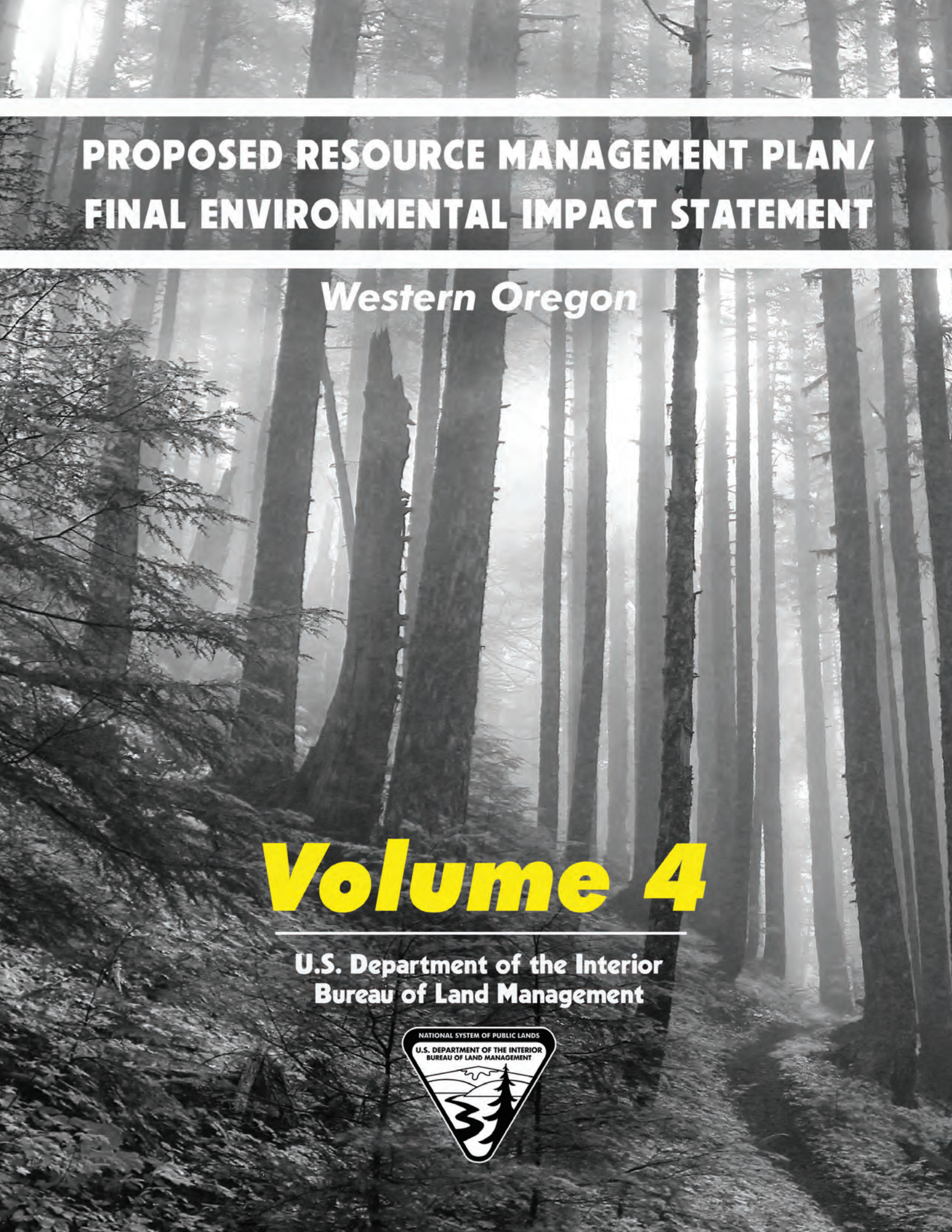

PROPOSED RESOURCE MANAGEMENT PLAN/ FINAL ENVIRONMENTAL IMPACT STATEMENT

Western Oregon

Volume 4

U.S. Department of the Interior
Bureau of Land Management

NATIONAL SYSTEM OF PUBLIC LANDS
U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

The BLM manages more than 245 million acres of public land, the most of any Federal agency. This land, known as the National System of Public Lands, is primarily located in 12 western states, including Alaska. The BLM also administers 700 million acres of sub-surface mineral estate throughout the nation.

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NATIONAL SYSTEM OF PUBLIC LANDS

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

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Appendix O – Recreation

Table O-1. Recreation Management Areas within the decision area by alternative and the Proposed RMP

District/ Field Office	Location No. on Figures O-1 to O-6	RMA Name	RMA Type	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)	PRMP (Acres)
Coos Bay	1	Bastendorff Beach	SRMA	39	39	39	39	39
	2	Blue Ridge Trail System	ERMA	-	1,405	1,405	1,405	1,405
	3	Coos Head	SRMA	-	-	11	11	60
	4	Dean Creek Elk Viewing Area	SRMA	14	14	14	1,146	1,146
	5	Doerner Fir Trail	ERMA	-	17	17	17	17
	6	Edson Creek Campground	SRMA	46	45	45	45	45
	7	Euphoria Ridge Trail	ERMA	-	-	-	473	-
	342	East Fork Illinois Trails*	ERMA	-	-	-	-	1,440
	8	Fawn Creek Campground	SRMA	3	3	3	3	3
	9	Floras Lake	ERMA	-	50	50	50	50
	10	Hinsdale Garden	SRMA	11	11	11	11	11
	11	Hunter Creek Trail System	ERMA	-	1,408	198	198	198
	12	Loon Lake Recreation Area	SRMA	77	76	76	76	76
	13	Lost Lake	SRMA	-	14	-	-	-
	14	North Spit Beach and Ponds Unit	ERMA	-	-	336	336	-
	15	North Spit Boat Ramp	SRMA	5	5	5	5	5
	16	North Spit Trail System	ERMA	-	1,317	1,317	-	1,505
	17	Park Creek Campground	SRMA	4	4	4	4	4
	18	Rocky Peak Trail	ERMA	-	1,948	1,948	1,948	1,948
	19	Sixes River Campground	SRMA	27	27	27	27	27
	20	Smith River Corridor	ERMA	-	-	9,505	9,505	9,505
	21	Smith River Falls Campground	SRMA	4	4	4	4	4
	22	Storm Ranch	SRMA	235	236	236	236	236
	23	Vincent Creek Campground	SMRA	4	4	4	4	4
	24	Wasson Creek	ERMA	-	-	-	5,813	5,811
	343	West Laverne Park Campground	SRMA	24	24	24	24	24
Eugene	25	Barlow Creek Trail and Trailhead	ERMA	-	-	-	100	-
	26	Calapooya Divide Backcountry Byway	ERMA	-	-	270	270	225
	27	Carpenter Bypass Mountain Bike Trail	ERMA	-	1,160	1,160	1,160	1,160
	28	Carpenter Bypass Staging Area	SRMA	1	1	1	1	1
	29	Cascade View OHV Complex	SRMA	6	6	6	6	6
	30	Clay Creek Recreation Site	SRMA	10	10	10	10	10
	31	Clay Creek Trail	ERMA	-	14	14	14	14
	32	Coburg Hiking Trail System	ERMA	-	-	2,019	2,019	1,940
	33	Coburg Hills Backcountry Byway	ERMA	-	-	79	79	79
	34	Crooked Creek OHV Staging Site	SRMA	1	1	1	1	1
	35	Culp Creek Expansion Site	SRMA	-	-	-	<1	-
	36	Culp Creek Trailhead	SRMA	1	<1	<1	<1	<1
	37	Dorena Dam Trail Access Site	SRMA	3	1	1	1	1
	38	Eagles Rest Hiking/Biking Trail	ERMA	-	3	3	3	3
	39	Esmond Lake Trailhead and Trail	ERMA	-	-	-	158	-
	40	Hult Equestrian Staging Area	SRMA	-	1	1	1	1
	41	Hult Reservoir Non-motorized Trail	ERMA	-	213	213	213	213

