yes/No	Rationale for Determination
A significant historic, cultural, or scenic value (including rare or sensitive archeological resources and religious or cultural resources important to Native Americans).	No	Area was not nominated for this value.
A fish and wildlife resource (including habitat for endangered, sensitive or threatened species, or habitat essential for maintaining species diversity).	Yes	Mojave desert tortoise (*Gopherus agassizii)*—federally listed (Threatened). This area does not contain designated critical habitat, but it does include habitat that is both high value from the USGS habitat model and habitat containing moderate to high density of Mojave desert tortoises important to maintain genetic and population connectivity between Ivanpah Valley, Bird Spring Valley, and the Las Vegas Valley.
	Yes	Western burrowing owl (*Athene cunicularia)*—BLM sensitive. Area includes modeled habitat.
	No	Desert kangaroo rat (*Dipodomys deserti)*—Not a BLM sensitive species.
	No	Desert pocket mouse (*Chaetodipus penicillatus sobrinus)*—Not a BLM sensitive species.

Relevance Value	Yes/No	Rationale for Determination
A natural process or system (including endangered, sensitive, or threatened plant species; rare, endemic, or relic plants or plant communities that are terrestrial, aquatic, or riparian; or rare geological features).	Yes	Yellow twotone beardtongue (*Penstemon bicolor ssp bicolor)*—BLM sensitive. Area includes occupied habitat, as well as areas that show a moderate to high likelihood of being habitat. Portions of the additional 10k acres were inventoried but no plants were identified.
	No	Las Vegas bearpoppy (*Arctomecon californica)*—BLM sensitive. This area does not contain the appropriate habitat for this species.
	No	Las Vegas buckwheat (*Eriogonum corymbosum var. nilesii)*—BLM sensitive, Candidate for federal listing. This area does not contain the appropriate habitat for this species.
	No	Sticky buckwheat (*Eriogonum viscidulum)*—BLM sensitive. This area does not contain the appropriate habitat for this species.
	No	Threecorner milkvetch (*Astragalus geyeri var. triquetrus)*—BLM sensitive. This area does not contain the appropriate habitat for this species.
Natural hazards (including areas of avalanche, dangerous flooding, landslides, unstable soils, seismic activity, or dangerous if it is determined through the resource management planning process that it has become part of a natural process).	No	Area was not nominated for this value. None known to be present.

Importance:

If a nominated value, resource, system, process, or hazard did not meet at least one of the relevance criteria, it was not evaluated for importance. A value, resource, system, process, or hazard meets the "importance" criterion if it is characterized by one or more of the following:

Importance Value	Yes/No	Rationale for Determination
Has more than locally significant qualities that give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared with any similar resource.	Yes	Mojave desert tortoise—The quality of the habitat is similar to the Red Cliffs Desert Preserve in southern Utah (personal communication Michael Burroughs, F&WS June 22, 2010). While the area does not contain designated critical habitat, it has been evaluated using two methods and includes high value habitat characteristics from the USGS habitat model, as well as high density tortoise populations through transect surveys. This species was formerly classified as an 8c (moderate degree of threat, high potential for recovery), but is now an 6c (high degree of threat, low potential for recovery).This combination makes habitat that is high quality with a high density existing population more than locally significant for the recovery of this species.
	No	Western burrowing owl—There is potential habitat throughout the region. The habitat in this area is not more than locally significant.
	Yes	Yellow twotone beardtongue—This species has a very limited range, making the habitat in this area more than locally significant to the survival of this species. The habitat in the western Las Vegas Valley is some of the best remaining habitat for this species.

Importance Value	Yes/No	Rationale for Determination
Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.	Yes	Mojave desert tortoise—Habitat for Mojave desert tortoise is sensitive to effects from proximity of urban interface making it vulnerable to adverse change from human impacts. Habitat corridors are naturally narrow in this area due to mountain ranges and dry lakebeds. Development in the area has narrowed these corridors further and risking isolation of tortoise popoulations. Habitat containing moderate to high density of Mojave desert tortoises important to maintain genetic and population connectivity between Ivanpah Valley, Bird Spring Valley, and the Las Vegas Valley is located in this proposed ACEC.
	Yes	Western burrowing owl—The species and habitat is found throughout much of the west. The habitat in the nominated area is not more exemplary or unique than other habitats. However, the proximity to development in the Las Vegas Valley makes this habitat more threatened than other burrowing owl habitat elsewhere in the region. In the additional 10k acre nomination from DCP, the area is further away from the development of the city, and while there may be impacts from motorized use, there is less threat of an irreplaceable loss of habitat associated with development in the rural/urban interface.
	Yes	Yellow twotone beardtongue—This habitat is important to the limited range of this species. The species is endemic to the Las Vegas Valley, and this population is directly adjacent to the Red Rock population, providing continuity of habitat. Additionally, the proximity to proximity to development in the Las Vegas Valley makes this habitat vulnerable to adverse change.
Has been recognized as warranting protection to satisfy national priority concerns or to carry out the mandates of FLPMA.	No	Mojave desert tortoise—While the species is federally listed, there is no designated critical habitat in the area. The species receives protection from the Endangered Species Act. The absence of designated critical habitat shows this area has not been specifically recognized as warranting protection.
	No	Western burrowing owl—BLM sensitive species for the State of Nevada, not a national priority.
	No	Yellow twotone beardtongue—BLM sensitive species for the State of Nevada, not a national priority.
Has qualities that warrant highlighting to satisfy public or management concerns about safety and public welfare.	No	This importance criteria does not apply to public safety and welfare related to community expansion or development. Therefore, using protection of this area as mitigation for development elsewhere does not meet this criterion.
Poses a significant threat to human life and safety or to property.	No	Area was not nominated for this value. Not present.

Nominated Area to Potential ACEC

The BLM interdisciplinary team determined that all of the 78,958 nominated acres meet at least one criterion for both relevance and importance and will be considered for incorporation in the Draft RMP/EIS. Specifically, the following values meet at least one criterion for both relevance and importance:

- Mojave desert tortoise
- Western burrowing owl
- Yellow twotone beardtongue

N.3.2.2. Bitter Springs Nominated ACEC

General Location:	Southeast and east of the Muddy Mountains wilderness and adjacent to the Lake Mead National Recreation Area.
General Description:	The area contains a population of Las Vegas bearpoppy, 10% of the occupied habitat mapped on BLM lands.
Nominated By:	BLM
Nominated Acreage:	61,840 acres.
Values Considered:	Scenic, desert bighorn sheep, Las Vegas bearpoppy, sticky ringstem, Las Vegas buckwheat.

Relevance

An area meets the "relevance" criterion if it contains one or more of the following:

Relevance Value	Yes/No	Rationale for Determination
A significant historic, cultural, or scenic value (including rare or sensitive archeological resources and religious or cultural resources important to Native Americans).	Yes	Scenic—Unique geologic features. Red sandstone and gypsum formations create interesting contrast of color and form. Riparian vegetation creates a contrast with the surrounding desert vegetation. Scenic views of Lake Mead
A fish and wildlife resource (including habitat for endangered, sensitive or threatened species, or habitat essential for maintaining species diversity).	Yes	Desert bighorn sheep (*Ovis canadensis nelson*)—BLM sensitive species, area contains both crucial and winter habitat. All crucial habitat (most important and near water) is already protected by the Bitter Springs nominated ACEC Approximately 20 tags in 2010, with 459 sheep from an aerial survey in 2008.
A natural process or system (including endangered, sensitive, or threatened plant species; rare, endemic, or relic plants or plant communities that are terrestrial, aquatic, or riparian; or rare geological features).	Yes	Las Vegas bearpoppy (*Arctomecon californica*), sticky ringstem (*Anulocaulis leiosolenus* var. *leiosolenus)* and Las Vegas buckwheat (*Eriogonum corymbosum* var. *nilesii*) a federal Candidate species—On land recently acquired by BLM to protect bearpoppy and buckwheat habitat. It is contiguous with the largest and densest populations of bearpoppy on Park Service lands.
Natural hazards (including areas of avalanche, dangerous flooding, landslides, unstable soils, seismic activity, or dangerous if it is determined through the resource management planning process that it has become part of a natural process).	No	Area was not nominated for this value. None known to be present.

Importance

The value, resource, system, process, or hazard described above must have substantial significance and values to satisfy the "importance" criteria. This generally means that the value, resource, system, process, or hazard is characterized by one or more of the following:

Importance Value	Yes/No	Rationale for Determination
Has more than locally significant qualities that give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared with any similar resource.	Yes	Scenic—While the scenic views from Lake Mead are similar to other that exist in region, there is a scenic backcountry byway that runs through this area (one of only two in the Field Office). In addition, the area was identified as containing Class A scenery in the visual resource inventory.
	Yes	Desert bighorn sheep—It is the largest bighorn population in the state. Sheep from the area are gathered and transplanted to other areas.
	Yes	Las Vegas bearpoppy—it is a regional endemic and the area represents a significant portion of its range.
	No	Sticky ringstem—it is a regional endemic and the area does not represent a significant portion of its range.
	Yes	Las Vegas buckwheat—it is a regional endemic and the area represents a significant portion of its range.
Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.	Yes	Scenic—The region is well known for its scenic resources. Heavy recreation, especially illegal off-trail use, could threaten the scenic values.
	Yes	Desert bighorn sheep—It is the largest bighorn population in the state. Sheep from the area are gathered and transplanted to other areas. The sheep population is growing (2008-2009 Big Game Status). The size of the population, and the associated condition of the habitat, is unique for the region, making it less fragile to adverse change.
	Yes	Las Vegas bearpoppy—Rare plant habitat is vulnerable to casual recreation.
	Yes	Sticky ringstem—Rare plant habitat is vulnerable to damage from casual recreation.
	Yes	Las Vegas buckwheat—Rare plant habitat is vulnerable to damage from casual recreation and anthropogenic fire.
Has been recognized as warranting protection to satisfy national priority concerns or to carry out the mandates of FLPMA.	No	Desert bighorn sheep—BLM sensitive species for the State of Nevada, not a national priority.
	Yes	Las Vegas buckwheat—Is a federally designated Candidate species, so is a national priority for protection under the ESA.
Has qualities that warrant highlighting to satisfy public or management concerns about safety and public welfare.	No	Area was not nominated for this value. None known to be present.
Poses a significant threat to human life and safety or to property.	No	Area was not nominated for this value. Not present.

Nominated Area to Potential ACEC

The BLM interdisciplinary team determined that all of the 61,840 nominated acres meet at least one criterion for both relevance and importance and will be considered in the Draft RMP/EIS. Specifically, the following values meet at least one criterion for both relevance and importance:

- Scenic values
- Desert bighorn sheep
- Las Vegas bearpoppy
- Sticky ringstem
- Las Vegas buckwheat

N.3.2.3. California Wash Nominated ACEC

General Location:	Western side of the Muddy Mountains and Valley of Fire State Park.
General Description:	Habitat for threecorner milkvetch.
Nominated By:	BLM
Nominated Acreage:	11,998 acres.
Values Considered:	Cultural, threecorner milkvetch habitat.

Relevance

An area meets the "relevance" criterion if it contains one or more of the following:

Relevance Value	Yes/No	Rationale for Determination
A significant historic, cultural, or scenic value (including rare or sensitive archeological resources and religious or cultural resources important to Native Americans).	Yes	Cultural—Ephemeral occupation sites.
A fish and wildlife resource (including habitat for endangered, sensitive or threatened species, or habitat essential for maintaining species diversity).	No	Area was not nominated for this value.
A natural process or system (including endangered, sensitive, or threatened plant species; rare, endemic, or relic plants or plant communities that are terrestrial, aquatic, or riparian; or rare geological features).	Yes	Threecorner milkvetch (*Astragalus geyeri* var. *triquetrus*)—BLM sensitive and state listed species. The area provides the unique soil type necessary for the plant.
Natural hazards (including areas of avalanche, dangerous flooding, landslides, unstable soils, seismic activity, or dangerous if it is determined through the resource management planning process that it has become part of a natural process).	No	Area was not nominated for this value. None known to be present.

Importance

The value, resource, system, process, or hazard described above must have substantial significance and values to satisfy the "importance" criteria. This generally means that the value, resource, system, process, or hazard is characterized by one or more of the following:

Importance Value	Yes/No	Rationale for Determination
Has more than locally significant qualities that give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared with any similar resource.	No	Cultural—Similar to other cultural values in the region.
	Yes	Threecorner milkvetch—the area provides a significant portion of habitat in its range.

Importance Value	Yes/No	Rationale for Determination
Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.	Yes	Cultural—Recreational OHV and motorcycle use in this area could impact the fragile, irreplaceable cultural resources, as well as looting and vandalism. The area has the potential to yield significant cultural information.
	Yes	Threecorner milkvetch—Habitat is irreplaceable and vulnerable to large site type right-of-ways. Plants are sensitive to surface disturbance and threatened from invasive species.
Has been recognized as warranting protection to satisfy national priority concerns or to carry out the mandates of FLPMA.	No	Cultural—Beyond requirements to address cultural resources in the National Historic Preservation Act, section 106, the area is not recognized as a national priority.
	No	Threecorner milkvetch—Plant is not federally listed.
Has qualities that warrant highlighting to satisfy public or management concerns about safety and public welfare.	No	Area was not nominated for this value. None known to be present.
Poses a significant threat to human life and safety or to property.	No	Area was not nominated for this value. Not present.

Nominated Area to Potential ACEC

The BLM interdisciplinary team determined that all of the 11,988 nominated acres meet at least one criterion for both relevance and importance and will be considered in the Draft RMP/EIS. Specifically, the following values meet at least one criterion for both relevance and importance:

- Cultural/historic values
- Threecorner milkvetch

N.3.2.4. Gale Hills (formerly Lovell Wash) Nominated ACEC

General Location:	Between West End Wash to the west and Calville Wash to the east.
General Description:	Significant population of Las Vegas bearpoppy, Anniversary Narrows slot canyon. The area has been heavily mined in the past.
Nominated By:	BLM
Nominated Acreage:	4,788 acres.
Values Considered:	Scenic, Las Vegas bearpoppy and historic mining.

Relevance

An area meets the “relevance” criterion if it contains one or more of the following:

Relevance Value	Yes/No	Rationale for Determination
A significant historic, cultural, or scenic value (including rare or sensitive archeological resources and religious or cultural resources important to Native Americans).	Yes	Scenic—The area is comprised of Class B scenery. However, there is a small portion that relates to the Anniversary narrows, which is a well-known and scenic hiking destination. The narrows is within the wilderness area, but the ACEC includes an incised wash that leads to the narrows.
	Yes	Cultural—The Anniversary mine is located in this area, as well as on adjacent private lands. The mine produced for several years. The borate was shipped to other locations in the region. The mine includes historic structures from borate complex and colemanite mines.

Relevance Value	Yes/No	Rationale for Determination
A fish and wildlife resource (including habitat for endangered, sensitive or threatened species, or habitat essential for maintaining species diversity).	Yes	Desert bighorn sheep (*Ovis canadensis nelson*)—BLM sensitive species, area contains winter range.
A natural process or system (including endangered, sensitive, or threatened plant species; rare, endemic, or relic plants or plant communities that are terrestrial, aquatic, or riparian; or rare geological features).	Yes	Las Vegas bearpoppy (*Arctomecon californica*)—BLM sensitive.
	Yes	Las Vegas buckwheat *Eriogonum corymbosum* var.*nilesii*)—BLM sensitive species, federal Candidate.
Natural hazards (including areas of avalanche, dangerous flooding, landslides, unstable soils, seismic activity, or dangerous if it is determined through the resource management planning process that it has become part of a natural process).	No	Area was not nominated for this value. None known to be present.

Importance

The value, resource, system, process, or hazard described above must have substantial significance and values to satisfy the "importance" criteria. This generally means that the value, resource, system, process, or hazard is characterized by one or more of the following:

Importance Value	Yes/No	Rationale for Determination
Has more than locally significant qualities that give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared with any similar resource.	Yes	Scenic—The area has unique geological features, rock outcrops, and slot canyons that are well known for users driving along the Lake Mead NRA.
	Yes	Cultural—The Anniversary mine is located in this area, as well as on adjacent private lands. Produced for several years. The borate was shipped to other locations in the region. The mine includes historic structures from borate complex and colemanite mines.
	No	Desert bighorn sheep—Species occurs throughout the region.
	Yes	Las Vegas bearpoppy—BLM sensitive species, endemic to the planning area.
	Yes	Las Vegas buckwheat—BLM sensitive species, federal Candidate, endemic to the planning area.
Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.	Yes	Scenic—The area is a destination source for recreation, in part due to the scenic qualities of the area. However, the recreation is non-motorized and does not threaten the scenic values. However, the scenic values are unique to the Mojave region and are sensitive to adverse visual changes.
	Yes	Cultural—Historic structures are vulnerable to adverse change and are sensitive to alternation.
	No	Desert bighorn sheep—This area comprises a very small portion of the available habitat in this area. In addition, the levels of use, motorized and non-motorized are low compared to other areas in the decision area.
	Yes	Las Vegas bearpoppy—Rare plant habitat is vulnerable to casual recreation.
	Yes	Las Vegas buckwheat—Rare plant habitat is vulnerable to damage from casual recreation and anthropogenic fire.

Importance Value	Yes/No	Rationale for Determination
Has been recognized as warranting protection to satisfy national priority concerns or to carry out the mandates of FLPMA.	No	Scenic—The area is recognized as having scenic values, but it has not been recognized as a national priority.
	No	Cultural—Beyond requirements to address cultural resources in the National Historic Preservation Act, section 106, the area is not recognized as a national priority.
	No	Desert bighorn sheep—BLM sensitive species for the State of Nevada, not a national priority.
	No	Las Vegas bearpoppy—BLM sensitive species for the State of Nevada, not a national priority.
	No	Las Vegas buckwheat—Is a federally designated Candidate species, so is a national priority for protection under the ESA.
Has qualities that warrant highlighting to satisfy public or management concerns about safety and public welfare.	No	Area was not nominated for this value. None known to be present.
Poses a significant threat to human life and safety or to property.	No	Area was not nominated for this value. Not present.

Nominated Area to Potential ACEC

The BLM interdisciplinary team determined that 3,865 acres of the nominated acres meet at least one criterion for both relevance and importance and will be considered in the Draft RMP/EIS. Specifically, the following values meet at least one criterion for both relevance and importance:

- Cultural/historic values
- Scenic values
- Las Vegas bearpoppy
- Las Vegas buckwheat

N.3.2.5. Grapevine Springs Nominated ACEC

General Location:	Southern Nye County, west of the Johnnie Mine on the western slope of the Spring Mountains.
General Description:	Spring and watershed with two spring snail populations.
Nominated By:	BLM
Nominated Acreage:	202 acres.
Values Considered:	Spring Mountains pyrg and southeast Nevada pyrg. A third yet to be identified pyrg has been observed.

Relevance

An area meets the “relevance” criterion if it contains one or more of the following:

Relevance Value	Yes/No	Rationale for Determination
A significant historic, cultural, or scenic value (including rare or sensitive archeological resources and religious or cultural resources important to Native Americans).	No	Area was not nominated for this value.
A fish and wildlife resource (including habitat for endangered, sensitive or threatened species, or habitat essential for maintaining species diversity).	Yes	Spring Mountains pyrg (*Pyrgulopsis deaconi*)—BLM sensitive species. Habitat for the species
	Yes	Southeast Nevada pyrg (*Pyrgulopsis turbatrix*)—BLM sensitive species. Habitat for the species.
A natural process or system (including endangered, sensitive, or threatened plant species; rare, endemic, or relic plants or plant communities that are terrestrial, aquatic, or riparian; or rare geological features).	Yes	Riparian values essential for the pyrgs.
Natural hazards (including areas of avalanche, dangerous flooding, landslides, unstable soils, seismic activity, or dangerous if it is determined through the resource management planning process that it has become part of a natural process).	No	Area was not nominated for this value. None known to be present.

Importance

The value, resource, system, process, or hazard described above must have substantial significance and values to satisfy the "importance" criteria. This generally means that the value, resource, system, process, or hazard is characterized by one or more of the following:

Importance Value	Yes/No	Rationale for Determination
Has more than locally significant qualities that give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared with any similar resource.	No	Spring Mountains pyrg—Habitat is available but it is not more than locally significant.
	No	Southeast Nevada pyrg—Habitat is available but it is not more than locally significant.
Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.	Yes	Spring Mountains pyrg—The springs where the pyrg are found are threatened by degradation from wild horses/burros.
	Yes	Southeast Nevada pyrg—The springs where the pyrg are found are threatened by degradation from wild horses/burros.
Has been recognized as warranting protection to satisfy national priority concerns or to carry out the mandates of FLPMA.	No	Spring Mountains pyrg—BLM sensitive species, not federally listed.
	No	Southeast Nevada pyrg—BLM sensitive species, not federally listed.
Has qualities that warrant highlighting to satisfy public or management concerns about safety and public welfare.	No	Area was not nominated for this value. None known to be present.
Poses a significant threat to human life and safety or to property.	No	Area was not nominated for this value. Not present.

Nominated Area to Potential ACEC

The BLM interdisciplinary team determined that 85 of the 202 nominated acres meet at least one criterion for both relevance and importance and will be considered in the Draft RMP/EIS. Other portions of the nominated 202 acres are still privately owned and thus were dropped from further consideration. Specifically, the following values meet at least one criterion for both relevance and importance:

- Spring Mountains pyrg
- Southeast Nevada pyrg

N.3.2.6. Highland Range Nominated ACEC

General Location:	Primarily within the existing Piute/Eldorado ACEC, northwest of the town of Searchlight.
General Description:	Habitat for a variety of BLM special status species.
Nominated By:	NDOW
Nominated Acreage:	53,015 acres.
Values Considered:	Golden eagle, phainopepla, western burrowing owl, peregrine falcon, chuckwalla, Gila monster, Bendire's thrasher, and desert bighorn sheep.

Relevance

An area meets the "relevance" criterion if it contains one or more of the following:

Relevance Value	Yes/No	Rationale for Determination
A significant historic, cultural, or scenic value (including rare or sensitive archeological resources and religious or cultural resources important to Native Americans).	No	Not nominated for these values.
A fish and wildlife resource (including habitat for endangered, sensitive or threatened species, or habitat essential for maintaining species diversity).	Yes	Golden eagle (*Aquila chrysaetos*)—BLM sensitive. Habitat is present.
	Yes	Phainopepla (*Phainopepla nitens*)—BLM sensitive species. NDOW diversity dataset (Jan 15, 2009) shows just one phainopepla point within the nominated area (that does not overlap with an existing ACEC).
	Yes	Western burrowing owl (*Athene cunicularia*)—BLM sensitive. Habitat is present.
	Yes	Peregrine falcon (*Falco peregrines*)—BLM sensitive. Habitat may be present.
	Yes	Chuckwalla (*Sauromalus ater (obesus)*)—BLM sensitive. Habitat may be present.
	Yes	Gila monster (*Heloderma suspectum cinctum*)—BLM sensitive. Habitat may be present.
	No	Bendire's thrasher (*Toxostoma bendirei*)—Not a BLM sensitive species.
	Yes	Desert bighorn sheep (*Ovis canadensis nelson)*—BLM sensitive species. The area includes crucial habitat and winter range, and the area also provides migratory connections between the Mojave National Preserve and habitat in Lake Mead National Recreation Area.

Relevance Value	Yes/No	Rationale for Determination
A natural process or system (including endangered, sensitive, or threatened plant species; rare, endemic, or relic plants or plant communities that are terrestrial, aquatic, or riparian; or rare geological features).	No	Not nominated for these values
Natural hazards (including areas of avalanche, dangerous flooding, landslides, unstable soils, seismic activity, or dangerous if it is determined through the resource management planning process that it has become part of a natural process).	No	Area was not nominated for this value. None known to be present.

Importance

The value, resource, system, process, or hazard described above must have substantial significance and values to satisfy the "importance" criteria. This generally means that the value, resource, system, process, or hazard is characterized by one or more of the following:

Importance Value	Yes/No	Rationale for Determination
Has more than locally significant qualities that give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared with any similar resource.	No	Golden eagle—There is potential habitat throughout the region. The habitat in this area is not more than locally significant.
	No	Phainopepla—There is potential habitat throughout the region. The habitat in this area is not more than locally significant.
	No	Western burrowing owl—There is potential habitat throughout the region. The habitat in this area is not more than locally significant.
	No	Peregrine falcon—There is potential habitat throughout the region. The habitat in this area is not more than locally significant.
	No	Chuckwalla—There is potential habitat throughout the region. The habitat in this area is not more than locally significant.
	No	Gila monster—There is potential habitat throughout the region. The habitat in this area is not more than locally significant.
Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.	No	Golden eagle—The species and habitat is found throughout the entire west. The habitat in the nominated area is not more exemplary or unique than other habitats.
	No	Phainopepla—There is potential habitat throughout the region. The highest quality habitat has already been included in other ACEC nominations.
	No	Western burrowing owl—The species and habitat is found throughout the entire west. The habitat in the nominated area is not more exemplary or unique than other habitats. The NDOW diversity dataset (Jan 15, 2009) shows no Western burrowing owl points within the nominated area.
	No	Peregrine falcon—BLM sensitive. NDOW diversity dataset (Jan 15, 2009) shows no peregrine falcon points within the nominated area.
	No	Chuckwalla—BLM sensitive. NDOW diversity dataset (Jan 15, 2009) shows no chuckwalla points within the nominated area.
	No	Gila monster—There is insufficient data to determine significance. Best available data contains too few data points from which to draw reasonable scientific conclusions.

Importance Value	Yes/No	Rationale for Determination
	Yes	Desert bighorn sheep inhabiting the McCullough and Highland ranges comprise the second largest population in BLM's Southern Nevada District. The Highland Range was designated as a crucial bighorn sheep habitat area in 1969 and continues to serve a vital role in maintaining the health and population size of this bighorn herd. Large-scale development within this range would adversely affect herd size and viability.
Has been recognized as warranting protection to satisfy national priority concerns or to carry out the mandates of FLPMA.	No	Golden eagle—BLM sensitive species for the State of Nevada, not a national priority. While there is a Bald and Golden Eagle Protection Act, this act does not require that this part of the habitat for golden eagle be a national priority.
	No	Phainopepla—BLM sensitive species for the State of Nevada, not a national priority.
	No	Western burrowing owl—BLM sensitive species for the State of Nevada, not a national priority.
	No	Peregrine falcon—BLM sensitive species, not a national priority.
	No	Chuckwalla—BLM sensitive species, not a national priority.
	No	Gila monster—BLM sensitive species for the State of Nevada, not a national priority.
Has qualities that warrant highlighting to satisfy public or management concerns about safety and public welfare.	No	Area was not nominated for this value. None known to be present.
Poses a significant threat to human life and safety or to property.	No	Area was not nominated for this value. Not present.

Nominated Area to Potential ACEC

The BLM interdisciplinary team determined that the 53,015 nominated acres meet at least one criterion for both relevance and importance and will be considered in the Draft RMP/EIS. Specifically, the following value meets at least one criterion for both relevance and importance:

- Desert bighorn sheep

The BLM interdisciplinary team determined that the area does not meet the criteria of relevance and importance for cultural values and natural processes or systems. This nominated area overlaps the existing Piute/Eldorado ACEC and the remainder has also been nominated by BLM as an addition to the existing ACEC with bighorn sheep as a proposed additional value. This nomination will be combined with Piute/Eldorado ACEC for future consideration in the Draft RMP/EIS.

N.3.2.7. Hiko Wash Nominated ACEC

General Location:	Near Laughlin SRMA and State Highway 164.
General Description:	Acacia woodland supporting numerous birds and other species. It contains cultural and historic sites and structures. Hiko spring provides a consistent source of water.
Nominated By:	BLM
Nominated Acreage:	708 acres.
Values Considered:	Cultural resource sites with prehistoric rock art and remains of historic structures.

Relevance

An area meets the "relevance" criterion if it contains one or more of the following:

Relevance Value	Yes/No	Rationale for Determination
A significant historic, cultural, or scenic value (including rare or sensitive archeological resources and religious or cultural resources important to Native Americans).	Yes	Scenic—Steep canyon with boulders, a waterfall, and riparian vegetation.
	Yes	Cultural—The wash contains Hiko Springs, an area providing a consistent source of water for hundreds of years of human habitat in the region. Historic homestead remnants and Prehistoric rock shelters.
A fish and wildlife resource (including habitat for endangered, sensitive or threatened species, or habitat essential for maintaining species diversity).	Yes	Neotropical bird habitat—Including phainopepla (*Phainopepla nitens*) and Lucy's warbler (*Vermivora luciae*).
	Yes	Desert bighorn sheep (*Ovis canadensis nelson*)—BLM sensitive species, area contains crucial habitat.
A natural process or system (including endangered, sensitive, or threatened plant species; rare, endemic, or relic plants or plant communities that are terrestrial, aquatic, or riparian; or rare geological features).	Yes	Riparian—Riparian habitat type is extremely limited in this ecoregion, making this habitat important to maintain species diversity and to support bird migration.
Natural hazards (including areas of avalanche, dangerous flooding, landslides, unstable soils, seismic activity, or dangerous if it is determined through the resource management planning process that it has become part of a natural process).	No	Area was not nominated for this value. None known to be present.

Importance

The value, resource, system, process, or hazard described above must have substantial significance and values to satisfy the "importance" criteria. This generally means that the value, resource, system, process, or hazard is characterized by one or more of the following:

Importance Value	Yes/No	Rationale for Determination
Has more than locally significant qualities that give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared with any similar resource.	No	Scenic—Other sites in the region have similar scenic characteristics.
	No	Cultural—Other sites in the region have similar site types, densities, and characteristics.
	Yes	Neotropical bird habitat—Highest priority mesquite/acacia and cottonwood habitat for bird conservation on BLM land in southern Nevada (L. Crampton, personal communication July 2010). The area contains a high diversity of birds.
	No	Desert bighorn sheep—Species occurs throughout the region.
	Yes	Riparian—Riparian habitat type is extremely limited in this ecoregion, making this habitat important to maintain species diversity and to support bird migration.

Importance Value	Yes/No	Rationale for Determination
Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.	Yes	Scenic—The area is threatened by vandalism and high levels of OHV use off of trails.
	Yes	Cultural—The cultural resources are vulnerable to adverse change from OHV use, high levels of recreation use and vandalism.
	Yes	Neotropical bird habitat—The area is threatened by vandalism and high levels of OHV use off of trails. Illegal construction of recreation facilities removed the proper flow of water through the area, reducing the quality of the habitat.
	No	Desert bighorn sheep—This riparian habitat provides water in the region. However, given the size of the area and the availability of adjacent habitat, this habitat is not rare or exemplary.
	Yes	Riparian—Riparian habitat type is extremely limited in this ecoregion, making this habitat important to maintain species diversity and to support bird migration and nesting. Native riparian vegetation is threatened with adverse changes by the invasion and the presence of tamarisk. Vandalism of vegetation treatments reduced the recovery of the riparian values.
Has been recognized as warranting protection to satisfy national priority concerns or to carry out the mandates of FLPMA.	No	Scenic—The area has not been recognized as a national priority for scenic values. However, the scenic values have been identified as an outstandingly remarkable value for wild and scenic river eligibility.
	No	Cultural—Beyond requirements to address cultural resources in the National Historic Preservation Act, section 106, the area is not recognized as a national priority.
	No	Neotropical bird habitat—Phainopepla and Lucy's warbler are a BLM sensitive species, not federally listed species.
	No	Desert bighorn sheep—BLM sensitive species for the State of Nevada, not a national priority.
	No	Riparian—While riparian habitat type is extremely limited in this ecoregion, it has not been recognized as a national priority for protection.
Has qualities that warrant highlighting to satisfy public or management concerns about safety and public welfare.	No	Area was not nominated for this value. None known to be present.
Poses a significant threat to human life and safety or to property.	No	Area was not nominated for this value. Not present.

Nominated Area to Potential ACEC

The BLM interdisciplinary team determined that all of the 708 nominated acres meet at least one criterion for both relevance and importance and will be considered in the Draft RMP/EIS. Specifically, the following values meet at least one criterion for both relevance and importance:

- Cultural/historic values
- Scenic values
- Neotropical bird habitat
- Riparian habitat

N.3.2.8. Ivanpah Valley 1 Nominated ACEC (BLM)

General Location:	Clark county, near the California border.
General Description:	Relict sandy soil deposits for white-margined penstemon.
Nominated By:	BLM
Nominated Acreage:	3,134 acres.
Values Considered:	White-margined penstemon.

Relevance

An area meets the "relevance" criterion if it contains one or more of the following:

Relevance Value	Yes/No	Rationale for Determination
A significant historic, cultural, or scenic value (including rare or sensitive archeological resources and religious or cultural resources important to Native Americans).	No	Not nominated for this value.
A fish and wildlife resource (including habitat for endangered, sensitive or threatened species, or habitat essential for maintaining species diversity).	No	Not nominated for this value.
A natural process or system (including endangered, sensitive, or threatened plant species; rare, endemic, or relic plants or plant communities that are terrestrial, aquatic, or riparian; or rare geological features).	Yes	White-margined penstemon (*Penstemon albomarginatus*)—BLM sensitive species. The largest population in the region due to the substrate.
Natural hazards (including areas of avalanche, dangerous flooding, landslides, unstable soils, seismic activity, or dangerous if it is determined through the resource management planning process that it has become part of a natural process).	No	Not nominated for this value.

Importance

The value, resource, system, process, or hazard described above must have substantial significance and values to satisfy the "importance" criteria. This generally means that the value, resource, system, process, or hazard is characterized by one or more of the following:

Importance Value	Yes/No	Rationale for Determination
Has more than locally significant qualities that give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared with any similar resource.	Yes	White-margined penstemon—The area represents a significant population of a regionally endemic plant
Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.	Yes	White-margined penstemon—circumstances that could occur if habitat were not protected makes this population fragile, sensitive, irreplaceable, and vulnerable to adverse change.

Importance Value	Yes/No	Rationale for Determination
Has been recognized as warranting protection to satisfy national priority concerns or to carry out the mandates of FLPMA.	No	White-margined penstemon—not federally protected.
Has qualities that warrant highlighting to satisfy public or management concerns about safety and public welfare.	No	While there may be sinkholes that could be hazardous to human activity, none have been identified that warrant highlighting for safety and public welfare.
Poses a significant threat to human life and safety or to property.	No	Area was not nominated for this value. Not present.

Nominated Area to Potential ACEC

The BLM interdisciplinary team determined that all of the 3,134 nominated acres meet at least one criterion for both relevance and importance. Specifically, the following values meet at least one criterion for both relevance and importance:

- White-margined penstemon

The majority of the Ivanpah population of penstemon is located within the Congressional disposal area for the Ivanpah Valley Airport. The Ivanpah 1 ACEC nomination will not be further analyzed because the majority of the relevant penstemon population is located within a legislative disposal area.

N.3.2.9. Ivanpah Valley 2 Nominated ACEC (BLM and Basin and Range Watch)

General Description:	Rare, diverse botanical and wildlife resources with largely undisturbed and unfragmented habitat.
Nominated By:	Basin and Range Watch.
Nominated Acreage:	89,599 acres.
Values Considered:	Habitat for BLM Nevada Sensitive Species.

Relevance

An area meets the “relevance” criterion if it contains one or more of the following:

Relevance Value	Yes/No	Rationale for Determination
A significant historic, cultural, or scenic value (including rare or sensitive archeological resources and religious or cultural resources important to Native Americans).	No	Nevada: VRI Class IV
	No	Nevada: Cultural— Historic and prehistoric features are present but similar to resources found elsewhere in the region.

Relevance Value	Yes/No	Rationale for Determination
A fish and wildlife resource (including habitat for endangered, sensitive or threatened species, or habitat essential for maintaining species diversity).	Yes	Mojave desert tortoise (*Gopherus agassizii)*—federally listed (Threatened). This area does not contain designated critical habitat, but the area includes known and modeled habitat, as well as habitat that is likely to support tortoise. West of I-15 contains moderate density habitat, including an artificially high population in the large scale translocation site.
	Yes	Gila Monster (*Heloderma suspectum*)—BLM Nevada Sensitive Species. Observed and habitat present.
	Yes	Desert bighorn sheep (*Ovis canadensis nelson*)—BLM Nevada Sensitive Species. Observed and habitat present in the Lucy Gray Mountains, which is within the nomination, and McCullough and Spring Mountains.
	Yes	Western burrowing owl (*Athene cunicularia*)—BLM Nevada Sensitive Species. Observed and year-round habitat present.
	Yes	Golden eagle (*Aquila chrysaetos*)—BLM Nevada Sensitive Species. Habitat is present, birds observed in McCollough Mountains to the east of the nomination.
	Yes	Loggerhead shrike (*Lanus ludovicianus*)—BLM Nevada Sensitive Species. Observed and habitat present.
	Yes	Le Conte's thrasher (*Toxostoma lecontei*)—BLM Nevada Sensitive Species. Area includes year round habitat.
	No	Crissal Thrasher (*Toxostoma crissale*) – former BLM Nevada Sensitive Species. Dense mesquite and acacia habitat is not present in Nevada in the nomination area.
	No	Vaux's swift (*Chaetura vaux*) – No threat ranking designated and non-breeding status within Nevada. Woodland habitat not present within nomination area of Nevada.
	Yes	Brewer's sparrow (*Spizella breweri*)—BLM Nevada Sensitive Species. Nomination area includes summer habitat.
	Yes	Gray vireo (*Vireo vicinior*) – former BLM Nevada Sensitive Species. Habitat present in areas with mesquite and acacia.
	No	Hepatic tanager (*Piranga flava*) – not a BLM Nevada Sensitive Species. No records in the NNHP within southern Nevada. Non-breeding status within NV. Accidental (casual or stray) within the state, usually far outside its normal range, seen infrequently and irregularly.
	No	sage thrasher (*Oreoscoptes montanus*) - CDFG species of Special Concern – potential winter and migration range. A sagebrush species.
	No	northern goshawk (*Accipiter gentillis*) – not a BLM Nevada Sensitive Species. Forest habitat is not present.
	Yes	northern harrier (*Circus cyaneus*) – not a BLM Nevada Sensitive Species. Potential winter habitat. Sighted at Primm Valley Resort.
	Yes	long-eared owl (*Asio otus*) - not a BLM Nevada Sensitive Species. Potential year-round range. Sighted near Primm Valley Resort.
	Yes	short-eared owl (*Asio flammeus*) - not a BLM Nevada Sensitive Species. Potential winter range.
	No	black swift (*Cypseloides niger*) - not a BLM Nevada Sensitive Species. No recorded sightings and Nevada not considered habitat.
	No	Lucy's warbler (*Oreothlypis luciae*) - not a BLM Nevada Sensitive Species. Habitat is mesquite bosques. No habitat in Nevada portion of the nomination.

Relevance Value	Yes/No	Rationale for Determination
	No	yellow warbler (*Dendroica petechia*) - not a BLM Nevada Sensitive Species. Habitat present in areas with mesquite and acacia near water. No habitat in Nevada portion of the nomination.
	No	Whip-poor-will (*Caprimulgus vociferous*) - not a BLM Nevada Sensitive Species. Generally considered outside range of Eastern whip-poor-will. Whip-poor-will sighting recorded in Death Valley, likely the newly described Mexican whip-poor-will (*Antrostomus arizonae*). No observations recorded in Ivanpah Valley.
	Yes	Costa's hummingbird (*Calypte costae*) - not a BLM Nevada Sensitive Species. Observed and habitat present in Ivanpah Valley, CA.
	Yes	Calliope hummingbird (*Stellula calliope*) - not a BLM Nevada Sensitive Species. Nomination is within the range of the species.
	No	Williamson's sapsucker (*Sphyrapicus thyroideus*) – not a BLM Nevada Sensitive Species. Nomination is considered outside the range of the species.
	No	willow flycatcher (*Empidonax traillii*) – not a BLM sensitive species. Does not occur within the nominated area in Nevada. No riparian habitat present. The listed Southwestern willow flycatcher does not occur in the nominated area.
	No	mountain plover (*Charadrius maontanus*) - not a BLM Nevada Sensitive Species. Outside winter and breeding range.
	Yes	cactus wren (*Campylorhynchus brunneicapillus*) - not a BLM Nevada Sensitive Species. Habitat present.
	Yes	Ferruginous hawk (*Buteo regalis*)—BLM Nevada Sensitive Species. Area includes winter habitat.
	Yes	Peregrine falcon (*Falco peregrines*)—BLM Nevada Sensitive Species. Area includes foraging habitat. No nesting documented within nomination in Nevada.
	Yes	Lewis's woodpecker (*Melanerpes lewis*)—BLM Nevada Sensitive Species. Area includes migration and winter habitat.
	No	Mule deer (*Odocoileus hemionus*) – Nevada game species managed by NDOW. Habitat in Nevada located in the McCullough Mtns outside the nomination area.
A natural process or system (including endangered, sensitive, or threatened plant species; rare, endemic, or relic plants or plant communities that are terrestrial, aquatic, or riparian; or rare geological features).	Yes	Nevada agave (*Agave utahensis* var. *nevadensis*) - not a BLM Nevada Sensitive Species. The nomination is within the geographic range of the species.
	Yes	Wright's beebrush (*Aloysia wrightii*) - not a BLM Nevada Sensitive Species. The nomination is within the geographic range of the species.
	Yes	Small-flowered androstephium (*Androstephium breviflorum*) - not a BLM Nevada Sensitive Species. The nomination is within the geographic range of the species.
	Yes	Desert bearpoppy (*Arctomecon merriamii*) - BLM Nevada Sensitive Species. The plant has been recorded within the nominated area.
	Yes	Mojave milkweed (*Asclepias nyctaginifolia*) - not a BLM Nevada Sensitive Species. The plant has been recorded within the nominated area.
	No	Borrego milkvetch (*Astragalus lentiginosus* var. *borreganus*) - not a BLM Nevada Sensitive Species. Clark County, NV is not considered within the geographic range of the species.

Relevance Value	Yes/No	Rationale for Determination
	Yes	Tidestrom's milkvetch (*Astragalus tidestromii*) - not a BLM Nevada Sensitive Species. The nomination is within the geographic range of the species.
	No	Chihuahua scaly cloakfern (*Astrolepis cochisensis* ssp. *cochisensis*) - not a BLM Nevada Sensitive Species. Clark County, NV is not considered within the geographic range of the species.
	Yes	black grama (*Bouteloua eriopoda*) - not a BLM Nevada Sensitive Species. The nomination is within the geographic range of the species.
	Yes	red grama (*Bouteloua trifida*) - not a BLM Nevada Sensitive Species. The nomination is within the geographic range of the species.
	Yes	Small threadstem sandmat (*Chamaesyce revoluta*) - not a BLM Nevada Sensitive Species. The nomination is within the geographic range of the species.
	Yes	purple bird's beak (*Cordylanthus parviflorus*) - not a BLM Nevada Sensitive Species. The nomination is within the geographic range of the species.
	Yes	desert pincushion (*Corypantha chlorantha*) - not a BLM Nevada Sensitive Species. The nomination is within the geographic range of the species.
	Yes	Gilman's springparsley (*Cymopteris gilmanii*) - not a BLM Nevada Sensitive Species. The nomination is within the geographic range of the species.
	Yes	Utah vine milkweed (*Cynanchum utahenses*) - not a BLM Nevada Sensitive Species. The nomination is within the geographic range of the species.
	Yes	Nine-awned pappus grass *(Enneapogon desvauxii*) - not a BLM Nevada Sensitive Species. The nomination is within the geographic range of the species.
	Yes	Utah fleabane (*Erigeron utahensis*) - not a BLM Nevada Sensitive Species. The species is found within San Bernardino County, CA therefore the nomination may be within the geographic range of the species.
	Yes	Hairy woollygrass (*Erioneuron pilosum*) - not a BLM Nevada Sensitive Species. The nomination is within the geographic range of the species.
	Yes	Clark Mountain spurge (*Euphorbia exstipulata* var. *exstipulata*) - not a BLM Nevada Sensitive Species. The species is found within San Bernardino County, CA therefore the nomination may be within the geographic range of the species.
	Yes	Limestone bedstraw (*Galium proliferum*) - not a BLM Nevada Sensitive Species. The species is found within San Bernardino County, CA therefore the nomination may be within the geographic range of the species.
	Yes	Parish's club-cholla (*Grusonia parishii*) - not a BLM Nevada Sensitive Species. The nomination is within the geographic range of the species.
	Yes	California false pennyroyal *(Hedeoma nanum* var. *californicum*) - not a BLM Nevada Sensitive Species. The nomination is within the geographic range of the species.
	Yes	Polished blazingstar (*Mentzelia polita*) - BLM Nevada Sensitive Species. The nomination is within the geographic range of the species.

Relevance Value	Yes/No	Rationale for Determination
	Yes	Wingseed blazingstar (*Mentzelia pterosperma*) - not a BLM Nevada Sensitive Species. The nomination is within the geographic range of the species.
	Yes	Utah mortonia (*Mortonia utahensis*) - not a BLM Nevada Sensitive Species. The nomination is within the geographic range of the species.
	Yes	Crowned muilla (*Muilla coronata*) - not a BLM Nevada Sensitive Species. The nomination is within the geographic range of the species.
	Yes	Cavedwelling evening primrose (*Oenothera cavernae*) - not a BLM Nevada Sensitive Species. The nomination is within the geographic range of the species.
	Yes	Aven Nelson's phacelia *(Phacelia anelsonii*) - not a BLM Nevada Sensitive Species. The nomination is within the geographic range of the species.
	No	Skyblue phacelia (*Phacelia coerulea*) - not a BLM Nevada Sensitive Species. The species is located in pinyon-juniper woodland, therefore would not occur within the nominated area.
	Yes	Goodding's phacelia (*Phacelia pulchella* var. *gooddingii*) - not a BLM Nevada Sensitive Species. The nomination is within the geographic range of the species.
	Yes	Chinese lantern (*Physalis lobata*) - not a BLM Nevada Sensitive Species. The nomination is within the geographic range of the species.
	Yes	Desert portulaca (*Portulaca halimoides*) - not a BLM Nevada Sensitive Species. The nomination is within the geographic range of the species.
	No	Abert's sanvitalia (*Sanvitalia abertii*) - not a BLM Nevada Sensitive Species. The species is located in pinyon-juniper woodland, therefore would not occur within the nominated area.
	Yes	Rusby's desert-mallow (*Sphaeralcea rusbyi* var. *eremicola*) - not a BLM Nevada Sensitive Species. The plant has been recorded within the nominated area in CA.
	Yes	Branched noseburn *(Tragia ramosa)* - not a BLM Nevada Sensitive Species. The nomination is within the geographic range of the species.
	Yes	White Margin Penstemon (*Penstemon albomarginatus*) - BLM Nevada Sensitive Species. Two populations of the species are located in the Ivanpah Valley.
	Yes	Aven Nelson phacelia (*Phacelia anelsonii*) - not a BLM Nevada Sensitive Species. The nomination is within the geographic range of the species.
	Yes	rosy twotone beardtongue (*Penstemon bicolor* ssp. *roseus*) - BLM Nevada Sensitive Species. The species has been documented within the nominated area in NV.
	Yes	yellow twotone penstemon (*Penstemon bicolor* ssp. *bicolor*) - BLM Nevada Sensitive Species. The species has been documented within the nominated area in NV.
	Yes	Death Valley ephedra (*Ephedra funerea*) - not a BLM Nevada Sensitive Species. The plant has been recorded within the nominated area in CA.
	Yes	New York Mountains catseye (*Cryptantha tumulosa*) - not a BLM Nevada Sensitive Species. The nomination is within the geographic range of the species.

Relevance Value	Yes/No	Rationale for Determination
	No	Spring Mountains milk-vetch (*Astragalus remotus*) - BLM Nevada Sensitive Species. This species has only been documented in the Spring Mountains. The nomination is not considered to contain the species.
	No	Nye milk-vetch (*Astragalus nyensis*) - not a BLM Nevada Sensitive Species. This species has not been documented within the nominated area.
	No	Mojave milk-vetch *(Astragalus mohavensis var. mohavensis)* - not a BLM Nevada Sensitive Species. This species has not been documented within the nominated area.
	Yes	Biological Soil Crusts—Present in the Ivanpah Valley.
Natural hazards (including areas of avalanche, dangerous flooding, landslides, unstable soils, seismic activity, or dangerous if it is determined through the resource management planning process that it has become part of a natural process).	No	Not nominated for this value.

Importance

The value, resource, system, process, or hazard described above must have substantial significance and values to satisfy the "importance" criteria. This generally means that the value, resource, system, process, or hazard is characterized by one or more of the following:

Importance Value	Yes/No	Rationale for Determination
Has more than locally significant qualities that give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared with any similar resource.	No	Mojave desert tortoise —The area is not designated critical habitat for this listed species. While there is habitat, habitat quality and population densities within the Nevada portion of Ivanpah Valley are not more distinctive than other habitat in the region. In addition, the habitat for the wild population on the west side of I-15 is fragmented by tortoise fence barriers to separate the experimental population in the large scale translocation site from the wild population.
	No	Though the following BLM Nevada Sensitive Species may occur within the nominated area, the habitat and populations in this area are not more than locally significant. ● Gila Monster ● desert bighorn sheep ● Brewer's sparrow ● ferruginous hawk ● golden eagle ● Le Conte's thrasher ● Lewis's woodpecker ● loggerhead shrike ● peregrine falcon ● western burrowing owl

Importance Value	Yes/No	Rationale for Determination
		● desert bearpoppy ● polished blazingstar ● rosy twotone beardtongue ● yellow twotone penstemon
	Yes	White-margined penstemon—The area represents a significant population of a regionally endemic plant.
	No	Though the following species may occur within the nominated area, the species have been reviewed in accordance with BLM Manual Section 6840 and did not meet the criteria for BLM Nevada Sensitive Species (October 2011). Habitat and populations in this area are not more than locally significant. ● cactus wren ● calliope hummingbird ● Costa's hummingbird ● gray vireo ● long-eared owl ● northern harrier ● short-eared owl ● Aven Nelson phacelia (*Phacelia anelsonii*) ● black grama (*Bouteloua eriopoda*) ● Branched noseburn *(Tragia ramosa)* ● California false pennyroyal *(Hedeoma nanum* var. *californicum*) ● cavedwelling evening primrose *(Oenothera cavernae)* ● chinese lantern (*Physalis lobata*) ● Clark Mountain spurge (*Euphorbia exstipulata* var. *exstipulata*) ● crowned muilla (*Muilla coronata*) ● Death Valley ephedra *(Ephedra funerea)* ● desert pincushion (*Corypantha chlorantha*) ● desert portulaca (*Portulaca halimoides*) ● Gilman's springparsley (*Cymopteris gilmanii*) ● Goodding's phacelia (*Phacelia pulchella* var. *gooddingii*) ● hairy woollygrass (*Erioneuron pilosum*)

Importance Value	Yes/No	Rationale for Determination
		● limestone bedstraw (*Galium proliferum*) ● Mojave milkweed (*Asclepias nyctaginifolia*) ● Nevada agave (*Agave utahensis* var. *nevadensis*) ● New York Mountains catseye *(Cryptantha tumulosa)* ● nine-awned pappus grass *(Enneapogon desvauxii*) ● Parish's club-cholla (*Grusonia parishii*) ● purple bird's beak (Cordylanthus parviflorus) ● red grama (*Bouteloua trifida*) ● Rusby's desert-mallow (*Sphaeralcea rusbyi* var. *eremicola*) ● small threadstem sandmat (*Chamaesyce revoluta*) ● small-flowered androstephium (*Androstephium breviflorum*) ● Tidestrom's milkvetch (*Astragalus tidestromii*) ● Utah fleabane (*Erigeron utahensis*) ● Utah mortonia (*Mortonia utahensis*) ● Utah vine milkweed (*Cynanchum utahenses*) ● wingseed blazingstar (*Mentzelia pterosperma*) ● Wright's beebrush (*Aloysia wrightii*)
Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.	Yes	Mojave desert tortoise — Populations and habitat within the Ivanpah Valley are important to maintain population connectivity for the Northeastern Recovery Unit of Mojave desert tortoise. The habitat for the wild population on the west side of I-15 is fragmented by tortoise fence barriers to separate the experimental population in the large scale translocation site from the wild population. Development of solar facilities within CA and NV and lack of habitat connection corridors under I-15 have left a narrow area of habitat occupied by tortoises within the nomination area east of I-15 along the Lucy Gray Mountains that maintains population connectivity. In addition, increased human use of the area for recreation and mining and increased demand for transmission utilities further threaten the function of the habitat corridor along the Lucy Gray Mountains. "Corridors" are defined as narrow areas of habitat in which resident tortoises persist and continue to interact with their neighbors within and outside the corridor, rather than a more narrow band of habitat will allow an individual tortoise to move through it to the other side, breed with a tortoise on that side, and produce viable offspring that contribute to the next generation.
	No	Though the following BLM Nevada Sensitive Species may occur within the nominated area, the habitat and populations in this area have not been identified as requiring special land designation to meet conservation goals.

Importance Value	Yes/No	Rationale for Determination
		● Gila Monster ● desert bighorn sheep ● Brewer's sparrow ● ferruginous hawk ● golden eagle ● Le Conte's thrasher ● Lewis's woodpecker ● loggerhead shrike ● peregrine falcon ● western burrowing owl ● desert bearpoppy ● polished blazingstar ● rosy twotone beardtongue ● yellow twotone penstemon
	Yes	White-margined penstemon—Due to the limited distribution of suitable habitat for this species, circumstances could occur if habitat were not protected that makes this population fragile, and vulnerable to adverse change.
	No	Though the following species may occur within the nominated area, the species have been reviewed in accordance with BLM Manual Section 6840 and did not meet the criteria for BLM Nevada Sensitive Species (October 2011). Habitat and populations in this area are not fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change at this time. ● cactus wren ● calliope hummingbird ● Costa's hummingbird ● gray vireo ● long-eared owl ● northern harrier ● short-eared owl ● Aven Nelson phacelia ● black grama ● Branched noseburn

Importance Value	Yes/No	Rationale for Determination
		● California false pennyroyal ● cavedwelling evening primrose ● chinese lantern ● Clark Mountain spurge ● crowned muilla ● Death Valley ephedra ● desert pincushion ● desert portulaca ● Gilman's springparsley ● Goodding's phacelia ● hairy woollygrass ● limestone bedstraw ● Mojave milkweed ● Nevada agave ● New York Mountains catseye ● nine-awned pappus grass ● Parish’s club-cholla ● purple bird’s beak ● red grama ● Rusby’s desert-mallow ● small threadstem sandmat ● small-flowered androstephium ● Tidestrom's milkvetch ● Utah fleabane ● Utah mortonia ● Utah vine milkweed ● wingseed blazingstar ● Wright’s beebrush

Importance Value	Yes/No	Rationale for Determination
Has been recognized as warranting protection to satisfy national priority concerns or to carry out the mandates of FLPMA.	No	Mojave desert tortoise — While the species is federally listed, there is no designated critical habitat in the area. While the species receives protection from the Endangered Species Act, the absence of designated critical habitat shows this area has not been specifically recognized as warranting protection to meet national priority concerns or to carry out the mandates of FLPMA at this time.
	No	Though the following BLM Nevada Sensitive Species may occur within the nominated area, the habitat and populations in this area have not been specifically recognized as warranting protection to meet national priority concerns or to carry out the mandates of FLPMA at this time. ● Gila Monster ● desert bighorn sheep ● Brewer's sparrow ● ferruginous hawk ● golden eagle ● Le Conte's thrasher ● Lewis's woodpecker ● loggerhead shrike ● peregrine falcon ● western burrowing owl ● desert bearpoppy ● polished blazingstar ● rosy twotone beardtongue ● white margin penstemon ● yellow twotone penstemon
	No	Though the following species may occur within the nominated area, the species have been reviewed in accordance with BLM Manual Section 6840 and did not warrant protection to satisfy national priority concerns or to carry out the mandates of FLPMA at this time. ● cactus wren ● calliope hummingbird ● Costa's hummingbird ● gray vireo ● long-eared owl ● northern harrier

Importance Value	Yes/No	Rationale for Determination
		● short-eared owl ● Aven Nelson phacelia ● black grama ● Branched noseburn ● California false pennyroyal ● cavedwelling evening primrose ● chinese lantern ● Clark Mountain spurge ● crowned muilla ● Death Valley ephedra ● desert pincushion ● desert portulaca ● Gilman's springparsley ● Goodding's phacelia ● hairy woollygrass ● limestone bedstraw ● Mojave milkweed ● Nevada agave ● New York Mountains catseye ● nine-awned pappus grass ● Parish’s club-cholla ● purple bird’s beak ● red grama ● Rusby’s desert-mallow ● small threadstem sandmat ● small-flowered androstephium ● Tidestrom's milkvetch ● Utah fleabane ● Utah mortonia ● Utah vine milkweed

Importance Value	Yes/No	Rationale for Determination
		● wingseed blazingstar ● Wright's beebrush
Has qualities that warrant highlighting to satisfy public or management concerns about safety and public welfare.	No	Area was not nominated for this value. None known to be present.
Poses a significant threat to human life and safety or to property.	No	Area was not nominated for this value. Not present.

Nominated Area to Potential ACEC

This area was nominated to include 89,599 acres of public land. Basin and Range Watch identified this area as being important for several sensitive species. Their nomination states, "The Ivanpah Valley contains an important habitat that supports a variety of rare and important species as well as important visual and cultural resources. The Ivanpah Valley is also undergoing pressure to develop various land uses. Golden Eagle, Western Burrowing Owl, Peregrine Falcon, chuckwalla and Gila monster occur here, as well as many rare plants from Nevada and California."

The BLM interdisciplinary team determined that 40,180 nominated acres meet criteria for both relevance and importance. Specifically, the following meet at least one criterion for both relevance and importance:

- Mojave desert tortoise – 30,912 acres
- White-margined penstemon – 13,795 acres (based on presence surveys and habitat modeling that includes low potential habitat)

Approximately 4,527 acres of white-margined penstemon habitat north and east of Roach Dry Lakebed overlaps with the area meeting relevance and importance for Mojave desert tortoise. This was considered as a single 30,912-acre unit in the Silver State Solar South Supplemental EIS.

The Congressional disposal area for the Ivanpah Valley Airport contains 4,181 acres of the white-margined penstemon habitat. The Ivanpah population within the disposal boundary will not be further analyzed for ACEC designation within this planning effort as it is a legislative disposal area.

The remaining penstemon habitat is located in a population around Jean Dry Lakebed and in Hidden Valley. The Basin and Range Watch nomination area does not include this entire population. BLM has analyzed this population as a whole unit within the Jean Lake ACEC nomination below.

The BLM interdisciplinary team determined that the area does not meet the criteria of relevance and importance for cultural values and natural hazards. BLM acknowledges the value of many of the fish and wildlife species and natural process or systems nominated that did not meet the importance criteria. Many of the current ACECs and proposed ACECs contain these resources and will provide adequate protection. In addition, the RMP contains objectives and minimization measures to provide protection for these resources outside designated areas.

N.3.2.10. Jean Lake Nominated ACEC

General Location:	Due south of the Las Vegas Valley and approximately 5 miles east of Interstate 15.
General Description:	Large dry lakebeds (playas) in the middle of each valley serve as the terminus for drainage from the surrounding mountains. The nominated area comprises of areas of the valley floor with highly gypsumiferous substrate.
Nominated By:	BLM and Desert Conservation Program.
Nominated Acreage:	12,692 acres (BLM nomination), including 3,109 acres (City of Henderson and DCP nomination) wholly contained within the BLM nominated area.
Values Considered:	Mojave desert tortoise, western burrowing owl, white-margined penstemon, twotone beardtongue, desert kangaroo rat, desert pocket mouse.

Relevance

An area meets the "relevance" criterion if it contains one or more of the following:

Relevance Value	Yes/No	Rationale for Determination
A significant historic, cultural, or scenic value (including rare or sensitive archeological resources and religious or cultural resources important to Native Americans).	No	Not nominated for these values.
A fish and wildlife resource (including habitat for endangered, sensitive or threatened species, or habitat essential for maintaining species diversity).	Yes	Mojave desert tortoise (*Gopherus agassizii*)—federally listed (Threatened). This area does not contain designated critical habitat, but the area includes known and modeled habitat.
	Yes	Western burrowing owl (*Athene cunicularia*)—BLM sensitive. Area includes modeled habitat.
	No	Desert kangaroo rat (*Dipodomys deserti*)—Not a BLM sensitive species.
	No	Desert pocket mouse (*Chaetodipus penicillatus sobrinus*)—Not a BLM sensitive species.
A natural process or system (including endangered, sensitive, or threatened plant species; rare, endemic, or relic plants or plant communities that are terrestrial, aquatic, or riparian; or rare geological features).	Yes	White-margined penstemon (*Penstemon albomarginatus*)—BLM sensitive. One of the best populations in the region due to the substrate.
	Yes	Yellow twotone beardtongue (*Penstemon bicolor ssp bicolor)*—BLM sensitive. While this area does potentially contain habitat, the significant portion of the population is in the western part of the Las Vegas Valley and Red Rock NCA.
Natural hazards (including areas of avalanche, dangerous flooding, landslides, unstable soils, seismic activity, or dangerous if it is determined through the resource management planning process that it has become part of a natural process).	No	Area was not nominated for this value. None known to be present.

Importance:

If a nominated value, resource, system, process, or hazard did not meet at least one of the relevance criteria, it was not evaluated for importance. A value, resource, system, process, or hazard meets the "importance" criterion if it is characterized by one or more of the following:

Importance Value	Yes/No	Rationale for Determination
Has more than locally significant qualities that give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared with any similar resource.	No	Mojave desert tortoise—The area is not designated critical habitat. While there is habitat, its values (quality and densities) are not more distinctive than other habitat in the region.
	No	Western burrowing owl—There is potential habitat throughout the region. The habitat in this area is not more than locally significant.
	Yes	White-margined penstemon—The area represents a significant population of a regionally endemic plant.
	No	Yellow twotone beardtongue—The most significant portions of the population are in the western part of the Las Vegas Valley and Red Rock NCA. The potential habitat in this area is not more than locally significant.
Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.	No	Mojave desert tortoise—Compared to other tortoise habitat in the region, this area is not exemplary or unique.
	No	Western burrowing owl—The species and habitat is found throughout much of the west. The habitat in the nominated area is not more exemplary or unique than other habitats.
	Yes	White-margined penstemon—Due to the limited distribution of suitable habitat for this species, circumstances could occur if habitat were not protected that makes this population fragile, and vulnerable to adverse change.
	No	Yellow twotone beardtongue—The most significant portions of the population are in the western part of the Las Vegas Valley and Red Rock NCA. The nominated areas are not exemplary or unique for this species.
Has been recognized as warranting protection to satisfy national priority concerns or to carry out the mandates of FLPMA.	No	Mojave desert tortoise—While the species is federally listed, there is no designated critical habitat in the area. While the species receives protection from the Endangered Species Act, the absence of designated critical habitat shows this area has not been specifically recognized as warranting protection.
	No	Western burrowing owl—BLM sensitive species for the State of Nevada, not a national priority.
	No	White-margined penstemon—BLM sensitive species for the State of Nevada, not a national priority.
	No	Yellow twotone beardtongue—BLM sensitive species for the State of Nevada, not a national priority.
Has qualities that warrant highlighting to satisfy public or management concerns about safety and public welfare.	No	This importance criteria does not apply to public safety and welfare related to community expansion or development. Therefore, using protection of this area as mitigation for development elsewhere does not meet this criterion.
Poses a significant threat to human life and safety or to property.	No	Area was not nominated for this value. Not present.

Nominated Area to Potential ACEC

The BLM interdisciplinary team determined that 11,605 acres of the nominated acres meet at least one criterion for both relevance and importance and will be considered in the Draft RMP/EIS. Specifically, the following values meet at least one criterion for both relevance and importance:

- White-margined penstemon

N.3.2.11. LaMadre (North and South) Nominated ACEC

General Location:	Along the Las Vegas Valley, north of Las Vegas west of US Highway 95.
General Description:	Ridges and other habitat for desert bighorn sheep.
Nominated By:	NDOW
Nominated Acreage:	2,431 acres.
Values Considered:	Peregrine falcon, desert bighorn sheep, western burrowing owl, black-chinned sparrow, golden eagle, Mojave desert tortoise, Gila monster.

Relevance

An area meets the "relevance" criterion if it contains one or more of the following:

Relevance Value	Yes/No	Rationale for Determination
A significant historic, cultural, or scenic value (including rare or sensitive archeological resources and religious or cultural resources important to Native Americans).	No	Not nominated for these values.
A fish and wildlife resource (including habitat for endangered, sensitive or threatened species, or habitat essential for maintaining species diversity).	Yes	Peregrine falcon (*Falco peregrines*)—Habitat is present. Based on 2006 data from NDOW the eyrie is not located in the nominated area.
	Yes	Desert bighorn sheep (*Ovis canadensis nelson*)—BLM sensitive species, area contains winter habitat.
	Yes	Western burrowing owl (*Athene cunicularia*)—BLM sensitive. Habitat is present.
	No	Black-chinned sparrow (*Spizella atrogularis*)—Not a BLM sensitive species.
	Yes	Golden eagle (*Aquila chrysaetos*)—BLM sensitive. Habitat is present.
	Yes	Mojave desert tortoise (*Gopherus agassizii*)—federally listed (threatened), downward trend. The species was an 8c (moderate degree of threat, high potential for recovery), but is now a 6c (high degree of threat, low potential for recovery).
	Yes	Gila monster (*Heloderma suspectum cinctum*)—BLM sensitive. Habitat is present.
A natural process or system (including endangered, sensitive, or threatened plant species; rare, endemic, or relic plants or plant communities that are terrestrial, aquatic, or riparian; or rare geological features).	No	Not nominated for these values
Natural hazards (including areas of avalanche, dangerous flooding, landslides, unstable soils, seismic activity, or dangerous if it is determined through the resource management planning process that it has become part of a natural process).	No	Area was not nominated for this value. None known to be present.

Importance

The value, resource, system, process, or hazard described above must have substantial significance and values to satisfy the "importance" criteria. This generally means that the value, resource, system, process, or hazard is characterized by one or more of the following:

Importance Value	Yes/No	Rationale for Determination
Has more than locally significant qualities that give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared with any similar resource.	No	Peregrine falcon—There is potential habitat throughout the region. The habitat in this area is not more than locally significant.
	No	Desert bighorn sheep—Species occurs throughout the region.
	No	Western burrowing owl—There is potential habitat throughout the region. The habitat in this area is not more than locally significant.
	No	Golden eagle—There is potential habitat throughout the region. The habitat in this area is not more than locally significant.
	No	Mojave desert tortoise—There is potential habitat throughout the region. The habitat in this area is not more than locally significant.
	No	Gila monster—There is potential habitat throughout the region. The habitat in this area is not more than locally significant.
Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.	No	Peregrine falcon—The adjacent landscape in Red Rocks NCA is protected. The documented sightings are in the NCA. The habitat in the proposed area is not irreplaceable, unique, or exemplary.
	No	Desert bighorn sheep—While there have been documented sightings of bighorn sheep, the adjacent landscape in Red Rocks NCA is protected, which contains the majority of the habitat. The habitat in the proposed area is not irreplaceable, unique, or exemplary.
	No	Western burrowing owl—The species and habitat is found throughout the entire west. The habitat in the nominated area is not more exemplary or unique than other habitats.
	No	Golden eagle—The species and habitat is found throughout the entire west. The habitat in the nominated area is not more exemplary or unique than other habitats.
	No	Mojave desert tortoise—Not designated critical habitat. Habitat is very low density in the nominated areas and is not unique.
	No	Gila monster—The species and habitat is found throughout the region. The habitat in the nominated area is not more exemplary or unique than other habitats.
Has been recognized as warranting protection to satisfy national priority concerns or to carry out the mandates of FLPMA.	No	Peregrine falcon—BLM sensitive species, not a national priority.
	No	Desert bighorn sheep—BLM sensitive species for the State of Nevada, not a national priority.
	No	Western burrowing owl—BLM sensitive species for the State of Nevada, not a national priority.
	No	Golden eagle—BLM sensitive species for the State of Nevada, not a national priority. While there is a Bald and Golden Eagle Protection Act, this act does not require that this part of the habitat for golden eagle be a national priority.
	No	Mojave desert tortoise—Not designated critical habitat. Habitat is very low density in the nominated areas.
	No	Gila monster—BLM sensitive species for the State of Nevada, not a national priority.

Importance Value	Yes/No	Rationale for Determination
Has qualities that warrant highlighting to satisfy public or management concerns about safety and public welfare.	No	Area was not nominated for this value. None known to be present.
Poses a significant threat to human life and safety or to property.	No	Area was not nominated for this value. Not present.

Nominated Area to Potential ACEC

This area was nominated to include 2,430 acres of public land. NDOW identified this area as being important for peregrine falcons and several other sensitive species. Their nomination states, "A peregrine falcon eyrie is located in the area. The lower ridges on the western periphery of the Las Vegas Valley situated south and east of the main LaMadre ridge are important seasonal use areas for desert bighorn. This area consistently holds the highest density of desert bighorn in the greater Spring Mountains. The area also supports the Western burrowing owl, black-chinned sparrow, golden eagle, Mojave desert tortoise, and Gila monster. Development has encroached immediately adjacent to the proposed ACEC in the northern portion (i.e. Lone Mountain Community Pit) and receives high recreational use elsewhere."

The BLM interdisciplinary team determined that the area does not meet the criteria of relevance and importance for cultural values, fish and wildlife resources, and natural processes or systems.

N.3.2.12. Lava Dune Nominated ACEC

General Location:	On a lava flow from a cinder cone north of US-95 and Valley View Road.
General Description:	Lava flow that captures sand and seeds from Big Dune located to the southwest.
Nominated By:	BLM
Nominated Acreage:	623 acres.
Values Considered:	Big Dune endemic beetle species.

Relevance

An area meets the "relevance" criterion if it contains one or more of the following:

Relevance Value	Yes/No	Rationale for Determination
A significant historic, cultural, or scenic value (including rare or sensitive archeological resources and religious or cultural resources important to Native Americans).	No	Area was not nominated for this value.
A fish and wildlife resource (including habitat for endangered, sensitive or threatened species, or habitat essential for maintaining species diversity).	Yes	Giuliani's big dune scarab (*Pseudocotalpa giulianii*)—BLM sensitive species.
	Yes	Big Dune aphodius scarab (*Aphodius sp.*)—BLM sensitive species.
	Yes	Large aegialian scarab (*Aegialia magnifica*)—BLM sensitive species.
	Yes	Rulien's miloderes weevil (*Miloseres rulieni*)—BLM sensitive species.

Relevance Value	Yes/No	Rationale for Determination
A natural process or system (including endangered, sensitive, or threatened plant species; rare, endemic, or relic plants or plant communities that are terrestrial, aquatic, or riparian; or rare geological features).	No	Area was not nominated for this value.
Natural hazards (including areas of avalanche, dangerous flooding, landslides, unstable soils, seismic activity, or dangerous if it is determined through the resource management planning process that it has become part of a natural process).	No	Area was not nominated for this value. None known to be present.

Importance

The value, resource, system, process, or hazard described above must have substantial significance and values to satisfy the "importance" criteria. This generally means that the value, resource, system, process, or hazard is characterized by one or more of the following:

Importance Value	Yes/No	Rationale for Determination
Has more than locally significant qualities that give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared with any similar resource.	Yes	Giuliani's Big Dune scarab—BLM sensitive species. Proposed for federal listing in 2010. The USFWS is conducting a 90-day review to determine the listing status of the species. Species is endemic to Big Dune and Lava Dune.
	Yes	Big Dune aphodius scarab—BLM sensitive species. Species is endemic to Big Dune and Lava Dune.
	Yes	Large aegialian scarab—BLM sensitive species. Proposed for federal listing in 2010. The USFWS is conducting a 90-day review to determine the listing status of the species. Species is endemic to Big Dune and Lava Dune.
	Yes	Rulien's miloderes weevil—BLM sensitive species. Species is endemic to Big Dune and Lava Dune.
Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.	Yes	Giuliani's Big Dune Scarab—BLM sensitive species. Species is endemic to Big Dune and Lava Dune. Species is vulnerable to adverse change in its habitat.
	Yes	Big Dune aphodius scarab—BLM sensitive species. Species is endemic to Big Dune and Lava Dune. Species is vulnerable to adverse change in its habitat.
	Yes	Large aegialian scarab—BLM sensitive species. Species is endemic to Big Dune and Lava Dune. Species is vulnerable to adverse change in its habitat.
	Yes	Rulien's miloderes weevil—BLM sensitive species. Species is endemic to Big Dune and Lava Dune. Species is vulnerable to adverse change in its habitat.
Has been recognized as warranting protection to satisfy national priority concerns or to carry out the mandates of FLPMA.	No	Species are not federally listed at this time.
Has qualities that warrant highlighting to satisfy public or management concerns about safety and public welfare.	No	Area was not nominated for this value. None known to be present.
Poses a significant threat to human life and safety or to property.	No	Area was not nominated for this value. Not present.

Nominated Area to Potential ACEC

The BLM interdisciplinary team determined that about 435 of the nominated acres meet at least one criterion for both relevance and importance and will be considered in the Draft RMP/EIS. Specifically, the following values meet at least one criterion for both relevance and importance:

- Giuliani's Big Dune scarab
- Big Dune aphodius scarab
- Large aegialian scarab
- Rulien's miloderes weevil

N.3.2.13. Logandale Nominated ACEC

General Location:	To the west of Logandale in Clark County.
General Description:	Habitat for threecorner milkvetch.
Nominated By:	BLM
Nominated Acreage:	8,118 acres.
Values Considered:	Threecorner milkvetch, scenic, cultural, wildlife.

Relevance

An area meets the "relevance" criterion if it contains one or more of the following:

Relevance Value	Yes/No	Rationale for Determination
A significant historic, cultural, or scenic value (including rare or sensitive archeological resources and religious or cultural resources important to Native Americans).	Yes	Scenic—Aztec sandstone formations create outstanding contrast with color, form, line, texture with the surrounding desert.
	Yes	Cultural—Prehistoric and historic features, sites, and artifacts.
A fish and wildlife resource (including habitat for endangered, sensitive or threatened species, or habitat essential for maintaining species diversity).	Yes	Desert bighorn sheep (*Ovis canadensis nelson*)—BLM sensitive species, area contains winter range.
	No	Mojave desert tortoise (*Gopherus agassizii*)—federally listed (threatened), downward trend. Not critical habitat. The area has high value habitat from the USGS model, but it is currently considered low density for tortoise populations.
A natural process or system (including endangered, sensitive, or threatened plant species; rare, endemic, or relic plants or plant communities that are terrestrial, aquatic, or riparian; or rare geological features).	Yes	Threecorner milkvetch (*Astragalus geyeri* var. *triquetrus*)—BLM sensitive species, State listed.
	Yes	Sticky buckwheat (*Eriogonum viscidulum*)—BLM sensitive species.
Natural hazards (including areas of avalanche, dangerous flooding, landslides, unstable soils, seismic activity, or dangerous if it is determined through the resource management planning process that it has become part of a natural process).	No	Area was not nominated for this value. None known to be present.

Importance

The value, resource, system, process, or hazard described above must have substantial significance and values to satisfy the "importance" criteria. This generally means that the value, resource, system, process, or hazard is characterized by one or more of the following:

Importance Value	Yes/No	Rationale for Determination
Has more than locally significant qualities that give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared with any similar resource.	Yes	Scenic—The contrast and scenic quality is greater than others in the region. The region is well known for its scenic resources.
	Yes	Cultural—Variety of temporal site types. Prehistoric and historic features, sites, and artifacts unique for the region.
	No	Desert bighorn sheep—Species occurs throughout the region.
	Yes	Threecorner milkvetch—BLM sensitive species, State Listed, endemic to the planning area.
	No	Sticky buckwheat—BLM sensitive species, found elsewhere in the region.
Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.	Yes	Scenic—Recreation, especially illegal off-trail use, could threaten the scenic values.
	Yes	Cultural—Recreational OHV and motorcycle use in this area could allow access to sensitive cultural values, allowing looting and vandalism. The area has the potential to yield significant cultural information.
	No	Desert bighorn sheep—The bighorn habitat is in areas that the OHV users cannot directly use. Indirect impacts from displacement associated with OHV use could affect the species, but they have adequate escape routes.
	Yes	Threecorner milkvetch—Habitat is irreplaceable and vulnerable to large site type right-of-ways. Plants are sensitive to surface disturbance and threatened from invasive species.
	No	Sticky buckwheat—There is habitat present for this species but it is not high priority or high density habitat.
Has been recognized as warranting protection to satisfy national priority concerns or to carry out the mandates of FLPMA.	No	Scenic—The area is widely recognized as having scenic values, but it has not yet been recognized as a national priority.
	No	Cultural—Beyond requirements to address cultural resources in the National Historic Preservation Act, section 106, the area is not recognized as a national priority.
	No	Desert bighorn sheep—BLM sensitive species for the State of Nevada, not a national priority.
	No	Threecorner milkvetch—Not federally designated, not a national priority.
	No	Sticky buckwheat—Not federally designated, not a national priority.
Has qualities that warrant highlighting to satisfy public or management concerns about safety and public welfare.	No	Area was not nominated for this value. None known to be present.
Poses a significant threat to human life and safety or to property.	No	Area was not nominated for this value. Not present.

Nominated Area to Potential ACEC

The BLM interdisciplinary team determined that 6,072 acres of the nominated acres meet at least one criterion for both relevance and importance and will be considered in the Draft RMP/EIS. Specifically, the following values meet at least one criterion for both relevance and importance:

- Cultural/historic values
- Scenic values

- Threecorner milkvetch

N.3.2.14. Lower Mormon Mesa Nominated ACEC

General Location:	The portion of Mormon Mesa south of Interstate 15.
General Description:	An approximately five million year old remnant floodplain containing one of the oldest calcium carbonite soils in the world.
Nominated By:	BLM
Nominated Acreage:	66,353 acres.
Values Considered:	Soil and geology.

Relevance

An area meets the "relevance" criterion if it contains one or more of the following:

Relevance Value	Yes/No	Rationale for Determination
A significant historic, cultural, or scenic value (including rare or sensitive archeological resources and religious or cultural resources important to Native Americans).	No	Area was not nominated for these values. (see Old Spinish Trail ACEC nomination below)
A fish and wildlife resource (including habitat for endangered, sensitive or threatened species, or habitat essential for maintaining species diversity).	No	Area was not nominated for these values.
A natural process or system (including endangered, sensitive, or threatened plant species; rare, endemic, or relic plants or plant communities that are terrestrial, aquatic, or riparian; or rare geological features).	Yes	Rare Geologic Feature—Remnant terraced lake deposit, with stage 6 soil that is considered one of the oldest calcium carbonate soils in the world
Natural hazards (including areas of avalanche, dangerous flooding, landslides, unstable soils, seismic activity, or dangerous if it is determined through the resource management planning process that it has become part of a natural process).	No	Area was not nominated for this value. None known to be present.