District/ Field Office	Location No. on Figures O-1 to O-6	RMA Name	RMA Type	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)	PRMP (Acres)
	42	Hult Reservoir Recreation Area	SRMA	21	21	21	21	21
	43	Lost Creek Backcountry Byway	ERMA	-	-	145	145	145
	44	Lost Creek Trails	ERMA	-	20	20	20	20
	45	Low Pass OHV Emphasis Area	ERMA	-	-	511	511	-
	46	Lower Lake Creek Falls	SRMA	2	2	2	2	2
	47	Martin Rapids Overlook	SRMA	3	3	3	3	3
	48	McGowan Creek Environmental Education Area Trail	ERMA	-	80	80	80	91
	49	McGowan Creek Environmental Education Area	SRMA	1	1	1	1	1
	50	McKenzie River Campground	SRMA	-	-	146	146	146
	51	McKenzie River Dispersed Recreation Corridor	ERMA	-	-	276	276	276
	52	McKercher Park	SRMA	2	<1	<1	<1	<1
	53	Mosby Creek Trailhead	SRMA	10	10	10	10	10
	54	North Bowl Campground	ERMA	-	-	83	83	83
	55	Rennie Boat Landing	SRMA	1	1	1	1	1
	56	Row River Trail	ERMA	-	67	67	67	67
	57	Row River Trail Expansion	ERMA	-	-	3	3	32
	58	Sharps Creek Expansion Site	ERMA	-	-	-	5	-
	59	Sharps Creek Recreation Site	SRMA	3	3	3	3	3
	60	Shotgun Creek Backcountry Byway	ERMA	-	-	169	169	169
	61	Shotgun Creek Recreation Site	SRMA	16	16	16	16	16
	62	Shotgun Non-Motorized Trail System	ERMA	-	64	64	64	64
	63	Shotgun OHV Trail System	ERMA	-	5,755	5,753	5,753	5,753
	64	Silver Creek Boat and McKenzie River Watchable Wildlife Site	SRMA	2	1	1	1	1
	65	Siuslaw Bend Campground	ERMA	-	-	-	483	-
	66	Siuslaw River	SRMA	-	-	-	8,403	-
	67	Smith Creek	SRMA	3	1	1	1	1
	68	Taylor Landing Recreation Site	SRMA	3	3	3	3	3
	69	Tyrrell Seed Orchard Interpretive Trail	ERMA	-	8	8	8	8
	70	Upper Lake Creek	ERMA	-	13,021	13,021	13,021	12,486
	71	Whitewater Day Use Area	SRMA	8	6	6	6	6
	72	Whittaker Creek Recreation Area	SRMA	2	2	2	2	2
	73	Whittaker Creek Trail	ERMA	-	13	13	13	13
	74	Willamalane Non-Motorized Trails	ERMA	-	-	-	1,057	1,057
	75	Willamette River Greenway	SRMA	4	4	4	4	4
	76	Wolf Creek Environmental Education Site and Trail	ERMA	-	-	-	549	-
Klamath Falls	77	Barnes Valley Boat Ramp	ERMA	8	8	8	8	-
	78	Bryant Mountain	ERMA	-	-	9,086	9,094	9.094
	79	Frog Camp	SRMA	7	7	7	7	-
	80	Gerber	ERMA	-	41,332	41,332	39,917	39,908
	81	Gerber Recreation Area	SRMA	473	272	272	272	272
	82	Hogback Mountain	SRMA	-	2,284	2,284	-	2,284
	83	KFRA	ERMA	-	-	-	140,576	-
	84	Klamath River Campground	SRMA	38	26	26	26	24
	85	Klamath River WSR	ERMA	-	2,663	2,663	2,663	2,634

District/ Field Office	Location No. on Figures O-1 to O-6	RMA Name	RMA Type	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)	PRMP (Acres)
	86	Lower Klamath Hills	B=E, C,D=S, PRMP=E	-	1,596	1,596	1,596	1,596
	87	Miller Creek Camp	SRMA	2	2	2	2	2
	88	North Bryant Mountain	SRMA	-	-	5	-	-
	89	Pacific Crest Trail Corridor	SRMA	7	7	7	7	659
	90	Potholes Camp	SRMA	8	8	8	8	8
	91	South Bryant Mountain	SRMA	-	-	3	-	-
	92	Spring Island River Access	SRMA	6	2	2	2	2
	93	Stan H Spring	SRMA	6	2	2	-	2
	94	Stukel Mountain	C=E, D=S, PRMP= E	-	-	9,622	9,622	9,622
	95	Surveyor Campground	SRMA	28	28	28	28	27
	96	Surveyor Mountain	ERMA	-	18,033	18,033	-	17,377
	97	Swan Lake Rim	ERMA	-	-	9,106	9,106	9,106
	98	Topsy Recreation Site	SRMA	14	14	14	14	14
	99	Willow Valley Reservoir Boat Ramp	SRMA	12	12	12	12	12
	100	Wood River Wetland	A,C,D=S, B=E	1	3,174	3,174	3,174	-
Medford	101	Anderson-Little Apple	ERMA	-	-	7,483	7,483	7,482
	102	Anderson Addition	ERMA	-	-	10,076	10,076	10,076
	103	Armstrong Gulch Trailhead	SRMA	1	1	1	1	-
	104	Baker Cypress Trail	ERMA	-	3	3	3	3
	105	Bald-Wagon	ERMA	-	-	3,124	-	3,124
	344	Beacon Hill*	ERMA	-	-	-	-	4,617
	106	Beacon Hill Trail	ERMA	-	12	12	12	12
	107	Bear Gulch Trailhead	SRMA	<1	<1	<1	<1	-
	108	Bell Forest	ERMA	-	-	3,800	-	3,800
	109	Bolt Mountain Trail	ERMA	-	10	392	392	392
	110	Buck-Berry Rock	ERMA	-	-	6,504	6,504	6,504
	111	Buck Prairie II XC Ski Trailhead	SRMA	1	1	1	1	-
	112	Buck Prairie II XC Ski Trails	SRMA	-	967	-	-	-
	113	Buck Prairie Toilet	SRMA	<1	<1	<1	<1	-
	114	Buck Prairie XC Ski Trails	SRMA	-	967	-	-	-
	115	Buck Prairie/Hyatt	ERMA	-	-	11,845	16,817	9,927
	116	Buckhorn Mountain	ERMA	-	-	8,284	8,284	8,206
	117	Bunny Meadows	A=S, B,C,D=E, PRMP=E	8	8	8	8	8
	118	Burma Pond Campground and Trailhead	SRMA	2	2	2	2	9
	119	Burma Pond Trail	ERMA	-	4	4	4	-
	120	Cathedral Hills Trail System	B=E, C,D=S, PRMP=S	-	545	546	546	546
	121	Chicken Foot	SRMA	<1	-	-	-	-
	122	China Gulch	SRMA	<1	-	-	-	-
	123	Cow Creek Backcountry Byway	ERMA	-	88	-	-	41
	124	Coyote Creek OHV Area	ERMA	-	-	-	14,569	-