Importance

The value, resource, system, process, or hazard described above must have substantial significance and values to satisfy the "importance" criteria. This generally means that the value, resource, system, process, or hazard is characterized by one or more of the following:

Importance Value	Yes/No	Rationale for Determination
Has more than locally significant qualities that give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared with any similar resource.	Yes	Rare Geologic Feature—The age of the soils and rarity of the feature make this more than locally significant for geological scientific purposes.
Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.	Yes	Rare Geologic Feature—The cliffs associated with the Lower Mormon Mesa is the only exposure of this geologic feature in the region. This feature contains a remnant floodplain isolated through stream downcutting in the Virgin River, Muddy Creek, and several small gullies. This area has stage 6 soil that is considered one of the oldest calcium carbonite soils in the world. It is a rare and exemplary example of desert soils. Due to its scarcity, loss of this resource would be irreplaceable.Circumstances that could threaten the processes or could remove the resource and make it vulnerable to adverse change include complete removal of the soil surface or altering the hydrologic percolation and eolian sand deposition (large site-type ROWs that result in soil clearance). Undercutting along the face of the mesa threatens the visible exposures, and over time (well beyond the life of an RMP) could remove the mesa entirely.
Has been recognized as warranting protection to satisfy national priority concerns or to carry out the mandates of FLPMA.	Yes	Rare Geologic Feature—The area is vulnerable to damage from erosion and development.
Has qualities that warrant highlighting to satisfy public or management concerns about safety and public welfare.	No	Area was not nominated for this value. None known to be present.
Poses a significant threat to human life and safety or to property.	No	Area was not nominated for this value. Not present.

Nominated Area to Potential ACEC

The BLM interdisciplinary team determined that 66,353 of the nominated acres meet at least one criterion for both relevance and importance and will be considered in the Draft RMP/EIS. Specifically, the following values meet at least one criterion for both relevance and importance:

- Rare geologic feature

N.3.2.15. Mesa Milkvetch Nominated ACEC

General Location:	A portion of Mormon Mesa south of Interstate 15.
General Description:	The area contains habitat for threecorner milkvetch.
Nominated By:	BLM
Nominated Acreage:	9,183 acres.
Values Considered:	Cultural, threecorner milkvetch habitat.

Relevance

An area meets the “relevance” criterion if it contains one or more of the following:

Relevance Value	Yes/No	Rationale for Determination
A significant historic, cultural, or scenic value (including rare or sensitive archeological resources and religious or cultural resources important to Native Americans).	Yes	Cultural—Prehistoric habitations.
A fish and wildlife resource (including habitat for endangered, sensitive or threatened species, or habitat essential for maintaining species diversity).	No	Area was not nominated for these values.
A natural process or system (including endangered, sensitive, or threatened plant species; rare, endemic, or relic plants or plant communities that are terrestrial, aquatic, or riparian; or rare geological features).	Yes	Threecorner milkvetch (*Astragalus geyeri* var. *triquetrus*)—BLM sensitive and state listed species. The area provides the unique soil type necessary for the plant.
Natural hazards (including areas of avalanche, dangerous flooding, landslides, unstable soils, seismic activity, or dangerous if it is determined through the resource management planning process that it has become part of a natural process).	No	Area was not nominated for this value. None known to be present.

Importance

The value, resource, system, process, or hazard described above must have substantial significance and values to satisfy the "importance" criteria. This generally means that the value, resource, system, process, or hazard is characterized by one or more of the following:

Importance Value	Yes/No	Rationale for Determination
Has more than locally significant qualities that give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared with any similar resource.	No	Cultural—Similar to other cultural site types and conditions in the region.
	Yes	Threecorner milkvetch—the area provides a significant portion of habitat in its range.
Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.	Yes	Cultural—Recreational OHV and motorcycle use in this area could impact the fragile, irreplaceable cultural resources, as well as looting and vandalism. The area has the potential to yield significant cultural information.
	Yes	Threecorner milkvetch—habitat is irreplaceable and vulnerable to large site type right-of-ways. Plants are sensitive to surface disturbance (e.g., illegal OHV use off roads and trails) and threatened from invasive species.
Has been recognized as warranting protection to satisfy national priority concerns or to carry out the mandates of FLPMA.	No	Cultural—Beyond requirements to address cultural resources in the National Historic Preservation Act, section 106, the area is not recognized as a national priority.
	No	Threecorner milkvetch—BLM sensitive species for the State of Nevada, not a national priority.

Importance Value	Yes/No	Rationale for Determination
Has qualities that warrant highlighting to satisfy public or management concerns about safety and public welfare.	No	Area was not nominated for this value. None known to be present.
Poses a significant threat to human life and safety or to property.	No	Area was not nominated for this value. Not present.

Nominated Area to Potential ACEC

The BLM interdisciplinary team determined that 9,183 of the nominated acres meet at least one criterion for both relevance and importance and will be considered in the Draft RMP/EIS. Specifically, the following values meet at least one criterion for both relevance and importance:

- Cultural/historic values
- Threecorner milkvetch

N.3.2.16. Moapa Mesquite Nominated ACEC

General Location:	Three kilometers north of the community of Glendale, NV, in Clark County within T 14 S, R 66 E, Sections 23, 26, 35, and 36.
General Description:	Mesquite woodland and cultural resource sites. Parallel to and about 300 m east of Meadow Valley Wash. The western edge is flanked by two irrigated agricultural fields.
Nominated By:	BLM
Nominated Acreage:	2,219 acres.
Values Considered:	Cultural resource sites with prehistoric (of all ages) and possibly protohistoric campsites and mesquite harvest sites.

Relevance

An area meets the “relevance” criterion if it contains one or more of the following:

Relevance Value	Yes/No	Rationale for Determination
A significant historic, cultural, or scenic value (including rare or sensitive archeological resources and religious or cultural resources important to Native Americans).	Yes	Cultural—Cultural resource sites with prehistoric (of all ages) and possibly protohistoric campsites and mesquite harvest sites.
A fish and wildlife resource (including habitat for endangered, sensitive or threatened species, or habitat essential for maintaining species diversity).	No	Area was not nominated for these values.

Relevance Value	Yes/No	Rationale for Determination
A natural process or system (including endangered, sensitive, or threatened plant species; rare, endemic, or relic plants or plant communities that are terrestrial, aquatic, or riparian; or rare geological features).	Yes	Riparian Woodland—Riparian and transition woodland habitat types are extremely limited in this ecoregion, making this habitat important to maintain species diversity and to support bird migration. The mesquite acacia woodlands associated with the riparian transition areas provide wildlife habitat essential for maintaining species diversity.
Natural hazards (including areas of avalanche, dangerous flooding, landslides, unstable soils, seismic activity, or dangerous if it is determined through the resource management planning process that it has become part of a natural process).	No	Area was not nominated for this value. None known to be present.

Importance

The value, resource, system, process, or hazard described above must have substantial significance and values to satisfy the "importance" criteria. This generally means that the value, resource, system, process, or hazard is characterized by one or more of the following:

Importance Value	Yes/No	Rationale for Determination
Has more than locally significant qualities that give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared with any similar resource.	No	Cultural—Similar to other cultural values in the region.
	Yes	Riparian Woodland—Riparian habitat type is extremely limited in this ecoregion, making this habitat important to maintain species diversity and to support bird migration.
Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.	Yes	Cultural—Recreational use in this area could impact the fragile, irreplaceable cultural resources. The area has the potential to yield significant cultural information.
	Yes	Riparian woodland plant community is fragile and threatened by casual recreation, illegal woodcutting, development, and anthropogenic fire.
Has been recognized as warranting protection to satisfy national priority concerns or to carry out the mandates of FLPMA.	No	Cultural—Beyond requirements to address cultural resources in the National Historic Preservation Act, section 106, the area is not recognized as a national priority.
	No	Riparian—While riparian habitat type is extremely limited in this ecoregion, it has not been recognized as a national priority for protection, beyond providing habitat for various sensitive and threatened species.
Has qualities that warrant highlighting to satisfy public or management concerns about safety and public welfare.	No	Area was not nominated for this value. None known to be present.
Poses a significant threat to human life and safety or to property.	No	Area was not nominated for this value. Not present.

Nominated Area to Potential ACEC

The BLM interdisciplinary team determined that 1,510 of the nominated acres meet at least one criterion for both relevance and importance and will be considered in the Draft RMP/EIS. Specifically, the following values meet at least one criterion for both relevance and importance:

- Cultural/historic values

- Riparian woodland

N.3.2.17. Mt. Schader Nominated ACEC

General Location:	Southern Nye County, on the western slope of the Spring Mountains.
General Description:	Cultural resources including rock art panels.
Nominated By:	BLM
Nominated Acreage:	285 acres.
Values Considered:	Cultural resources including rock art panels that are threatened by theft and vandalism.

Relevance

An area meets the "relevance" criterion if it contains one or more of the following:

Relevance Value	Yes/No	Rationale for Determination
A significant historic, cultural, or scenic value (including rare or sensitive archeological resources and religious or cultural resources important to Native Americans).	Yes	Cultural—Rock art panels.
A fish and wildlife resource (including habitat for endangered, sensitive or threatened species, or habitat essential for maintaining species diversity).	No	Area was not nominated for this value.
A natural process or system (including endangered, sensitive, or threatened plant species; rare, endemic, or relic plants or plant communities that are terrestrial, aquatic, or riparian; or rare geological features).	No	Area was not nominated for this value.
Natural hazards (including areas of avalanche, dangerous flooding, landslides, unstable soils, seismic activity, or dangerous if it is determined through the resource management planning process that it has become part of a natural process).	No	Area was not nominated for this value. None known to be present.

Importance

The value, resource, system, process, or hazard described above must have substantial significance and values to satisfy the "importance" criteria. This generally means that the value, resource, system, process, or hazard is characterized by one or more of the following:

Importance Value	Yes/No	Rationale for Determination
Has more than locally significant qualities that give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared with any similar resource.	Yes	Cultural—The area is eligible for the National Register of Historic Places, it is regionally significant.
Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.	Yes	Cultural—The area contains a variety of prehistoric site types that are vulnerable to adverse change from public access and recreational use.
Has been recognized as warranting protection to satisfy national priority concerns or to carry out the mandates of FLPMA.	No	Cultural—Beyond requirements to address cultural resources in the National Historic Preservation Act, section 106, the area is not recognized as a national priority.
Has qualities that warrant highlighting to satisfy public or management concerns about safety and public welfare.	No	Area was not nominated for this value. None known to be present.
Poses a significant threat to human life and safety or to property.	No	Area was not nominated for this value. Not present.

Nominated Area to Potential ACEC

The BLM interdisciplinary team determined that 283 of the nominated acres meet at least one criterion for both relevance and importance and will be considered in the Draft RMP/EIS. Specifically, the following values meet at least one criterion for both relevance and importance:

- Cultural/historic values

N.3.2.18. Muddy Mountains Nominated ACEC

General Location:	Northeast of Las Vegas, adjacent to the Lake Mead National Recreation Area.
General Description:	Rugged cliffs and canyons within the Muddy Mountain Range.
Nominated By:	NDOW
Nominated Acreage:	228,297 acres.
Values Considered:	Desert bighorn sheep, peregrine falcon, golden eagle, phainopepla, Western burrowing owl, desert kangaroo rat, Gila monster.

Relevance

An area meets the “relevance” criterion if it contains one or more of the following:

Relevance Value	Yes/No	Rationale for Determination
A significant historic, cultural, or scenic value (including rare or sensitive archeological resources and religious or cultural resources important to Native Americans).	No	Not nominated for these values.
A fish and wildlife resource (including habitat for endangered, sensitive or threatened species, or habitat essential for maintaining species diversity).	Yes	Desert bighorn sheep (*Ovis canadensis nelson*)—BLM sensitive species, area contains both crucial and winter habitat. All crucial habitat (most important and near water) is already protected by the Bitter Springs nominated ACEC Approximately 20 tags in 2010, with 459 sheep from an aerial survey in 2008.
	Yes	Peregrine falcon (*Falco peregrines*)—BLM sensitive. Habitat is present. NDOW diversity dataset (Jan 15, 2009) shows just two peregrine falcon points within the nominated area, both within the designated wilderness area.
	Yes	Golden eagle (*Aquila chrysaetos*)—BLM sensitive. NDOW diversity dataset (Jan 15, 2009) shows just two golden eagle points within the nominated area.
	Yes	Phainopepla (*Phainopepla nitens*)—BLM sensitive species. NDOW diversity dataset (Jan 15, 2009) shows just one phainopepla point within the nominated area. Some of the mesquite/acacia habitat in the nominated area is already located within a different proposed ACEC.
	Yes	Western burrowing owl (*Athene cunicularia*)—BLM sensitive. Habitat is present.
	No	Desert kangaroo rat (*Dipodomys deserti*)—Not a BLM sensitive species.
	Yes	Gila monster (*Heloderma suspectum cinctum*)—BLM sensitive. Habitat is present.
A natural process or system (including endangered, sensitive, or threatened plant species; rare, endemic, or relic plants or plant communities that are terrestrial, aquatic, or riparian; or rare geological features).	No	Not nominated for these values
Natural hazards (including areas of avalanche, dangerous flooding, landslides, unstable soils, seismic activity, or dangerous if it is determined through the resource management planning process that it has become part of a natural process).	No	Area was not nominated for this value. None known to be present.

Importance

The value, resource, system, process, or hazard described above must have substantial significance and values to satisfy the "importance" criteria. This generally means that the value, resource, system, process, or hazard is characterized by one or more of the following:

Importance Value	Yes/No	Rationale for Determination
Has more than locally significant qualities that give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared with any similar resource.	Yes	Desert bighorn sheep—It is the largest bighorn population in the state. Sheep from the area are gathered and transplanted to other areas.
	No	Peregrine falcon—There is potential habitat throughout the region. The habitat in this area is not more than locally significant.
	No	Golden eagle—There is potential habitat throughout the region. The habitat in this area is not more than locally significant.
	No	Phainopepla—There is potential habitat throughout the region. The habitat in this area is not more than locally significant.
	No	Western burrowing owl—There is potential habitat throughout the region. The habitat in this area is not more than locally significant.
	No	Gila monster—There is insufficient data to determine significance. Best available data contains too few data points from which to draw reasonable scientific conclusions.
Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.	Yes	Desert bighorn sheep—It is the largest bighorn population in the state. Sheep from the area are gathered and transplanted to other areas. The sheep population is growing (2008-2009 Big Game Status). The size of the population, and the associated condition of the habitat, is unique for the region, making it less fragile to adverse change.
	No	Peregrine falcon—The habitat in the proposed area is not irreplaceable, unique, or exemplary. The two identified occurrences are located in designated wilderness; therefore further protection is not needed.
	No	Golden eagle—The species and habitat is found throughout the entire west. The habitat in the nominated area is not more exemplary or unique than other habitats.
	No	Phainopepla—There is potential habitat throughout the region. The highest quality habitat has already been included in other ACEC nominations. This area was not identified in the mesquite/acacia conservation management strategy.
	No	Western burrowing owl—The species and habitat is found throughout the entire west. The habitat in the nominated area is not more exemplary or unique than other habitats.
	No	Gila monster—There is insufficient data to determine significance. Best available data contains too few data points from which to draw reasonable scientific conclusions.
Has been recognized as warranting protection to satisfy national priority concerns or to carry out the mandates of FLPMA.	No	Desert bighorn sheep—BLM sensitive species for the State of Nevada, not a national priority.
	No	Peregrine falcon—BLM sensitive species, not a national priority.
	No	Golden eagle—BLM sensitive species for the State of Nevada, not a national priority. While there is a Bald and Golden Eagle Protection Act, this act does not require that this part of the habitat for golden eagle be a national priority.
	No	Phainopepla—BLM sensitive species for the State of Nevada, not a national priority.
	No	Western burrowing owl—BLM sensitive species for the State of Nevada, not a national priority.
	No	Gila monster—BLM sensitive species for the State of Nevada, not a national priority.

Importance Value	Yes/No	Rationale for Determination
Has qualities that warrant highlighting to satisfy public or management concerns about safety and public welfare.	No	Area was not nominated for this value. None known to be present.
Poses a significant threat to human life and safety or to property.	No	Area was not nominated for this value. Not present.

Nominated Area to Potential ACEC

This area was nominated to include 228,297 acres of public land. NDOW identified this area as being important for several sensitive species. Their nomination states, "The area supports largest population of desert bighorn sheep in Nevada. Two peregrine falcon nesting territories are known; the area is also important for the golden eagle, phainopepla, Western burrowing owl, desert kangaroo rat, and likely the Gila monster."

The BLM interdisciplinary team determined that 159,868 nominated acres meet at least one criterion for both relevance and importance. Specifically, the following values meet at least one criterion for both relevance and importance:

- Desert bighorn sheep

N.3.2.19. Old Spanish Trail Nominated ACEC

General Location:	Lower Mormon Mesa and California Wash regions of northeast Clark County and Stump Springs area of western Clark County.
General Description:	The Old Spanish Trail was a trade route linking Santa Fe, New Mexico and Los Angeles, California in use between 1829 and 1848. The trail combined Spain's early routes with ancient Native American foot paths and hundreds of traders, soldiers, merchants and horse thieves traveled the "longest, crookedest, most arduous pack mule trail in the history of America." In Nevada, the Old Spanish Trail stretched for more than 150 miles as it ran from one water source to the next. Seven interpretive kiosks are located near the trail from Mesquite to Pahrump, Nevada. Because of its rich history and national significance, the Old Spanish Trail has been designated as a national historic trail. The Bureau of Land Management and the National Park Service are currently conducting a Comprehensive Management Plan and Draft Environmental Impact Statement. Once planning is completed, the two agencies will jointly administer the national historic trail, which is more than 2,700 miles in length and crosses New Mexico, Colorado, Arizona, Utah, Nevada, and California. BLM proposes to establish the segments of the Old Spanish Trail within the planning area measuring approximately 111 miles as an ACEC to protect the trail and cultural resources along its alignment.
Nominated By:	BLM,
Nominated Acreage:	51,449 (BLM).
Values Considered:	Cultural

Relevance:

An area meets the "relevance" criterion if it contains one or more of the following:

Relevance Value	Yes/No	Rationale for Determination
A significant historic, cultural, or scenic value (including rare or sensitive archeological resources and religious or cultural resources important to Native Americans).	Yes	Cultural, area contains a segment of the Old Spanish Trail.
A fish and wildlife resource (including habitat for endangered, sensitive or threatened species, or habitat essential for maintaining species diversity).	No	Area was not nominated for this value. Resources evaluated under other nominations.
A natural process or system (including endangered, sensitive, or threatened plant species; rare, endemic, or relic plants or plant communities that are terrestrial, aquatic, or riparian; or rare geological features).	No	Area was not nominated for this value. Resources evaluated under other nominations.
Natural hazards (including areas of avalanche, dangerous flooding, landslides, unstable soils, seismic activity, or dangerous if it is determined through the resource management planning process that it has become part of a natural process).	No	Area was not nominated for this value. None known to be present.

Importance:

If a nominated value, resource, system, process, or hazard did not meet at least one of the relevance criteria, it was not evaluated for importance. A value, resource, system, process, or hazard meets the "importance" criterion if it is characterized by one or more of the following:

Importance Value	Yes/No	Rationale for Determination
Has more than locally significant qualities that give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared with any similar resource.	Yes	Cultural—The Old Spanish Trail is a national historic trail and was a trade route linking Santa Fe, New Mexico to Los Angeles, CA from 1829 to 1848.
Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.	Yes	Cultural—The cultural resources associated with the Old Spanish Trail are unique and documented along portions of the trail found within the proposed ACEC.
Has been recognized as warranting protection to satisfy national priority concerns or to carry out the mandates of FLPMA.	Yes	Cultural—The Old Spanish Trail is a national historic trail.
Has qualities that warrant highlighting to satisfy public or management concerns about safety and public welfare.	No	Area was not nominated for this value. Not present.
Poses a significant threat to human life and safety or to property.	No	Area was not nominated for this value. Not present.

Nominated Area to Potential ACEC

The BLM interdisciplinary team determined that 51,449 nominated acres along the National Historic Trail meet at least one criterion for both relevance and importance and will be considered in the Draft RMP/EIS. Specifically, the following values meet at least one criterion for both relevance and importance:

- Cultural/historic values

N.3.2.20. Opal Mountains Nominated ACEC

General Location:	East of the Arizona state line, near the town of Nelson, the southern portion of the nominated area overlaps with the existing Piute/Eldorado ACEC..
General Description:	Habitat for BLM special status species, an extension of the existing Piute/Eldorado ACEC.
Nominated By:	NDOW
Nominated Acreage:	77,410 acres.
Values Considered:	Peregrine falcon, golden eagle, phainopepla, Western burrowing owl, desert kangaroo rat, Bendire's thrasher, desert pocket mouse, desert bighorn sheep, Gila monster, other reptiles of concern.

Relevance

An area meets the "relevance" criterion if it contains one or more of the following:

Relevance Value	Yes/No	Rationale for Determination
A significant historic, cultural, or scenic value (including rare or sensitive archeological resources and religious or cultural resources important to Native Americans).	No	Not nominated for these values.
A fish and wildlife resource (including habitat for endangered, sensitive or threatened species, or habitat essential for maintaining species diversity).	Yes	Peregrine falcon (*Falco peregrines*)—BLM sensitive. NDOW diversity dataset (Jan 15, 2009) shows no peregrine falcon points within the nominated area.
	Yes	Golden eagle (*Aquila chrysaetos*)—BLM sensitive. NDOW diversity dataset (Jan 15, 2009) shows two golden eagle points within the nominated area.
	Yes	Phainopepla (*Phainopepla nitens*)—BLM sensitive. Habitat is present. NDOW diversity dataset (Jan 15, 2009) shows seven phainopepla points within the nominated area.
	Yes	Western burrowing owl (*Athene cunicularia*)—BLM sensitive. Habitat is present. NDOW diversity dataset (Jan 15, 2009) shows just one Western burrowing owl points within the nominated area.
	No	Desert kangaroo rat (*Dipodomys deserti*)—Not a BLM sensitive species.
	No	Bendire's thrasher (*Toxostoma bendirei*)—Not a BLM sensitive species.
	No	Desert pocket mouse (*Chaetodipus penicillatus sobrinus*)—Not a BLM sensitive species.
	Yes	Desert bighorn sheep (*Ovis canadensis nelson*)—BLM sensitive species, area contains both crucial and winter habitat.
	Yes	Gila monster (*Heloderma suspectum cinctum*)—BLM sensitive. Habitat is present.
	No	Other reptiles of concern—Not sufficient information in the proposal to analyze relevance.

Relevance Value	Yes/No	Rationale for Determination
A natural process or system (including endangered, sensitive, or threatened plant species; rare, endemic, or relic plants or plant communities that are terrestrial, aquatic, or riparian; or rare geological features).	No	Not nominated for these values
Natural hazards (including areas of avalanche, dangerous flooding, landslides, unstable soils, seismic activity, or dangerous if it is determined through the resource management planning process that it has become part of a natural process).	No	Area was not nominated for this value. None known to be present.

Importance

The value, resource, system, process, or hazard described above must have substantial significance and values to satisfy the "importance" criteria. This generally means that the value, resource, system, process, or hazard is characterized by one or more of the following:

Importance Value	Yes/No	Rationale for Determination
Has more than locally significant qualities that give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared with any similar resource.	No	Peregrine falcon—There is potential habitat throughout the region. The habitat in this area is not more than locally significant.
	No	Golden eagle—There is potential habitat throughout the region. The habitat in this area is not more than locally significant.
	No	Phainopepla—There is potential habitat throughout the region. The habitat in this area is not more than locally significant.
	No	Western burrowing owl—There is potential habitat throughout the region. The habitat in this area is not more than locally significant.
	No	Desert bighorn sheep—Species occurs throughout the region. The habitat in this area is not more than locally significant.
	No	Gila monster—There is potential habitat throughout the region. The habitat in this area is not more than locally significant.
Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.	No	Peregrine falcon—The species and habitat is found throughout the west. The habitat in the proposed area is not irreplaceable, unique, or exemplary.
	No	Golden eagle—The species and habitat is found throughout the entire west. The habitat in the nominated area is not more exemplary or unique than other habitats.
	No	Phainopepla—The species and habitat is found throughout the southwest. The habitat in the nominated area is not more exemplary or unique than other habitats.
	No	Western burrowing owl—The species and habitat is found throughout the entire west. The habitat in the nominated area is not more exemplary or unique than other habitats.
	No	Desert bighorn sheep—Population estimate for the entire Eldorado Mountains is 180 (2008-2009 Big Game Status). The southern Eldorado Mountains support a low-density herd as well as a fall migrant segment from the northern portion of the range. The size of the habitat in the proposed area, compared

Importance Value	Yes/No	Rationale for Determination
		with the size of the entire Eldorado Mountains population, is small and the threats are minimal where the habitat is located.
	No	Gila monster—The species and habitat is found throughout the region. The habitat in the nominated area is not more exemplary or unique than other habitats.
Has been recognized as warranting protection to satisfy national priority concerns or to carry out the mandates of FLPMA.	No	Peregrine falcon—BLM sensitive species, not a national priority.
	No	Golden eagle—BLM sensitive species for the State of Nevada, not a national priority. While there is a Bald and Golden Eagle Protection Act, this act does not require that this part of the habitat for golden eagle be a national priority.
	No	Phainopepla—BLM sensitive species for the State of Nevada, not a national priority.
	No	Western burrowing owl—BLM sensitive species for the State of Nevada, not a national priority.
	No	Desert bighorn sheep—BLM sensitive species for the State of Nevada, not a national priority.
	No	Gila monster—BLM sensitive species for the State of Nevada, not a national priority.
Has qualities that warrant highlighting to satisfy public or management concerns about safety and public welfare.	No	Area was not nominated for this value. None known to be present.
Poses a significant threat to human life and safety or to property.	No	Area was not nominated for this value. Not present.

Nominated Area to Potential ACEC

This area was nominated to include 77,410 acres of public land. NDOW identified this area as being important for several sensitive species. Their nomination states, "An extension is recommended of the existing Piute/Eldorado ACEC complex towards Nelson, excluding private properties and existing land protection designations. Historic peregrine falcon territory; records / suitable habitat for golden eagle, phainopepla, Western burrowing owl, desert kangaroo rat, Bendire's thrasher, desert pocket mouse, and desert bighorn. While highly visited by various recreational enthusiasts, the area is one of a few where reports of Gila monster are regularly received. Many of the other reptiles of concern have also been observed in the area."

The BLM interdisciplinary team determined that the area does not meet the criteria of relevance and importance for cultural values, fish and wildlife resources, and natural processes or systems.

N.3.2.21. Pahrump Valley to McCullough Mountains Nominated ACEC

General Location:	Bordered to the east by Sloan NCA and the Boulder City Conservation Easement and on the west by the eastern end of Pahrump Valley near Old Spanish Trail Hwy.
General Description:	Varied terrain with habitat for numerous BLM special status species.
Nominated By:	NDOW
Nominated Acreage:	274,061 acres.
Values Considered:	Peregrine falcon, Bendire's thrasher, desert kangaroo rat, golden eagle, phainopepla, and desert pocket mouse, as well as other BLM sensitive species, Mojave desert tortoise and chuckwalla, Le Conte's thrasher, and desert bighorn sheep.

Relevance

An area meets the "relevance" criterion if it contains one or more of the following:

Relevance Value	Yes/No	Rationale for Determination
A significant historic, cultural, or scenic value (including rare or sensitive archeological resources and religious or cultural resources important to Native Americans).	No	Not nominated for these values.
A fish and wildlife resource (including habitat for endangered, sensitive or threatened species, or habitat essential for maintaining species diversity).	Yes	Peregrine falcon (*Falco peregrines*)—BLM sensitive. Habitat is present. NDOW diversity dataset (Jan 15, 2009) shows no peregrine falcon points within the nominated area.
	No	Bendire's thrasher (*Toxostoma bendirei*)—Not a BLM sensitive species.
	No	Desert kangaroo rat (*Dipodomys deserti*)—Not a BLM sensitive species.
	Yes	Golden eagle (*Aquila chrysaetos*)—BLM sensitive. Habitat is present.
	Yes	Phainopepla (*Phainopepla nitens*)—BLM sensitive species. NDOW diversity dataset (Jan 15, 2009) shows just four phainopepla points within the large nominated area.
	No	Desert pocket mouse (*Chaetodipus penicillatus sobrinus*)—Not a BLM sensitive species.
	Yes	Mojave desert tortoise (*Gopherus agassizii*)—Either not in designated critical habitat or in areas already nominated for ACEC proposals. West of I-15 contains moderate density habitat, including an artificially high population in the large scale translocation site.
	Yes	Chuckwalla (*Sauromalus ater (obesus))*—BLM sensitive. Habitat is present.
	Yes	Le Conte's thrasher (*Toxostoma lecontei*)—BLM sensitive. Habitat is present.
	Yes	Desert bighorn sheep (*Ovis canadensis nelson*)—BLM sensitive species, area contains both crucial and winter habitat.
A natural process or system (including endangered, sensitive, or threatened plant species; rare, endemic, or relic plants or plant communities that are terrestrial, aquatic, or riparian; or rare geological features).	No	Not nominated for these values
Natural hazards (including areas of avalanche, dangerous flooding, landslides, unstable soils, seismic activity, or dangerous if it is determined through the resource management planning process that it has become part of a natural process).	No	Area was not nominated for this value. None known to be present.

Importance

The value, resource, system, process, or hazard described above must have substantial significance and values to satisfy the "importance" criteria. This generally means that the value, resource, system, process, or hazard is characterized by one or more of the following:

Importance Value	Yes/No	Rationale for Determination
Has more than locally significant qualities that give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared with any similar resource.	No	Peregrine falcon—There is potential habitat throughout the region. The habitat in this area is not more than locally significant.
	No	Golden eagle—There is potential habitat throughout the region. The habitat in this area is not more than locally significant.
	No	Phainopepla—There is potential habitat throughout the region. The habitat in this area is not more than locally significant.
	No	Mojave desert tortoise—There is potential habitat throughout the region. The habitat in this area is not more than locally significant.
	No	Chuckwalla—There is potential habitat throughout the region. The habitat in this area is not more than locally significant.
	No	Le Conte's thrasher—There is potential habitat throughout the region. The habitat in this area is not more than locally significant.
	No	Desert bighorn sheep—Species occurs throughout the region.
Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.	No	Peregrine falcon—The habitat in the proposed area is not irreplaceable, unique, or exemplary. NDOW diversity dataset (Jan 15, 2009) shows no occurrences in the nominated area.
	No	Golden eagle—The species and habitat is found throughout the entire west. The habitat in the nominated area is not more exemplary or unique than other habitats. NDOW diversity dataset (Jan 15, 2009) shows just three golden eagle points within the nominated area.
	No	Phainopepla—The species and habitat is found throughout the region. The habitat in the nominated area is not more exemplary or unique than other habitats.
	Yes	Mojave desert tortoise—Populations and habitat within the Ivanpah Valley are important to maintain population connectivity for the Northeastern Recovery Unit of Mojave desert tortoise. The habitat for the wild population on the west side of I-15 is fragmented by tortoise fence barriers to separate the experimental population in the large scale translocation site from the wild population. Development of solar facilities within CA and NV and lack of habitat connection corridors under I-15 have left a narrow area of habitat occupied by tortoises within the nomination area east of I-15 along the Lucy Gray Mountains that maintains population connectivity. In addition, increased human use of the area for recreation and mining and increased demand for transmission utilities further threaten the function of the habitat corridor along the Lucy Gray Mountains. "Corridors" are defined as narrow areas of habitat in which resident tortoises persist and continue to interact with their neighbors within and outside the corridor, rather than a more narrow band of habitat will allow an individual tortoise to move through it to the other side, breed with a tortoise on that side, and produce viable offspring that contribute to the next generation.
	No	Chuckwalla—There are no uses threatening chuckwalla habitat.
	No	Le Conte's Thrasher—Habitat may be present, but the NDOW diversity dataset (Jan 15, 2009) shows no thrasher points within the nominated area.
	No	Desert bighorn sheep—The threats are minimal where the habitat is located.

Importance Value	Yes/No	Rationale for Determination
Has been recognized as warranting protection to satisfy national priority concerns or to carry out the mandates of FLPMA.	No	Peregrine falcon—BLM sensitive species, not a national priority.
	No	Golden eagle—BLM sensitive species for the State of Nevada, not a national priority. While there is a Bald and Golden Eagle Protection Act, this act does not require that this part of the habitat for golden eagle be a national priority.
	No	Phainopepla—BLM sensitive species for the State of Nevada, not a national priority.
	No	Mojave desert tortoise—Not designated critical habitat (outside of other nominated ACEC). Habitat is very low to moderate density in the nominated areas.
	No	Chuckwalla—BLM sensitive species, not a national priority.
	No	Le Conte's thrasher—BLM sensitive species for the State of Nevada, not a national priority.
	No	Desert bighorn sheep—BLM sensitive species for the State of Nevada, not a national priority.
Has qualities that warrant highlighting to satisfy public or management concerns about safety and public welfare.	No	Area was not nominated for this value. None known to be present.
Poses a significant threat to human life and safety or to property.	No	Area was not nominated for this value. Not present.

Nominated Area to Potential ACEC

The BLM interdisciplinary team determined that approximately 44,000 acres of the nominated acres within Ivanpah Valley meet at least one criterion for both relevance and importance and will be considered for incorporation in the Draft RMP/EIS. Specifically, the following values meet at least one criterion for both relevance and importance:

- Mojave desert tortoise

In addition, about 14,000 acres of the nominated area within the spring mound complex around Stump Springs meets at least one criterion for both relevance and importance for neotropical birds under a separate nomination.

N.3.2.22. Pahrump Valley Nominated ACEC

General Location:	Along the southwestern edge of the community of Pahrump.
General Description:	A large complex of linear woodlands that follow the general east-west drainage pattern in Pahrump Valley.
Nominated By:	BLM
Nominated Acreage:	41,770 acres.
Values Considered:	Cultural resource sites with prehistoric (of all ages) and possibly protohistoric campsites, mesquite harvest sites, mesquite acacia woodlands, Neotropical bird habitat, Pahrump Valley buckwheat.

Relevance

An area meets the "relevance" criterion if it contains one or more of the following:

Relevance Value	Yes/No	Rationale for Determination
A significant historic, cultural, or scenic value (including rare or sensitive archeological resources and religious or cultural resources important to Native Americans).	No	Area was not nominated for this value.
A fish and wildlife resource (including habitat for endangered, sensitive or threatened species, or habitat essential for maintaining species diversity).	Yes	Neotropical bird habitat.
A natural process or system (including endangered, sensitive, or threatened plant species; rare, endemic, or relic plants or plant communities that are terrestrial, aquatic, or riparian; or rare geological features).	Yes	Pahrump Valley buckwheat (*Eriogonum bifurcatum)*—Some point files of known occurrences, but no modeled habitat.
	Yes	Relic plant community (mesquite acacia woodlands) and riparian habitat.
Natural hazards (including areas of avalanche, dangerous flooding, landslides, unstable soils, seismic activity, or dangerous if it is determined through the resource management planning process that it has become part of a natural process).	No	Area was not nominated for this value. None known to be present.

Importance

The value, resource, system, process, or hazard described above must have substantial significance and values to satisfy the "importance" criteria. This generally means that the value, resource, system, process, or hazard is characterized by one or more of the following:

Importance Value	Yes/No	Rationale for Determination
Has more than locally significant qualities that give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared with any similar resource.	Yes	Neotropical bird habitat—*T*he size and largely unfragmented mesquite area is unique compared to other areas of mesquite in the region.
	Yes	Pahrump valley buckwheat—BLM sensitive species. One of three known populations and the largest of the three which makes it locally significant and distinctive.
	No	While the area contains examples of a relic plant community, it is not more than locally significant compared with other similar resources.
Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.	Yes	Neotropical bird habitat is fragile and threatened by casual recreation (OHV use), illegal woodcutting, development, and anthropogenic fire.
	Yes	Pahrump valley buckwheat—Vulnerable to development and sensitive to hydrologic modification. The population is unique to the area.
	Yes	Relic plant community is fragile and threatened by casual recreation, illegal woodcutting, development, and anthropogenic fire.
Has been recognized as warranting protection to satisfy national priority concerns or to carry out the mandates of FLPMA.	No	Area was not nominated for this value. None known to be present.

Importance Value	Yes/No	Rationale for Determination
Has qualities that warrant highlighting to satisfy public or management concerns about safety and public welfare.	No	Area was not nominated for this value. None known to be present.
Poses a significant threat to human life and safety or to property.	No	Area was not nominated for this value. None known to be present.

Nominated Area to Potential ACEC

The BLM interdisciplinary team determined that all of the 41,770 nominated acres meet at least one criterion for both relevance and importance and will be considered in the Draft RMP/EIS. Specifically, the following values meet at least one criterion for both relevance and importance:

- Mesquite acacia woodlands
- Neotropical bird habitat
- Pahrump Valley buckwheat

N.3.2.23. Perkins Ranch Nominated ACEC

General Location:	Along the Muddy River near Moapa, Nevada.
General Description:	High priority riparian habitat along the Muddy River.
Nominated By:	BLM
Nominated Acreage:	408 acres.
Values Considered:	Riparian values, Southwestern willow flycatcher and Moapa dace, and other special status species including the Muddy River population of the Virgin River chub.

Relevance

An area meets the "relevance" criterion if it contains one or more of the following:

Relevance Value	Yes/No	Rationale for Determination
A significant historic, cultural, or scenic value (including rare or sensitive archeological resources and religious or cultural resources important to Native Americans).	Yes	Cultural—High potential for prehistoric habitations and associated artifacts.
A fish and wildlife resource (including habitat for endangered, sensitive or threatened species, or habitat essential for maintaining species diversity).	Yes	Southwestern willow flycatcher (*Empidonax traillii extimus*)—federally listed (endangered); not designated critical habitat, but the species has been documented upstream from this location.
	Yes	Moapa dace (*Moapa coriacea*)—federally listed (endangered), listed in 1967. Not currently inhabited, but through development of a fish barrier and removal of exotic fish species, this area would be used for habitat.
	Yes	Muddy River population of the Virgin River chub (*Gila seminude*)—federally listed (endangered), however, no designated critical habitat on the Muddy River.
	Yes	Neotropical bird habitat—Including Lucy's warbler (*Vermivora luciae*), BLM sensitive; yellow warbler (*Dendroica petechial*), BLM sensitive; yellow-billed cuckoo (*Coccyzus americanus*), federal candidate.

Relevance Value	Yes/No	Rationale for Determination
A natural process or system (including endangered, sensitive, or threatened plant species; rare, endemic, or relic plants or plant communities that are terrestrial, aquatic, or riparian; or rare geological features).	Yes	Riparian—Riparian habitat type is extremely limited in this ecoregion, making this habitat important to maintain species diversity and to support bird migration. Includes two linear miles of the Muddy River.
Natural hazards (including areas of avalanche, dangerous flooding, landslides, unstable soils, seismic activity, or dangerous if it is determined through the resource management planning process that it has become part of a natural process).	No	Area was not nominated for this value. None known to be present.

Importance

The value, resource, system, process, or hazard described above must have substantial significance and values to satisfy the "importance" criteria. This generally means that the value, resource, system, process, or hazard is characterized by one or more of the following:

Importance Value	Yes/No	Rationale for Determination
Has more than locally significant qualities that give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared with any similar resource.	Yes	Cultural—The presence of extensive prehistoric habitation sites.
	Yes	Riparian, Neotropical bird habitat, Southwestern Willow Flycatcher, and Yellow-billed Cuckoo—Riparian habitat type is extremely limited in this ecoregion, making this habitat important to maintain species diversity and to support bird migration. There are still components of willow and mesquite associated with the riparian woodland area. The listed species are more than locally significant due to their listing.
	Yes	Moapa dace—federally listed (endangered), listed in 1967. Not currently inhabited, but through development of a fish barrier and removal of exotic fish species, this area would be used for habitat. Only occupies six miles of stream habitat in the Upper Muddy River area
	Yes	Muddy River population of the Virgin River chub—federally listed (endangered), however, no designated critical habitat on the Muddy River. Only found in the Virgin and Muddy Rivers.
Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.	Yes	Cultural—Vandalism and looting, although not as heavy impacts from OHV use.
	Yes	Riparian, Neotropical bird habitat, Southwestern Willow Flycatcher, and Yellow-billed Cuckoo—Riparian habitat type is extremely limited in this ecoregion, making this habitat important to maintain species diversity and to support bird migration. Native riparian vegetation is threatened with adverse changes by the invasion and abundance of tamarisk. Tamarisk crowds out the native willows and other understory vegetation, although there is still a willow component in this area. Development of riparian habitats along the Muddy River also reduces the amount and quality of riparian vegetation. Degradation of the riparian habitat through recreational use, invasive species, and water loss would impact the fragile habitat. The presence of the invasive species, such as tamarisk,

Importance Value	Yes/No	Rationale for Determination
		increases the fuel load in this area raising the risk of wildland fire altering key habitat components.
	Yes	Moapa dace—federally listed (endangered), listed in 1967. The presence of non-native fish that feed on this species threatens the dace. Barriers in the river obstruct free-movement for spawning and access to other habitat components. Lack of appropriately designed barriers also allow non-native species introduced to Lake Mead to access this area and prey on the dace.
	Yes	Muddy River population of the Virgin River chub—federally listed (endangered), however, no designated critical habitat on the Muddy River. Presence of non-native fish that feed on this species threatens the chub. Barriers in the river obstruct free-movement for spawning and access to other habitat components. Lack of appropriately designed barriers also allow non-native species introduced to Lake Mead to access this area and prey on this species.
Has been recognized as warranting protection to satisfy national priority concerns or to carry out the mandates of FLPMA.	No	Cultural—Beyond requirements to address cultural resources in the National Historic Preservation Act, section 106, the area is not recognized as a national priority.
	Yes	Riparian, Neotropical bird habitat, southwestern willow flycatcher, and yellow-billed cuckoo—While riparian habitat type is extremely limited in this ecoregion, its protection is not associated with a national priority in itself. The federally listed Southwestern Willow Flycatcher, and Yellow-billed Cuckoo could occur in this area. While not designated critical habitat, limited range and the documented presence of these species makes this area key to the recovery of the species, which is a national priority.
	Yes	Moapa dace—federally listed (endangered), listed in 1967. Not currently inhabited, but through development of a fish barrier and removal of exotic fish species, this area could be used for habitat. Recovery of this species, which would include use of this area, is a national priority.
	No	Muddy River population of the Virgin River chub—While the species is federally listed (endangered), there is no designated critical habitat on the Muddy River. While recovery of this species, which could include use of this area, is a national priority, this portion of potential habitat is not designated critical and therefore not deemed as "recognized as warranting protection to satisfy national priority concerns."
Has qualities that warrant highlighting to satisfy public or management concerns about safety and public welfare.	No	Area was not nominated for this value. None known to be present.
Poses a significant threat to human life and safety or to property.	No	Area was not nominated for this value. Not present.

Nominated Area to Potential ACEC

The BLM interdisciplinary team determined that all of the 408 nominated acres meet at least one criterion for both relevance and importance and will be considered in the Draft RMP/EIS. Specifically, the following values meet at least one criterion for both relevance and importance:

- Cultural/historic values
- Riparian values

- Southwestern willow flycatcher
- Moapa dace
- Muddy River population of the Virgin River chub.

N.3.2.24. South Bare Mountains (Crater Flat) Nominated ACEC

General Location:	Northeast side of US Highway 95 near the town of Beatty in southern Nye County.
General Description:	Mountain range along the Amargosa Desert area.
Nominated By:	Nevada Department of Wildlife (NDOW).
Nominated Acreage:	87,692 acres.
Values Considered:	Desert bighorn sheep, chuckwalla.

Relevance

An area meets the "relevance" criterion if it contains one or more of the following:

Relevance Value	Yes/No	Rationale for Determination
A significant historic, cultural, or scenic value (including rare or sensitive archeological resources and religious or cultural resources important to Native Americans).	No	Not nominated for these values.
A fish and wildlife resource (including habitat for endangered, sensitive or threatened species, or habitat essential for maintaining species diversity).	Yes	Desert bighorn sheep (*Ovis canadensis nelson*)—BLM sensitive species. Some crucial habitat and winter habitat within the proposed area, but very small in comparison to the proposed area.
	No	Chuckwalla (*Sauromalus ater (obesus)*)—Nomination is for protection of a use of this species (collection), not for the protection of the species. Protection of this use is not a relevant value. The species does not need protection due to the high levels of collection currently taking place, indicating a healthy population.
A natural process or system (including endangered, sensitive, or threatened plant species; rare, endemic, or relic plants or plant communities that are terrestrial, aquatic, or riparian; or rare geological features).	No	Not nominated for these values.
Natural hazards (including areas of avalanche, dangerous flooding, landslides, unstable soils, seismic activity, or dangerous if it is determined through the resource management planning process that it has become part of a natural process).	No	Area was not nominated for this value. None known to be present.

Importance

The value, resource, system, process, or hazard described above must have substantial significance and values to satisfy the "importance" criteria. This generally means that the value, resource, system, process, or hazard is characterized by one or more of the following:

Importance Value	Yes/No	Rationale for Determination
Has more than locally significant qualities that give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared with any similar resource.	No	Desert bighorn sheep—Species occurs throughout the region.
Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.	No	Desert bighorn sheep—The population is stable (2008-2009 Big Game Status), but it is small compared to others in the region, but the threats are minimal where the habitat is located.
Has been recognized as warranting protection to satisfy national priority concerns or to carry out the mandates of FLPMA.	No	Desert bighorn sheep—BLM sensitive species for the State of Nevada, not a national priority.
Has qualities that warrant highlighting to satisfy public or management concerns about safety and public welfare.	No	Area was not nominated for this value. None known to be present.
Poses a significant threat to human life and safety or to property.	No	Area was not nominated for this value. Not present.

Nominated Area to Potential ACEC

This area was nominated to include 87,650 acres of public land. NDOW identified this area as being important for at least the desert bighorn sheep and the chuckwalla. Their nomination states, "The area receives a high degree of attention by commercial reptile collectors. Given the numerous applications for solar energy development throughout the Amargosa Desert area, concerns have arisen for species whose distributions will be severely fragmented or reduced as a result of energy development in the area. Delineation of this proposed ACEC ideally would encompass all of the Bare Mountains but constrained here by BLM's Southern Nevada and Battle Mountain District's jurisdictional boundaries."

The BLM interdisciplinary team determined that the area does not meet the criteria of relevance and importance for cultural values, fish and wildlife resources, and natural processes or systems.

N.3.2.25. South Newbury Mountains Nominated ACEC

General Location:	The most southern portion of BLM lands, southwest of Laughlin.
General Description:	Habitat for BLM special status species.
Nominated By:	NDOW
Nominated Acreage:	26,877 acres.
Values Considered:	Desert kangaroo rat, desert pocket mouse, phainopepla, peregrine falcon, Le Conte's thrasher, western burrowing owl, Lucy's warbler, crissal thrasher, and chuckwalla.

Relevance

An area meets the "relevance" criterion if it contains one or more of the following:

Relevance Value	Yes/No	Rationale for Determination
A significant historic, cultural, or scenic value (including rare or sensitive archeological resources and religious or cultural resources important to Native Americans).	No	Not nominated for these values.
A fish and wildlife resource (including habitat for endangered, sensitive or threatened species, or habitat essential for maintaining species diversity).	No	Desert kangaroo rat (*Dipodomys deserti*)—Not a BLM sensitive species.
	No	Desert pocket mouse (*Chaetodipus penicillatus sobrinus*)—Not a BLM sensitive species.
	Yes	Phainopepla (*Phainopepla nitens*)—BLM sensitive. Habitat is present.
	Yes	Peregrine falcon (*Falco peregrines*)—BLM sensitive. Habitat may be present.
	Yes	Le Conte's thrasher (*Toxostoma lecontei*)—BLM sensitive. Habitat is present.
	Yes	Western burrowing owl (*Athene cunicularia*)—BLM sensitive. Habitat may be present.
	Yes	Lucy's warbler (*Vermivora luciae*)—BLM sensitive. Habitat is present.
	Yes	Crissal thrasher (*Toxostoma crissale*)—BLM sensitive. Habitat is present.
	Yes	Chuckwalla (*Sauromalus ater (obesus)*)—BLM sensitive. Habitat is present.
A natural process or system (including endangered, sensitive, or threatened plant species; rare, endemic, or relic plants or plant communities that are terrestrial, aquatic, or riparian; or rare geological features).	No	Not nominated for these values.
Natural hazards (including areas of avalanche, dangerous flooding, landslides, unstable soils, seismic activity, or dangerous if it is determined through the resource management planning process that it has become part of a natural process).	No	Area was not nominated for this value. None known to be present.

Importance

The value, resource, system, process, or hazard described above must have substantial significance and values to satisfy the "importance" criteria. This generally means that the value, resource, system, process, or hazard is characterized by one or more of the following:

Importance Value	Yes/No	Rationale for Determination
Has more than locally significant qualities that give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared with any similar resource.	No	Phainopepla—There is potential habitat throughout the region. The habitat in this area is not more than locally significant.
	No	Peregrine falcon—There is potential habitat throughout the region. The habitat in this area is not more than locally significant.
	No	Le Conte's thrasher—There is potential habitat throughout the region. The habitat in this area is not more than locally significant.
	No	Western burrowing owl—There is potential habitat throughout the region. The habitat in this area is not more than locally significant.
	No	Lucy's warbler—There is potential habitat throughout the region. The habitat in this area is not more than locally significant.
	No	Crissal thrasher—There is potential habitat throughout the region. The habitat in this area is not more than locally significant.
	No	Chuckwalla—There is potential habitat throughout the region. The habitat in this area is not more than locally significant.
Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.	No	Phainopepla—The species and habitat is found throughout the southwest. Hiko Spring is already included in a separate ACEC nomination. The habitat in the remainder of the nominated area is not more exemplary or unique than other habitats.
	No	Peregrine falcon—The species and habitat is found throughout the west. The habitat in the proposed area is not irreplaceable, unique, or exemplary.
	No	Le Conte's thrasher—The species and habitat is found throughout the region. The habitat in the nominated area is not more exemplary or unique than other habitats.
	No	Western burrowing owl—The species and habitat is found throughout the entire west. The habitat in the nominated area is not more exemplary or unique than other habitats.
	No	Lucy's warbler—The species and habitat is found throughout the southwest. Hiko Spring is already included in a separate ACEC nomination. The habitat in the remainder of the nominated area is not more exemplary or unique than other habitats.
	No	Crissal thrasher—The species and habitat is found throughout the region. The habitat in the nominated area is not more exemplary or unique than other habitats.
	No	Chuckwalla—The species and habitat is found throughout the region. The habitat in the nominated area is not more exemplary or unique than other habitats.
Has been recognized as warranting protection to satisfy national priority concerns or to carry out the mandates of FLPMA.	No	Phainopepla—BLM sensitive species for the State of Nevada, not a national priority.
	No	Peregrine falcon—BLM sensitive species, not a national priority.
	No	Le Conte's thrasher—BLM sensitive species for the State of Nevada, not a national priority.
	No	Western burrowing owl—BLM sensitive species for the State of Nevada, not a national priority.
	No	Lucy's warbler—BLM sensitive species for the State of Nevada, not a national priority.
	No	Crissal thrasher—BLM sensitive species for the State of Nevada, not a national priority.
	No	Chuckwalla—BLM sensitive species, not a national priority.

Importance Value	Yes/No	Rationale for Determination
Has qualities that warrant highlighting to satisfy public or management concerns about safety and public welfare.	No	Area was not nominated for this value. None known to be present.
Poses a significant threat to human life and safety or to property.	No	Area was not nominated for this value. Not present.

Nominated Area to Potential ACEC

This area was nominated to include 26,877 acres of public land. NDOW identified this area as being important for several sensitive species. Their nomination states, "An extension is recommended of the existing Piute/Eldorado ACEC complex towards Laughlin, excluding private property and existing land protection designations. Also important for desert kangaroo rat, desert pocket mouse, phainopepla, peregrine falcon, Le Conte's thrasher, western burrowing owl, Lucy's warbler, crissal thrasher. This is an important area for the BLM Sensitive Species, chuckwalla. This area receives high use by OHVs and commercial reptile collectors and also has one application for wind energy development."

The BLM interdisciplinary team determined that the area does not meet the criteria of relevance and importance for cultural values, fish and wildlife resources, and natural processes or systems. However, a portion of this nominated area overlaps another nominated ACEC which could be considered in the RMP alternatives.

N.3.2.26. Specter Hills Nominated ACEC

General Location:	The Rock Valley, North of Ash Meadows and Specter Range in Nye County.
General Description:	The only three populations of white-margined penstemon within Nye County, and the northernmost populations of the species.
Nominated By:	BLM
Nominated Acreage:	6,603 acres.
Values Considered:	White-margined penstemon.

Relevance

An area meets the "relevance" criterion if it contains one or more of the following:

Relevance Value	Yes/No	Rationale for Determination
A significant historic, cultural, or scenic value (including rare or sensitive archeological resources and religious or cultural resources important to Native Americans).	No	Area was not nominated for these values.
A fish and wildlife resource (including habitat for endangered, sensitive or threatened species, or habitat essential for maintaining species diversity).	No	Area was not nominated for these values.

Relevance Value	Yes/No	Rationale for Determination
A natural process or system (including endangered, sensitive, or threatened plant species; rare, endemic, or relic plants or plant communities that are terrestrial, aquatic, or riparian; or rare geological features).	Yes	White-margined penstemon (*Penstemon albomarginatus*)—BLM sensitive species. Northernmost extent of the species range. The Rock Valley is the largest population group in Nye County with an estimated 20,000 individuals on 236 acres in 2001.
Natural hazards (including areas of avalanche, dangerous flooding, landslides, unstable soils, seismic activity, or dangerous if it is determined through the resource management planning process that it has become part of a natural process).	No	Area was not nominated for this value. None known to be present.

Importance

The value, resource, system, process, or hazard described above must have substantial significance and values to satisfy the "importance" criteria. This generally means that the value, resource, system, process, or hazard is characterized by one or more of the following:

Importance Value	Yes/No	Rationale for Determination
Has more than locally significant qualities that give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared with any similar resource.	Yes	White-margined penstemon—The area represents the northernmost populations of a regionally endemic plant
Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.	Yes	White-margined penstemon—Road maintenance, mineral development and OHV use threaten the species at these locations.
Has been recognized as warranting protection to satisfy national priority concerns or to carry out the mandates of FLPMA.	No	White-margined penstemon—not federally listed.
Has qualities that warrant highlighting to satisfy public or management concerns about safety and public welfare.	No	Area was not nominated for this value. None known to be present.
Poses a significant threat to human life and safety or to property.	No	Area was not nominated for this value. Not present.

Nominated Area to Potential ACEC

The BLM interdisciplinary team determined that 5,429 acres of the nominated acres meet at least one criterion for both relevance and importance and will be considered in the Draft RMP/EIS. Specifically, the following values meet at least one criterion for both relevance and importance:

- White-margined penstemon

N.3.2.27. Spirit Mountain Nominated ACEC

General Location:	The southeast area between the Piute/Eldorado Valley ACEC and Spirit Mountain Wilderness/Lake Mead National Recreation Area
General Description:	T. 30 S., R. 65 E., sections 28, 29, 32, 33T. 31 S., R.65 E., sections 4, 5, 7, 8, 9, 16, 17, 18, 19, 20, 21
Nominated By:	National Park Service (NPS)
Nominated Acreage:	9,488 acres.
Values Considered:	VRM, Cultural, Bighorn Sheep.

Relevance

An area meets the "relevance" criterion if it contains one or more of the following:

Relevance Value
Yes/No
Rationale for Determination

A significant historic, cultural, or scenic value (including rare or sensitive archeological resources and religious or cultural resources important to Native Americans).

Yes
Cultural - Ethnographic and historic features.

Yes
Historic – There is historic mining in the area.

Yes
Scenic – The Newberry Mountains contain significant scenic qualities due to dramatic relief, rugged nature of the landscape which creates striking vistas of the surrounding desert.

A fish and wildlife resource (including habitat for endangered, sensitive or threatened species, or habitat essential for maintaining species diversity).

Yes
Desert bighorn sheep (*Ovis canadensis nelson*)—BLM sensitive species. The area does contain habitat for bighorn sheep.

Importance

The value, resource, system, process, or hazard described above must have substantial significance and values to satisfy the "importance" criteria. This generally means that the value, resource, system, process, or hazard is characterized by one or more of the following:

Importance Value	Yes/No	Rationale for Determination
Has more than locally significant qualities that give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared with any similar resource.	Yes	Cultural - A portion of the nominated area falls within the Traditional Cultural Property for Native Americans and is a part of cultural landscape surrounding Spirit Mountain.
	Yes	Historic – Regionally important as a Historic Mining District.
	No	Scenic - Other sites in the region have similar scenic characteristics.
	No	Bighorn Sheep – While the area does contain habitat for bighorn sheep, the habitat has not been identified as either crucial winter or summer habitat by NDOW.

Importance Value	Yes/No	Rationale for Determination
Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.	Yes	Cultural – Traditional use of the area is vulnerable to adverse change and effects that change would have an effect on the cultural landscape surrounding Spirit Mountain.
	Yes	Historic - The area's resources are fragile and some areas have experienced high use. Use over time would continue to result in adverse change.
	No	Scenic – The area does not contain specific assets or conditions A portion of the area is protected within the Spirit Mountain Wilderness. Other sites in the region have similar scenic characteristics.
	No	Bighorn Sheep - The area is similar to habitat already protected by Lake Mead NRA and Piute/Eldorado ACEC. A portion of the bighorn habitat is also already protected by the Spirit Mountain Wilderness.
Has been recognized as warranting protection to satisfy national priority concerns or to carry out the mandates of FLPMA.	No	Cultural - Beyond requirements to address cultural resources in the National Historic Preservation Act, section 106, the area is not recognized as a national priority.
	No	Scenic - A portion of the nominated area is within Spirit Mountain Wilderness which is managed to preserve its natural character. The remainder of the nominated area has scenic character similar to that within the region; it is not national priority.
	No	Western burrowing owl—BLM sensitive species for the State of Nevada, not Bighorn Sheep – While bighorn is a BLM sensitive species in Nevada, it is not a national priority.a national priority.
Has qualities that warrant highlighting to satisfy public or management concerns about safety and public welfare.	No	Area was not nominated for this value. None known to be present.
Poses a significant threat to human life and safety or to property.	No	Area was not nominated for this value. Not present.

Nominated Area to Potential ACEC

The BLM interdisciplinary team determined that all 9,488 nominated acres meet at least one criterion for both relevance and importance. Specifically, the following values meet at least one criterion for both relevance and importance:

- cultural/historic values

N.3.2.28. Specter Range to Devil's Hole Hills Nominated ACEC

General Location:	Within Nye County west of the town of Mercury.
General Description:	Mountain range east of the Amargosa Valley.
Nominated By:	Nevada Department of Wildlife (NDOW)
Nominated Acreage:	238,538 acres.
Values Considered:	Desert bighorn sheep, phainopepla, golden eagle, peregrine falcon, Le Conte's thrasher, desert kangaroo rat, western burrowing owl, reptile collectors.

Relevance

An area meets the "relevance" criterion if it contains one or more of the following:

Relevance Value	Yes/No	Rationale for Determination
A significant historic, cultural, or scenic value (including rare or sensitive archeological resources and religious or cultural resources important to Native Americans).	No	Not nominated for these values.
A fish and wildlife resource (including habitat for endangered, sensitive or threatened species, or habitat essential for maintaining species diversity).	Yes	Desert bighorn sheep (*Ovis canadensis nelson*)—BLM sensitive species. Some crucial habitat and winter habitat within the proposed area, but smaller that the proposed area (not including the lowlands).
	N/A	Phainopepla (*Phainopepla nitens*)—BLM sensitive species. Present, but already within the Amargosa/Mesquite existing ACEC and habitat is already addressed by the expansion of that ACEC in another proposal.
	No	Golden eagle (*Aquila chrysaetos*)—BLM sensitive. NDOW diversity dataset (Jan 15, 2009) shows no golden eagle points within the nominated area (one is in the existing Ash Meadows ACEC/Refuge).
	No	Peregrine falcon (*Falco peregrines*)—BLM sensitive. NDOW diversity dataset (Jan 15, 2009) shows no peregrine falcon points within the nominated area.
	Yes	Le Conte's thrasher (*Toxostoma lecontei*)—BLM sensitive. Habitat is present.
	No	Desert kangaroo rat (*Dipodomys deserti*)—Not a BLM sensitive species.
	Yes	Western burrowing owl (*Athene cunicularia*)—BLM sensitive. Habitat is present.
	No	Reptile collection—Nomination is for protection of a use (collection), not for the protection of the species. Protection of this use is not a relevant value.
A natural process or system (including endangered, sensitive, or threatened plant species; rare, endemic, or relic plants or plant communities that are terrestrial, aquatic, or riparian; or rare geological features).	No	Not nominated for these values.
Natural hazards (including areas of avalanche, dangerous flooding, landslides, unstable soils, seismic activity, or dangerous if it is determined through the resource management planning process that it has become part of a natural process).	No	Area was not nominated for this value. None known to be present.

Importance

The value, resource, system, process, or hazard described above must have substantial significance and values to satisfy the "importance" criteria. This generally means that the value, resource, system, process, or hazard is characterized by one or more of the following:

Importance Value	Yes/No	Rationale for Determination
Has more than locally significant qualities that give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared with any similar resource.	No	Desert bighorn sheep—Species occurs throughout the region.
	No	Le Conte's thrasher—There is potential habitat throughout the region. The habitat in this area is not more than locally significant.
	No	Western burrowing owl—There is potential habitat throughout the region. The habitat in this area is not more than locally significant.
Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.	No	Desert bighorn sheep—The population is stable (2008-2009 Big Game Status), one of the two populations (Specter) are small compared to others in the region, but the other population (Last Chance) is larger (120 in 2009). The threats are minimal where the habitat is located.
	No	Le Conte's thrasher—Present, but the NDOW diversity dataset (Jan 15, 2009) shows one thrasher point within the nominated area, and it is already within the Amargosa/Mesquite existing ACEC, which is for bird habitat.
	No	Western burrowing owl—The species and habitat is found throughout the entire west. The habitat in the nominated area is not more exemplary or unique than other habitats. Additionally, NDOW diversity dataset (Jan 15, 2009) shows no Western burrowing owl points within the nominated area.
Has been recognized as warranting protection to satisfy national priority concerns or to carry out the mandates of FLPMA.	No	Desert bighorn sheep—BLM sensitive species for the State of Nevada, not a national priority.
	No	Le Conte's thrasher—BLM sensitive species for the State of Nevada, not a national priority.
	No	Western burrowing owl—BLM sensitive species for the State of Nevada, not a national priority.
Has qualities that warrant highlighting to satisfy public or management concerns about safety and public welfare.	No	Area was not nominated for this value. None known to be present.
Poses a significant threat to human life and safety or to property.	No	Area was not nominated for this value. Not present.

Nominated Area to Potential ACEC

This area was nominated to include 238,538 acres of public land. NDOW identified this area as being important for at least the desert bighorn sheep and several other sensitive species. Their nomination states, "The Specter and Last Chance ranges support desert bighorn sheep. Phainopepla, golden eagle, peregrine falcon, Le Conte's thrasher, desert kangaroo rat, and Western burrowing owl are also likely present based on site records and/or potential habitat. The area receives a high degree of attention by commercial reptile collectors."

The BLM interdisciplinary team determined that the area does not meet the criteria of relevance and importance for cultural values, fish and wildlife resources, and natural processes or systems.

N.3.2.29. Stewart Valley Nominated ACEC

General Location:	1.25 miles west of Pahrump on Highway 372, then north on Ash Meadows Road for 4.75 miles. The legal location is T 19 S, R 52 E, Sec. 31 and T 20 S, R 52 E, Sections 6 and 7.
General Description:	Mesquite woodland flanked by the Resting Spring Range to the west and High Peak Mountain to the east.
Nominated By:	BLM

Nominated Acreage:	5,204 acres.
Values Considered:	Cultural resource sites with prehistoric (of all ages) and possibly protohistoric campsites and mesquite harvest sites, Pahrump Valley buckwheat.

Relevance

An area meets the "relevance" criterion if it contains one or more of the following:

Relevance Value	Yes/No	Rationale for Determination
A significant historic, cultural, or scenic value (including rare or sensitive archeological resources and religious or cultural resources important to Native Americans).	Yes	Cultural—Cultural resource sites with prehistoric (of all ages) and possibly protohistoric campsites and mesquite harvest sites.
A fish and wildlife resource (including habitat for endangered, sensitive or threatened species, or habitat essential for maintaining species diversity).	No	Area was not nominated for this value.
A natural process or system (including endangered, sensitive, or threatened plant species; rare, endemic, or relic plants or plant communities that are terrestrial, aquatic, or riparian; or rare geological features).	Yes	Mesquite woodlands—This site, though small in size, is one of the most pristine mesquite woodlands remaining in southern Nevada. Trees at Stewart Valley are significantly larger and have fewer stems than trees at other sites, and reach heights of 25-30 feet with stems approaching 3 feet in diameter.
	Yes	Pahrump Valley buckwheat (*Eriogonum bifurcatum*)—BLM sensitive species.
Natural hazards (including areas of avalanche, dangerous flooding, landslides, unstable soils, seismic activity, or dangerous if it is determined through the resource management planning process that it has become part of a natural process).	No	Area was not nominated for this value. None known to be present.

Importance

The value, resource, system, process, or hazard described above must have substantial significance and values to satisfy the "importance" criteria. This generally means that the value, resource, system, process, or hazard is characterized by one or more of the following:

Importance Value	Yes/No	Rationale for Determination
Has more than locally significant qualities that give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared with any similar resource.	No	Cultural—Sites are similar in nature and distribution to others areas in the region.
	No	Mesquite woodlands—Resource is similar in nature and composition to others areas in the region.
	Yes	Pahrump Valley buckwheat—BLM sensitive species that is endemic to this area. The habitat is in a narrowly restricted range that straddles the Nevada/California border.

Importance Value	Yes/No	Rationale for Determination
Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.	Yes	Cultural—The location of the area adjacent to the town of Pahrump and the associated OHV use makes this area specifically vulnerable to adverse change from such use.
	Yes	Mesquite woodlands—Vulnerable to adverse changes from OHV and truck use between and among the trees. Also sensitive to woodcutting. This area is based on a perched water table, making its continued presence dependent on the continued availability of the water resources.There is a public demand for using the mesquite for firewood.This area is also located in hydrographic basin that has been over-appropriated.OHV use on the dunes fragments and degrades the mesquite, and affects recruitment.
	Yes	Pahrump Valley buckwheat—The habitat for this species is in the location of the area adjacent to the town of Pahrump and the associated OHV use makes this area specifically vulnerable to adverse change from such use.
Has been recognized as warranting protection to satisfy national priority concerns or to carry out the mandates of FLPMA.	No	Cultural—Beyond requirements to address cultural resources in the National Historic Preservation Act, section 106, the area is not recognized as a national priority.
	No	Mesquite woodlands—No national priority, except as habitat (see above).
	No	Pahrump Valley buckwheat—BLM sensitive species, not federally listed.
Has qualities that warrant highlighting to satisfy public or management concerns about safety and public welfare.	No	Area was not nominated for this value. None known to be present.
Poses a significant threat to human life and safety or to property.	No	Area was not nominated for this value. Not present.

Nominated Area to Potential ACEC

The BLM interdisciplinary team determined that all of the 5,204 nominated acres meet at least one criterion for both relevance and importance and will be considered in the Draft RMP/EIS. Specifically, the following values meet at least one criterion for both relevance and importance:

- Cultural/historic values
- Mesquite woodlands
- Pahrump Valley buckwheat

N.3.2.30. Stuart Ranch Nominated ACEC

General Location:	Meadow Valley Wash, 10 miles north of Moapa off of SR 168 and extends north to the Lincoln-Clark County Line in eastern Clark County.
General Description:	Two parcels spanning the active wash and riparian system extending up out of the large wash channel and onto higher elevation mesa comprised of Mojave shrub community. Water is present within portions of the wash at all times of the year.
Nominated By:	BLM
Nominated Acreage:	278 acres.
Values Considered:	Special status species, historic and cultural values.

Relevance

An area meets the “relevance” criterion if it contains one or more of the following:

Relevance Value	Yes/No	Rationale for Determination
A significant historic, cultural, or scenic value (including rare or sensitive archeological resources and religious or cultural resources important to Native Americans).	Yes	Cultural—A variety of site types, including prehistoric and historic and unique rock art.
A fish and wildlife resource (including habitat for endangered, sensitive or threatened species, or habitat essential for maintaining species diversity).	Yes	Relict leopard frog (*Rana onca*) while not present in Meadow Valley Wash, there is a planned reintroduction in a constructed refugia, and this area is within its historic range.
	Yes	Southwestern willow flycatcher (*Empidonax traillii extimus*)—federally listed (endangered). The species has been documented in the wash, however, the area was not designated by the U.S. Fish and Wildlife Service as critical habitat.
	Yes	Meadow Valley Wash desert sucker (*Catostomus clarki ssp.*)—BLM sensitive species.
	Yes	Meadow Valley Wash speckled dace (*Rhinichthys osculus ssp.*)—BLM sensitive species.
	Yes	Mojave desert tortoise (*Gopherus agassizii*)—federally listed (threatened), downward trend; designated critical habitat. The species was an 8c (moderate degree of threat, high potential for recovery), but is now a 6c (high degree of threat, low potential for recovery).
A natural process or system (including endangered, sensitive, or threatened plant species; rare, endemic, or relic plants or plant communities that are terrestrial, aquatic, or riparian; or rare geological features).	Yes	Riparian—Riparian habitat type is extremely limited in this ecoregion, making this habitat important to maintain species diversity and to support bird migration.
Natural hazards (including areas of avalanche, dangerous flooding, landslides, unstable soils, seismic activity, or dangerous if it is determined through the resource management planning process that it has become part of a natural process).	No	Area was not nominated for this value. None known to be present.

Importance

The value, resource, system, process, or hazard described above must have substantial significance and values to satisfy the "importance" criteria. This generally means that the value, resource, system, process, or hazard is characterized by one or more of the following:

Importance Value	Yes/No	Rationale for Determination
Has more than locally significant qualities that give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared with any similar resource.	Yes	Cultural—Rock art is more than locally significant due to its diversity in the small area, as well as the presence of historic glyphs.
	No	Relict leopard frog—While introductions are planned, it is not known if they will be successful. Therefore, it is not known whether this is important habitat or not.
	No	Southwestern willow flycatcher—federally listed (endangered); The species has been documented in the wash, however, the area was not designated by the U.S. Fish and Wildlife Service as

Importance Value	Yes/No	Rationale for Determination
		critical habitat, therefore it is not considered more than locally significant compared to other similar habitat.
	Yes	Meadow Valley Wash Desert Sucker—BLM sensitive species. Endemic to the Meadow Valley Wash area.
	Yes	Meadow Valley Wash Speckled dace—BLM sensitive species. Endemic to the Meadow Valley Wash area.
	Yes	Mojave desert tortoise—federally listed (threatened), designated critical habitat.
	Yes	Riparian—Riparian habitat type is extremely limited in this ecoregion. This one is even more significant due to its perennial stream flow.
Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.	Yes	Cultural—Recreational use in this area could impact the fragile, irreplaceable cultural resources, as well as looting and vandalism, including shooting. The area has the potential to yield significant cultural information.
	No	Relict leopard frog—While introductions are planned, it is not known if they will be successful. Therefore, it is not known whether this is important habitat or not.
	No	Southwestern willow flycatcher—While habitat along the river is highly restricted by the presence of invasive tamarisk, threatening the species with adverse changes, its condition is not unique or rare.
	Yes	Meadow Valley Wash Desert sucker—BLM sensitive species, rare because they are endemic only in this area.
	Yes	Meadow Valley Wash Speckled dace—BLM sensitive species, rare because they are endemic only in this area.
	Yes	Mojave desert tortoise—federally listed (threatened), downward trend; designated critical habitat.
	Yes	Riparian—Riparian habitat type is extremely limited in this ecoregion, making this habitat important to maintain species diversity and to support bird migration. Native riparian vegetation is threatened with adverse changes by the invasion and abundance of tamarisk. Tamarisk could crowd out the native willows and other understory vegetation. Degradation of the riparian habitat through recreational use, invasive species, and water loss would impact the fragile habitat and the unique species.
Has been recognized as warranting protection to satisfy national priority concerns or to carry out the mandates of FLPMA.	No	Cultural—Beyond requirements to address cultural resources in the National Historic Preservation Act, section 106, the area is not recognized as a national priority.
	No	Relict leopard frog—While introductions are planned, it is not known if they will be successful. Therefore, it is not known whether this is important habitat or not.
	No	Southwestern willow flycatcher—federally listed (endangered); The species has been documented in the wash, however, the area was not designated by the U.S. Fish and Wildlife Service as critical habitat and is therefore not identified as “warranting protection to satisfy national priority concerns.
	No	Meadow Valley Wash Desert Sucker—BLM sensitive species, but not a federally listed species.
	No	Meadow Valley Wash Speckled dace—BLM sensitive species, but not a federally listed species.
	Yes	Mojave desert tortoise—federally listed (threatened), downward trend; critical habitat.

Importance Value	Yes/No	Rationale for Determination
	No	Riparian—While riparian habitat type is extremely limited in this ecoregion, it has not been recognized as a national priority for protection, beyond providing habitat for the Southwestern willow flycatcher.
Has qualities that warrant highlighting to satisfy public or management concerns about safety and public welfare.	No	Area was not nominated for this value. None known to be present.
Poses a significant threat to human life and safety or to property.	No	Area was not nominated for this value. Not present.

Nominated Area to Potential ACEC

The BLM interdisciplinary team determined that all of the 278 nominated acres meet at least one criterion for both relevance and importance and will be considered in the Draft RMP/EIS. Specifically, the following values meet at least one criterion for both relevance and importance:

- Cultural/historic values
- Southwestern willow flycatcher
- Meadow Valley desert sucker
- Meadow Valley Wash speckled dace
- Mojave desert tortoise
- Riparian habitat

N.3.2.31. Stump Spring 2 Nominated ACEC

General Location:	Located in western Clark County, north of the town of Sandy Valley. The area borders California on the southwest and on the north and northeast borders the Spring Mountains National Recreation Area. The northwest and southwest sides are bordered by other BLM lands, with some adjacent private lands. Nevada Highway 160 crosses the nominated area, as well as several well-used unpaved roads used to access Sandy Valley.
General Description:	The majority of the nominated ACEC lies on the floor of Pahrump Valley; the valley floor is at an elevation of 2,600 ft. to 3,000 ft. The nominated ACEC ascends the northeastern slopes of Pahrump Valley in the foothills of the Spring Mountains, reaching a high point of about 5,500 ft. Smaller isolated hills and ridges occur in the southern portion of the area. The area also contains a portion of the Old Spanish National Historic Trail.
Nominated By:	DCP, BLM
Nominated Acreage:	119,943 acres (DCP), expanded to 126,952 by BLM
Values Considered:	Mojave desert tortoise, western burrowing owl, desert kangaroo rat, desert pocket mouse, threecorner milkvetch, sticky buckwheat, Las Vegas buckwheat, Las Vegas bearpoppy, yellow two-toned beardtongue, Pahrump Valley buckwheat.

Relevance:

An area meets the “relevance” criterion if it contains one or more of the following:

Relevance Value	Yes/No	Rationale for Determination
A significant historic, cultural, or scenic value (including rare or sensitive archeological resources and religious or cultural resources important to Native Americans).	No	Area was not nominated for this value. Resources evaluated under other nominations.
A fish and wildlife resource (including habitat for endangered, sensitive or threatened species, or habitat essential for maintaining species diversity).	Yes	Mojave desert tortoise (*Gopherus agassizii)*—federally listed (Threatened)—This area does not contain designated critical habitat, but the area includes known and modeled habitat, as well as habitat that is likely to support tortoise.
	Yes	Western burrowing owl (*Athene cunicularia)*—BLM sensitive. Area includes modeled habitat.
	No	Desert kangaroo rat (*Dipodomys deserti)*—Not a BLM sensitive species.
	No	Desert pocket mouse (*Chaetodipus penicillatus sobrinus)*—Not a BLM sensitive species.
A natural process or system (including endangered, sensitive, or threatened plant species; rare, endemic, or relic plants or plant communities that are terrestrial, aquatic, or riparian; or rare geological features).	Yes	Pahrump Valley buckwheat (*Eriogonum bifurcatum.)*—BLM sensitive. A small portion of the nominated area includes occupied habitat.
	No	Yellow twotone beardtongue (*Penstemon bicolor ssp Bicolor)*—BLM sensitive. Outside the known range of the species.
	No	Las Vegas bearpoppy (*Arctomecon californica)*—BLM sensitive. Outside the known range of the species.
	No	Las Vegas buckwheat (*Eriogonum corymbosum var. Nilesii)*—BLM sensitive, Candidate for federal listing. Outside the known range of the species.
	No	Sticky buckwheat (*Eriogonum viscidulum)*—BLM sensitive. Outside the known range of the species.
	No	Threecorner milkvetch (*Astragalus geyeri var. Triquetrus)*—BLM sensitive. Outside the known range of the species.
Natural hazards (including areas of avalanche, dangerous flooding, landslides, unstable soils, seismic activity, or dangerous if it is determined through the resource management planning process that it has become part of a natural process).	No	Area was not nominated for this value. None known to be present.

Importance:

If a nominated value, resource, system, process, or hazard did not meet at least one of the relevance criteria, it was not evaluated for importance. A value, resource, system, process, or hazard meets the "importance" criterion if it is characterized by one or more of the following:

Importance Value	Yes/No	Rationale for Determination
Has more than locally significant qualities that give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared with any similar resource.	No	Mojave desert tortoise—The area is not designated critical habitat. While there is habitat, its values (quality and densities) are not more distinctive than other habitat in the region.
	No	Western burrowing owl—There is potential habitat throughout the region. The habitat in this area is not more than locally significant.
	Yes	Pahrump Valley buckwheat—BLM sensitive species. One of three known populations and the largest of the three which makes it locally significant and distinctive.

Importance Value	Yes/No	Rationale for Determination
Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.	No	Mojave desert tortoise—Compared to other tortoise habitat in the region, this area is not exemplary or unique.
	No	Western burrowing owl—The species and habitat is found throughout much of the west. The habitat in the nominated area is not more exemplary or unique than other habitats.
	Yes	Pahrump Valley buckwheat—Vulnerable to development and sensitive to hydrologic modification. The population is unique to the area.
Has been recognized as warranting protection to satisfy national priority concerns or to carry out the mandates of FLPMA.	No	Mojave desert tortoise—While the species is federally listed, there is no designated critical habitat in the area. The species receives protection from the Endangered Species Act, the absence of designated critical habitat shows this area has not been specifically recognized as warranting protection.
	No	Western burrowing owl—BLM sensitive species for the State of Nevada, not a national priority.
	No	Pahrump Valley buckwheat—BLM sensitive species for the State of Nevada, as well as State listed. Not a national priority.
Has qualities that warrant highlighting to satisfy public or management concerns about safety and public welfare.	No	Area was not nominated for this value. Not present.
Poses a significant threat to human life and safety or to property.	No	Area was not nominated for this value. Not present.

Nominated Area to Potential ACEC

The BLM interdisciplinary team determined that approximately 210 acres of the nominated acres meet at least one criterion for both relevance and importance. Specifically, the following values meet at least one criterion for both relevance and importance:

- Pahrump Valley buckwheat

The 210 acre area that met R&I criteria is within and next to the community of Sandy Valley. In order to avoid confusion with the existing Stump Spring ACEC, the area in Sandy Valley will be proposed for ACEC designation in the RMP under the name “Sandy Valley ACEC”.