District/ Field Office	Location No. on Figures O-1 to O-6	RMA Name	RMA Type	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)	PRMP (Acres)
	125	Deer Creek Education/Interpretive Area	SRMA	-	-	41	41	41
	126	Deming Gulch Equestrian Trailhead	SRMA	1	1	-	-	-
	127	Deming Gulch Trailhead	SRMA	<1	<1	-	-	-
	128	East Applegate Ridge Trail	ERMA	-	-	44	44	44
	129	East Fork Illinois Trails	C=E, D=S	-	-	1,441	1,441	-
	130	Eight Dollar Accessible Boardwalk Trailhead	SRMA	<1	-	-	-	-
	131	Eight Dollar Mountain	ERMA	-	-	2,095	2,134	2,134
	132	Eight Dollar Mountain Boardwalk Trail	ERMA	-	1	-	-	-
	133	Eight Dollar Mountain Interpretive Site	ERMA	-	-	-	39	-
	134	Eight Dollar Mountain Parking Area	SRMA	<1	<1	-	-	-
	135	Elderberry Flat Campground	SRMA	23	23	23	23	23
	136	Enchanted-Timber	ERMA	-	-	-	13,774	-
	137	Enchanted Forest and Felton Trails	ERMA	-	36	37	37	38
	138	Enchanted Forest Trailhead	SRMA	2	2	-	-	-
	139	Enchanted Well	ERMA	-	-	-	8,641	-
	140	Espy Trailhead	SRMA	1	1	-	-	-
	141	Evans Creek Hang Gliding Launch Site	ERMA	-	-	-	26	-
	142	Galice Hellgate Backcountry Byway	ERMA	-	258	258	258	258
	143	Gold Nugget Waysides	SRMA	11	11	49	49	49
	144	Grants Pass Peak Non-motorized Trails	ERMA	-	-	11,927	11,834	11,923
	145	Grave Creek to Marial Backcountry Byway	ERMA	-	348	348	348	348
	146	Grayback Mountain Trail	ERMA	-	76	76	76	77
	147	Grayback Mountain Trailhead	SRMA	<1	<1	<1	<1	-
	148	Green Springs Mtn. Loop Trailhead	SRMA	<1	<1	-	-	-
	149	Green Top Mountain	ERMA	-	-	-	5,316	5,316
	150	Grizzly Peak	SRMA	-	-	-	3,593	-
	151	Grizzly Peak Trail	SRMA	-	-	2,954	-	2,951
	152	Grizzly Peak Trailhead	SRMA	1	506	-	-	-
	153	Hidden Creek Trail	ERMA	-	7	7	7	7
	154	Hidden Creek Trailhead	SRMA	<1	-	-	-	-
	155	Hyatt Lake Campground	SRMA	37	149	149	149	52
	156	Hyatt Watchable Wildlife Site	SRMA	-	2	2	2	-
	157	Illinois Forks Park	ERMA	-	-	79	79	77
	158	Isabella	SRMA	<1	-	-	-	-
	159	Jack Ash Trail and Connector Trail	ERMA	-	-	203	203	203
	160	Jackson Creek	ERMA	-	-	507	-	507
	161	Jacksonville Woodlands Trailhead	SRMA	1	1	-	-	-
	162	Jacksonville Woodlands Trails	ERMA	-	105	103	103	103
	163	Jeffrey Pine Loop Trail	ERMA	-	4	-	-	-
	164	Kane Creek	SRMA	<1	-	-	-	-
	165	Kenney Meadows Recreation Site	SRMA	20	20	20	20	20
	166	Kerby	ERMA	-	-	654	654	654
	167	Kerby Peak Trail	ERMA	-	36	36	36	36

District/ Field Office	Location No. on Figures O-1 to O-6	RMA Name	RMA Type	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)	PRMP (Acres)
	168	Kerby Peak Trailhead	SRMA	<1	<1	<1	<1	-
	169	King Mountain Trail	SRMA	-	5	5	5	6
	170	King Mountain Trailhead	SRMA	1	1	1	1	-
	171	Lake Selmac Trails	B=E, C,D=S, PRMP= S	-	440	443	443	443
	172	Layton Ditch Trail	ERMA	-	43			-
	173	Layton Ditch Trailhead	SRMA	<1	-	-	-	-
	174	Left Right Center Foots	ERMA	-	-	7,657	7,657	7,651
	175	Little Applegate Trailhead	SRMA	1	1	-	-	-
	176	Lodgepole	SRMA	<1	<1	<1	<1	<1
	177	Logan Cut	ERMA	-	-	527	527	526
	178	London Peak Trail	ERMA	-	14	14	14	15
	179	Lower Table Rock Trailhead	SRMA	2	-	-	-	-
	180	Medco Railroad Trail	ERMA	-	-	-	106	106
	181	Mount Bolivar Trailhead	SRMA	<1	<1	<1	<1	<1
	182	Mountain of the Rogue	SRMA	-	-	5,069	5,069	5,069
	183	Mungers Butte	ERMA	-	-	11,873	11,873	11,873
	184	Northwest Hills	ERMA	-	-	480	2,620	2,341
	185	Nugget Falls	ERMA	-	5	-	-	-
	186	Pacific Crest Trail 1 and 2	SRMA	1,094	955	951	951	6,161
	187	Pacific Crest Trailhead at Little Hyatt Lake	SRMA	<1	-	-	-	-
	188	Provolt Seed Orchard	SRMA	-	-	295	295	294
	189	Quartz Creek OHV Area	SRMA	-	-	8,344	8,344	8,344
	190	Rainie Falls Overlook	SRMA	1	1	<1	<1	-
	191	Rattlesnake	ERMA	-	21	56	56	56
	192	Rock Creek Trails	ERMA	-	-	6,793	6,793	5,706
	193	Rockydale	ERMA	-	-	186	186	186
	194	Rogue Greenway	ERMA	-	-	370	370	370
	195	Rogue Timber	ERMA	-	-	7,906	-	7,902
	196	Rogue Wild and Scenic River	SRMA	15,949	11,409	11,409	11,409	11,395
	197	Rough and Ready Trail	ERMA	-	2	2	2	2
	198	Roundtop Mountain	SRMA	-	-	13,168	13,168	13,168
	199	Section 29	ERMA	-	-	203	203	202
	200	Silver Creek	ERMA	-	-	57	57	57
	201	Skull Creek Campground	SRMA	8	7	7	7	7
	202	Skycrest Trailhead	SRMA	<1	<1	-	-	-
	203	Sterling Mine Ditch Trail	SRMA	-	1,322	1,279	1,279	1,280
	204	Table Mountain Snow Play Area	SRMA	9	9	9	9	9
	205	Table Rock Trailheads	SRMA	-	4	-	-	-
	206	Table Rock Trails	ERMA	-	52	-	-	-
	207	Table Rocks	SRMA	-	-	1,329	1,329	1,282
	208	Thompson-Cantrall	ERMA	-	-	23,317	23,317	23,317
	209	Timber Mountain Recreation Area	ERMA	-	10,160	-	-	-
	210	Tucker Flat Campground	SRMA	9	8	8	8	12
	211	Tunnel Ridge Trailhead	SRMA	1	1	-	-	-
	212	Upper Table Rock Trailhead	SRMA	2	-	-	-	-
	213	Wagner Creek Trail	ERMA	-	2	2	2	2