N.3.2.32. Upper Las Vegas Wash and Corn Creek Nominated ACECs

General Location:	In the Las Vegas Valley south of the Desert National Wildlife Refuge.
General Description:	A series of springs, dunes stabilized by mesquite and catclaw, saltbush flat associated with ancient lakebed formations, and moderately dissected drainages. NDOW nominated Corn Creek ACEC, which overlaps much of this area and has been included in the ACEC.
Nominated By:	BLM, NDOW (Corn Creek).
Nominated Acreage:	22,244 acres; 31,590 acres nominated by NDOW (Corn Creek).
Values Considered:	Sensitive botanical, cultural, and paleontological resources.

Relevance

An area meets the “relevance” criterion if it contains one or more of the following:

Relevance Value	Yes/No	Rationale for Determination
A significant historic, cultural, or scenic value (including rare or sensitive archeological resources and religious or cultural resources important to Native Americans).	Yes	Cultural—Traditional travel corridor.
A fish and wildlife resource (including habitat for endangered, sensitive or threatened species, or habitat essential for maintaining species diversity).	Yes	Migratory birds—The wash provides habitat for migratory birds.
	Yes	Le Conte's thrasher (*Toxostoma lecontei*)—BLM sensitive. Habitat is present. High numbers have been identified in this area.
	Yes	Phainopepla (*Phainopepla nitens*)—BLM sensitive species. Best habitat and most data points from the NDOW diversity dataset (Jan 15, 2009) are in an area that is now private. Lesser quality habitat is still present in the wash.
	Yes	Western burrowing owl (*Athene cunicularia*)—BLM sensitive. Habitat is present.
	No	Desert kangaroo rat (*Dipodomys deserti*)—Not a BLM sensitive species.
	No	Desert pocket mouse (*Chaetodipus penicillatus sobrinus*)—Not a BLM sensitive species.
A natural process or system (including endangered, sensitive, or threatened plant species; rare, endemic, or relic plants or plant communities that are terrestrial, aquatic, or riparian; or rare geological features).	Yes	Las Vegas bearpoppy (*Arctomecon californica*)—BLM sensitive species.
	Yes	Las Vegas buckwheat (*Eriogonum corymbosum* var.*nilesii*)—BLM sensitive species, federal Candidate
	Yes	Paleontological—Pleistocene megafauna localities, Las Vegas Wash formation which includes unique geological setting with series of paleo-spring mounds, dunes, lakebed formations, and drainages.
Natural hazards (including areas of avalanche, dangerous flooding, landslides, unstable soils, seismic activity, or dangerous if it is determined through the resource management planning process that it has become part of a natural process).	No	Area was not nominated for this value. None known to be present.

Importance

The value, resource, system, process, or hazard described above must have substantial significance and values to satisfy the "importance" criteria. This generally means that the value, resource, system, process, or hazard is characterized by one or more of the following:

Importance Value	Yes/No	Rationale for Determination
Has more than locally significant qualities that give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared with any similar resource.	Yes	Cultural—Regionally significant based on traditional use of the wash as a travel corridor.
	Yes	Las Vegas buckwheat—BLM sensitive species, federal Candidate, endemic to the planning area.
	Yes	Las Vegas bearpoppy—BLM sensitive species, endemic to the planning area.
	Yes	Paleontological—The concentration, diversity, and chronological timeframe of the Pleistocene megafauna localities is more than locally significant. These in conjunction with unique geological setting including sedimentary structures associated with spring mounts provide an opportunity to study past climate change.
	No	Migratory birds—There is potential habitat throughout the region. The habitat in this area is not more than locally significant.
	Yes	Le Conte's thrasher—Higher numbers of individuals have been identified in portions of this area than identified elsewhere.
	No	Phainopepla—There is potential habitat throughout the region. The habitat in this area is not more than locally significant.
	No	Western burrowing owl—There is potential habitat throughout the region. The habitat in this area is not more than locally significant.
Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.	Yes	Cultural—Traditional use of the area is vulnerable to adverse change and the effects such changes would have on the integrity of the wash and the surrounding environment. The limited nature of this type of resource makes this area irreplaceable.
	Yes	Las Vegas buckwheat—BLM sensitive species, federal Candidate. Habitat type (gypsum soils) is sensitive to disturbance from recreation and other surface disturbing activities.
	Yes	Las Vegas bearpoppy—BLM sensitive species, State Listed. Habitat type (gypsum soils) is sensitive to disturbance from recreation and other surface disturbing activities.
	Yes	Paleontological—The concentration, diversity, and chronological timeframe of the Pleistocene megafauna localities is more than locally significant. These in conjunction with unique geological setting including sedimentary structures associated with spring mounts provide an opportunity to study past climate change.
	No	Migratory birds—The species and habitat is found throughout the region. The habitat in the nominated area is not more exemplary or unique than other habitats.
	No	Le Conte's thrasher—Present, but the NDOW diversity dataset (Jan 15, 2009) shows one thrasher point just outside the ACEC boundary in the Desert National Wildlife Refuge.
	No	Phainopepla—The species and habitat is found throughout the region. The habitat in the nominated area is not more exemplary or unique than other habitats.
	No	Western burrowing owl—The species and habitat is found throughout the entire west. The habitat in the nominated area is not more exemplary or unique than other habitats.

Importance Value	Yes/No	Rationale for Determination
Has been recognized as warranting protection to satisfy national priority concerns or to carry out the mandates of FLPMA.	Yes	Cultural—Traditional use of the area makes the area subject to EO 13007, which is a national priority.
	Yes	Las Vegas buckwheat—Is a federally designated Candidate species and is a national priority for protection under the ESA.
	No	Las Vegas bearpoppy—Not federally designated, is not a national priority.
	Yes	Paleontological—Paleontological resources in this area have been considered for national monument or NCA designation through Congressional legislation. The additional focus on paleontological resources in this area indicates an increased national priority for this area.
	No	Migratory birds—While it is a unique area that has some components that are very good migratory bird habitat, management of this area for its migratory bird habitat is not a national priority.
	No	Le Conte's thrasher—BLM sensitive species for the State of Nevada, not a national priority.
	No	Phainopepla—BLM sensitive species for the State of Nevada, not a national priority.
	No	Western burrowing owl—BLM sensitive species for the State of Nevada, not a national priority.
Has qualities that warrant highlighting to satisfy public or management concerns about safety and public welfare.	No	Area was not nominated for this value. None known to be present.
Poses a significant threat to human life and safety or to property.	No	Area was not nominated for this value. Not present.

Nominated Area to Potential ACEC

The BLM interdisciplinary team determined that all of the 22,244 BLM and DCP nominated acres meet at least one criterion for both relevance and importance. The values within the SNPLMA disposal boundary will not be further analyzed for ACEC designation within this planning effort as it is a legislative disposal area. The remaining 12,296 acres meeting relevance and importance will be considered in the Draft RMP/EIS. Specifically, the following values meet at least one criterion for both relevance and importance:

- Cultural/historic values
- Paleontological
- Le Conte's thrasher
- Las Vegas bearpoppy (only within SNPLMA disposal boundary, will not be included as a value in the ACEC evaluated in the RMP)
- Las Vegas buckwheat (only within SNPLMA disposal boundary, will not be included as a value in the ACEC evaluated in the RMP)

N.3.2.33. Valley of Fire Nominated ACEC

General Location:	Located in northeastern Clark County north and east of Lake Mead, just west of the Overton Arm of Lake Mead. The northwest boundary is comprised of Interstate 15 and the Moapa River Indian Reservation. The Valley of Fire State Park is located to the east of the nominated ACEC. On the south and southeast, the nominated ACEC borders the Lake Mead NRA. The area wraps around the northern and eastern sides of the Muddy Mountains Wilderness Area, with the wilderness boundary forming the nomination boundary in these areas.
General Description:	The nominated ACEC includes mountainous terrain with a dominant ecosystem type of Mojave Desert scrub (covering 86% of the nomination). Small amounts of blackbrush, salt desert scrub, dry lake bed, and mesquite/catclaw habitats occur on the valley floor in the south and southwest of the nomination. The nomination also includes substantial areas of gypsum soils, 13,155 acres (approximately 10% of the area). The area completely overlaps two BLM ACEC (California Wash and Bitter Springs), evaluated for similar values.
Nominated By:	DCP
Nominated Acreage:	131,378 acres
Values Considered:	Mojave desert tortoise, western burrowing owl, desert kangaroo rat, desert pocket mouse, threecorner milkvetch, sticky buckwheat, Las Vegas buckwheat, Las Vegas bearpoppy, yellow two-toned beardtongue.

Relevance:

An area meets the "relevance" criterion if it contains one or more of the following:

Relevance Value	Yes/No	Rationale for Determination
A significant historic, cultural, or scenic value (including rare or sensitive archeological resources and religious or cultural resources important to Native Americans).	No	Not nominated for these values.
A fish and wildlife resource (including habitat for endangered, sensitive or threatened species, or habitat essential for maintaining species diversity).	Yes	Mojave desert tortoise (*Gopherus agassizii)*—federally listed (Threatened). This area does not contain designated critical habitat, but the area includes known and modeled habitat, as well as habitat that is likely to support tortoise.
	Yes	Western burrowing owl (*Athene cunicularia)*—BLM sensitive. The entire area includes modeled habitat.
	No	Desert kangaroo rat (*Dipodomys deserti)*—Not a BLM sensitive species.
	No	Desert pocket mouse (*Chaetodipus penicillatus sobrinus)*—Not a BLM sensitive species.
A natural process or system (including endangered, sensitive, or threatened plant species; rare, endemic, or relic plants or plant communities that are terrestrial, aquatic, or riparian; or rare geological features).	Yes	Threecorner milkvetch (*Astragalus geyeri var. triquetrus)*—BLM sensitive. Portions of the area includes occupied habitat.
	No	Yellow twotone beardtongue (*Penstemon bicolor ssp bicolor)*—BLM sensitive. The presence of this species is not confirmed.
	No	Las Vegas bearpoppy (*Arctomecon californica)*—BLM sensitive. There are known populations within the area, specifically within areas that were evaluated as BLM nominated ACECs (California Wash and Bitter Springs). Outside these areas there is low likelihood to contain this species.
	No	Las Vegas buckwheat (*Eriogonum corymbosum var. nilesii)*—BLM sensitive, Candidate for federal listing. There are known populations within the area, specifically within areas that were evaluated as BLM nominated ACECs (California

Relevance Value	Yes/No	Rationale for Determination
		Wash and Bitter Springs). Outside these areas there is low likelihood to contain this species.
	Yes	Sticky buckwheat (*Eriogonum viscidulum)*—BLM sensitive. Area includes occupied habitat. The habitat for this plant is already captured by the Bitter Springs nominated ACEC.
Natural hazards (including areas of avalanche, dangerous flooding, landslides, unstable soils, seismic activity, or dangerous if it is determined through the resource management planning process that it has become part of a natural process).	No	Area was not nominated for this value. None known to be present.

Importance:

If a nominated value, resource, system, process, or hazard did not meet at least one of the relevance criteria, it was not evaluated for importance. A value, resource, system, process, or hazard meets the "importance" criterion if it is characterized by one or more of the following:

Importance Value	Yes/No	Rationale for Determination
Has more than locally significant qualities that give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared with any similar resource.	No	Mojave desert tortoise—The area is not designated critical habitat. While there is habitat, its values (quality and densities) are not more distinctive than other habitat in the region.
	No	Western burrowing owl—There is potential habitat throughout the region. The habitat in this area is not more than locally significant.
	No	Threecorner milkvetch—The areas with the best habitat have already been considered in other ACEC nominations. The areas remaining are not more than locally significant.
	No	Sticky buckwheat—The areas with the best habitat have already been considered in other ACEC nominations. The areas remaining are not more than locally significant.
Has qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse change.	No	Mojave desert tortoise—Compared to other tortoise habitat in the region, this area is not exemplary or unique.
	No	Western burrowing owl—The species and habitat is found throughout much of the west. The habitat in the nominated area is not more exemplary or unique than other habitats.
	Yes	Threecorner milkvetch—Habitat in California Wash is irreplaceable and vulnerable to large site type right-of-ways. Plants are sensitive to surface disturbance and threatened from invasive species.
	No	Sticky buckwheat—The areas with the best habitat have already been considered in other ACEC nominations. The areas remaining are not exemplary or unique.
Has been recognized as warranting protection to satisfy national priority concerns or to carry out the mandates of FLPMA.	No	Mojave desert tortoise—While the species is federally listed, there is no designated critical habitat in the area. The species receives protection from the Endangered Species Act, the absence of designated critical habitat shows this area has not been specifically recognized as warranting protection.
	No	Western burrowing owl—BLM sensitive species for the State of Nevada, not a national priority.
	No	Threecorner milkvetch—BLM sensitive species for the State of Nevada, as well as State listed. Not a national priority.
	No	Sticky buckwheat—BLM sensitive species for the State of Nevada, not a national priority.

Importance Value	Yes/No	Rationale for Determination
Has qualities that warrant highlighting to satisfy public or management concerns about safety and public welfare.	No	This importance criteria does not apply to public safety and welfare related to community expansion or development. Therefore, using protection of this area as mitigation for development elsewhere does not meet this criterion.
Poses a significant threat to human life and safety or to property.	No	Area was not nominated for this value. Not present.

Nominated Area to Potential ACEC

The BLM interdisciplinary team determined that only those areas that overlap with the BLM nominated California Wash and Bitter Springs areas meet at least one criterion for both relevance and importance. Therefore, only those areas will be considered in the Draft RMP/EIS.

N.4. Summary of ACEC Evaluations

Table N.4, "Summary Evaluation of Existing ACECs and Areas Nominated for ACEC Designation" (p. 2116) shows all of the existing ACECs and nominated areas where relevance and importance criteria were met, whether the ACEC overall meets the relevance and importance criteria and the values that were considered in the evaluation. The information Acres for existing ACECs have been updated from the 1998 RMP Record of Decision to reflect BLM's best estimate of size based on updates to the United States Public Land Survey System (PLSS) and other official surveys, and changes in agencies overseeing land management. For example, lands withdrawn since 1998 to the US Fish and Wildlife Service for the Ash Meadows National Wildlife Refuge have been removed. In many cases, for existing ACECs, the acres being nominated for the present RMP/EIS process are different from both the ROD and currently managed acres and are shown in the 'Nominated Acres' column. The number values for the relevance and importance criteria are listed in Section N.1.1.1.

Table N.4. Summary Evaluation of Existing ACECs and Areas Nominated for ACEC Designation

Existing or Nominated ACEC Name	Relevance Criteria	Importance Criteria	Meets R and I	Values to be Considered Further	Nominated Acres to be Considered Further
Amargosa Mesquite ACEC	1,2,3	1,2	Yes	Cultural resources, neotropical bird habitat; relic plant community (mesquite)	9,646
Arden Historic Sites ACEC	-	-	No	Historic railroad construction and mining	0[a]

Existing or Nominated ACEC Name	Relevance Criteria	Importance Criteria	Meets R and I	Values to be Considered Further	Nominated Acres to be Considered Further
Arrow Canyon ACEC	1,3	1,2,3	Yes	Cultural (Prehistoric rock art), scenic, paleontological (Miocene bird tracks), geologic (candidate for the mid carboniferous boundary stratotype section).	2,070
Ash Meadows ACEC	2,3	1,2	Yes	Special status species habitat (5 animal and 7 plant species)	28,202
Big Dune ACEC	2	1,2	Yes	Special status species habitat - Rare, endemic beetle species habitat.	2,456
Bird Spring Valley (nominated)	2,3	1,2	Yes	Mojave desert tortoise, western burrowing owl, yellow two-toned beardtongue,	78,958
Bitter Springs (nominated)	1,2,3	1,2	Yes	Scenic; Las Vegas bearpoppy; sticky ringstem; Las Vegas buckwheat; desert bighorn sheep	61,840[b]
California Wash (nominated)	1,3	1,2	Yes	Cultural; threecorner milkvetch	11,998
Coyote Springs ACEC	2	1,2,3	Yes	Mojave desert tortoise	51,528
Crescent Townsites ACEC	-	-	No	Historic railroad construction and mining	0[c]
Devils Throat ACEC	4	4,5	Yes	Natural hazard area	639
Gold Butte, Part A ACEC	1,2	1,2,3	Yes	Scenic; cultural; Mojave desert tortoise; relict leopard frog	186,063
Gold Butte, Part B ACEC	1,2,3	1,2,3	Yes	Scenic; cultural; Mojave desert tortoise; relict leopard frog; desert bighorn sheep; Las Vegas buckwheat; Las Vegas bearpoppy	116,734

Existing or Nominated ACEC Name	Relevance Criteria	Importance Criteria	Meets R and I	Values to be Considered Further	Nominated Acres to be Considered Further
Gold Butte, Part C ACEC (Virgin Mountains)	1,2,3	1,2,3	Yes	Scenic; cultural; desert bighorn sheep; relict forest stands (sky island)	35,707
Gold Butte Townsites ACEC	1	2	Yes	Historic mining.	159
Grapevine Springs Watershed (nominated)	2,3	2	Yes	Spring Mountains pyrg; Southeast Nevada pyrg	85
Hidden Valley ACEC	1	1,2,3	Yes	Scenic; cultural prehistoric habitation and rock art.	3,356
Highland Range (nominated)	2	2	Yes	Desert bighorn sheep[d]	53,015
Hiko Wash (nominated)	1,2,3	1,2	Yes	Scenic; cultural; neotropical bird habitat; riparian (including acacia woodlands)	708
Ivanpah Valley 1 (nominated)	3	1,2	Yes	White-margined penstemon	3,134[e]
Ivanpah Valley 2 (nominated)	2,3	1,2	Yes	Sensitive plant and animal species	40,180[f]
Jean Lake (nominated)	2,3	1,2	Yes	White-margined penstemon	11,605
Keyhole Canyon ACEC	1,2	1,2,3	Yes	Scenic; cultural prehistoric habitation and rock art; Mojave desert tortoise	639
LaMadre (North and South) (nominated)	2	-	No	-	0
Lava Dune (nominated)	2	1,2	Yes	Special status species habitat - Rare, endemic beetle species habitat.	435
Logandale (nominated)	1,2,3	1,2	Yes	Scenic; cultural; threecorner milkvetch	6,072
Gale Hills (nominated)	1,2,3	1,2	Yes	Scenic; cultural; Las Vegas bearpoppy; Las Vegas buckwheat	3,865

Existing or Nominated ACEC Name	Relevance Criteria	Importance Criteria	Meets R and I	Values to be Considered Further	Nominated Acres to be Considered Further
Lower Mormon Mesa (nominated)	3	1,2,3	Yes	rare geologic feature (remnant terraced lake deposit, with stage 6 soil that is considered one of the oldest soils in the North America)	66,353
Mesa Milkvetch (nominated)	1,3	1,2	Yes	Cultural; threecorner milkvetch	9,183
Moapa Mesquite (nominated)	1,3	1,2	Yes	Cultural; riparian mesquite woodland	1,510
Mormon Mesa ACEC	2	1,2,3	Yes	Mojave desert tortoise	167,888
Mt. Schrader (nominated)	1	1,2	Yes	Cultural - prehistoric rock art.	283
Muddy Mountains (nominated)	2	1,2	Yes	Desert bighorn sheep	159,868[g]
Old Spanish Trail (nominated)	1	1,2,3	Yes	Cultural/historic – National Historic Trail	51,449
Opal Mountains (nominated)	2	-	No	-	0
Pahrump Valley to McCullough Mountains (nominated)	2	2	Yes	Mojave desert tortoise[h]	44,000[i]
Pahrump Valley Mesquite Woodland (nominated)	2,3	1,2	Yes	Neotropical bird habitat; Pahrump Valley buckwheat; relic plant community (mesquite acacia woodlands)	41,770
Perkins Ranch (nominated)	1,2,3	1,2,3	Yes	Cultural; southwestern willow flycatcher; Moapa dace; Muddy River population of the Virgin River chub; neotropical bird habitat; riparian	408
Piute/Eldorado ACEC	1,2	1,2,3,4	Yes	Scenic, Mojave desert tortoise; desert bighorn sheep	352,159

Existing or Nominated ACEC Name	Relevance Criteria	Importance Criteria	Meets R and I	Values to be Considered Further	Nominated Acres to be Considered Further
Rainbow Gardens ACEC	1,3	1,2,3	Yes	Scenic; cultural; Las Vegas buckwheat; Las Vegas bearpoppy; Paleontological (Pleistocene megafauna); geologic feature (Great unconformity)	35,353
Red Rock Spring ACEC	1,2	1,2,3	Yes	Cultural; relict leopard frog	638
River Mountains ACEC	1,2	1,2	Yes	Scenic (viewshed for Henderson and Boulder City); bighorn sheep habitat	6,697
South Bare Mountains (Crater Flat) (nominated)	2	-	No	-	0
South Newbury Mountains (nominated)	2	-	No	-	0
Specter Hills(nominated)	3	1,2	Yes	White-margined penstemon	5,429
Specter Range to Devil's Hole (nominated)	2	-	No	-	0
Spirit Mountain (nominated)	1,2	1,2	Yes	Cultural/historic	9,488
Stewart Valley (nominated)	1,3	1,2	Yes	Cultural; mesquite woodlands; Pahrump Valley buckwheat	5,204
Stuart Ranch (nominated)	1,2,3	1,2,3	Yes	Cultural;Meadow Valley desert sucker; Meadow Valley Wash speckled dace; Mojave desert tortoise; riparian	278
Stump Spring ACEC	1	1,2,3	Yes	Cultural (prehistoric camp and historic trail)	646
Stump Spring 2 (nominated)	1,2	1,2,3	Yes	Pahrump Valley buckwheat	210[j]
Upper Las Vegas Wash and Corn Creek (nominated)	1,2,3	1,2,3	Yes	Cultural; paleontological; Le Conte's thrasher	12,296

Existing or Nominated ACEC Name	Relevance Criteria	Importance Criteria	Meets R and I	Values to be Considered Further	Nominated Acres to be Considered Further
Valley of Fire (nominated)	2,3	1,2	Yes	threecorner milkvetch; Las Vegas bearpoppy; sticky ringstem; Las Vegas buckwheat; desert bighorn sheep	73,828[k]
Virgin River ACEC	1,2,3	1,2,3	Yes	Cultural; Virgin River chub; woundfin; southwestern willow flycatcher; riparian habitat	8,500
Whitney Pocket ACEC	1	2	Yes	Cultural - Prehistoric habitation and rock art and historic structures.	160

[a]This ACEC no longer meets R&I criteria and will be considered for removal of ACEC designation.

[b]This nominated area and values overlap with the Muddy Mountains nomination.

[c]This ACEC no longer meets R&I criteria and will be considered for removal of ACEC designation.

[d]Overlaps with the Piute/Eldorado ACEC and contains the same values.

[e] The Ivanpah population will not be further analyzed for ACEC designation within this planning effort as it is a legislative disposal area

[f] This ACEC was considered and analyzed in the Silver State South SEIS. It will not be considered further in the RMP/EIS at this time.

[g] This nominated area and values overlap with the Bitter Springs nomination.

[h] The portion of the nominated area within the spring mound complex around Stump Springs meet at least one criterion for both relevance and importance for neotropical birds under the Pahrump Valley Mesquite nomination.

[i] This nominated area overlaps with areas meeting R&I for desert tortoise in the Bird Spring nomination.

[j]To avoid confusion, the proposed ACEC will be renamed to “Sandy Valley ACEC”.

[k]This nominated area and values overlap with the Bitter Springs and California Wash nominations.

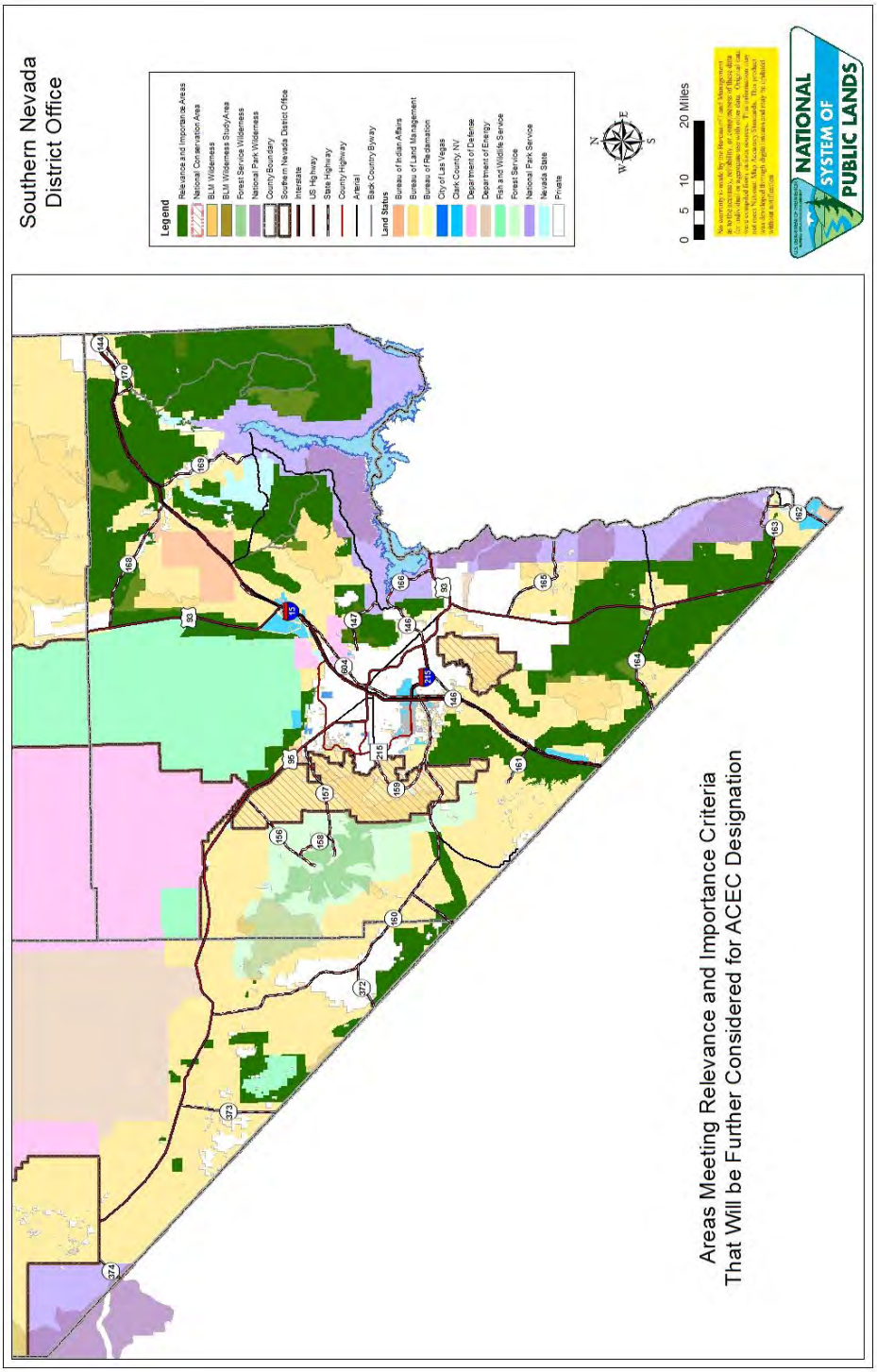

Figure N.3. Map — Areas Meeting Relevance and Importance Criteria

Appendix O. Supplemental Rules

O.1. Introduction

The purpose of the Supplementary Rules is to focus on decisions made in the Resource Management Plan (RMP) where enforcement or additional guidance is needed, especially for public health and safety, resource protection and utilization. Many management decisions can be implemented through existing laws and regulations, however, unique and site-specific restrictions and prohibitions need to be clearly spelled out for ease of understanding and clarity. The BLM's tools to achieve this are closure and restriction orders, supplementary rules, and special rules. Supplementary rules ensure that RMP decisions concerning restrictions, prohibitions, and allowable uses are first properly understood and followed, and second, provide for civil and criminal penalties should these restrictions and prohibitions not be followed.

O.2. How to Read and Use This Document

This document addresses the process by which the supplementary rules will be enacted, including public involvement and opportunities and the proposed supplementary rules themselves. The rules would be implemented under each alternative, although the size, scope, and levels of restriction would change.

O.3. Summary

The proposed supplementary rules include all closure and restriction orders, special rules, and supplementary rules. The rules are divided into subsections for ease of understanding, implementation, and enforcement. The justification and reasoning behind each restriction or prohibition is presented throughout the RMP in Chapter 2 Alternatives; Chapter 3; Affected Environment; and Chapter 4; Environmental Consequences.

O.4. Authority

The regulations that allow for the creation and enforcement of closure and restriction orders, supplementary rules, and special rules are issued in the Code of Federal Regulations (CFR), 43 CFR, under the provisions of the following:

- Federal Land Policy and Management Act of 1976 (43 USC, 1701 et seq.).
- Sikes Act (16 USC, 670g).
- Taylor Grazing Act (43 USC, 315a); Wild and Scenic Rivers Act (16 USC, 1281c).
- Act of September 18, 1960, as amended (16 USC, 877 et seq.).
- Land and Water Conservation Fund Act (16 USC, 460l-6a).
- National Trails System Act (16 USC, 1241 et seq.).

The authority is specifically given in the following regulations:

- Supplemental Rules (43 CFR, 8365.1-6).
- Closure and Restriction Orders (43 CFR, 8364.1).
- Special Rules (43 CFR, 8341.2 and 8351.2-1).

O.5. Process

The process of creating and enacting supplementary rules, closure or restriction orders, and special rules involves several steps, including creation and development of rules, public comment and feedback, and final publication. For the purposes of this process, all existing rules affecting the Las Vegas and Pahrump field offices are assumed to be rescinded and replaced. This resolves several issues that have developed over the years, including boundary changes, acquired lands, and obsolete rules. In addition, presenting all the rules, updated and rewritten in a consistent manner, aids in understanding and ability to enforce.

O.6. Rule Creation

The process of creating supplementary rules begins with the management actions presented in the alternatives of the RMP. These decisions essentially create restrictions and prohibitions that need to be backed with written rules to ensure they are fully understood and enforceable. In many cases, the process of creating rules is intuitive or the justification for a rule is self-explanatory. For example, a restriction on access to a specific area for protection of a resource would result in a rule stating access to that area is prohibited. In some cases, the proposed rules respond to specific identified issues, which may or may not be directly addressed in the RMP, but respond to an existing need. For efficiency, this type of rule is included with the rules resulting from specific RMP decisions to provide a complete version of the proposed supplementary rules that would go into effect.

O.7. Public Process

In order for special rules to be implemented, a public process is required. As outlined in 43 CFR, 8365.1-6, specific steps are taken to ensure that interest groups and public lands users are adequately informed of newly proposed rules before they go into effect. The first step of this process is the publication of a proposed set of rules and then a period for public response and comment. This appendix within the RMP and the associated notices, press releases, and public meetings serve as the opportunity for the public to review and comment on the proposed rules, along with the RMP as a whole. This appendix has also been made available as a stand-alone document at the BLM's Southern Nevada District Office on behalf of the Las Vegas and Pahrump field offices. In addition, the RMP and this appendix are available for download on BLM Southern Nevada District's website.

During the public process, reviewers are encouraged to comment on several elements of the proposed rules, including consistency and clarity. Specifically as it relates to clarity, Executive Order 12866 requires each agency to write regulations that are simple and easy to understand. As such, comments on how to make these supplementary rules easier to understand are encouraged, including answers to the following questions:

- Are the requirements in the supplementary rules clearly stated?
- Do the supplementary rules contain technical language or jargon that interferes with their clarity?
- Does the format of the supplementary rules (for example, grouping and order of sections, use of headings, and paragraphing) aid or reduce their clarity?
- Would the supplementary rules be easier to understand if they were divided into more (but shorter) sections?

After public comments have been addressed and in conjunction with the Notice of Availability for the Final RMP, final supplementary rules will be made available through similar channels as the proposed rules, including press releases, publication in the Federal Register, and the BLM's Southern Nevada District Office and website.

O.8. Public Comment Procedures

Written comments on the proposed supplementary rules should be specific, should be confined to issues pertinent to the proposed supplementary rules, and should explain the reason for any recommended change. Where possible, comments should reference the specific section or paragraph of the rule that the comment is addressing. The BLM is not obligated to consider or include in the Administrative Record for the proposed supplementary rules (a) comments that the BLM receives after the close of the comment period, unless they are postmarked or electronically dated before the deadline, or (b) comments delivered to an address other than those listed.

Comments, including names, street addresses, and other contact information of respondents, will be available for public review at the BLM's Southern Nevada District Office during regular business hours, Monday through Friday, except federal holidays. Before including your address, telephone number, e-mail address, or other personal identifying information in your comment, you should be aware that your entire comment including your personal identifying information may be made publicly available at any time. While you can ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee that we will be able to do so.

O.9. Other Procedural Matters

In addition the public process described, creation and enactment of additional regulations is guided by myriad legislation. As such, the following were given consideration as part of the development of these proposed supplemental rules:

National Environmental Policy Act (NEPA): These rules have been developed in conjunction with the RMP and associated environmental impact statement. The rules themselves and the actions to support and justify do not constitute a major federal action significantly affecting the quality of the human environment under Section 102(2)(C) of NEPA, 42 USC, 4332(2)(C). The public is invited to comment on the RMP, along with these rules, in accordance with the public comment procedures outlined.

Regulatory Flexibility Act: Congress enacted the Regulatory Flexibility Act (RFA) of 1980, as amended, 5 USC, 601-612, to ensure that government regulations do not unnecessarily or disproportionately burden small entities. The RFA requires a regulatory flexibility analysis if a rule would have a significant economic impact, either detrimental or beneficial, on a substantial number of small entities. These rules establish allowable, restricted and prohibited uses and rules of conduct for public use of specific public lands. Therefore, the BLM has determined under the RFA that these rules would not have a significant economic impact on a substantial number of small entities.

Small Business Regulatory Enforcement Fairness Act: These proposed supplementary rules do not constitute a "major rule," as defined at 5 USC, 804(2).

Unfunded Mandates Reform Act (2 USC, 1531 et seq.): These proposed supplementary rules do not impose an unfunded mandate on state, local, or tribal governments or the private sector of more than $100 million per year; nor do these supplementary rules have a significant or unique effect on state, local, or tribal governments or the private sector.

Executive Order 12630, Governmental Actions and Interference with Constitutionally Protected Property Rights (Takings): These proposed supplementary rules do not represent a government action capable of interfering with constitutionally protected property rights. The supplementary rules do not address property rights in any form and do not cause the impairment of one's property rights. Therefore, the BLM has determined that these proposed supplementary rules would not cause a "taking" of private property or require further discussion of takings implications under this executive order.

Executive Order 13132, Federalism: The proposed supplementary rules will not have a substantial direct effect on the states, on the relationship between the national government and the states, or on the distribution of power and responsibilities among the various levels of government. These supplementary rules do not conflict with any state law or regulation. Therefore, in accordance with Executive Order 13132, the BLM has determined that these supplementary rules do not have sufficient federalism implications to warrant preparation of a Federalism Assessment.

Executive Order 12988, Civil Justice Reform: Under Executive Order 12988, the BLM Nevada State Office has determined that these proposed supplementary rules would not unduly burden the judicial system and that they meet requirements of sections 3(a) and 3(b)(2) of the Order.

Executive Order 13175, Consultation and Coordination with Indian Tribal Governments: In accordance with Executive Order 13175, the BLM has found that these proposed supplementary rules do not include policies that have tribal implications. The supplementary rules do not affect tribal resource, religious, or property rights.

Executive Order 13211, Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use: These proposed supplementary rules do not comprise a significant energy action. The rules will not have an adverse effect on energy supply, production, or consumption and have no connection with energy policy.

Executive Order 13352, Facilitation of Cooperative Conservation: In accordance with Executive Order 13352, the BLM has determined that the proposed supplementary rules will not impede facilitating cooperative conservation, will take appropriate account of and consider the interests of persons with ownership or other legally recognized interests in land or other natural resources, will properly accommodate local participation in the federal decision-making process, and will provide that the programs, projects, and activities are consistent with protecting public health and safety. These rules merely establish rules of conduct for recreation on certain public lands.

Paperwork Reduction Act: These proposed supplementary rules do not contain information collection requirements that the Office of Management and Budget must approve under the Paperwork Reduction Act, 44 USC, 3501 et seq.

Information Quality Act: In developing these proposed supplementary rules, the BLM did not conduct or use a study, experiment, or survey requiring peer review under the Information Quality Act (Section 515 of Pub. L. 106-554).

O.10. Proposed Supplementary Rules

The following constitute the proposed supplementary rules, closure and restriction orders, and special rules to be enacted concurrently with the final RMP. For clarity and ease of understanding, the rules are broken down into subsections, grouping rules relating to similar issues together. Definitions used throughout the rules are provided first.

O.10.1. Definitions

The following definitions apply to the proposed supplementary rules, unless modified within a specific part or regulation:

1. Drug paraphernalia means equipment, products, and materials of any kind which are used, intended for use, or designed for use in planting, propagating, cultivating, growing, harvesting, manufacturing, compounding, converting, producing, preparing, testing, analyzing, packaging, repackaging, storing, containing, concealing, injecting, ingesting, inhaling, or otherwise introducing into the human body a controlled substance. It includes diluting agents or substances.
2. Motor vehicle means any vehicle that is self-propelled by a non-living power source, including a vehicle that is propelled by electric power. Motorized wheelchairs are exempt from this definition.
3. Operator means any person who operates, drives, controls, or otherwise has charge of a mechanical mode of transportation or any other mechanical equipment.
4. Public lands mean any lands owned by the United States and administered by the Secretary of the Interior through the Bureau of Land Management without regard to how the United States acquired ownership. This includes paved or unpaved parking lots or other paved or unpaved areas where vehicles are parked or areas where the public may drive a motorized vehicle, paved or unpaved roads, roads, routes, or trails.
5. Firearm means any weapon capable of firing a projectile including, but not limited to, a rifle, shotgun, handgun, BB-gun, or pellet gun.
6. Sunrise to sunset means those specific times published by the U.S. Navy Astronomical Applications Department, when the upper edge of the disk of the sun is on the horizon, considered unobstructed relative to the location of interest.
7. Graffiti means any unauthorized inscription, word, figure, painting, or other defacement that is written, marked, etched, scratched, sprayed, drawn, painted, or engraved on or otherwise affixed to any surface by any graffiti implement, to the extent that the graffiti was not authorized in advance by the Bureau of Land Management.
8. Graffiti implement means an aerosol paint container, a broad-tipped marker, gum label, paint stick or graffiti stick, etching equipment, brush, or any other device capable of scarring or leaving a visible mark on any natural or man-made surface.
9. Disorderly conduct is when a person commits any of the following prohibited acts with intent to cause public alarm, nuisance, jeopardy, or violence, or knowingly or recklessly creating risk thereof:
    a. Engages in fighting or threatening, or in violent behavior.
    b. Uses language, an utterance or gesture, or engages in a display or act that is obscene, physically threatening or menacing, or done in a manner that is likely to inflict injury or incite an immediate breach of the peace.