District/ Field Office	Location No. on Figures O-1 to O-6	RMA Name	RMA Type	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)	PRMP (Acres)
	214	Wagner Creek Trailhead	SRMA	<1	<1	-	-	-
	215	Wellington Mine Trail	ERMA	-	-	44	44	45
	216	West Applegate Ridge Trail	ERMA	-	-	-	210	-
	217	West Fork Evans Creek	ERMA	-	-	3,042	3,042	3,042
	218	Whiskey Creek Overlook	SRMA	<1	<1	<1	<1	<1
	219	Wild Rogue Canyon	ERMA	-	-	-	50,451	50,451
	220	Wildcat Campground and Horse Camp	SRMA	-	47	47	47	-
	221	Williams Creek Wayside	SRMA	1	1	-	-	-
	222	Wolf Gap Trailhead	SRMA	1	1	-	-	-
	223	Woodrat	ERMA	-	-	3,876	3,876	3,876
	224	Woodrat Mtn. Gliding Sites	SRMA	7	7	-	-	7
Roseburg	225	Baker Park	SRMA	12	12	12	12	-
	226	Bohemia Trail	ERMA	-	-	-	16	-
	227	Boomer Hill OHV	ERMA	-	-	4,635	4,635	-
	345	Calapooya Divide Backcountry Byway*	ERMA	-	-	-	-	44
	228	Cavitt Creek Falls Recreation Site	SRMA	16	16	16	16	16
	229	China Ditch	ERMA	-	62	62	62	61
	230	Cow Creek Backcountry Byway	ERMA	-	-	88	88	88
	231	Cow Creek Backcountry Byway Kiosk	SRMA	1	1	1	1	1
	232	Cow Creek Recreation Gold Panning Area	SRMA	4	4	4	4	4
	233	E-Mile Day-Use Area	SRMA	5	5	5	5	5
	234	Eagleview Group Campground	SRMA	12	12	12	12	12
	235	Emerald Trail	B=E, C,D=S	-	17	17	17	-
	236	Hill Creek Trail	B=E, CD=S	-	2	2	2	-
	237	Hill Creek Wayside	SRMA	1	1	1	1	-
	238	Honeycombs	ERMA	-	-	-	63	4
	239	Hubbard Creek OHV	ERMA	-	-	11,587	11,587	11,583
	240	Island Creek Day-Use Area	SRMA	1	1	28	28	28
	241	Lone Pine Group Campground	SRMA	9	9	9	9	-
	242	Lone Rock Drift Boat Launch	SRMA	2	<1	<1	<1	1
	243	Millpond/Lone Pine Recreation Site	SRMA	-	-	23	23	52
	244	Millpond Recreation Site	SRMA	21	21	-	-	-
	245	Narrows	ERMA	-	-	16	16	16
	246	North Bank-West Entrance	SRMA	1	1	1	1	2
	247	North Bank-Comstock Day Use Area	SRMA	2	2	2	2	2
	248	North Bank Habitat Management Area	ERMA	-	6,586	6,586	6,586	6,523
	249	North Umpqua Trail-Swiftwater	B=E, C,D=S	-	65	65	65	-
	250	North Umpqua Trail-Tioga	B=E, C,D=S	-	33	33	33	-
	251	North Umpqua Wild Scenic River Corridor	SRMA	-	-	2,058	2,058	2,058
	252	Olalla Creek OHV	ERMA	-	-	4,752	4,752	-

District/ Field Office	Location No. on Figures O-1 to O-6	RMA Name	RMA Type	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)	PRMP (Acres)
	253	Osprey Boat Ramp	SRMA	2	3	3	3	3
	254	Red Top Pond	ERMA	-	11	11	11	12
	255	Rock Creek Recreation Site	SRMA	19	19	21	21	22
	256	Rock Creek Trail	ERMA	-	-	-	14	-
	257	Sawmill Trail	B=E, C,D=S	-	20	20	20	-
	258	Scaredman Recreation Site	SRMA	10	10	10	10	10
	259	Smith River Corridor-Roseburg	ERMA	-	-	140	140	140
	260	South Fork Deer Creek OHV	ERMA	-	-	1,402	1,402	-
	261	South Umpqua	ERMA	-	-	-	4	-
	262	Stick Beach	B=E, C,D=S	-	1	1	1	-
	263	Susan Creek Day Use Area	SRMA	2	2	2	2	-
	264	Susan Creek Falls Trail	B=E, C,D=S	-	8	8	8	-
	265	Susan Creek Falls Trailhead	SRMA	1	1	1	1	-
	266	Susan Creek Recreation Site	SRMA	25	25	25	25	-
	267	Swiftwater Day-Use Area	SRMA	4	4	4	4	4
	268	Swiftwater Trailhead	SRMA	2	2	2	2	-
	269	Tinhat Pond	ERMA	-	-	-	5	-
	270	Tyee Recreation Area	SRMA	14	14	14	14	14
	271	Upper Susan Creek Falls Trail	ERMA	-	-	-	1,318	53
	272	White Rock OHV Area	ERMA	-	-	9,846	9,846	-
	273	Wolf Creek Falls Trail	B=E, D, PRMP= S,	-	14	-	14	16
	274	Wolf Creek Falls Trailhead	SRMA	2	2	-	2	-
	275	Wolf Creek Falls Trailhead and Trail	SRMA	-	-	16	-	-
Salem	276	Alder Glen	SRMA	5	-	-	-	-
	277	Alder Glen Campground	SRMA	-	4	4	4	-
	278	Alsea Falls Hiking Trails	ERMA	-	272	272	272	-
	279	Alsea Falls Recreation Site	SRMA	36	31	31	31	-
	280	Alsea Falls Shared Use Trail System	SRMA	-	1,510	2,923	2,923	-
	346	Alsea Falls*	SRMA	-	-	-	-	3,226
	281	Aquila Vista	SRMA	178	178	178	178	178
	282	Baty Butte Trail	ERMA	-	551	-	-	551
	283	Canyon Creek	SRMA	13	13	13	13	13
	284	Cedar Grove	SRMA	5	5	5	5	5
	285	Crabtree Valley	ERMA	-	-	914	914	584
	286	Crazy Cougar	ERMA	-	-	1,444	1,444	1,312
	287	Crooked Finger	ERMA	-	-	-	451	451
	288	Crown Zellerbach Trail (CZ Mainline)	ERMA	-	-	23	23	23
	289	Dogwood	SRMA	6	6	6	6	6
	290	Dovre	SRMA	4	4	4	4	-
	291	Eagle Creek Trail	ERMA	-	160	160	160	160
	292	Elk Bend	SRMA	4	4	4	4	-
	293	Elkhorn Creek WSR	ERMA	-	-	-	1,103	1,103
	294	Elkhorn Valley Campground	SRMA	78	78	78	78	78
	295	Fan Creek	SRMA	3	3	3	3	-
	296	Fishermen's Bend Recreation Site	SRMA	183	184	184	184	184