O.10.2. Alcohol and Drugs

1. **Operation of a motor vehicle while under the influence of alcohol or drugs:** It shall be illegal to operate or be in actual physical control of a motor vehicle on public lands while under the influence of alcohol, a drug or drugs, or any combination thereof, to a degree that renders the operator incapable of safe operation of that vehicle; or the alcohol concentration in the blood or breath is 0.08 grams or more of alcohol per 100 milliliters of blood or 210 liters of breath. If the state of Nevada establishes by statute a more restrictive standard of alcohol concentration than that defined in this supplementary rule, that more restrictive standard is hereby adopted and made a part of this supplementary rule and supersedes the standard specified in the preceding sentence.
2. **Open container of alcoholic beverage:** It shall be illegal to carry or store a bottle, can or other receptacle containing an alcoholic beverage that is open, or has been opened, or whose seal is broken or the contents of which have been partially removed, within a motor vehicle on public lands. Each person within a motor vehicle is responsible for complying with the provision in this section that pertains to carrying an open container. The operator of a motor vehicle is the person responsible for complying with the provisions of this section that pertain to the storage of an open container.
3. **Possession of alcohol by a minor:** Consumption or possession of any alcoholic beverage by a person under 21 years of age and the selling, offering to sell, or otherwise furnishing or supplying any alcoholic beverage to a person less than 21 years of age on public lands is prohibited. This does not apply to the selling, handling, serving, or transporting of alcoholic beverages by a person in the course of his lawful employment by a licensed manufacturer, wholesaler, or retailer of alcoholic beverages.
4. **Possession of drug paraphernalia:** Possession of drug paraphernalia, as defined in Definitions (1) (p. 2127), by any person on public lands is prohibited.

O.10.3. Camping

1. **Use of campfires:** Campfires, camp stoves, and charcoal grills are permitted on BLM-administered public lands within the planning area, in accordance with prevailing fire conditions and restrictions, unless otherwise prohibited through these supplemental rules, such as in day-use only areas or by state or county regulation.
2. **Campfires in day-use only areas:** In areas designated for day-use only, campfires and the collection of combustible materials for use in a campfire are prohibited. The use of camp stoves and charcoal grills is allowed in accordance with prevailing fire restrictions.
3. Bringing in, disposing of, or possession of any firewood or pallets containing nails, screws, or other metal hardware is prohibited.

O.10.4. Domesticated Animals

1. **Domesticated animal waste:** Waste deposited by a domesticated animal at any developed site on public lands, including campgrounds, picnic areas, and parking areas, must be removed and appropriately disposed of.
2. **Domesticated animal abandonment:**It shall be unlawful for any person to willfully abandon a domesticated animal on public lands.

O.10.5. Wild Horses and Burros

1. Riding, attempting to ride, handling, or otherwise harassing or disturbing wild horses or burros is prohibited.
2. Entering the planning area while in possession of hay, pelletized hay, straw, mulch, grain, salt, mineral supplement or other livestock feed for the purposes of feeding, attracting, or luring wild horses and burros is prohibited.
3. Entering the planning area while in possession of any plant materials, food, or refuse for the purposes of feeding, attracting, or luring wild horses and burros is prohibited.

O.10.6. Firearms

Unless specifically addressed by regulations set forth in 43 CFR, the laws and regulations of Clark and Nye counties and the state of Nevada shall govern the use and possession of firearms. Such state and county laws and regulations that are now in effect or that may later be in effect are hereby adopted and made part of these supplemental rules.

1. **Discharge of firearms:** It shall be unlawful to discharge a firearm, as defined in Definitions (5) (p. 2127), except when hunting with a valid state hunting license in areas closed to recreational target shooting. An exception also shall be made in accordance with the laws or law enforcement officers in the performance of their duties. See REC-09 for proposed alternatives and related maps (p. 2140) for specific closure areas.
2. **Target shooting:** Target shooting, where allowed, is governed by the following rules:
   a. Target shooting may occur only where a suitable backdrop exists to prevent ammunition from travelling excessive distances.
   b. Uses language, an utterance or gesture, or engages in a display or act that is obscene, physically threatening or menacing, or done in a manner that is likely to inflict injury or incite an immediate breach of the peace.
   c. Target shooting is not permitted in the direction of or toward any man-made object (except targets), structure, camp, or dwelling.
   d. Targets must be retrievable and suitable for the purpose. Rocks, trees, and other natural features, cultural or historic artifacts, glass, household trash, appliances, cars, and signs do not constitute targets.
   e. All materials used for targets must be retrieved on completion of target shooting, and removed from BLM lands. This includes all spent shells and cartridges.
   f. Skeet/clay pigeon shooting and any similar style of target shooting that disperses targets in an irretrievable fashion must be an environmentally friendly, biodegradable type.
   g. The use/discharge of explosive of any kind, incendiary or chemical device, pyrotechnic devices or exploding targets is prohibited.
   h. The use of steel core/jacket ammunition is prohibited.

O.10.7. Other Restrictions

1. **Advertising and commercial signs:** No person or organization shall announce, advertise, or call to public attention in any way any article, service, or thing for sale or hire, or paste, tack, or otherwise post any commercial sign, placard, or advertisement on public lands without prior authorization from the BLM.

2. **Concessions, vending, and peddling:** It shall be unlawful for any person or organization to operate a concession or expose or offer for sale any service, article or thing, nor shall any person or organization on public lands operate any stand, cart, or vehicle for the transportation, sale, or display of such items, unless specifically authorized through a special recreation permit issued to include vending.

3. **Defacement:** It shall be unlawful for any person to apply graffiti to any natural or man-made surface on any BLM managed lands.

4. **Fireworks and explosives:** Possession of fireworks and explosives of any kind are prohibited. The use/discharge of explosives of any kind, incendiary or chemical devices, pyrotechnic devices, or exploding targets is prohibited on all public lands within the planning area without written authorization from the BLM.

5. **Memorialization:** It shall be unlawful for any person or organization to establish, erect, or define a memorial site on public lands without prior written authorization from the BLM. Memorial sites include the erection of religious symbols, creation of shrines, the placement of placards or other items identifying persons, events, animals, or other things that may be memorialized.

6. **Noncommercial signs:** No person or organization shall announce, advertise, or call to public attention in any way any article, service, or location, or paste, tack, or otherwise post any sign or placard on public lands without prior authorization from the BLM.

7. **Obstructions across rivers:** It shall be unlawful to tie any obstruction from one bank of a river to the other, including cables, ropes, and rafts without written authorization from the BLM.

8. **Possession of graffiti implements:** It shall be unlawful for any person to possess any graffiti implement while in or on any BLM-managed lands, unless otherwise authorized.

9. **Safety flags on motorized vehicles:** Unless participating in a permitted event, all motorized vehicles, other than those traveling on maintained roads, must be equipped with an safety flag with a minimum 8-foot whip mast and a minimum six (6) inch by twelve (12) safety flag. The mast must be securely mounted on the vehicle and extend a minimum eight (8) feet from the ground to the mast tip when the vehicle is stopped.

10. **Speed:** Do not operate any motorized vehicle in speeds in excess of county regulations unless otherwise posted on any route within the planning area, or in excess of 15 mph within any designated camping area.

11. **Noise:** Do not operate or use any audio equipment, such as a radio, television, musical instrument, other noise-producing device, or motorized equipment between the hours of 12 A.M. and 6 A.M. in a manner that makes unreasonable noise that disturbs other visitors; or operate or use a public address system without written authorization from the BLM authorized officer. Specific areas may be identified in supplemental planning documents.

O.10.8. Prohibited Acts

You must not:

1. Burn any refuse, including but not limited to trash, without written authorization by the BLM and/or any other local government agency. Wire burning and/or related activities are prohibited.
2. Operate a motorized vehicle in a recreation area without the attached safety flag as described under Other Restrictions (9) (p. 2130) of these supplementary rules;
3. Operate a motorized vehicle in excess of the posted speed limit;
4. Possess or use any glass cup or bottle, empty or not, used for carrying any liquid for drinking purposes outside of enclosed vehicles, or camp trailers.
5. Dumping gray or wastewater on public lands directly from a vehicle or trailer is prohibited. Water and sewage tanks must be emptied only at legal dumping stations.
6. Disposal of human waste is prohibited.
7. Freely roll down dunes, hills, and cliffs any object that creates a hazard to other users.

O.11. Penalties

Under the Federal Land Policy and Management Act of 1976, 43 USC, 1733(a), if you violate or fail to comply with these supplementary rules, you may be subjected to imprisonment for not more than 12 months or a fine in accordance with 18 USC 3571, other penalties in accordance with 43 USC, 1733, or both.

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Appendix P. Laws, Regulations, and Policies

P.1. Soil Management

- **Classification and Multiple Use Act (78 stat. 986, U.S.C. 141118), 43 CFR 1725.3–3(h) as of October 1, 1981**: One of the objectives of public land management listed in the Act is "Watershed Protection", which is defined as the protection, regulated use, and development of any public lands in manner to control runoff; to minimize soil erosion, siltation, and other destructive consequences of uncontrolled water flows; and to maintain and improve storage, yield, quality, and quantity of surface and subsurface waters.
- **Farmland Protection Policy Act of 1984 (7 U.S.C. 4201–4209)**: Federal agencies are (a) to identify and take into account the adverse effects of their programs on the preservation of farmland, (b) to consider alternative actions, as appropriate, that could lessen adverse effects, and (c) to ensure that their programs, to the extent practicable, are compatible with State and units of local government and private programs and policies to protect farmland.
- **Soil Conservation and Domestic Allotment Act of 1935, as amended, April 27, 1935 (P.L. 74–46)**: By Reorganization Plan No. IV and Secretary Order 2835, this Act authorizes the BLM to conduct and publish surveys, investigations, and research relating to the character of soil erosion; to disseminate information on erosion prevention measures; and to conduct demonstration projects in areas subject to wind and water erosion. The Act further provides for the "preservation and improvement of soil fertility, promotion of economic use and conservation of land, and diminution of exploitation and wasteful and unscientific use of national soil resources."
- **Soil and Water Resource Conservation Act of November 18 1977 (16 U.S.C. 2001)**: This Act directs the Secretary of Agriculture to appraise the Nation's soil and water resources on a continuing basis and to develop and update periodically a program for furthering the conservation, protection, and enhancement of the soil and water resources.
- **Soil Information Assistance for Community Planning and Resource Development Act of 1966, September 7, 1966 (42 U.S.C. 3271 et seq.)**: This Act directs the Secretary of Agriculture to provide assistance to States and other public agencies in the classification and interpretation of kinds of soil and in the intensification of use and benefits of the National Cooperative Soil Survey. The Act further provides for consultation with other federal agencies to assure coordination of work.
- **Pollution Prevention Act of 1990 (42 U.S.C. 1310113109)**: Requires and encourages prevention and reduction of waste streams and other pollution through minimization, process change, and recycling. Encourages and requires development of new technology and markets to meet objectives.
- **Surface Mining Control and Reclamation Act of 1977 (30 U.S.C. 1201 et seq.)**: Requires the consideration of protection and/or re-establishment of fish and wildlife habitat during the design, assessment, and implementation of reclamation plans and during designation of areas unsuitable for mining. It requires application of unsuitability criteria prior to coal leasing and proposed mining operations for minerals or mineral materials other than coal.
- **Watershed Protection and Flood Control Act of 1954, as amended, August 4, 1954**: Under this Act, the Federal Government is directed to cooperate with States and their political subdivisions, soil or water conservation Planning Areas, flood prevention or control Planning Areas, and other local public agencies to prevent erosion or floodwater and sediment damage.
- **E. O. 11988, Flood plain Management, May 24, 1977 (42 FR 26951)**: Directs federal agencies to provide leadership and take action on federal lands to avoid, to the extent possible,

the long and shortterm adverse impacts associated with the occupancy and modification of flood plains. Agencies are required to avoid the direct or indirect support of development on flood plains whenever there are practical alternatives and evaluate the potential effects of any proposed action on flood plains.

- **E.O. 11989, Offroad Vehicles, May 24, 1977 (42 FR 26959)**: Directs heads of federal agencies to close areas to offroad vehicle (ORV) use whenever it is determined that use of ORVs is or will cause considerable adverse impact to soil, vegetation, wildlife, wildlife habitat, or certain other resources on the public lands.
- **40 CFR 15001508**, Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act, July 1, 1986.

Policies

Department of Interior and BLM policies are generally encompassed by the federal laws and regulations listed above and may provide specific guidance for particular issues. In general it is BLM policy to collect and maintain soil resource information consistent with management needs and to develop, test and apply soil interpretations to guide use and management of soils and related resources. (BLM Manual 7100).

BLM Manuals and Handbooks

- **BLM Manual 7000**: Soil, Water, and Air Management
- **BLM Manual 7100**: Soil Resource Management
- **BLM Technical Reference 17347**: Ecological Site Inventory (2001)
- **BLM Technical Reference 173719**: Riparian Wetland Soils (2003)
- **BLM Manual 6521**: State Agencies

P.2. Water Resources

- Federal Clean Water Act (CWA, 1977)
- Executive Order (EO) 11988 (May 24, 1977), the Floodplains EO
- Executive Order (EO) 11990 (May 24, 1977), the Wetlands EO

P.3. Wild Horses and Burros

The Bureau of Land Management is responsible for the protection, management and control of wild horses and burros on public lands in accordance with the Wild Free-Roaming Horses and Burros Act (WFRHBA) of 1971, as amended (Public Law 92-195), which states that BLM "shall manage wild free-roaming horses and burros in a manner that is designed to achieve and maintain a thriving natural ecological balance on the public lands." The WFRHBA directs the Departments of Interior and Agriculture to protect wild free-roaming horses and burros from capture, branding, harassment, or death, and to accomplish this in areas where they were found in 1971 (herd areas). The 4700 series of the Code of Federal Regulations further directs the multiple aspects of managing the wild horse and burro program.

The Federal Land Policy and Management Act of 1976 (FLPMA, PL-43, 1701) directed the BLM to scientifically manage rangelands under the principles of use and sustained yield. Under FLPMA, wild horses and burros were one of several multiple uses (along with recreation, mining,

domestic grazing, and fish and wildlife) that the BLM must manage in combination to best meet the public's present and future needs. FLPMA included approval for the use of helicopters for gathers and required that a current inventory of wild horses and burros be completed. The Public Rangeland Improvement Act of 1978 (PRIA), amended PL-92-195, defined excess horses, mandated research, and provided guidance on the adoption process and titling for wild horses and burros.

P.4. Wildland Fire

- Protection Act of September 20, 1922 (42 Stat. 857; 16 U.S.C. 594).
- McSweeney-McNary Act of 1928 (45 Stat. 221; 16 U.S.C. 487) – repealed.
- Economy Act of June 30, 1932 (47 Stat. 417; 31 U.S.C. 686).
- Taylor Grazing Act of June 28, 1934 (48 Stat. 1269; 43 U.S.C. 315).
- Clean Water Act of 1948 (CWA) as amended 1966, 1972 (33 U.S.C. 1251-1387).
- Reciprocal Fire Protection Act of May 27, 1955 (69 Stat. 66; 2 U.S.C. 1856, 1856a).
- Wilderness Act of 1964 (16 U.S.C. 1131-1136).
- National Historic Preservation Act of 1966 (P.L. 89-665; 80 Stat. 915; 16 U.S.C. 470) as amended (1992).
- National Environmental Policy Act (NEPA) of 1969 (42 U.S.C. 4321-4370).
- Clean Air Act of 1970 (CAA) as amended 1977, 1990, 2004 (42 U.S.C. 7401 – 7671q).
- Wild Free-Roaming Horse and Burro Act of 1971, as amended (PL 92-195).
- Public Rangeland Improvement Act of 1978 (PL 95-514).
- Alaska Native Claims Settlement Act of 1971 (43 USC 1601).
- Endangered Species Act of 1973 (ESA) (16 U.S.C. 1531-1544).
- Federal Fire Prevention and Control Act, October 29, 1974 (88 Stat. 1535, 15 U.S.C. 2201).
- Disaster Relief Act of 1974, as amended in 1980 and 1988, Sec. 5121 (42 U.S.C. 5121).
- Federal Land Policy and Management Act (FLPMA) of 1976 (43 U.S.C. 1701, et seq).
- Federal Grant and Cooperative Agreement Act, 1977 (P.L. 950224, as amended by P.L. 97-258, September 13, 1982), (96 Stat. 1003; 31 U.S.C. 6301 thru 6308).
- Alaska National Interest Lands Conservation Act (ANILCA) of 1980 (16 USC 3101 et seq.).
- Healthy Forests Restoration Act of 2003 (HFRA).
- Tribal Forest Protection Act, 2004 (P.L. 108).
- Federal Land Assistance, Management and Enhancement (FLAME) Act, 2009.
- Omnibus Consolidated Appropriations Act 1997, amended 1998, Public Law 104-208, then Public Law 105-277, Wyden Amendment. (Appropriations Act of 2001: Public Law 107-63 (HR 2217) Wildland Fire Management). (Appropriations Act of 2003: Public Law108-7, Section 323 Stewardship Contracting).
- The Multiple-Use Sustained-Yield Act of June 12, 1960.
- The Forest and Rangeland Renewable Resources Planning Act of August 17, 1974.
- Code of Federal Regulations, Title 43 - Public Lands: Interior.
- Code of Federal Regulations (CFR), Title 40 - Protection of Environment.
- Native American Consultation per Executive Orders 12866, 13084 et al. Protocol Agreement (1998) with State Historic Preservation Office, Nevada.
- The President's National Energy Policy (Executive Order 13212).
- Departmental Manual Part 620 for Wildland Fire Management.
- Department of the Interior Departmental Manual - General Policy and Procedures – Alaska (620 DM 2).
- United States Department of the Interior Manual (910 DM 1.3).
- BLM Handbook H-1740-2 (Integrated Vegetation Management).

- Interagency Standards for Fire and Fire Aviation Operations (Red Book).
- BLM Manual 9211 (Fire Planning).
- Bureau of Land Management Fire Management Planning Handbook - H-9211-1.
- Guidance for Implementation of Federal Wildland Fire Management Policy (February 2009).
- National Cohesive Wildland Fire Management Strategy.

P.5. Leasable Minerals

The Mineral Leasing Act of 1920 (MLA) first identified specific leasable minerals (coal, phosphate, oil, oil shale, gas, and sodium) as well as setting royalties and rental rates for these deposits. Several acts have amended the MLA to include new types and varieties of leasable minerals. These are the Potassium Act of 1927 (added potash [potassium] varieties consisting of chlorides, sulphates, carbonates, borates, silicates, and nitrates), the Geothermal Steam Act of 1970 (added geothermal resources), the Federal Onshore Oil and Gas Lease Reform Act of 1989, and a presidential order titled "The Onshore Oil and Gas Order No. 1" in 2007. A more complete list of the acts that have created the leasable minerals commodities and amended the MLA are below.

Laws & Policies

- **The Act of February 25, 1920 (30 USC 181 et seq., 41 Stat. 437):** Commonly referred to as the Mineral Leasing Act. Deposits of coal, phosphate, oil, oil shale, gas and sodium are classed as leasable minerals.
- **The Act of April 17, 1926 (44 Stat. 301):** Added sulphur deposits in New Mexico and Louisiana subject to Mineral Leasing Act.
- **The Act of June 8, 1926 (30 USC 291–293):** Dealt with gold, silver and quicksilver (mercury) in confirmed private land grants.
- **The Act of February 7, 1927 (44 Stat. 1057):** Commonly referred to as the Potassium Act. Expanded varieties of potash subject to Mineral Leasing Act by added chlorides, sulphates, carbonates, borates, and silicates.
- **The Act of May 21, 1930 (30 USC 301–306):** Authorizes leasing of oil and gas deposits under certain rights-of-way to the owner of the rights-of-way.
- **The Act of May 9, 1942 (56 Stat. 273):** Authorizes leasing on certain lands in Nevada, amended by the Act of October 25, 1949 (63 Stat. 886).
- **Section 402 of Reorganization Plan No. 3 of 1946 (5 USC Appendix):** Hard rock leasable mineral deposits. Transfers functions of leasing or other mineral disposals from Secretary of Agriculture to Secretary of Interior.
- **The Act of August 7, 1947 (30 USC 351–359 et seq., 61 Stat. 913):** Commonly referred to the Acquired Lands Act. Allows for leasing on acquired lands.
- **The Act of August 7, 1953 (67 Stat. 462):** Commonly referred to the Outer Continental Shelf Lands Act which authorizes competitive leasing of all minerals on the outer continental shelf.
- **The Act of August 13, 1954 (30 USC 521–531 et seq., 68 Stat. 708):** Commonly referred to as the Multiple Mineral Development Act, and allows for the development of both leasable and locatable minerals from the same tract of land under the leasing and locatable laws.
- **The Act of October 8, 1964 (16 USC 460n et seq.):** Allows for permitting of mineral leasing in the Lake Mead National Recreation Area as long as operations will "preserve the scenic, scientific and historic features contributing to public enjoyment of the area."
- **The Act of December 24, 1970 (84 Stat. 1566):** Commonly referred to the Geothermal Steam Act and Establishes a leasing system for geothermal resources and associated by-products.

- **The Act of September 3, 1974 (88 Stat. 1079):** Commonly referred to as the Geothermal Energy Research, Development, Demonstration Act) and promotes development and utilization of geothermal resources.
- **The Act of August 4, 1976 (90 Stat. 1083):** Commonly referred to the Federal Coal Leasing Amendments Act of 1975.
- **The Act of August 3, 1977 (30 USC 1201 et seq., 91 Stat. 445):** Commonly referred to the Surface Mining Control and Reclamation Act and requires reclamation of all surface mined coal lands.
- **The Act of August 4, 1977 (42 USC 7101 et seq.):** Commonly referred to as the Department of Energy Organization Act.
- **The Act of September 18, 1978 (92 Stat. 629):** Amended the Outer Continental Shelf Lands Act of August 7, 1953 (67 Stat. 462).
- **The Act of October 30, 1978 (92 Stat. 2073–2075).**
- **The Act of June 28, 1980 (94 Stat. 553):** Commonly referred to as the Deep Seabed Hard Mineral Resources Act.
- **Federal Onshore Oil and Gas Lease Reform Act of 1989.**
- **Presidential Order titled "The Onshore Oil and Gas Order No. 1" (2007).**

Regulations

- **43 CFR 3100 series:** Oil and Gas Leasing Regulations
- **43 CFR 3195:** Helium Contract Regulations
- **43 CFR 3200:** Geothermal Leasing Regulations
- **43 CFR 3400:** Coal Management Regulations
- **43 CFR 3500:** Leasing of Solid Minerals Other than Coal and Oil Shale Regulations
- **43 CFR 3900:** Oil Shale Management Regulations

P.6. Saleable Minerals

Laws & Policies

- **The Act of July 31, 1947 (30 USC 601, et seq., 61 Stat. 681):** Commonly referred to as the Materials Act and authorizes the disposal of sand, stone, gravel and common clays through sales.
- **The Act of July 23, 1955 (30 USC 611–615, 69 Stat. 367):** Commonly referred to as the Surface Resources Act of 1955 and added common varieties of sand, gravel, cinders, pumice, pumicite or clay subject to the Materials Act.
- **The Mining and Minerals Policy Act of 1970 (Public Law 91–631):** Was incorporated into FLPMA.

Regulations

- **43 CFR 3600 series:** Mineral Materials Regulations

P.7. Locatable Minerals

Laws & Policies:

- **General Mining Law of May 10, 1872, as amended (17 Stat. 91).**
- **The Act of August 4, 1892 (27 Stat. 348):** Commonly referred to as the Building Stone Placer Act.
- **The Act of August 30, 1954 (68 Stat. 934):** Atomic Energy Commission is authorized to issue permits and mining of fissionable materials.
- **The Act of August 11, 1955 (69 Stat. 679):** Staking uranium claims on coal lands.
- **The Act of September 28, 1962 (76 Stat. 652):** Removed petrified wood as a locatable mineral.
- **The Act of October 21, 1976 (43 USC 1701, et seq., 90 Stat. 2743):** Commonly referred to as the Federal Land Policy and Management Act (FLPMA) of 1976.

Regulations:

- **43 CFR 3715:** Use and Occupancy Under the Mining Laws Regulations
- **43 CFR 3800 series:** Surface Management Regulations

P.8. National Landscape Conservation System

Laws and Policies

- Wilderness Act Public Law 88-577 (16 U.S.C. 1131-1136) September 3, 1964
- National Trails System Act Public Law 90-534, as amended through Public Law 111-11, March 30,2009
- Wild and Scenic Rivers Act Public Law 90-542 October 2,1968
- Omnibus Pubic Land Management Act of 2009 Public Law 111-11 March 30, 2009
- Clark County Conservation of Public Lands and Natural Resources Act of 2002 Public Law 107-282 November 6, 2002
- Lincoln County Conservation, Recreation, and Development Act of 2004 Public Law 108-424 November 30, 2004
- BLM Manual 6320 - Considering Lands with Wilderness Characteristics in the BLM Land Use Planning Process
- BLM Manual 6330 - Management of Wilderness Study Areas
- BLM Manual 6340 - Management of Designated Wilderness Areas
- BLM Manual 6250 - National Scenic and Historic Trail Administration
- BLM Manual 6280 - Management of National Scenic and Historic Trails and Trails Under Study or Recommened as Suitable for Congressional Designation
- BLM Manual 6400 - Wild and Scenic Rivers - Policy and Program Direction for Identification, Evaluation, Planning, and Management
- BLM Manual 8380 - Cave and Karst Resources Management
- BLM Manual 8400 - Visual Resource Management

Appendix Q. Maps for the Las Vegas and Pahrump Field Offices RMP

Chapter 2 (Alternatives)

Map 2.6.3.1 - 5. Areas of Ecological Importance, Alternative 2

Map 2.6.1.9 - 1. Wildland Fire Management, Alternatives 2–4

Map 2.6.1.12 - 1. Visual Resource Management, Alternative 1

Map 2.6.1.12 - 2. Visual Resource Management, Alternative 2

Map 2.6.1.12 - 3. Visual Resource Management, Alternative 3

Map 2.6.1.12 - 4. Visual Resource Management, Alternative 4

Map 2.6.1.13 - 1. Wilderness and Lands With Wilderness Characteristics, Alternative 1

Map 2.6.1.13 - 2. Wilderness and Lands With Wilderness Characteristics, Alternative 2

Map 2.6.1.13 - 3. Wilderness and Lands With Wilderness Characteristics, Alternative 3

Map 2.6.1.13 - 4. Wilderness and Lands With Wilderness Characteristics, Alternative 4

Map 2.6.2.2 - 1. Grazing Allotments, Alternative 1

Map 2.6.2.2 - 3. Grazing Allotments, Alternative 3

Map 2.6.2.2 - 4. Grazing Allotments, Alternative 4

Map 2.6.2.3 - 1. Fluid Leasable Minerals, Alternative 1

Map 2.6.2.3 - 2. Fluid Leasable Minerals, Alternative 2

Map 2.6.2.3 - 3. Fluid Leasable Minerals, Alternative 3

Map 2.6.2.3 - 4. Fluid Leasable Minerals, Alternative 4

Map 2.6.2.3 - 13. Solid Leasable Minerals, Alternative 1

Map 2.6.2.3 - 14. Solid Leasable Minerals, Alternative 2

Map 2.6.2.3 - 15. Solid Leasable Minerals, Alternative 3

Map 2.6.2.3 - 16. Solid Leasable Minerals, Alternative 4

Map 2.6.2.3 - 5. Locatable Minerals, Alternative 1

Map 2.6.2.3 - 6. Locatable Minerals, Alternative 2

Map 2.6.2.3 - 7. Locatable Minerals, Alternative 3

Map 2.6.2.3 - 8. Locatable Minerals, Alternative 4

Map 2.6.2.3 - 9. Saleable Minerals, Alternative 1

Map 2.6.2.3 - 10. Saleable Minerals, Alternative 2

Map 2.6.2.3 - 11. Saleable Minerals, Alternative 3

Map 2.6.2.3 - 12. Saleable Minerals, Alternative 4

Map 2.6.2.4 - 9. Recreational Target Shooting Closures, Alternative 1

Map 2.6.2.4 - 10. Recreational Target Shooting Closures, Alternative 2

Map 2.6.2.4 - 11. Recreational Target Shooting Closures, Alternative 3

Map 2.6.2.4 - 5. Recreation Management Areas, Alternative 1

Map 2.6.2.4 - 6. Recreation Management Areas, Alternative 2

Map 2.6.2.4 - 7. Recreation Management Areas, Alternative 3

Map 2.6.2.4 - 8. Recreation Management Areas, Alternative 4

Map 2.6.2.4 - 1. Off-Highway Vehicle Designations, Alternative 1

Map 2.6.2.4 - 2. Off-Highway Vehicle Designations, Alternative 2

Map 2.6.2.4 - 3. Off-Highway Vehicle Designations, Alternative 3

Map 2.6.2.4 - 4. Off-Highway Vehicle Designations, Alternative 4

Map 2.6.2.5 - 2. Travel Management Areas, Alternative 2

Map 2.6.2.5 - 3. Travel Management Areas, Alternative 3

Map 2.6.2.5 - 4. Travel Management Areas, Alternative 4

Map 2.6.2.6 - 1. Disposal Boundaries, Alternative 1

Map 2.6.2.6 - 2. Disposal Boundaries, Alternative 2

Map 2.6.2.6 - 3. Disposal Boundaries, Alternative 3

Map 2.6.2.6 - 4. Disposal Boundaries, Alternative 4

Map 2.6.2.6 - 5. Solar Energy, Alternative 1

Map 2.6.2.6 - 6. Solar Energy, Alternative 2

Map 2.6.2.6 - 7. Solar Energy, Alternative 3

Map 2.6.2.6 - 8. Solar Energy, Alternative 4

Map 2.6.2.6 - 9. Wind Energy, Alternative 1

Map 2.6.2.6 - 10. Wind Energy, Alternative 2

Map 2.6.2.6 -11. Wind Energy, Alternative 3

Map 2.6.2.6 -12. Wind Energy, Alternative 4

Map 2.6.2.6 - 13. Utility Corridors, Alternative 1

Map 2.6.2.6 - 14. Utility Corridors, Alternative 2

Map 2.6.2.6 -15. Utility Corridors, Alternative 3

Map 2.6.2.6 - 16. Utility Corridors, Alternative 4

Map 2.6.3.1 - 1. Areas of Critical Environmental Concern, Alternative 1

Map 2.6.3.1 - 2. Areas of Critical Environmental Concern, Alternative 2

Map 2.6.3.1 - 3. Areas of Critical Environmental Concern, Alternative 3

Map 2.6.3.1 - 4. Areas of Critical Environmental Concern, Alternative 4

Map 2.6.3.3 - 1. Wild and Scenic Rivers, Alternative 1

Map 2.6.3.3 - 2. Wild and Scenic Rivers, Alternative 2

Map 2.6.3.3 - 3. Wild and Scenic Rivers, Alternative 3

Chapter 3 (Affected Environment)

Map 3.2.2.3 - 1. Geology

Map 3.2.4.4 - 1. Hydrologic Basins

Map 3.2.4.4 - 2. NHD HUC 19

Map 3.2.3.1 - 1. Soil (Water Erodibility Group)

Map 3.2.3.1 - 2. Soil (Wind Erodibility Group)

Map 3.2.5.11 - 1. Vegetation Community

Map 3.2.5.13 - 1. Weed Inventory

Map 3.2.6.1 - 1. Ash Meadows Critical Habitat

Map 3.2.6.1 - 2. Bighorn Sheep Habitat

Map 3.2.6.1 - 3. Desert Tortoise Critical Habitat

Map 3.2.6.1 - 4. Desert Tortoise Habitat Model

Map 3.2.6.1 - 5. Virgin/Muddy River Habitat

Map 3.2.8.1 - 1. Herd Areas

Map 3.2.8.1 - 2. Herd Management Areas

Map 3.3.3.1 - 1. Geothermal Potential

Map 3.3.3.1 - 2. Geothermal Well Location

Map 3.3.3.3 - 3. Locatable Potential

Map 3.3.3.1 - 3. Oil and Gas Lease Parcels

Map 3.3.3.1 - 4. Oil and Gas Permits

Map 3.3.3.1 - 5. Oil and Gas Potential

Map 3.3.3.2 - 1. Sand and Gravel Potential

Map 3.4.3.1 - 1. National Trails

Map 3.4.2.1 - 1. Back Country Byways

Map 3.5.2.3 - 1. Formerly Used Defense Sites

Appendix R. Best Management Practices for Formerly Used Defense Sites

1. Upon identifying munitions response sites (MRS) on BLM-administered lands, the BLM, in consultation with the U.S. Army Corps of Engineers (USACE) or a military component, will develop and implement risk management plans for formerly used defense sites (FUDS) or other former MRS that may be identified in the future. Costs incurred for implementation of risk management, if any, will be funded by the USACE or responsible military component. BLM assumes that MRS contain additional and/or residual amounts of unexploded ordnance (UXO), discarded military munitions (DMM), or munition constituents until the BLM and USACE agree that no unacceptable risk exists or further response actions are required.
2. To reduce and manage risks on BLM-administered lands, data sharing between BLM and the USACE will occur to review and update FUDS inventories and address munitions and explosives of concern (MEC)-contaminated sites within the planning area, when necessary. Law enforcement, firefighting, and emergency first response personnel will be provided FUDS inventories.
3. Response actions and land management decisions will be conducted between BLM and the USACE regarding FUDS or other MRS with both parties agreeing on the remedy selection when a response action is required.
4. Coordinate with the USACE on all ongoing land management activities associated with FUDS or other MRS to initiate prompt site evaluations and site cleanup actions. In accordance with the Statement of Principles for Collaborative Decision Making, all FUDS cleanup actions on BLM-administered lands will comply with federal, state, and local regulations and BLM policy.
5. Provide reasonable access to authorized response agencies for MRS investigations, including removal and/or remedial actions as necessary via a signed land-use authorization. Emergency response agencies or other authorized agencies must provide notification to the BLM as soon as practicable, but not later than 24 hours after site entry onto BLM-administered lands.
6. Ensure that MEC removal and remedial actions are consistent with federal, state, and local regulations and BLM land-use plans to protect the environment and reduce risks to the public and employees. BLM managers and personnel do not touch, move, or remove MEC on BLM-administered lands. Where appropriate, BLM and the USACE may agree to leave some MEC in place and restrict public access to reduce the risk to the public and the environment.
7. Collaborate with the USACE for a written agreement to establish roles and responsibilities when conducting periodic FUDS reviews to evaluate the effectiveness of the remedy, remedy optimization, and advancements in new technologies.
8. Notify the public recreating on MRS of the hazards specific to the MEC identified or suspected at the site. Provide written notification to existing authorized users of the hazards specific to the site. Provide training or educational materials to the public and existing authorized users on the steps to take if they discover items suspected to be munitions or parts of munitions.
9. Prior to a disposal, through the Environmental Site Assessment (ESA) process, determine if there are hazards (e.g. MRS) resulting from past military activities. Where hazards are present as a result of past military activities, the Department of Defense (DOD) retains the responsibility and control of all military munitions as set forth in 10 U.S.C. §172. The DOD is solely responsible for removal and/or remedial actions for MEC with the concurrence of BLM.
10. Prior to acquisition of real property (including withdrawn public lands that are returning to the jurisdiction of the Secretary of the Interior), the BLM will determine, through the ESA

process, if hazards associated with past military activities are present, including other public health and safety concerns (e.g. MRS) where there may be MEC. If hazards associated with past military activities or other public health and safety concerns are present, the extent of DOI's exposure to cleanup liability and other associated risks must be evaluated on a case-by-case basis. BLM will not acquire contaminated property.

11. Coordinate with the DOD, USACE, and other authorized agencies when appropriate on land-use authorizations proposed on BLM-administered lands at FUDS or other MRS. Such coordination may require imposing land-use controls, which may inhibit or preclude certain authorized uses.

Glossary

Acquisition: The BLM acquires land, easements, and other real property rights when it is in the public interest and consistent with approved land-use plans. The BLM's land acquisition program is designed to (1) improve management of natural resources through consolidation of federal, state, and private lands; (2) increase recreational opportunities, preserve open space, and/or ensure accessibility of public lands; (3) secure key property necessary to protect habitat for threatened and endangered species, promote high-quality riparian areas, and promote biological diversity; (4) preserve archaeological and historical resources; and (5) implement specific acquisitions authorized by acts of Congress.

Active season: The part of the year when desert tortoises are active, generally from March 15 to May 31 and September 1 to October 31.

Active use: Livestock grazing term meaning the current authorized use, including livestock grazing and conservation use. Active use may constitute a portion, or all, of permitted use. Active use does not include temporary non-use or suspended use of forage within all or a portion of an allotment (43 Code of Federal Regulations [CFR] 4100.0-5).

Actual use: Livestock grazing term meaning where, how many, what kind or class of livestock, and how long livestock graze on an allotment or on a portion or pasture of an allotment.

Adits: A horizontal passage leading into a mine for the purposes of access or drainage.

Administrative purposes: Administrative use functions involving regular maintenance or operation of facilities or programs.

Administrative route: Routes that are limited to administrative (official or authorized) users only.

Administrative use: Official use related to management and resources of public lands by federal, state, or local governments or non-official use sanctioned by an appropriate authorization instrument, such as rights-of-way (ROW), permit, lease, or maintenance agreement.

Air quality: The quality of the atmosphere as determined by the concentration of air pollutants, visibility, odors, sound, and other energy forms (such as solar radiation) transmitted through the atmosphere.

Allotment: An area of land designated and managed for livestock grazing.

Allotment management plan (AMP): A document prepared in consultation with the grazing lessees or permittees involved that applies to livestock operations on public lands. The document (1) prescribes the manner in and

extent to which livestock operations will be conducted to meet the multiple-use, sustained yield, economic, and other needs and objectives as determined for the lands by the secretary concerned; (2) describes the type, location, ownership, and general specifications for the range improvements to be installed and maintained on the lands to meet the livestock grazing and other objectives of land management; and (3) contains such other provisions relating to livestock grazing and other objectives found by the secretary concerned to be consistent with the provisions of this act and other applicable law.

Analysis of the management situation (AMS): Assessment of the current management direction. It includes a consolidation of existing data needed for analyzing and resolving identified issues, a description of current BLM management guidance, and a discussion of existing problems and opportunities for solving them.

Animal unit month (AUM).: A standardized measurement of the amount of forage necessary for the sustenance of one cow unit or its equivalent for 1 month (about 800 pounds of usable air-dried forage).

Anthropogenic: Caused or produced by humans.

Appropriate management level (AML): The number of adult horses or burros (expressed as a range with an upper and lower limit) to be managed within a herd management area. Forage for wild horses and burros (animal unit months) is allocated based on the AML upper limit.

Areas of critical environmental concern (ACEC): Areas within public lands in which special management attention is required (when such areas are developed or used or where no development is required) to protect and prevent irreparable damage to important historic, cultural, or scenic values; fish and wildlife resources; or other natural systems or processes or to protect life and safety from natural hazards.

Assessment: The act of evaluating and interpreting data and information for a defined purpose.

Authorized officer: A federal employee who has the delegated authority to make a specific decision.

Avoidance area: Areas with sensitive resources and/or values where rights-of way and Section 302 permits, leases, and easements would be strongly discouraged. Authorizations made in avoidance areas would have to be compatible with the purpose for which the area was designated and not be otherwise feasible on lands outside the avoidance area.

Backcountry: A recreation setting classification characterized by a naturally appearing landscape with human modifications not readily noticeable, small areas with limited evidence of surface or vegetative disturbances, and little or no evidence of primitive

roads or motorized use. Small, isolated structures may be present. Contains some primitive trails made of native materials (e.g., log bridges and carved wooden signs).

Backcountry byways: A component of the national scenic byway system that focuses primarily on corridors along backcountry roads which have high scenic, historic, archeological, or other public interest values. The road may vary from a single-track bike trail to a low-speed, paved road that traverses backcountry areas.

Bench: A step-like part of a mine where minerals are being extracted.

Best management practices (BMP): A suite of techniques that guide or may be applied to management actions to aid in achieving desired outcomes. BMPs are often developed in conjunction with land-use plans, but they are not considered a land-use plan decision unless the land-use plan specifies that they are mandatory. The practices may be updated or modified without a plan amendment if they are not mandatory.

Big game: Large wildlife species that are hunted (e.g., elk, deer, bison, bighorn sheep, and pronghorn).

Biological assessment (BA): The document prepared by or under the direction of the BLM concerning listed and proposed species and designated and proposed critical habitats that may be present in the action area. The document contains the BLM's determination of potential effects of the action on such species and habitats. Biological assessments are required for formal consultations and conferences on "major construction projects." They are recommended for all formal consultations and formal conferences and many informal consultations in which a written evaluation of the effects of an action on listed or proposed species and on designated or proposed critical habitat is needed.

Biological diversity (biodiversity): The full range of variability within and among living organisms and the ecological complexes in which they occur. Biological diversity encompasses ecosystem or community diversity, species diversity, and genetic diversity.

Biological evaluation: The gathering and evaluation of information on proposed endangered and threatened species and critical and proposed critical habitat for actions that do not require a biological assessment.

Biological opinion (BO): The document that includes (1) the U.S. Fish and Wildlife Service's and/or National Marine Fisheries Service's opinion as to whether or not a federal action is likely to jeopardize the continued existence of a listed species or to result in the destruction or adverse modification of designated critical habitat; (2) a summary of information on which the opinion is based; and (3) a detailed discussion of the effects of the action on a listed species or designated critical habitat. Depending on the determination of jeopardy or non-jeopardy, the

biological opinion may contain reasonable and prudent alternatives, a statement of anticipated take of listed animals, and conservation recommendations for listed plants.

Biological soil crust: See Cryptobiotic Soil Crust.

Burned area rehabilitation (BAR): See Rehabilitation.

Candidate species: Taxa for which the U.S. Fish and Wildlife Service has sufficient information on their status and threats to support proposing the species for listing as endangered or threatened under the Endangered Species Act but for which issuance of a proposed rule is currently precluded by higher priority listing actions. Separate lists for plants, vertebrate animals, and invertebrate animals are published periodically in the Federal Register.

Casual use: Any short-term, non-commercial activity ordinarily resulting in no or negligible disturbance of public lands, resources, or improvements. Casual use generally includes surveying, marking routes, and data collection. It also includes collecting of geochemical, rock, soil, or mineral specimens using hand tools, hand panning, and non-motorized sluicing. It also generally includes use of metal detectors, gold spears, and other battery-operated devices for sensing the presence of minerals, and hand and battery-operated dry-washers. Casual use excludes the use of mechanized earth-moving equipment, truck-mounted drilling equipment, suction dredges, and motorized vehicles in areas designated as closed to off-highway vehicles, chemicals, or explosives. It also excludes occupancy or operations in which the cumulative effects of the activities result in more than negligible disturbance.

Cave: Any naturally occurring void, cavity, recess or system of interconnected passages that occurs beneath the surface of the earth or within a cliff or ledge (including any cave resources therein, but not including any vug, mine, tunnel, aqueduct, or other man-made excavation) and is large enough to permit an individual to enter, whether or not the entrance is naturally formed or man-made. Such term shall include any natural pit, sinkhole, or other feature that is an extension of the entrance.

Cave resource: Includes any material or substance occurring naturally in caves on federal lands, such as animal life, plant life, paleontological deposits, sediments, minerals, speleogens, and speleothems.

Cherry-stemmed route: A dead-end route where the boundary of the wilderness extends up one side of the route, around its terminus, and down the other side.

Climate: The description of the long-term pattern of weather in a particular area. Climate is the aggregate of weather in a particular area.

Climate change: A change in the statistical properties of the climate system when measured over long periods of time, regardless of the cause. Fluctuations over short periods of time, shorter than a few decades, such as El Niño, do not represent climate change.

Closed: Generally denotes that an area is unavailable for a particular use or uses; refers to specific definitions found in law, regulations, or policy guidance for application to individual programs. For example, 43 CFR 8340.0-5 sets forth the specific meaning of "closed" as it relates to OHV use, and 43 CFR 8364 defines "closed" as it relates to closure and restriction orders.

Code of Federal Regulations (CFR): The official codification of federal regulations established under the Federal Register Act.

Collaboration: A cooperative process in which interested parties, often with widely varied interests, work together to seek solutions with broad support for managing public and other lands.

Collaborative partnerships or collaborative stewardship: Refers to people working together, sharing knowledge and resources, to achieve desired outcomes for public lands and communities within statutory and regulatory frameworks.

Commercial purpose or activity: The circumstance where a holder attempts to produce a profit by allowing the use of its facilities by an additional party.

Commercial service: In the context of decisions related to management of lands with wilderness characteristics, commercial services are those necessary for activities that are proper for realizing the primitive recreational wilderness purposes of the area. Commercial services are allowed to the extent necessary for realizing primitive recreational experiences in a wilderness setting.

Commercial use: Recreation use of public lands and related waters for business or financial gain. When any person, group, or organization makes or attempts to make a profit, receive money, amortize equipment, or obtain goods or services as compensation from participants in recreation activities occurring on public lands or related waters, the use is considered commercial. An activity, service, or use is commercial if anyone collects a fee or receives other compensation that is not strictly a sharing of, or is in excess of, actual expenses incurred for the purposes of the activity, service, or use. Commercial use is also characterized by situations when a duty of care or expectation of safety is owed participants as a result of compensation. It may also be characterized by paid public advertising for participants.

Competitive event: Any organized, sanctioned, or structured use, event, or activity on public land in which two or more contestants compete and either or both of the following elements apply: (1) participants register,

enter, or complete an application for the event; (2) a predetermined course or area is designated; or one or more individuals contesting an established record such as for speed or endurance.

Conformance: Means that a proposed action shall be specifically provided for in the land-use plan or, if not specifically mentioned, shall be clearly consistent with the goals, objectives, or standards of the approved land-use plan.

Conservation agreement: A formal written document agreed to by BLM and another federal agency, state agency, local government, tribes, or the private sector to achieve the conservation of candidate species or other special status species through voluntary cooperation. It documents the specific actions and responsibilities for which each party agrees to be accountable. The objective of a conservation agreement is to reduce threats to a special status species or its habitat. An effective conservation agreement may lower species' listing priority or eliminate the need for listing.

Conservation strategy: A strategy outlining current activities or threats that are contributing to the decline of a species, along with the actions or strategies needed to reverse or eliminate such a decline or threats. Conservation strategies are generally developed for species of plants and animals that are designated as BLM-sensitive species or that U.S. Fish and Wildlife Service or National Marine Fisheries Service have determined to be federal candidates under the Endangered Species Act.

Consistency: Means that the proposed land-use plan does not conflict with officially approved plans, programs, and policies of tribes, other federal agencies, and state and local governments (to the extent practical within federal law, regulation, and policy).

Contamination: A general term for any undesirable substance not normally present in the environment. Examples include but are not limited to Comprehensive Environmental Response, Compensation and Liability Act, hazardous substances, and/or petroleum products.

Controlled surface use: Surface occupancy or use that is subject to special operating constraints for the purpose of protecting a defined parcel of land.

Controlled surface use stipulation: Use and occupancy is allowed (unless restricted by another stipulation), but identified resource values require special operational constraints that may modify lease rights. A CSU is used for operating guidance and access. The stipulation shall explicitly describe what activity is to be protected or controlled, or what operational constraints will be required, and shall identify the applicable specific area and the purpose for the requirement. For example, stay on existing roads and trails. The stipulation should be performance-based, typically requiring the operator to submit a plan to the agency for the authorized officer's approval, outlining

how the operator will meet performance requirements identified in the stipulation.

Cooperating agency: Assists the lead federal agency in developing an environmental assessment or environmental impact statement. The Council on Environmental Quality regulations implementing the National Environmental Policy Act of 1969 (NEPA) define a cooperating agency as any agency that has jurisdiction by law or special expertise for proposals covered by NEPA (40 CFR 1501.6). Any federal, state, or local government jurisdiction with such qualifications may become a cooperating agency by agreement with the lead agency.

Council on Environmental Quality (CEQ): An advisory council to the president of the United States established by the National Environmental Policy Act of 1969. It reviews federal programs to analyze and interpret environmental trends and information.

Critical habitat: (1) The specific areas within the geographical area currently occupied by a species, at the time it is listed in accordance with the Endangered Species Act, on which are found those physical or biological features (i) essential to the conservation of the species and (ii) that may require special management considerations or protection, and (2) specific areas outside the geographical area occupied by a species at the time it is listed upon determination by the U.S. Fish and Wildlife Service and/or National Marine Fisheries Service that such areas are essential for the conservation of the species. Critical habitats are designated in 50 CFR 17 and 226. The constituent elements of critical habitat are those physical and biological features of designated or proposed critical habitat essential to the conservation of the species.

Cryptobiotic soil crust: Biological communities that form a surface layer or crust on some soils. These communities consist of cyanobacteria (blue-green bacteria), micro fungi, mosses, lichens, and green algae and perform many important functions, including fixing nitrogen and carbon, maintaining soil surface stability, and preventing erosion. Cryptobiotic crusts also influence the nutrient levels of soils and the status and germination of plants in the desert. These crusts are slow to recover after severe disturbance.

Cultural resource inventory classes: (See *BLM Manual,* Section 8110.21.) **Class I: Existing Data Inventory —** A study of published and unpublished documents, records, files, registers, and other sources, resulting in analysis and synthesis of all reasonably available data. Class I inventories encompass prehistoric, historic, and ethnological/sociological elements and are in large part chronicles of past land uses. They may have major relevance to current land-use decisions. **Class II: Sampling Field Inventory —** A statistically based sample survey designed to help characterize the probable density, diversity,

and distribution of archaeological properties in a large area by interpreting the results of surveying limited and discontinuous portions of the target area. **Class III: Intensive Field Inventory** — A continuous, intensive survey of an entire target area aimed at locating and recording all archaeological properties that have surface indications by walking close-interval parallel transects until the area has been thoroughly examined. Class III methods vary geographically, conforming to the prevailing standards for the region involved.

Cultural resource or cultural property: A definite location of human activity, occupation, or use identifiable through field inventory (survey), historical documentation, or oral evidence. The term includes archaeological, historic, or architectural sites, structures, or places with important public and scientific uses, and may include definite locations (sites or places) of traditional cultural or religious importance to specified social and/or cultural groups. Cultural resources are concrete, material places and things that are located, classified, ranked, and managed through the system of identifying, protecting, and using for public benefit described in this manual series.

Cumulative impact: The impact on the environment resulting from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

Dark skies: Denoting or located in a place where the darkness of the night sky is relatively free of interference from artificial light.

Desert pavement: A desert surface that is covered with closely packed, interlocking angular or rounded rock fragments of pebble and cobble size one to two deep that rest on or are embed in underlying soil. Aridisols associated with desert pavement typically have formed in eolian parent material from several centimeters to meters deep immediately underlying the surface clasts. Wherever found, desert pavement plays a fundamental role in the long-term evolution of the land surfaces it mantles. Surface clasts protect underlying sediments and soil from removal by wind and water and provide a substrate for the capture of eolian sand, silt, clay, and salts.

Designated corridor: BLM's preferred route for placing rights-of-way for utilities (i.e. pipelines and power lines) and transportation (i.e. highways and railroads).

Designated roads and trails: Specific roads and trails identified by the BLM (or other agencies) where some type of motorized vehicle use is appropriate and allowed either seasonally or yearlong.

Designation: The act of indicating or identifying. This may be accomplished in various ways including Public law (e.g. wilderness areas), presidential proclamation (e.g. national monuments), or by administrative action through secretarial designation or the land use plan. Recreation management areas are designated through the land-use plan.

Dispersed or extensive recreation: Recreation activities of an unstructured type that are not confined to specific locations or dependent on recreation sites. Examples of these activities may be hunting, fishing, off-road vehicle use, hiking, and sightseeing.

Disposal: Transfer of public lands out of federal ownership to another party through sale, exchange, Recreation and Public Purposes (R&PP) Act, or other land law statutes.

Disposal areas: Areas designated for disposal/conveyance. These areas are either legislative disposal areas or land-use planning disposal areas (also referred to as lands identified as suitable for disposal). Legislative disposal areas are areas congressionally mandated by law for disposal. Land-use planning disposal areas are areas identified through land-use planning where lands were evaluated as suitable for disposal pursuant to Section 203 of FLPMA.

Disruptive activities: Activities that preclude basic life functions for a species. These activities could result in individuals leaving a currently used area; increased stress on the individual; and/or not breeding, young abandonment, or aberrant behavior.

Disturbed area: Any action created through mechanized or mechanical means that would cause soil mixing or result in alteration or removal of soil or vegetation and expose the mineral soil to erosive processes. Used in the literal context of actual, physical disturbance, and movement or removal of the land surface and vegetation. Examples include construction of roads and trails, well pads, pits, reservoirs, pipelines, and facilities. Emergency activities, rangeland monitoring, routine maintenance associated with an approved authorization, dispersed recreational activities (e.g., hunting, hiking), and livestock grazing are not considered surface disturbance.

Easement: An interest in land entitling the owner or holder, as a matter or right, to enter upon land owned by another party for a particular purpose.

Eligible river: A river or river segment found to meet criteria found in Sections 1(b) and 2(b) of the Wild and Scenic Rivers Act of being free flowing and possessing one or more outstandingly remarkable value.

Emergency rehabilitation: See Rehabilitation.

Emergency stabilization: Planned actions to stabilize and prevent unacceptable degradation to natural and cultural resources, to minimize threats to life or property resulting from the effects of a fire, or to repair/replace/construct physical improvements necessary to prevent degradation of land or resources.

Endangered species: Any animal or plant species in danger of extinction throughout all or a significant portion of its range as designated by the U.S. Fish and Wildlife Service under the Endangered Species Act. Also see Threatened Species.

Endangered Species Act (ESA): The U.S. Endangered Species Act is federal legislation that aims to conserve the ecosystems upon which endangered and threatened species depend. The act was signed into law in December 1973. The ESA protects plant and animal species and is jointly administered by the U.S. Fish and Wildlife Service and NOAA Fisheries. Its aim is twofold: to provide protection for species that are in danger of extinction and to conserve the habitats on which those species depend.

Environmental impact statement (EIS): A formal public document required by the federal government under NEPA for certain federal actions that documents the information required to evaluate the environmental impact of a project. It informs decision makers and the public of the reasonable alternatives that would avoid or minimize adverse impacts or enhance the quality of the environment. This is the highest level of environmental analysis and documentation in the NEPA process.

Environmental justice (EJ): Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," directs federal agencies to assess whether their actions have disproportionately high and adverse human health or environmental effects on minority or low-income populations.

Ephemeral stream: A stream that flows only in direct response to precipitation and whose channel is at all times above the water table. Ephemeral streams generally do not flow continuously for more than 30 days and generally have more robust upland vegetation than that found outside of the ephemeral riparian-wetland area.

Event (special recreation permit event): A single, structured, organized, consolidated, or scheduled meeting or occurrence for recreational use of public lands and water resources; may be composed of several related activities.

Exclusion area: Areas with sensitive resources and/or values where rights-of-way and Section 302 permits, leases, and easements would not be authorized.

Executive order (EO): An executive order is a presidential directive with the force of law. It does not need congressional approval. The Supreme Court has upheld executive orders as valid either under the general

constitutional grant of executive powers to the president or if authority for it was expressly granted to the president by Congress. Congress can repeal or modify an executive order by passing a new law; however, it must be signed by the president or overridden by his veto.

Extensive recreation management area (ERMA): The ERMA is an administrative unit that requires specific management consideration in order to address recreation use, demand, or Recreation and Visitor Services program investments.

Federal-aid highways: Highways on the National Highway System, the Interstate System, and all other public roads not classified as local roads or rural minor collectors.

Federal Land Policy and Management Act of 1976 (FLPMA): Public Law 94-579, October 21, 1976, often referred to as BLM's "Organic Act." The act that (1) set out, for the Bureau of Land Management, standards for managing public lands including land-use planning, sales, withdrawals, acquisitions, and exchanges; (2) authorized the setting up of local advisory councils representing major citizens groups interested in land-use planning and management, (3) established criteria for reviewing proposed wilderness areas, and (4) provided guidelines for other aspects of public land management such as grazing.

Federal lands: As used in this document, lands owned by the United States, without reference to how the lands were acquired or what federal agency administers the lands. The term includes mineral estates or coal estates underlying private surface, but excludes lands held by the United States in trust for Indians, Aleuts, or Eskimos (see also Public Land).

Federal Register: A daily publication that reports presidential and federal agency documents.

Federal reserved water rights: Where Congress, or the Executive Branch, has withdrawn lands from the public domain for a specific federal purpose, such reservation may create a federal reserved water right to unappropriated water in the amount necessary to fulfill the primary purpose of the reservation *(U.S. v. New Mexico)*. The U.S. Supreme Court established federal reserved water rights in the 1908 case of *Winters v. United States*, 207 U.S. 568.

Finding of no significant impact (FONSI): A finding that explains that an action will not have a significant effect on the environment and, therefore, an environmental impact statement will not be required (40 CFR 1508.13).

Fire management objective: Planned, measurable result desired from fire protection and use based on land-use goals and objectives.

Fire management plan (FMP): A plan that identifies and integrates all wildland fire management and related activities within the context of approved land/resource management plans. It defines a program to manage wildland fires (wildfire and prescribed fire). The plan is supplemented by operational plans including, but not limited to, preparedness plans, preplanned dispatch plans, and prevention plans. Fire management plans ensure that wildland fire management goals and components are coordinated.

Fire management unit (FMU): A land use area definable by objectives, management constraints, topographic features, access, marginal values to be protected, political boundaries, historic fire ignitions, fuel types, major fire regime groups, etc., that set it apart from the characteristics of an adjacent FMU. The FMUs may have dominant management objectives and pre-selected strategies assigned to accomplish these objectives.

Fire planning unit (FPU): The geographic scope of the landscape defined for the fire management analysis. A fire planning unit consists of one or more fire management units. The FPUs may relate to a single administrative unit, a sub-unit, or any combination of units or subunits. The FPUs are scalable and may be contiguous or non-contiguous. The FPUs are not predefined by agency administrative unit boundaries, and may relate to one or more agencies; they may be described spatially.

Fire regime: Description of the patterns of fire occurrence, frequency, size, and severity — and sometimes, vegetation and fire effects — in a vegetation type or ecosystem. Fire regimes are most commonly characterized by variables such as frequency, severity, effects, meteorology, patch and pattern, seasonality, and fire behavior characteristics. A fire regime is a generalization based on fire histories at individual sites. Fire regimes can often be described as cycles because some parts of the histories usually get repeated, and the repetitions can be counted and measured, such as fire return interval.

Fire regime condition class (FRCC): The depiction of the degree of departure from historical fire regimes, possibly resulting in alterations of key ecosystem components. These classes categorize and describe vegetation composition, structure, and fire regime conditions for biophysical setting The risk of loss of key ecosystem components from wildfires increases from Condition Class 1 (lowest risk) to Condition Class 3 (highest risk). The FRCC involves two pieces of information: (1) the historic fire regime (I-V), and (2) the condition class.

Fiscal year: The federal government's annual accounting period that begins on October 1 and ends on September 30 of the following calendar year.

Fluid minerals: Oil, gas, coalbed natural gas, and geothermal resources.

Forage: Vegetation of all forms available and of a type used for animal consumption.

Fragile soils: Soils with intrinsic properties and in areas that make them especially susceptible to erosion. These properties include high salt concentrations, very fine textures, shallow depths, and steep slopes (more than 30 percent).

Free flowing: Existing or flowing in natural condition without impoundment, diversion straightening, rip-rapping, or other modification of the waterway (Section 16(b) of the Wild and Scenic Rivers Act).

Free roaming: Wild horses and burros are able to move without restriction by fences or other barriers within a herd management area.

Front country: A recreation setting classification characterized by a setting on or near improved roads but away from highways that includes moderate evidence of human modification that generally harmonizes with the surrounding natural landscape. Surface and vegetative modifications are common. Structures, including small reservoirs, power lines, and microwave installations, are generally scattered, remaining visually subordinate. Recreation facilities (e.g., campsites, restrooms, trails, and interpretive signs) are generally small and rustic.

Functioning at risk: (1) Condition in which vegetation and soil are susceptible to losing their ability to sustain naturally functioning biotic communities. Human activities, past or present, may increase the risks. (2) Uplands or riparian-wetland areas that are properly functioning, but in which a soil, water, or vegetation attribute makes them susceptible to degradation and lessens their ability to sustain natural biotic communities. Uplands are particularly at risk if their soils are susceptible to degradation. Human activities, past or present, may increase the risks (Rangeland Reform Draft Environmental Impact Statement Glossary). Also see Proper Functioning Condition and Nonfunctioning Condition.

Geographic information system (GIS): A system of computer hardware, software, data, people, and applications that capture, store, edit, analyze, and graphically display a potentially wide array of geospatial information.

Glory holes: A surface depression produced by block caving in underground mining.

Goal: A broad statement of a desired outcome; usually not quantifiable and may not have established time frames for achievement.

Grandfathered rights: Usually the right to use in a non-conforming manner due to existence of use prior to the establishment of conforming terms and conditions.

Greenhouse gas (GHG): A greenhouse gas, sometimes abbreviated as GHG, is a gas in an atmosphere that absorbs and emits radiation in the thermal infrared range. Greenhouse gases in the earth's atmosphere are water vapor, carbon dioxide, methane, nitrous oxide, and ozone.

Ground-disturbing: When previously undisturbed ground is compacted to a level that prevents seeds from germinating or destroys the cryptobiotic crust, or when the top layer of soil that prevents wind and/or water erosion is removed.

Groundwater: Water located beneath the earth's surface in soil pore spaces and in the fractures of rock formations. Groundwater supplies wells, streams, springs, seeps, and other bodies of water. Its use is regulated by the Nevada Department of Conservation & Natural Resources, Nevada Division of Water Resources. Nevada Revised Statues Chapters 533 and 534 address the use of the groundwater in Nevada.

Guideline: A practice, method, or technique determined to be appropriate to ensure that standards can be met or that significant progress can be made toward meeting the standard. Guidelines are tools such as grazing systems, vegetative treatments, or improvement projects that help managers and permittees achieve standards. Guidelines may be adapted or modified when monitoring or other information indicates the guideline is not effective or a better means of achieving the applicable standard becomes appropriate.

Habitat: The place where an organism (plant or animal) lives. There are four major divisions of habitat, namely, terrestrial, freshwater, estuarine, and marine.

Habitat fragmentation: Process by which habitats are increasingly subdivided into smaller units resulting in their increased insularity and losses of total habitat area.

Habitat management plan (HMP): An officially approved activity plan for a specific geographic area of public land. An HMP identifies wildlife habitat and related objectives, defines the sequence of actions to be implemented to achieve the objectives, and outlines procedures for evaluating accomplishments.

Herd (horse or burro): One or more stallions and mares.

Herd area (HA): Geographic areas of public lands identified as habitat used by wild horses and burros when the Wild Free-Roaming Horses and Burros Act of 1971 was enacted (December 12, 1971).

Herd management area (HMA): May be established in those herd area within which wild horses and burros can be managed for the long term. HMAs are designated through the land-use process for the maintenance of wild horse and burro herds. In delineating each HMA, the authorized officer shall

consider the appropriate management level for the herd, the habitat requirements of the animals, the relationships with other uses of the public and adjacent private lands, and the constraints contained in 43 CFR 4710.4.

Heritage tourism: A form of recreation that involves experiencing the settings, activities, and people that represent past and present experiences, stories, and peoples. It may include historic, cultural, and natural resources and may be dispersed, self-guided, or tour-guided in any recreational setting.

High-value habitat: Any particular habitat that sustains a community, population, or subpopulation. It includes intensive use areas that because of relative wide distribution do not constitute crucial (Utah Division of Wildlife Resources [UDWR] critical) values but are highly important to high-interest wildlife. It may also include moderately sensitive habitats of high-interest species that have low reclamation potential. Class 3 streams, lakes, ponds, or reservoirs. Reconstruction or enhancement of these areas may be possible, but should be avoided if not possible. Examples include less crucial (critical) but more widely distributed summer and/or winter ranges, important feeding areas, areas of high wildlife diversity and/or density of high-interest species, natural wetlands, and all other riparian areas.

Hydrology: The scientific study of the properties, distribution, and effects of water on the earth's surface, in the soil and underlying rocks, and in the atmosphere.

Impacts (or effects): Environmental consequences (the scientific and analytical basis for comparison of alternatives) as a result of a proposed action. Effects may be either direct, which are caused by the action and occur at the same time and place, or indirect, which are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable, or cumulative.

Implementation decisions: Decisions that take action to implement land-use planning decisions; generally appealable to the Interior Board of Land Appeals under 43 CFR 4.410.

Implementation plan: A sub-geographic or site-specific plan written to implement decisions made in a land-use plan. Implementation plans include activity plans and project plans (they are types of implementation plans).

Implementation plan (recreation): A site-specific plan written to implement decisions made in a land-use plan. An implementation plan usually selects and applies best management practices to meet land-use planning objectives. Implementation plans are synonymous with "activity" plans. Examples of implementation plans include interdisciplinary management plans, travel and transportation management

plans, habitat management plans, RAMPs, recreation project plans, coordinated resource management plans, and allotment management plans.

Impoundment: A body of water confined by a dam, dike, floodgate, or other artificial barrier.

Indian tribe: Any Indian group in the conterminous United States that the Secretary of the Interior recognizes as possessing tribal status (listed periodically in the Federal Register).

Indicators: Components of a system whose characteristics (presence or absence, quantity, distribution) are used as an index of an attribute (e.g., rangeland health attribute) that are too difficult, inconvenient, or expensive to measure (Interagency Technical Reference 1734-8, 2000).

Instant study areas (ISA): A formally designated natural and primitive area identified by the Nevada BLM that has undergone an accelerated wilderness review and for all intents and purposes is managed as a wilderness study area.

Interdisciplinary team (IDT): Staff specialists representing identified skill and knowledge needs working together to resolve issues and provide recommendations to an authorized officer.

Intermittent or seasonal stream: A stream that flows only at certain times of the year when it receives water from springs or from some surface source such as melting snow in mountainous areas. Generally, intermittent streams flow continuously for periods of at least 30 days and usually have visible vegetation or physical characteristics reflective of permanent water influences, such as the presence of cottonwoods.

Invasive plants: Plants that are not part of (if exotic), or are a minor component of (if native), the original plant community or communities that have the potential to become a dominant or co-dominant species on the site if their future establishment and growth is not actively controlled by management interventions, or are classified as exotic or noxious plants under state or federal law. Species that become dominant for only one to several years (e.g. short-term response to drought or wildfire) are not invasive plants (USDI, BLM, 2007b).

Karst: Landscape underlain by limestone that has been eroded by dissolution, producing ridges, towers, fissures, sinkholes, and other characteristic landforms.

Land tenure adjustments: A change in land ownership patterns, or legal status, to improve their administrative manageability and/or their usefulness to the public.

Land-use allocation: The identification in a land-use plan of the activities and foreseeable development that are allowed, restricted, or excluded for all or part of the decision area, based on desired future conditions.

Land-use authorization: Issuance of leases and permits to authorize certain kinds of development, uses or occupancy of public lands. Leases and permits are issued for activities such as temporary or permanent commercial facilities (except on mining claims), harvesting native or introduced species, residential occupancy, recreation (e.g., camping, ski resorts), agriculture (crops, apiaries), construction equipment storage, livestock holding or feeding areas not related to a grazing permit, water pipelines and well pumps (for irrigation or other purposes), and advertising displays.

Land-use plan (LUP): A set of decisions that establish management direction for lands within an administrative area, as prescribed under the planning provisions of Federal Land Policy and Management Act; and an assimilation of LUP-level decisions developed through the planning process outlined in 43 CFR 1600, regardless of the scale at which the decisions were developed. The term includes resource management plans and management framework plans.

Land-use plan amendment: The process for considering or making changes in the terms, conditions, and decisions of approved resource management plans or management framework plans. Usually only one or two issues are considered that involve only a portion of the decision area.

Land-use plan decision: Establishes desired outcomes and actions needed to achieve them. Decisions are reached using the planning process in 43 CFR 1600. When they are presented to the public as proposed decisions, they can be protested to the BLM director. They are not appealable to the Interior Board of Land Appeals.

Lease: An authorization or contract by which BLM conveys the use of property to another party in return for rental payments. Federal Land Policy Management Act Section 302 provides BLM's authority to issue leases for the use, occupancy, and development of the public lands. Leases are also authorized under the Recreation and Public Purpose Act for an established or definitely proposed project for which there is a reasonable timetable of development and satisfactory development and management plans (43 CFR 2741.5). Leases are issued for purposes such as communication sites, airports, parks, and other recreational facilities. The regulations establishing procedures for the processing of these leases are found in 43 CFR 2920, 2800, and 2740.

Leaseable minerals: Leasable minerals are those minerals on public lands where the land is leased to individuals for their exploration and development. Leasable minerals have been subdivided into two classes, fluid and solid. Fluid minerals include oil and gas; geothermal resources and associated byproducts; and oil shale, native asphalt, oil-impregnated

sands, and any other material in which oil is recoverable only by special treatment after the deposit is mined or quarried. Solid leasable minerals are those leased under the mineral leasing acts and those hardrock minerals leased under Reorganization Plan No. 3 of 1946 (acquired lands). Solid leasable minerals are specific minerals such as coal and phosphates. All minerals on acquired lands are considered to be leasable minerals. Leasable minerals are associated with the following laws: Mineral Leasing Act of 1920, as amended and supplemented, Mineral Leasing Act for Acquired Lands of 1947, as amended, and the Geothermal Steam Act of 1970, as amended.

Lease notice: A lease notice provides more detailed information concerning limitations that already exist in law, lease terms, regulations, or operational orders. A lease notice also addresses special items the lessee should consider when planning operations.

Lease stipulations: A condition of lease issuance that provides a level of protection for other resource values or land uses by restricting lease operations during certain times or locations or to avoid unacceptable impacts, to an extent greater than standard lease terms or regulations. A stipulation is an enforceable term of the lease contract, supersedes any inconsistent provisions of the standard lease form, and is attached to and made a part of the lease. Lease stipulations further implement the Bureau of Land Management's regulatory authority to protect resources or resource values. Lease stipulations are developed through the land-use planning process.

Less active season: The part of the year when desert tortoises are not active and mitigation will be less for most activities. Generally from June 1 through August 31 and November 1 to March 15.

Limited use: An area restricted at certain times, in certain areas, and/or to certain vehicular use. These restrictions may be of any type, but can generally be accommodated within the following type of categories: numbers of vehicles, types of vehicles, time or season of vehicle use, permitted use only, use on existing roads and trails, use on designated routes, and other restrictions.

Limited-value habitat: Habitat that is abundant and not essential to sustain a community, population, or subpopulation. This includes occasional use areas that are either sparsely populated or show sporadic or unpredictable use by high-interest wildlife. These areas have limited reclamation potential. Wildlife may be displaced due to the common occurrence of these habitats. Examples include yearlong deer range of low habitat quality; Class 5 and 6 streams, lakes, ponds, or reservoirs; and low-quality habitat in juxtaposition to areas of higher wildlife values.

Locatable minerals: Minerals subject to exploration, development, and disposal by staking mining claims as authorized by the Mining Law of 1872,

as amended. This includes deposits of gold, silver, and other uncommon minerals not subject to lease or sale.

Low-value habitat: Habitat that is abundant and not essential to sustain a community, population, or subpopulation.

Management decision: A decision made by the BLM to manage public lands. Management decisions include land-use plan decisions and implementation decisions.

Management opportunities: A component of the analysis of the management situation and actions or management directions that could be taken to resolve issues or management concerns.

Material site rights-of-way (ROW): Authorized appropriated sites required for construction and long-term maintenance of federal-aid highways located on lands under the jurisidiction of BLM and transferred under the authorities contained in 23 U.S.C. §§and 317.

Mechanical transport: Any vehicle, device, or contrivance for moving people or material in or over land, water, snow, ice, or air that has moving parts as essential components of the transport and which apply a mechanical advantage, regardless of power source. Wheelchairs or other mobility devices that meet the definition of "wheelchair" in the Americans with Disabilities Act, Section 508 (c), are not prohibited.

Mechanized travel (travel management): Moving by means of mechanical devices such as a bicycle; not powered by a motor.

Middle country: A recreation setting classification characterized by a naturally setting landscape except for obvious primitive roads, with subtle human modifications, small areas with limited evidence of surface or vegetative disturbances, and evidence of primitive roads or motorized use. Small, isolated structures may be present. Contains maintained and marked trails, simple trailhead developments, improved signs, and very basic toilets.

Migratory Bird Treaty Act (MBTA): The act that fully protects all migratory birds and their parts (including eggs, nests, and feathers).

Mineral: A naturally formed chemical element or compound having a definite chemical composition and, usually, a characteristic crystal form. A mineral is generally considered to be inorganic, although organic compounds are classified as minerals by some (American Geological Institute 1974). The term is also sometimes informally used to refer to resources such as oil, gas, coal, and stone that are derived from the earth.

Mineral entry: The filing of a claim on public land to obtain the right to any locatable minerals it may contain.

Minimize impacts: To reduce the adverse impact of an activity to the lowest practical level. This can be done by either not approving an activity or through measures such as stipulations, restrictions, BMPs, and SOPs identified during the NEPA process.

Mining claim: A parcel of land that a miner takes and holds for mining purposes, having acquired the right of possession by complying with the Mining Law and local laws and rules. A mining claim may contain as many adjoining locations as the locator may make or buy. There are four categories of mining claims: lode, placer, millsite, and tunnel site.

Mining hazards: See Adits, Bench, Glory Holes, and Shafts.

Mitigation: A method or process by which impacts from actions may be made less injurious to the environment through appropriate protective measures. 40 CFR 1508.20 further defines mitigation as (1) avoiding the impact altogether by not taking a certain action or parts of an action; (2) minimizing an impact by limiting the degree or magnitude of the action and its implementation; (3) rectifying the impact by repairing, rehabilitating, or restoring the affected environment; (4) reducing or eliminating the impact over time by preservation and maintenance; and (5) compensating for the impact by replacing or providing substitute resources or environments.

Monitoring (plan monitoring): The process of tracking the implementation of land-use plan decisions and collecting and assessing data/information necessary to evaluate the effectiveness of land-use planning decisions.

Motorized equipment: Any machine that applies force by transferring energy from a motor, engine, or other non-living power source.

Motor vehicle: Any means of transportation over land, snow, or ice that is powered by a motor, engine, or other non-living power source.

Multiple use: The management of public lands and their various resource values so that they are used in the combination that will best meet the present and future needs of the American people; making the most judicious use of the land for some or all of these resources or related services over areas large enough to provide sufficient latitude for periodic adjustments in use to changing needs and conditions; the use of some land for less than all of the resources; a combination of balanced and diverse resource uses that takes into account the long-term needs of future generations for renewable and nonrenewable resources, including but not limited to recreation; range; timber; minerals; watershed; wildlife and fish; and natural scenic, scientific, and historical values; and harmonious and coordinated management of the various resources without permanent impairment of the productivity of the land and the quality of the environment with consideration being given to the relative values of the resources and not necessarily to the

combination of uses that will give the greatest economic return or the greatest unit output.

National Environmental Policy Act (NEPA): The federal law that established a national policy for the environment and requires federal agencies (1) to become aware of the environmental ramifications of their proposed actions, (2) to fully disclose to the public proposed federal actions and provide a mechanism for public input to federal decision-making, and (3) to prepare environmental impact statements for every major action that would significantly affect the quality of the human environment.

National Historic Preservation Act (NHPA): A federal statute that established a federal program to further the efforts of private agencies and individuals in preserving the nation's historic and cultural foundations. The National Historic Preservation Act (1) authorized the National Register of Historic Places, (2) established the Advisory Council on Historic Preservation and a National Trust Fund to administer grants for historic preservation, and (3) authorized the development of regulations to require federal agencies to consider the effects of federally assisted activities on properties included on or eligible for the National Register of Historic Places. Also see National Register of Historic Places.

National Register of Historic Places: The National Register of Historic Places, expanded and maintained by the Secretary of the Interior, as authorized by Section 2(b) of the Historic Sites Act and Section 101(a)(1)(A) of the National Historic Preservation Act. The national register lists cultural properties found to qualify for inclusion because of their local, state, or national significance. Eligibility criteria and nomination procedures are found in 36 CFR 60. The secretary's administrative responsibility for the national register is delegated to the National Park Service.

National Wild and Scenic River System: A system of nationally designated rivers and their immediate environments that have outstandingly remarkable values such as scenic, recreational, geologic, fish and wildlife, historic, cultural, and other similar values and are preserved in a free-flowing condition. The system consists of three river classifications: (1) **Recreational:** Rivers or sections of rivers that are readily accessible by road or railroad and that may have some development along their shorelines and may have undergone some impoundments or diversion in the past; (2) **Scenic:** Rivers or sections of rivers free of impoundments with shorelines or watersheds still largely undeveloped but accessible in places by roads; and (3) **Wild:** Rivers or sections of rivers free of impoundments and generally inaccessible except by trails, with watersheds or shorelines essentially primitive and waters unpolluted. All rivers or river segments in these classifications must possess at least one outstandingly remarkable value that is river-related.

Natural hydrologic function: The natural hydrologic process of the dynamic equilibrium between the movement of water and the movement of sediment absent of human modifications.

Naturalness: Lands and resources exhibit a high degree of naturalness when affected primarily by the forces of nature and where the imprint of human activity is substantially unnoticeable. BLM has authority to inventory, assess, and/or monitor the attributes of the lands and resources on public lands, which, taken together, are an indication of an area's naturalness. These attributes may include the presence or absence of roads and trails, fences, and other improvements; the nature and extent of landscape modifications; the presence of native vegetation communities; and the connectivity of habitats.

Nonattainment area: An area in which the level of a criteria air pollutant is higher than the level allowed by the federal standards. A single area may have acceptable levels of one criteria air pollutant but unacceptable levels of one or more other criteria air pollutants. Therefore, an area can be both attainment and non-attainment at the same time.

No net unmitigated loss: To maintain the current quantity and quality of existing habitat by protecting the habitat or by mitigating for loss due to anthropogenic disturbances.

Nonfunctioning condition: (1) Condition in which vegetation and ground cover are not maintaining soil conditions that can sustain natural biotic communities. (2) Riparian-wetland areas are considered to be in nonfunctioning condition when they don't provide adequate vegetation, landform, or large woody debris to dissipate stream energy associated with high flows and thus are not reducing erosion, improving water quality, or other normal characteristics of riparian areas. The absence of a floodplain may be an indicator of nonfunctioning condition (DEIS glossary). See also Properly Functioning Condition and Functioning at Risk.

No surface occupancy (NSO): A fluid minerals leasing constraint that prohibits occupancy or disturbance on all or part of the lease surface to protect special values or uses. Lessees may exploit the fluid mineral resources under the leases restricted by this constraint through use of directional drilling from sites outside the area.

No surface occupancy stipulation: Use or occupancy of the land surface for fluid mineral exploration or development is prohibited in order to protect identified resource values. NSO may be appropriate when there are other important resource values that cannot coexist with oil and gas development and protection of these resource values has been determined in the RMP to be more in the public interest than allowing fluid mineral development on the lands. If directional drilling from off the lease is not practical, the lands would normally be identified in the RMP as closed and withheld from leasing accept when drainage of resource is determined.

Noxious weed: A plant species designated by federal or state law as generally possessing one or more of the following characteristics: aggressive and difficult to manage; parasitic; a carrier or host of serious insects or disease; or non-native, new, or not common to the United States.

Objective: A description of a desired condition for a resource. Objectives can be quantified and measured and, where possible, have established time frames for achievement.