District/ Field Office	Location No. on Figures O-1 to O-6	RMA Name	RMA Type	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)	PRMP (Acres)
	297	Green Peter Peninsula	ERMA	-	-	1,557	2,056	2,055
	298	High Peak-Grindstone	ERMA	-	-	-	976	-
	299	Highland	ERMA	-	-	-	844	844
	300	Ivors Wayside	SRMA	2	2	2	2	2
	301	Kilchis Glider Launch Site	ERMA	-	-	38	38	-
	302	Little North Fork Wilson	ERMA	-	-	1,160	1,160	-
	303	Marmot Recreation Site	SRMA	-	26	92	92	92
	304	Marmot Trail System	ERMA	-	-	576	-	530
	305	Mary's Peak	ERMA	-	-	-	3,774	3,759
	306	Mill Creek	SRMA	6	6	469	6	-
	307	Mill Creek-Gooseneck	ERMA	-	-	7,416	7,878	7,300
	347	Mill Creek Recreation Site*	SRMA	-	-	-	-	469
	308	Missouri Bend	SRMA	3	3	3	3	3
	348	Mountaindale*	ERMA	-	-	-	-	199
	309	Table Rock Fork – Molalla River	ERMA	-	5,907	13,997	19,906	19,353
	310	Monument Peak Trail System	ERMA	-	909	909	909	909
	311	Nasty Rock Trail	ERMA	-	135	135	135	135
	349	Nestucca River*	SRMA	-	-	-	-	134
	312	Nestucca Backcountry Byway	ERMA	-	323	322	322	204
	313	North Fork Eagle Creek Campground	SRMA	-	-	-	68	68
	314	North Fork Santiam County Park	SRMA	12	12	12	12	12
	315	Old Miner's Meadow	SRMA	3	3	-	3	3
	316	Oxbow Regional Park	SRMA	265	260	260	260	260
	317	Pacific City	ERMA	-	-	79	79	63
	318	Quartzville Backcountry Byway	ERMA	-	34	34	34	34
	319	Quartzville Creek and Yellowstone Trail	ERMA	-	-	2,731	2,727	2,727
	320	Quartzville Creek Corridor	ERMA	-	2,060	-	-	-
	322	Salmonberry Rail to Trail	ERMA	-	-	14	14	14
	321	Sandy-Salmon WSR Corridor	ERMA	-	785	-	-	-
	323	Sandy-Salmon River Corridor	ERMA	-	-	1,824	2,400	1,870
	324	Sandy Ridge Trail System	SRMA	-	1,260	2,239	3,802	3,802
	325	Sandy Ridge Trailhead	SRMA	29	29	52	52	52
	326	Scaponia Park	SRMA	8	8	8	8	8
	327	Shellburg Trail System	ERMA	-	-	283	283	283
	328	Sheridan Peak Overlook	SRMA	4	3	3	3	3
	329	Silver Falls State Park	SRMA	237	237	237	237	237
	330	Snow Peak/Neal Creek	ERMA	-	-	-	6,763	6,757
	331	South Fork Alsea Backcountry Byway	ERMA	-	88	88	88	88
	332	South Fork Clackamas Waterfalls	ERMA	-	-	-	1,116	1,116
	333	Table Rock Wilderness-Pechuck Lookout	ERMA	-	6,171	6,171	6,171	6,171
	350	Tillamook Ridge-Little North Fork Wilson*	ERMA	-	-	-	-	5,745
	334	Three Bears-Hardy Creek	SRMA	14	14	14	14	14
	335	Upper Nestucca OHV Trail System	ERMA	-	6,713	6,494	10,663	7,633
	336	Wildcat Creek	ERMA	-	-	-	2,444	-
	337	Wildcat Creek Trail System	SRMA	-	-	2,444	-	2,444
	338	Wildwood Recreation Site	SRMA	311	553	553	553	553
	339	Wilhoit Springs	ERMA	-	-	-	571	561
	340	Yaquina Head ONA	SRMA	91	91	91	91	91
	341	Yellowbottom	SRMA	13	13	13	13	13

***** Denotes Recreation Management Areas (RMAs) in the Proposed Resource Management Plan (PRMP) with different names and spatial extents then RMAs identified in the action alternatives. The Proposed RMP combined several RMAs or split RMAs where necessary to logically manage recreation opportunities and protect similar recreation setting characteristics when compared to RMA boundaries in the action alternatives.