Off-highway vehicle (OHV): Any motorized vehicle capable of or designed for travel on or immediately over land, water, or other natural terrain, excluding (1) any non-amphibious registered motorboat; (2) any military, fire, emergency, or law enforcement vehicle while being used for emergency purposes; (3) any vehicle whose use is expressly authorized by the authorized officer or otherwise officially approved; (4) vehicles in official use; and (5) any combat or combat support vehicle when used for national defense.

Official use: Use by an employee, agent, or designated representative of the federal government or one of its contractors in the course of his or her employment, agency responsibilities, or representation.

Offsite mitigation: There are times when onsite mitigation alone may not be sufficient to adequately mitigate impacts and achieve BLM resource and value objectives. In these cases, it may be appropriate to consider mitigation outside the area of impact (e.g., compensating for the impact) to achieve BLM resource and value objectives.

Open: Generally denotes that an area is available for a particular use or uses. Refer to specific program definitions found in law, regulations, or policy guidance for application to individual programs. For example, 43 CFR 8340.0-5 defines the specific meaning of "open" as it relates to off-highway vehicle use as "an area where all types of vehicle use is permitted at all times, anywhere in the area subject to the operating regulations and vehicle standards set forth in" 43 CFR 8341 and 8342 (43 CFR 8340.0-5(f)).

Outcomes-focused management (OFM): OFM is defined as an approach to park and recreation management that focuses on the positive outcomes of engaging in recreational experiences. Outcomes are categorized as individual, social, economic, and environmental.

Outstandingly remarkable values (ORV): Values among those listed in Section 1(b) of the Wild and Scenic Rivers Act: "Scenic, recreational, geological, fish and wildlife, historical, cultural, or other similar values." Other similar values that may be considered include ecological, biological or botanical, paleontological, hydrological, scientific, or research values.

Perennial stream: A stream that flows continuously. Perennial streams are generally associated with a water table in the localities through which they flow.

Permit: A short-term, revocable authorization to use public lands for specific purposes, Federal Land Policy Management Act Section 302 provides the BLM's authority to issue permits for the use, occupancy, and development of the public lands. Permits are issued for purposes such as commercial or non-commercial filming, advertising displays, commercial or non-commercial croplands, apiaries, harvesting of native or introduced species, temporary or permanent facilities for commercial purposes (does not include mining claims), residential occupancy, construction equipment storage sites, assembly yards, oil rig stacking sites, mining claim occupancy if the residential structures are not incidental to the mining operation, and water pipelines and well pumps related to irrigation and non-irrigation facilities. The regulations establishing procedures for the processing of these permits are found in 43 CFR 2920.

Permitted use: The forage allocated by or under the guidance of an applicable land-use plan for livestock grazing in an allotment under a permit or lease, and that is expressed in animal unit months (43 CFR 4100.0-5).

Planning criteria: The standards, rules, and other factors developed by managers and interdisciplinary teams for their use in forming judgments about decision-making, analysis, and data collection during planning. Planning criteria streamline and simplify the resource management planning actions.

Plan of operations: A plan for mining exploration and development that an operation must submit to the BLM for approval when more than five acres a year will be disturbed or when an operator plans to work in an area of critical environmental concern or a wilderness area. A plan of operations must be submitted for any new operation that began after January 20, 2001, and that has production, regardless of acreage disturbed. A plan of operations must document in detail all actions that the operator plans to take from exploration through reclamation.

Potential natural community (PNC): The biotic community that would become established if all successional sequences were completed without interference by man under the present environmental conditions. Natural disturbances are inherent in development. PNCs can include naturalized non-native species.

Prescribed fire: Any fire intentionally ignited by management under an approved plan to meet specific objectives identified in a written and approved prescribed fire plan for which National Environmental Policy Act requirements (where applicable) have been met prior to ignition.

Primary road: A regularly maintained route, paved or unpaved, wide enough for at least two vehicles to pass. Provides access between two major points. Serves a large area with many routes of lesser quality branching from it.

Primitive: A recreation setting classification characterized by a setting that is essentially an unmodified natural environment with extremely rare evidence of surface or vegetative disturbances. Trails may be present and suited for wilderness use. Structures are small and extremely rare. Enforcement presence is very rare.

Primitive recreation: Activities that provide dispersed, undeveloped recreation and do not require facilities or motorized equipment.

Primitive road: A linear route managed for use by four-wheel drive or high-clearance vehicles. These routes do not customarily meet any BLM road design standards.

Project plan: A type of implementation plan (see Implementation Plan). A project plan typically addresses individual projects or several related projects. Examples of project plans include prescribed burn plans, trail plans, and recreation site plans.

Properly functioning condition (PFC): (1) An element of the Fundamentals of Rangeland Health for watersheds, and therefore a required element of state or regional standard and guidelines under 43 CFR 4180.2(b). (2) A condition in which vegetation and ground cover maintain soil conditions that can sustain natural biotic communities. For riparian areas, the process of determining function is described in BLM Technical Reference (TR) 1737-9. (3) Riparian-wetland areas are functioning properly when adequate vegetation, landform, or large woody debris is present to dissipate stream energy associated with high water flows, thereby reducing erosion and improving water quality; filter sediment, capture bed load, and aid floodplain development; improve floodwater retention and groundwater recharge; develop root masses that stabilize streambanks against cutting action; develop diverse ponding and channel characteristics to provide the habitat and the water depth, duration, and temperature necessary for fish production, waterfowl breeding, and other uses; and support greater biodiversity. The functioning condition of riparian-wetland areas is influenced by geomorphic features, soil, water, and vegetation. (4) Uplands function properly when the existing vegetation and ground cover maintain soil conditions capable of sustaining natural biotic communities. The functioning condition of uplands is influenced by geomorphic features, soil, water, and vegetation. See also Nonfunctioning Condition and Functioning at Risk.

Proposed species: Species that have been officially proposed for listing as threatened or endangered by the Secretary of the Interior. A proposed rule has been published in the Federal Register.

Public land: Land or interest in land owned by the United States and administered by the Secretary of the Interior through the BLM without regard to how the United States acquired ownership, except

lands located on the Outer Continental Shelf and land held for the benefit of Native Americans, Aleuts, and Eskimos.

Public purpose: The purpose of providing facilities or services for the benefit of the public in connection with, but not limited to, public health, safety, or welfare. Use of lands or facilities for habitation, cultivation, trade, or manufacturing is permissible only when necessary for and integral to, i.e., an essential part of, the public purpose.

Range improvement: An authorized physical modification or treatment designed to improve production of forage; change vegetation composition; control patterns of use; provide water; stabilize soil and water conditions; and restore, protect, and improve the condition of rangeland ecosystems to benefit livestock, wild horses and burros, and fish and wildlife. The term includes, but is not limited to, structures, treatment projects, and use of mechanical devices or modifications achieved through mechanical means (43 CFR 4100.0-5).

Rangeland: A kind of land on which the native vegetation, climax, or natural potential consists predominantly of grasses, grasslike plants, forbs, or shrubs. Rangeland includes lands revegetated naturally or artificially to provide a non-crop plant cover that is managed like native vegetation. Rangeland may consist of natural grasslands, savannahs, shrublands, most deserts, tundra, alpine communities, coastal marshes, and wet meadows.

Reasonable access: A route and method of access onto non-federal land that provides use consistent with similarly situated non-federal lands. Prior to issuing any access authorization, the following must be ensured: (1) The landowner has demonstrated a lack of any existing routes of access available by deed or under state or local law; (2) the route is so located and constructed as to minimize adverse impacts on soils, fish, and wildlife; scenic resources; heritage resources; threatened and endangered species; and other values of the federal land; and (3) when access routes exist across the adjacent non-federal lands or the best route as determined by the BLM is across non-federal land, the applicant landowner demonstrates that all legal recourse to obtain reasonable access across adjacent non-federal lands has been exhausted or has little chance of success.

Reclaiming or reclaimed (route): A route that has had very little or no use so that there is woody vegetation growing in the route that would be damaged by the passage of a vehicle. Erosion or vegetation may block the route and could damage a vehicle or cause it to get stuck.

Reclamation: Means taking measures required by subpart 3809.5 following disturbance of public lands caused by operations to meet applicable performance standards and achieve conditions required by BLM at the conclusion of operations. For a definition of "reclamation" applicable to operations conducted under the mining laws on Stock

Raising Homestead Act lands, see part 3810, subpart 3814 of this title. Components of reclamation include, where applicable: (1) isolation, control, or removal of acid-forming, toxic, or deleterious substances; (2) regrading and reshaping to conform with adjacent landforms, facilitate revegetation, control drainage, and minimize erosion; (3) rehabilitation of fisheries or wildlife habitat; (4) placement of growth medium and establishment of self-sustaining revegetation; (5) removal or stabilization of buildings, structures, or other support facilities; (6) plugging of drill holes and closure of underground workings, and; (7) providing for post-mining monitoring, maintenance, or treatment.

Record of decision: A document signed by a responsible official recording a decision that was preceded by the preparing of an environmental impact statement.

Recreational river: A wild and scenic river tentative classification that applies to those rivers or sections of rivers readily accessible by road or railroad that may have some development along their shorelines and that may have undergone some impoundment or diversion in the past and possess at least one river-related outstandingly remarkable value.

Recreation and Public Purposes Act (R&PP): The R&PP Act provides for the lease and sale of public lands determined valuable for public purposes. The objective of the R&PP Act is to meet the needs of state and local government agencies and nonprofit organizations by leasing or conveying public land required for recreation and public purpose uses.

Recreation management zones (RMZ): Subunits within a special recreation management area managed for distinctly different recreation products. Recreation products are composed of recreation opportunities, the natural resource and community settings within which they occur, and the administrative and service environment created by all affecting recreation-tourism providers, within which recreation participation occurs.

Recreation opportunities: The combination of recreation activities, settings, and experiences provided by a specific geographic area.

Recreation setting characteristics (RSC): Recreation setting characteristics are derived from the recreation opportunity spectrum. The RSCs are characterized as physical, social, and operational components and are further subdivided into specific characteristics (attributes). These characteristics are categorized across a spectrum of classes that describe a range of qualities and conditions of a recreation setting, for example primitive to urban.

Recreation settings: The collective distinguishing attributes of a landscape. Recreation settings determine the production of recreation opportunities.

Rehabilitation: Efforts undertaken within three to five years of a wildland fire to repair or improve fire damaged lands unlikely to recover to a

management approved conditions, or to repair or replace minor facilities damaged by fire.

Rehabilitation: The "repair" of a wildland fire area using native and or nonnative plant species to obtain a stable plant community that will protect the burned area from erosion and invasion by weeds.

Relict plant community: A remnant or fragment of the vegetation of an area that remains from a former period when the vegetation was more widely distributed.

Remoteness: See Solitude.

Renewable energy: Energy that comes from natural resources such as sunlight, wind, rain, tides, and geothermal heat, which are renewable (naturally replenished).

Resource management plan (RMP): A BLM planning document, prepared in accordance with Federal Land Policy and Management Act Section 202, that presents systematic guidelines for making resource management decisions. An RMP is based on an analysis of an area's resources, its existing management, and its capability for alternative uses. RMPs are issue-oriented and developed by an interdisciplinary team with public participation.

Resource-use level: The level of use allowed within an area, based on the desired outcomes and land-use allocations in the land-use plan. Targets or goals for resource use levels are established on an areawide or broad watershed level in the land-use plan. Site-specific resource use levels are normally determined at the implementation level, based on site-specific resource conditions and needs as determined through resource monitoring and assessments.

Response to wildland fire: Decisions and actions implemented to manage a wildland fire based on ecological, social, and legal consequences, the circumstances under which a fire occurs, and the likely consequences on firefighter and public safety and welfare, natural and cultural resources, and values to be protected. Response to ignition is guided by the objectives and strategies outlined in the land/resource management plan and/or fire management plan.

Restoration (fire): The continuation of rehabilitation beyond the initial three to five years or the repair or replacement of major facilities damaged by the fire.

Restoration (vegetation): Implementation of a set of actions that promotes plant community diversity and structure that allows plant communities to be more resilient to disturbance and invasive species over the long term.

Revegetation: Establishing or re-establishing desirable plants in areas where desirable plants are absent or of inadequate density, by management

alone (natural revegetation) or by seeding or transplanting (artificial revegetation).

Rights-of-way (ROW): A land-use authorization/grant for the use of public lands for specified purposes, for the construction, operation, maintenance, and termination of a project, such as pipelines, roads, telephone lines, electric lines, reservoirs.

Riparian: Pertaining to or situated on or along the bank of streams, lakes, springs, and reservoirs.

Riparian area: A form of wetland transition between permanently saturated wetlands and upland areas. A riparian area is defined as an area of land directly influenced by permanent (surface or subsurface) water. Riparian areas exhibit vegetation or physical characteristics that reflect the influence of permanent surface or subsurface water. Typical riparian areas include lands along, adjacent to, or contiguous with perennially and intermittently flowing rivers and streams, hanging gardens, and areas surrounding seeps and springs. Excluded are ephemeral streams or washes that lack vegetation and depend on free water in the soil.

Road: A transportation facility used primarily by vehicles having four or more wheels, documented as such by the owner, and maintained for regular and continuous use.

Road and route types: See Primary Road, Secondary Road, Tertiary Road, Single-Track Route, Way, Spur, and Reclaiming or Reclaimed (route).

ROW avoidance areas: Areas with sensitive resource values where linear and/or site-type land-use authorizations would be strongly discouraged and therefore "avoided." Authorizations to be considered within avoidance areas must be compatible with the purpose for which the area was designated and not be otherwise feasible on lands outside the avoidance area. Authorizations approved within these areas would be required to meet additional mitigation measures set forth by individual program areas that manage the "avoided" designated allocation.

ROW exclusion areas: Areas with sensitive resource values where linear and/or site-type land-use authorizations (such as ROWs, permits, leases, and easements) would not be authorized. These areas have been determined to be unsuitable for a land-use authorization because of (1) unique, highly valued, complex, or legally protected resources; (2) potentially significant environmental impacts resulting from conflicts with current land uses; or (3) areas posing substantial hazard to construction and/or operation of a linear facility (e.g., electric transmission line, pipeline, telephone line, fiber optic line). In these areas, land-use authorizations would be granted only in cases where there is a legal requirement to provide such access or an immediate public safety concern.

Rural: A recreation setting classification characterized by a substantially modified natural setting with culturally modified landscapes constantly in view. The setting may include pastoral, agricultural landscapes. Surface and vegetative modifications are typical, and constructed roads and highways are present. Structures are readily apparent and may include small dominant clusters, including campgrounds, group shelters, boat launches, and exhibits.

Saleable minerals: Common variety minerals on public lands, such as sand and gravel, which are used mainly for construction and are disposed of by sales or special permits to local governments.

Scenic byways: Highway routes that have roadsides or corridors of special aesthetic, cultural, or historic value. The corridor may contain outstanding scenic vistas, unusual geologic features, or other intrinsic qualities such as cultural, historic, natural, recreational, and archaeological values. Scenic byways can be designated at either the state or the federal level.

Scenic quality: The relative worth of a landscape from a visual perception point of view.

Scenic river: A wild and scenic river tentative classification that applies to those rivers or sections of rivers that are free of impoundments and whose shorelines are largely undeveloped but accessible in places by roads and possess at least one river-related outstandingly remarkable value.

Scoping: An early and open process for determining the scope of issues to be addressed and for identifying the significant issues related to a proposed action. This involves the participation of affected federal, state, and local agencies and any affected Native American tribe, proponent of the action, and other interested persons unless there is a limited exception under 40 CFR 1507.3I.

Secondary road: Paved or unpaved, a regularly maintained one- to two-lane route with routes of lesser quality branching from it. Connects primary roads and major points.

Secretary: The Secretary of the Interior when used in connection with public lands administered by him through the Bureau of Land Management.

Section 106 compliance: The requirement of National Historic Preservation Act Section 106 that any project funded, licensed, permitted, or assisted by the federal government be reviewed for impacts to significant historic properties and that the state historic preservation officer and the Advisory Council on Historic Preservation be allowed to comment on a project.

Section 7 consultation: The requirement of Section 7 of the Endangered Species Act that all federal agencies consult with the U.S. Fish and Wildlife Service or the National Marine Fisheries Service if a proposed action might affect a federally listed species or its critical habitat.

Segregation: The removal for a limited period, subject to valid existing rights, of a specified area of the public lands from the operation of the public land laws, including the mining laws, pursuant to the exercise by the Secretary of the Interior of regulatory authority to allow for the orderly administration of the public lands. See Withdrawal.

Segregative effect: The term "segregation," as it pertains to withdrawals, refers to the closure of lands to the operation of all/some of the public land laws and/or mineral laws. Public land laws authorize some means to dispose of the surface estate, whereas the mineral laws authorize disposal of the subsurface estate. The segregative effect of a withdrawal is stated in the order itself, or it is prescribed by the authority under which a withdrawal is made. Many withdrawals, particularly older ones, have been subsequently amended by statute or by other administrative orders. Consequently, interpretation of the current segregative effect of many withdrawals can be difficult.

Sensitive soils: Soils that have a high wind or water erosion hazard, are difficult to reclaim or restore due to physical and chemical properties (e.g., high salt or gypsum concentrations, high rock content, or low available water), or that are more susceptible to impacts and damage due to high water tables (hydric or wetland/riparian soils) or very fine surface textures. Information used to identify sensitive soils includes soils surveys, ecological site descriptions, local monitoring records, and research studies.

Sensitive species: Those species designated by a state director, usually in cooperation with the state agency responsible for managing the species and state natural heritage programs, as sensitive. They are those species that (1) could become endangered in or extirpated from a state or within a significant portion of its distribution; (2) are under status review by the U.S. Fish and Wildlife Service and/or the National Marine Fisheries Service; (3) are undergoing significant current or predicted downward trends in habitat capability that would reduce a species' existing distribution; (4) are undergoing significant current or predicted downward trends in population or density such that federal listed, proposed, or candidate or state listed status may become necessary; (5) typically have small and widely dispersed populations; (6) inhabit ecological refugia or other specialized or unique habitats; or (7) are state listed but may be better conserved through application of BLM sensitive species status.

Shafts: A vertical or sloping passageway made in the earth for finding or mining ore and ventilating underground excavations.

Significant: An effect that is analyzed in the context of the proposed action to determine the degree or magnitude of importance of the effect, whether beneficial or adverse. The degree of significance can be related to other actions with individually insignificant but cumulatively significant impacts.

Single-track route: A route up to a half meter wide upon which all-terrain vehicles or trucks are not allowed.

Solitude (remoteness): The state of being alone or remote from habitations or the sights and sounds of other people; the experience of a lonely, unfrequented, or secluded place.

Solitude and primitive/unconfined recreation: Visitors may have outstanding opportunities for solitude, or primitive and unconfined types of recreation when the sights, sounds, and evidence of other people are rare or infrequent, where visitors can be isolated, alone or secluded from others, where the use of the area is through non-motorized, non-mechanical means, and where no or minimal developed recreation facilities are encountered."

Special recreation management areas (SRMAs): The SRMA is an administrative unit where the existing or proposed recreation opportunities and recreation setting characteristics are recognized for their unique value, importance, or distinctiveness; especially compared to other areas used for recreation.

Special recreation permit (SRP): An authorization that allows for specific nonexclusive permitted recreational uses of public lands and related waters. SRPs are issued to control visitor use, protect recreational and natural resources, provide for the health and safety of visitors, and accommodate commercial recreational uses.

Special status species: Plant or animal species listed as threatened, endangered, candidate, or sensitive by the federal government or state governments.

Speleogen: Relief features on the walls, ceiling, and floor of any cave or lava tube that are part of the surrounding bedrock, including but not limited to anastomoses, scallops, meander niches, petromorphs and rock pendants in solutions caves and similar features unique to volcanic caves.

Speleothem: Any natural mineral formation or deposit occurring in a cave or lava tube, including but not limited to any stalactite, stalagmite, helictite, cave flower, flowstone, concretions, drapery, rimstone, or formation of clay or mud.

Split estate: Lands whose surface rights and mineral rights are owned by different entities.

Spring: A discrete natural flow of groundwater that naturally emerges from the earth at a reasonably distinct location, whether or not such flow

constitutes a source of water or is tributary to a watercourse, pond, or other body of water.

Spur: A route that exists for a specific purpose, such as access to a specific use or feature. Uses can be recreational or commercial. Features include campsites, mines, or range developments. A spur route is connected to another road or route type.

Staging area: An area where participants in an activity gather and make final preparations for the activity.

Standard: A description of the physical and biological conditions or degree of function required for healthy, sustainable lands (e.g., land health standards). To be expressed as a desired outcome (goal).

State historic preservation officer (SHPO): The official within and authorized by each state at the request of the Secretary of the Interior to act as liaison for the National Historic Preservation Act.

State implementation plan (SIP): A strategic document, prepared by a state (or other authorized air quality regulatory agency) and approved by the EPA, that thoroughly describes how requirements of the Clean Air Act will be implemented (including standards to be achieved,control measures to be applied, enforcement actions in case of violation, etc.).

State-listed species: Species listed by a state in a category implying but not limited to potential endangerment or extinction. Listing is either by legislation or regulation.

Stipulation: A mitigation measure or condition specified as a part of a permit, lease, or right-of-way.

Substantial value habitats: Any particular habitat that is common or of intermediate importance. Existence areas are used regularly by high-interest wildlife but are moderate levels with little or no concentrated use. These areas may also include moderately sensitive habitats of high-interest species with moderate reclamation potential. Wildlife uses may be displaced in response to development. Examples include extensive summer and/or winter ranges receiving regular use well below carrying capacity having little potential for increase due to other limiting factors; Class 4 streams, lakes, ponds, or reservoirs; and areas of moderate habitat quality.

Succession: The progressive replacement of plant communities on a site that leads to the potential natural plant community (i.e., attaining stability). Primary succession entails simultaneous succession of soil from parent material and vegetation. Secondary succession occurs following disturbances on sites that previously supported vegetation and entails plant succession on the more mature soils.

Successional status: The present state of vegetation and soil protection of an ecological site in relation to the potential natural community for the site.

Successional status is the expression of the relative degree to which kinds, proportions, and amounts of plants in a community resemble that of the potential natural community. The four classes of successional status ratings, expressed in terms of similarity to the potential natural community, are: 0 percent to 25 percent early seral class, 26 percent to 50 percent mid seral, 51 percent to 76 percent late seral, and 76 percent to 100 percent PNC.

Suitable river: An eligible river segment found through administrative study to meet the criteria for designation as a component of the national system, as specified in Section 4(a) of the Wild and Scenic Rivers Act.

Surface disturbance: Greater than casual use actions created through mechanized or mechanical means that would cause soil mixing and result in alteration or removal of soil and vegetation, exposing the mineral soil to erosive processes to the extent that reclamation may be required. These actions may include the use of mechanized earth-moving equipment; truck-mounted drilling equipment; geophysical exploration; vehicle travel off routes in areas designated as limited or closed to OHV use; placement of surface facilities such as utilities, pipelines, structures, and oil and gas wells; new road construction; and use of pyrotechnics, explosives, and hazardous chemicals. Surface-disturbing activities would not include livestock grazing, low-impact vegetation management tools (e.g., bullhog, hand thinning, or Dixie harrow), cross-country hiking, driving on designated routes, and scientific excavation and/or mitigation of limited scope approved by the field office manager.

Surface occupancy: Placement or construction on the land surface (either temporary or permanent) for more than 14 days requiring continual service or maintenance. Casual use is not included.

Suspended use: Temporarily withheld use that is shown on a grazing permit but is not available for active use because of a decision issued by the authorized officer or by agreement.

Take: Harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct. The term applies only to fish and wildlife.

Tertiary road: Generally a two-track route that may or may not be usable by a two-wheel drive vehicle. Does not receive formal maintenance.

Threatened species: Any plant or animal species likely to become endangered within the foreseeable future throughout all or a part of its range and designated by the U.S. Fish and Wildlife Service under the Endangered Species Act. Also see Endangered Species.

Thriving natural ecological balance (TNEB): Wild horses and burros are managed in a manner that assures significant progress is made toward achieving the Land Health Standards for upland vegetation and riparian plant communities, watershed function, and habitat quality for animal populations, as well as other site-specific or landscape-level objectives, including those necessary to protect and manage threatened, endangered, and sensitive species.

Timing limitation (seasonal restriction): A fluid minerals leasing constraint that prohibits surface use during specified time periods in order to protect identified resource values. The constraint does not apply to the operation and maintenance of production facilities unless analysis demonstrates that such constraints are needed and that less stringent, project-specific constraints would be insufficient.

Total maximum daily load (TMDL): An estimate of the total quantity of pollutants (from all sources including point, non-point, and natural) that may be allowed into waters without exceeding applicable water quality criteria.

Trail: Linear route managed for human-powered, stock, or off-highway vehicle forms of recreation or for historic or heritage values. Trails are not generally managed for use by four-wheel drive or high-clearance vehicles.

Travel management area (TMA): Polygons or delineated areas where travel management (either motorized or non-motorized) requires particular focus.

Travel management plan (TMP): The document that describes the process and decisions related to the selection and management of the transportation network.

Unauthorized use: The use, occupancy, or development of public lands without authorization or using, occupying, and developing them in a way that is beyond the scope and terms and conditions of an authorization. It includes acts or omissions causing undue or unnecessary degradation to the occupied public lands.

Unconfined recreation: Activities that are enjoyed without unnecessary management restriction.

Undertaking: A project, activity, or program funded in whole or in part under the direct or indirect jurisdiction of a federal agency, including those carried out by or on behalf of a federal agency; those carried out with federal financial assistance; those requiring a federal permit, license, or approval; and those subject to state or local regulation administered pursuant to a delegation or approval by a federal agency.

Unsuitability criteria: Criteria of the federal coal management program by which lands may be assessed as unsuitable for all or certain stipulated methods of coal mining (43 CFR 3461.5).

Urban: A recreation setting classification characterized by an urbanized setting with elaborate facilities. The setting may include large areas of alteration near streets roads, structures and may be near towns or cities. Surface and vegetative modifications are prevalent.

Use of wildland fire: Management of either wildfire or prescribed fire to meet resource objectives specified in L/RMPs. A wildland fire may be concurrently managed for one or more objectives and objectives can change as the fire spreads across the landscape (synonymous with fire use but NOT "wildland fire use," which is an obsolete term).

Utility: A service provided by a public utility, such as electricity, telephone, or water.

Valid existing rights: Legal "rights" or interest that are associated with a land or mineral estate and that cannot be divested from the estate until that interest expires or is relinquished. Lands within the decision area are subject to various authorizations, some giving "rights" to the holders and some of which could be construed as providing valid but lesser interests. Valid existing rights are established by various laws, leases, and filings under federal law.

Mineral: Authorizations for activities on existing mineral leases and mining claims are governed by valid existing rights. Valid existing rights vary from case to case with respect to oil and gas leases, mineral leases, and mining claims, but generally involve rights to explore, develop, and produce within the constraints of laws, regulations, and policies at the time the lease/claim was established or authorized.

Non-mineral: There are other situations, unrelated to minerals, in which the BLM has authorized some use of public land or has conveyed some limited interest in public land. The authorization may be valid and existing and may convey some "right" or interest. Many Rights-of way, easements, and leases granted on public land are in this category. These types vary from case to case, but the details of each one are specified in the authorizing document. Valid and existing authorizations of this type would continue to be allowed subject to the terms and conditions of the authorizing document.

Access: The presence of non-federal land and resources within the decision area has implications because owners of non-federal land or mineral rights surrounded by public land are entitled to reasonable access to their land or resources (*State of Utah v Andrus, 1979*). Reasonable access is defined as access that the Secretary of the Interior deems adequate to secure the owner reasonable use and enjoyment of the non-federal land. Such access is subject to rules and regulations governing the administration of public land. In determining reasonable access, the BLM has discretion to evaluate and would consider such things as proposed construction

methods and location, reasonable alternatives, and reasonable terms and conditions as are necessary to protect the public interest and resources of the decision area.

Other: There are a variety of other land-use authorizations that do not involve the granting of legal "rights" or interests. Outfitter and guide permits are an example. These permits authorize certain uses of public land for a specified time, under certain conditions, without conveying a right, title, or interest in the land or resources used. If at any time it is determined that an outfitter and guide permit, other such permit, or any activities under those permits are not consistent with the approved resource management plan, then the authorization would be adjusted, mitigated, or revoked where legally possible. Grazing permits are also in this category. Grazing permits or leases convey no right, title, or interest in the land or resources used. Other applicable laws and regulations govern changes to existing grazing permits and levels of livestock grazing.

Visual resource inventory (VRI): The visual resource inventory process provides BLM managers with a means for determining visual values. The inventory consists of a scenic quality evaluation, sensitivity level analysis, and a delineation of distance zones. Based on these three factors, BLM-administered lands are placed into one of four visual resource inventory classes.

Visual resource management (VRM): The inventory and planning actions taken to identify visual values and establish objectives for managing those values, and the management actions taken to achieve the visual management objectives.

Visual resource management classes: Classes with specific objectives for maintaining or enhancing scenic quality including the kinds landscape modifications that are acceptable to meet the objectives. **Class I** (preservation) provides for natural, ecological changes only. This class includes wilderness areas, some natural areas, some wild and scenic rivers, and other similar sites where landscape modification should be restricted. **Class II** (retention of the landscape character) includes areas where changes in any of the basic elements (form, line, color, or texture) caused by management activities should not be evident in the characteristic landscape. **Class III** (partial retention of the landscape character) includes areas where changes in the basic elements caused by management activities may be evident in the characteristic landscape. But the changes should remain subordinate to the existing landscape character. **Class IV** (modification of the landscape character) includes areas where changes may subordinate the original composition and character. But the changes should reflect what could be a natural occurrence in the characteristic landscape.

Visual resources: The visible physical features of a landscape (topography, water, vegetation, animals, structures, and other features) that constitute the scenery of an area.

Visual sensitivity levels: Measures of public concern (e.g., high, medium, or low) for the maintenance of scenic quality.

Water quality: The chemical, physical, and biological characteristics of water with respect to its suitability for a particular use.

Watershed: The fifth level of the hydrologic unit delineation system. A watershed is coded with 10 numerical digits, and watersheds range in size from 40,000 to 250,000 acres (Subcommittee on Spatial Water Data 2000).

Watershed health: Watersheds are in or making significant progress toward properly functioning physical condition, including their upland, riparian-wetland, and aquatic components; soil and plant conditions support infiltration, soil moisture storage, and the release of water that are in balance with climate and landform and maintain or improve water quality, water quantity, and timing and duration of flow.

Way: A road-like feature used by vehicles having four or more wheels but not declared a road by the owner. A way receives no maintenance to guarantee regular and continuous use.

Wilderness: BLM lands that have been designated by Congress as part of the National Wilderness Preservation System.

Wilderness characteristics: Features of the land associated with the concept of wilderness that may be considered in land use planning when BLM determines that those characteristics are reasonably present, of sufficient value (condition, uniqueness, relevance, importance) and need (trend, risk), and are practical to manage. See Naturalness, Solitude, and Primitive/Unconfined Recreation.

Wildfire: An unplanned ignition caused by lightning, volcanoes, unauthorized and accidental human-caused fires, and escaped prescribed fires.

Wildfire suppression: The response to wildfire (or an escaped prescribed fire) that results in curtailment of fire spread and eliminates all identified threats from the particular fire.

Wild free-roaming horses and burros: All unbranded and unclaimed horses and burros on public lands of the United States.

Wildland fire: A general term describing any non-structure fire that occurs in the vegetation and/or natural fuels. Wildland fire includes both wildfire and prescribed.

Wildland fire decision support system (WFDSS): A linear, stepwise, and standardized documentation process for wildland fires. The WFDSS is a web-based application which provides real time depiction of fire weather, values at risk, and summarization of land–use plan and fire management plan objectives in documenting wildland fire management decisions. For fires escaping initial attack, the WFDSS results in a WFDSS report that documents the objectives, fire situation, course of action, and rationale of the fire and line managers. The WFDSS replaces the WFSA (wildland fire situation analysis), wildland fire implementation plan (WFIP), and long-term implementation plan (LTIP) processes with a single process.

Wildland urban interface (WUI): The line, area, or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels.

OR

As defined by Healthy Forests Restoration Act (HFRA): (i) an area extending ½ mile from the boundary of an at-risk community; an area within 1 ½ miles of the boundary of an at-risk community, including any land that (I) has a sustained steep slope that creates the potential for wildfire behavior endangering the at-risk community, or (II) is in condition class 3, as documented by the Secretary in the project- specific environmental analysis; (iii) an area that is adjacent to an evacuation route for an at-risk community that the Secretary determines, in cooperation with the at-risk community, requires hazardous fuels reduction to provide safer evacuation from the at-risk community.

Wildlife: A broad term that includes birds, reptiles, amphibians, and nondomesticated mammals.

Wild river: A wild and scenic river tentative classification that applies to those rivers or sections of rivers that are free of impoundments and generally inaccessible except by trail, with watersheds or shorelines essentially primitive and waters unpolluted and possess at least one river-related outstandingly remarkable value. These represent vestiges of primitive America.

Withdrawal: Withholding an area of federal land from settlement, sale, location, or entry under some or all of the general land laws, for the purpose of limiting activities under those laws in order to maintain other public values in the area or reserving the area for a particular public purpose or program; or transferring jurisdiction over an area of federal land, other than property governed by the Federal Property and Administrative Services Act, from one department, bureau, or agency to another department, bureau, or agency. Also see Segregation.

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Abbreviation/Acronyms

A

ACEC:
Area of critical environmental concern

ADR:
Alternative dispute resolution

AIM:
Assessment inventory monitoring

AML:
Abandoned mine lands

AML:
Appropriate management level

AMS:
Analysis of the management situation

AUM:
Animal unit month

B

BAER:
Burned Area Emergency Response Program

BAR:
Burned area rehabilitation

BIA:
Bureau of Indian Affairs

BLM:
U.S. Department of the Interior, Bureau of Land Management

BMP:
Best management practices

BOR:
Bureau of Reclamation

C

CC:
Condition class

CEQ:
Council on Environmental Quality

CFR:
Code of Federal Regulations

CO_2:
Carbon monoxide

CSP:
Concentrated solar power (also called concentrating solar power)

CSU:
Controlled surface use

CTTMP:
Comprehensive transportation and travel management plan

CX:
Categorical exclusion

D

DAQ:
State of Nevada Department of Air Quality

DEIS:
Draft environmental impact statement

DFC:
Desired future condition

DM:
Departmental manual

DMM:
Discarded military munitions

DNA:
Determination of NEPA adequacy

DO:
Dissolved oxygen

DR:
Decision record (for an environmental assessment)

E

EA:
Environmental assessment

EDRR:
Early detection and rapid response

EIS:
Environmental impact statement

EJ:
Environmental justice

EO:
Executive order

EPA:
Environmental Protection Agency

EPS:
Economic profile system

EPSC:
Economic Profile System for Communities

ERMA:
Extensive recreation management area

ES:
Emergency stabilization

ESA:
Endangered Species Act of 1973, as amended

ESA:
Environmental Site Assessment

ESR:
Emergency stabilization and rehabilitation

F

FACA:
Federal Advisory Committee Act

FEIS:
Final environmental impact statement

FEIS:
Fire effects information system

FERC:
Federal Energy Regulatory Commission

FHWA:
Federal Highway Administration

FLPMA:
Federal Land Policy and Management Act

FMP:
Fire management plan

FMU:
Fire management unit

FMZ:
Fire management zone

FO:
Field office

FOIA:
Freedom of Information Act

FONSI:
Finding of no significant impact

FPA:
Fire program analysis

FPU:
Fire planning unit

FR:
Federal Register

FRCC:
Fire regime condition class

FS:
Forest Service

FUDS:
Formerly used defense sites

FUP:
Free-use permits

FWS:
Fish and Wildlife Service

FY:
Fiscal year

G

GIS:
Geographic information systems

H

HA:
Herd area

HFI:
Healthy Forests Initiative

HFRA:
Healthy Forests Restoration Act

HMA:
Herd management area

HMM:
Hazardous materials management

HMP:
Habitat management plan

HUC:
Hydrologic unit code

I

IB:
Information bulletin

IBLA:
Interior Board of Land Appeals

IDT:
Interdisciplinary team

IM:
Instruction memorandum [or memoranda]

IMP:
Interim management policy (for wilderness study areas)

ISA:
Instant study area

L

LAA:
Likely to adversely affect

LN:
Lease notice

LUA:
Land-use authorization

LUP:
Land-use plan

LVFO:
Las Vegas Field Office

M

MC:
Munitions constituents

MEC:
Munitions and explosives of concern

MIST:
Minimum impact suppression technique

MOA:
Memorandum of agreement

MOU:
Memorandum of understanding

MRS:
Munitions response sites

MSHCP:
Multi-species habitat conservation plan

N

NDOW:
Nevada Department of Wildlife

NEPA:
National Environmental Policy Act

NF:
National forest

NHPA:
National Historic Preservation Act

NHT:
National historic trail

NLAA:
Not likely to adversely affect

NLCS:
National Landscape Conservation System

NMFS:
National Marine Fisheries Service

NO_2:
Nitrogen dioxide

NOA:
Notice of availability

NOAA:
National Oceanic and Atmospheric Administration

NOI:
Notice of intent

NP:
National park

NPA:
National park agreement

NPDES:
National Pollutant Discharge Elimination System

NPS:
National Park Service

NRCS:
Natural Resources and Conservation Service

NREL:
National Renewable Energy Laboratory

NRHP:
National Register of Historic Places

NSO:
No surface occupancy

NWR:
National wildlife refuge

O

O&G:
Oil and gas

O_2:
Ozone

OEPC:
U.S. Department of the Interior, Office of Environmental Policy and Compliance

OHV:
Off-highway vehicle

OPA:
Outfitter permit area

ORV:
Outstandingly remarkable value

P

PFC:
Proper functioning condition

PFO:
Pahrump Field Office

PL:
Public law

PM_{10}:
Particulate matter 10 microns in diameter or smaller

$PM_{2.5}$:
Particulate matter 2.5 microns in diameter or smaller

PRP:
Potentially responsible party

PSD:
Prevention of significant deteriorations

PUP:
Pesticide use proposal

PV:
Photovoltaics

R

R&I:
Relevance and importance

R&PP:
Recreation and public purposes

RAC:
Resource Advisory Council

RAMP:
Recreation area management plan

RCRA:
Resource Conservation and Recovery Act

REA:
Rapid ecological assessment

RECO:
Renewable Energy Coordination Office

RMA:
Recreation management area

RMIS:
Recreation Management Information System

RMP:
Resource management plan

RMZ:
Recreation management zone

ROD:
Record of decision

ROW:
Rights-of-way

RSC:
Recreation-setting characteristics

S

SHPO:
State Historic Preservation Office

SLT:
Standard lease term

SMA:
Surface management agency

SNDO:
Southern Nevada District Office

SNPLMA:
Southern Nevada Public Land Management Act

SO_2:
Sulfur dioxide

SRMA:
Special recreation management area

SRP:
Special recreation permit

SSS:
Special status species

T

T&E:
Threatened and endangered

TCP:
Traditional cultural properties

TMDL:
Total maximum daily load

TNEB:
Thriving natural ecological balance

U

USC:
United States Code

USDA:
United States Department of Agriculture

USDI:
United States Department of the Interior

USDOT:
United States Department of Transportation

USFS:
United States Forest Service

USFWS:
United States Fish and Wildlife Service

USGS:
United States Geological Survey

UXO:
Unexploded ordnance

V

VRI:
Visual resource inventory

VRM:
Visual resource management

W

WFDSS:
Wildland fire decision support system

WFMI:
Wildland fire management information

WFRHBA:
Wild Free-Roaming Horses and Burros Act of 1971 (as amended)

WO:
BLM Washington Office

WQRP:
Water quality restoration plan

WSA:
Wilderness study area

WSR:
Wild and scenic rivers

WUI:
Wildland urban interface