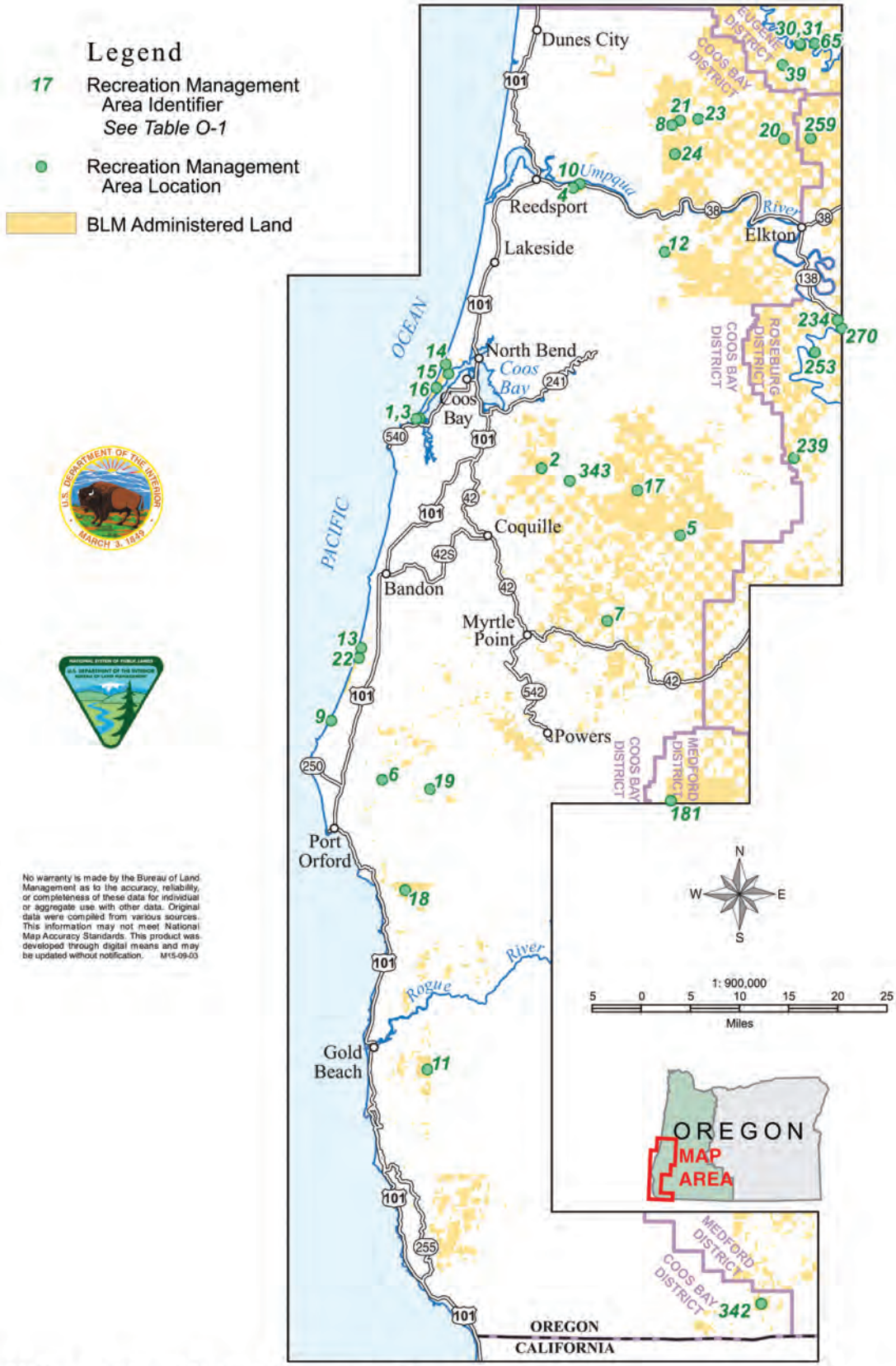


Figure O-1: Coos Bay District Recreation Management Areas

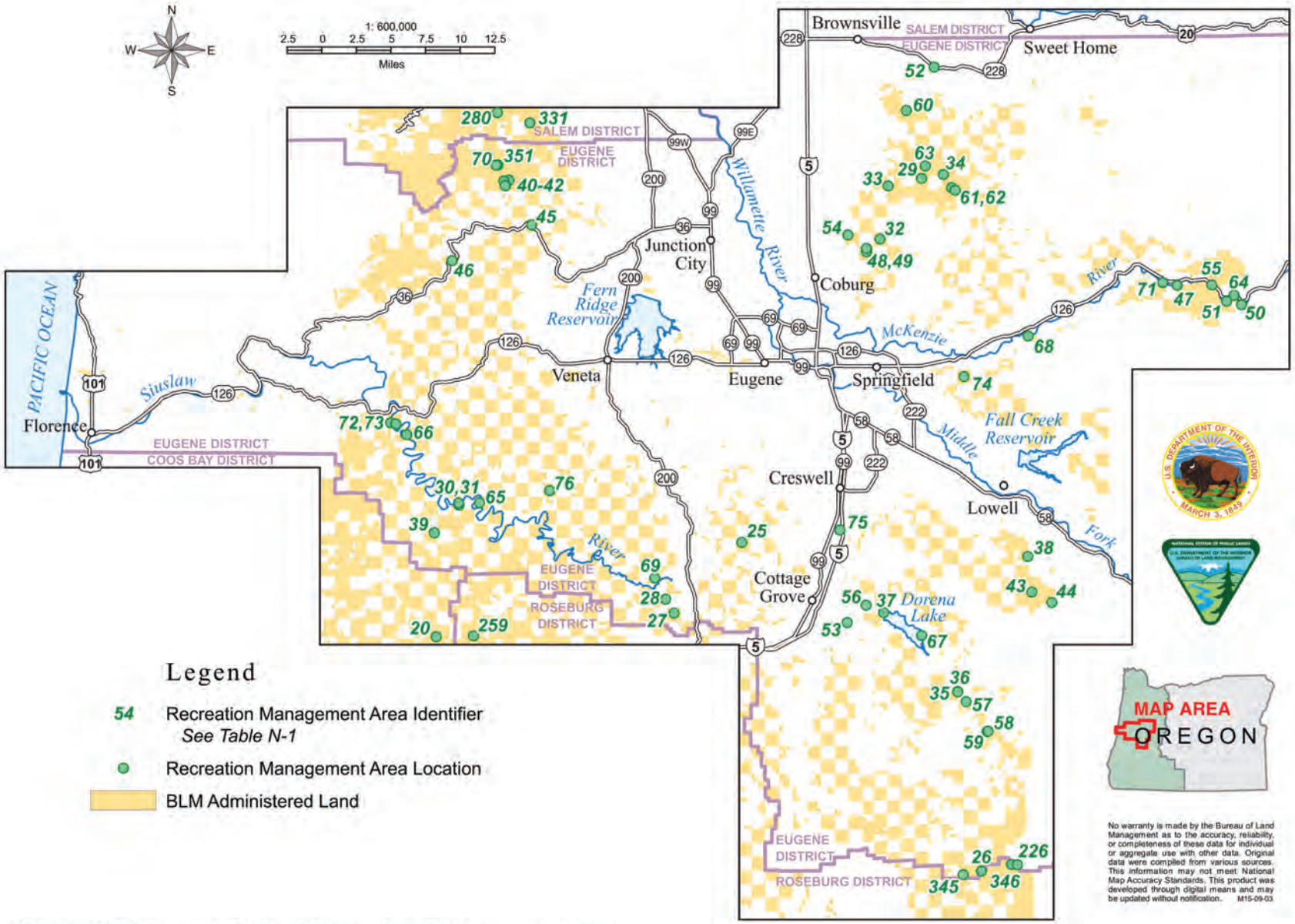


Figure O-2: Eugene District Recreation Management Areas

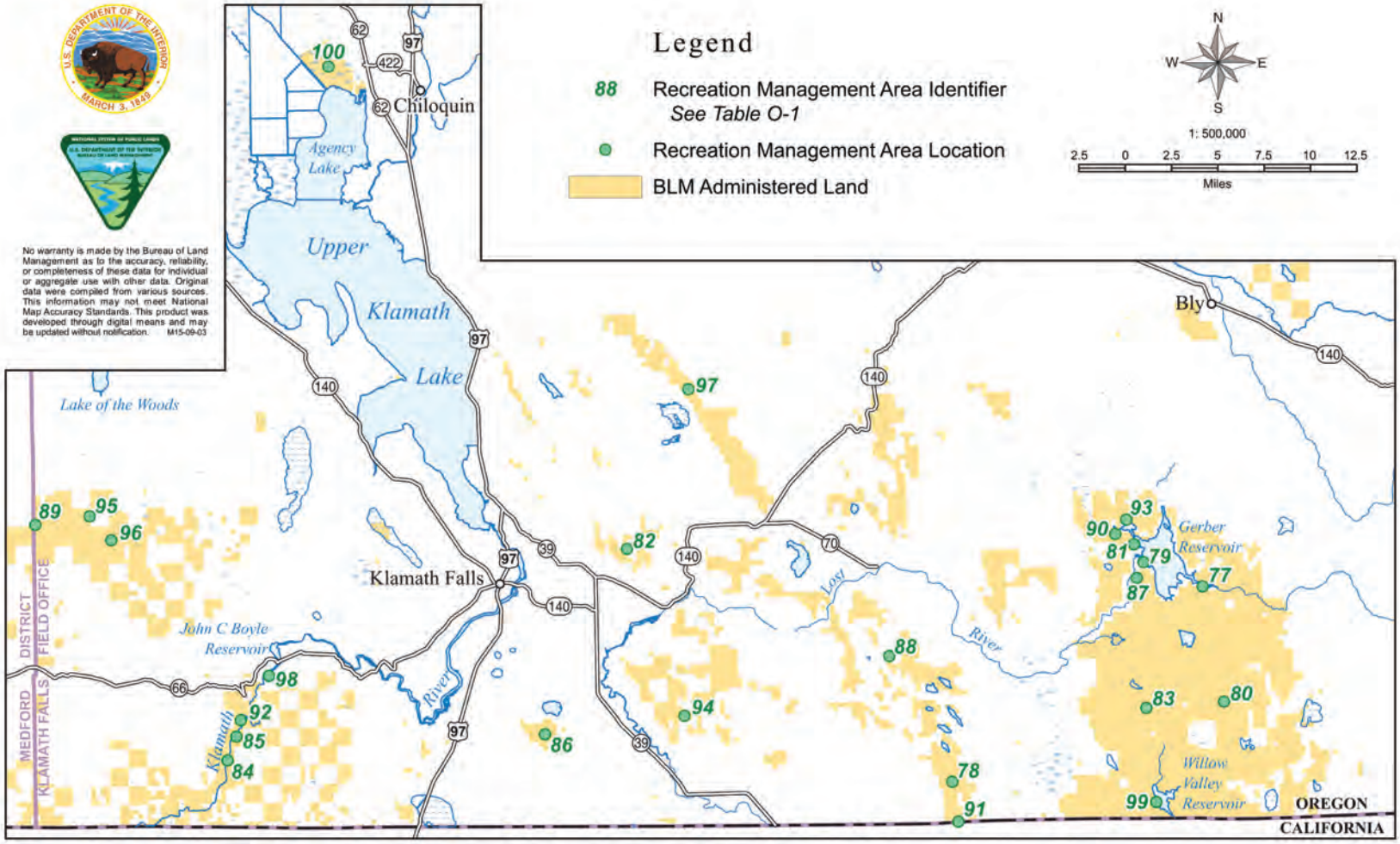
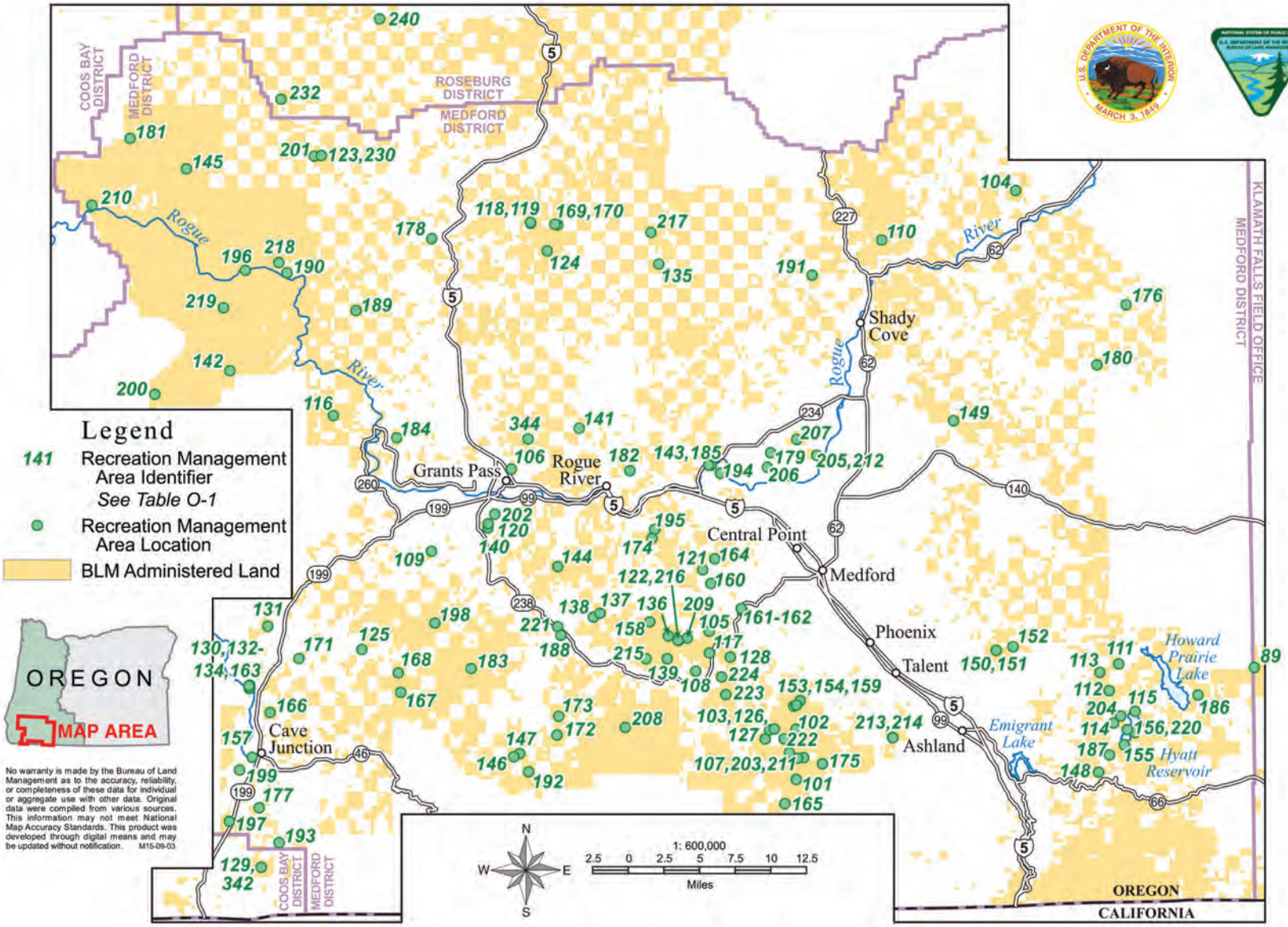


Figure O-3: Klamath Falls Field Office Recreation Management Areas



Map O-4: Medford District Recreation Management Areas

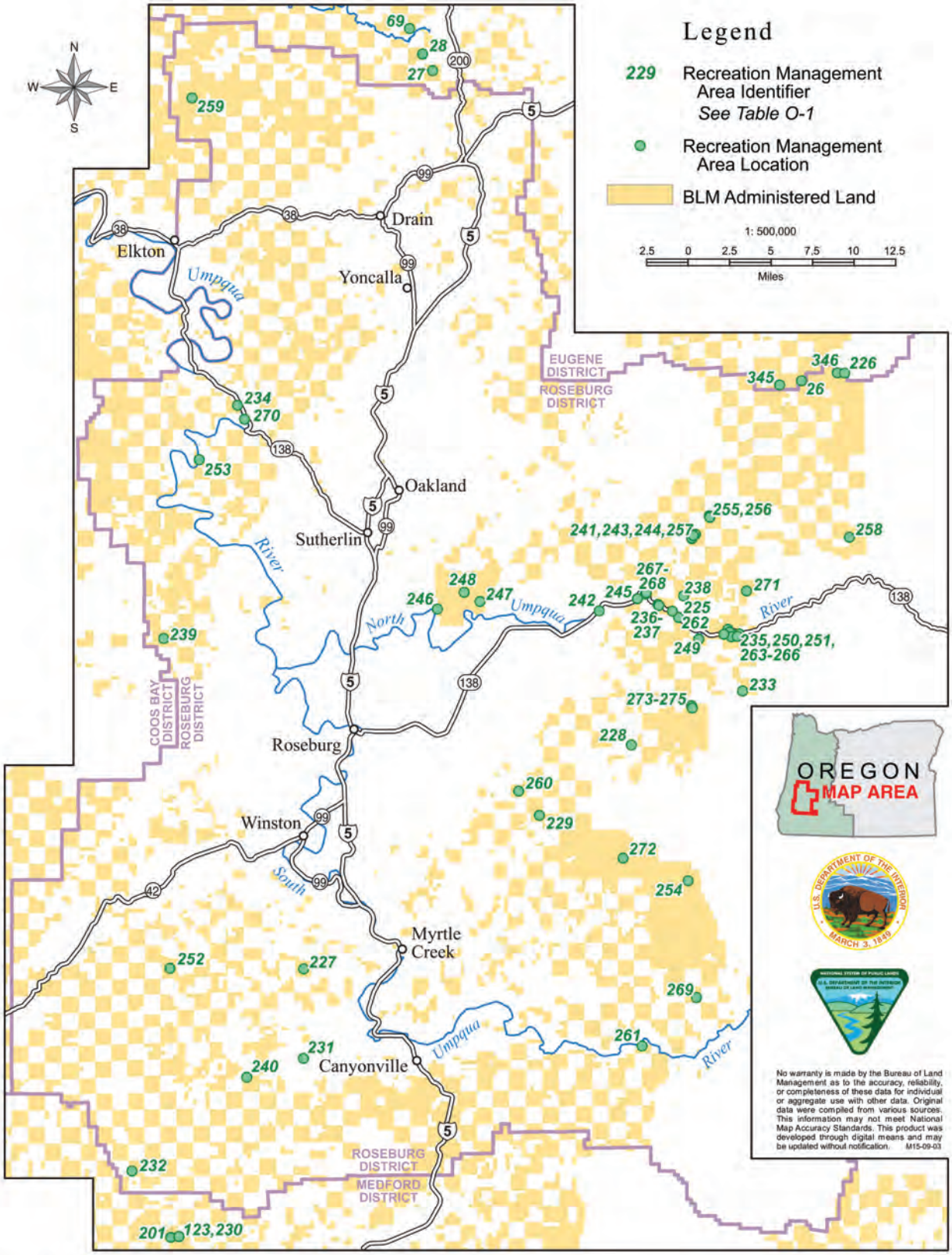


Figure O-5: Roseburg District Recreation Management Areas

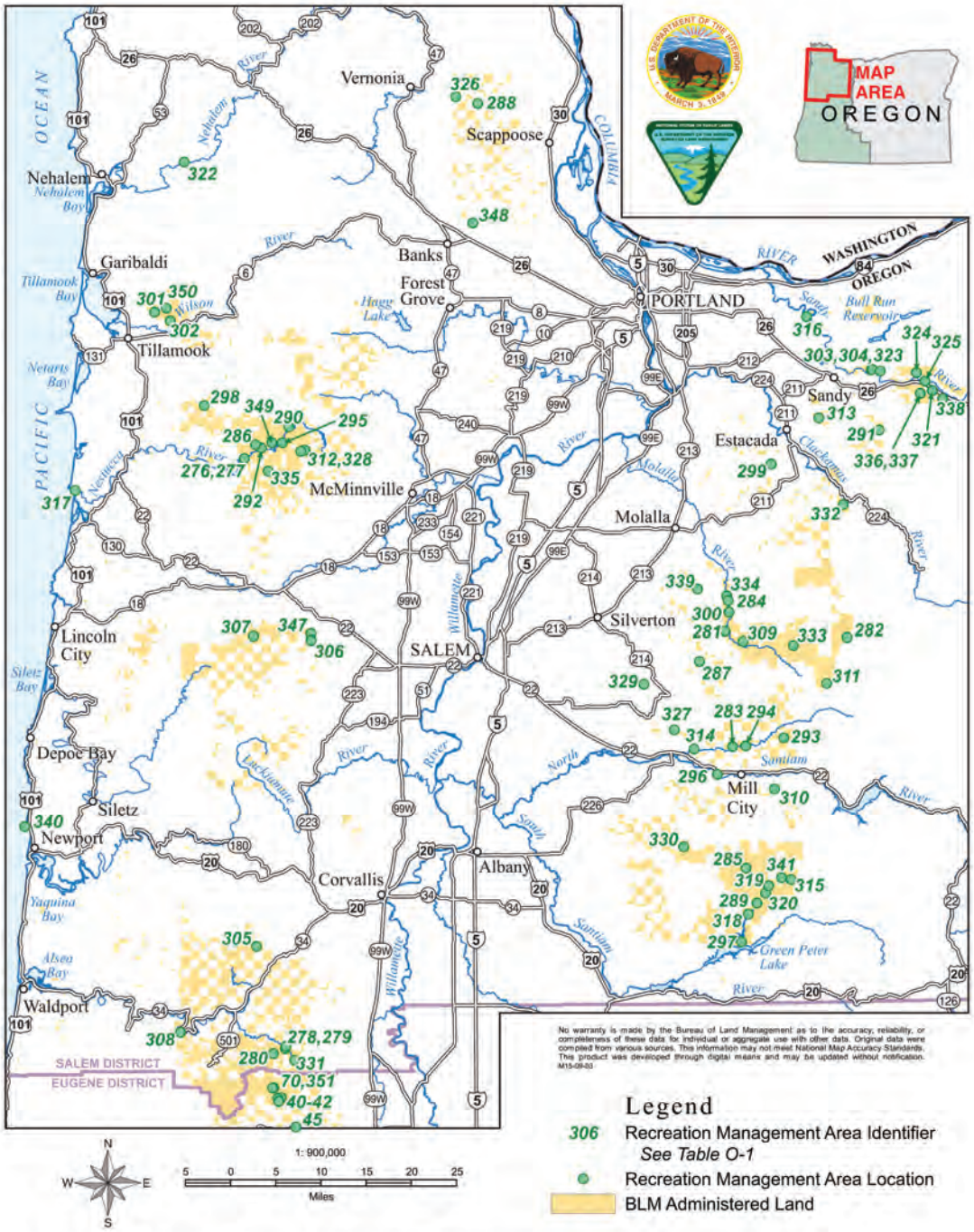


Figure O-6: Salem District Recreation Management Areas

More information on RMA Frameworks is located on the BLM web site at http://www.blm.gov/or/plans/rmpswesternoregon/feis.php.

At this location is a description of each Recreation Management Area using the RMA Frameworks. Each RMA description includes the recreation values, types of visitors, the outcome objectives, the Recreation Setting Characteristics, and the applicable management actions and allowable use restrictions.

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Appendix P – Socioeconomics

The socioeconomic analysis and this appendix were prepared for the BLM by a team of specialists at Environmental Resources Management (ERM) and subcontractors, under the project management of Clive Graham, ERM, and the direction of Stewart Allen of the interdisciplinary team.

Issue 1

How would the alternatives affect the supply, demand, and value of goods and services derived from BLM-administered lands?

Western Oregon Timber Market Model

The BLM modeled timber markets[34] in western Oregon using stumpage supply and demand functions that incorporate existing information, linear functions, and the economic constructs of supply, derived demand, and market arbitrage. In this analysis, the BLM described the stumpage market using linear equations for demand (Q_d) and supply (Q_s):

$$Q_d = a_1 - a_2 * P \quad (1)$$
$$Q_s = b_1 + b_2 * P \quad (2)$$

The parameters a_1, a_2 , $b_1, and\ b_2$ can be estimated from the observed market price, quantity, estimates of the stumpage supply, and demand elasticities. Key is the relation for estimating elasticity ($\in$) as:

$$\in = \frac{\Delta Q}{\Delta P} \times \frac{p}{q} \quad (3)$$

Equation 3 can be rewritten to solve for the slope of equations 1 and 2 (a_2, b_2) as:

$$slope = \in \times \frac{q}{p} \quad (4)$$

The intercept terms of equations 1 and 2 (a_1, b_1) can be solved as:

$$intercept = \frac{q}{slope \times p} \quad (5)$$

The development of the supply and demand relations each involve additional steps described in the following paragraphs. Once the equations are parameterized, they can be solved as simultaneous equations for market equilibrium (where $q_s = q_d$ and $p_s = p_d$). In this analysis, the BLM assumed that market arbitrage following changes in BLM timber harvest would lead to new market equilibrium prices and private harvest levels.

Stumpage Supply

The supply curve is constructed as a composite of the behavior of different groups of timberland owners. In this case, it represents the timber harvest behavior of five different timberland owners/agencies: private

[34] Timber markets are regional in nature defined by available species and mix of manufacturing facilities. Traditionally, western Oregon is considered part of the larger Douglas-fir region, or the Pacific Northwest, Westside. For a more detailed discussion, see Haynes (2008).

entities, State agencies, the U.S. Forest Service, the BLM, and other public entities. Of these five owner groups, only the private timberland owners are known to be responsive to different price levels. The BLM assumed in this analysis that the four public owner groups set harvest levels through various planning processes that are generally unresponsive to price levels. In the context of equation 2, this means that the slope coefficient is based solely on the elasticity of private timberland owners. Public owners contribute only to the intercept term; the q in equation 5 includes both public and private timber harvest.

Stumpage Demand

In the case of saw timber, the largest product markets are for solid wood products like lumber and panel products.[35] In this case, the BLM derived stumpage demand function from product demand. In agricultural literature,[36] factor and product markets are linked through a concept called the "elasticity of price transmission" (∂), defined as

$$\partial = \frac{\Delta P^p}{\Delta P^s} \times \frac{P^s}{P^p} \quad (6)$$

where P^p is product price, and P^s is the stumpage price. The elasticity of price transmission is calculated in two steps. First, a marketing margin can be estimated as:

$$P^s = c_1 + c_2 \times P^p \quad (7)$$

Second, using the results from equation 7, ∂ is calculated as:

$$\partial = \frac{1}{c_2} \times \frac{P^s}{P^p} \quad (8)$$

The elasticity of price transmission is necessary to estimate the elasticity of demand for stumpage, consistent with product markets as shown in equation 9.

$$\in_s = \in_p \times \partial \quad (9)$$

With $\in_s$, equation 4 can estimate the slope of the stumpage demand function, and equation 5 can estimate the slope coefficient.

Parameterizing the Model

In this analysis, the BLM estimated the model using data for 2012 (**Table P-1**). Price data (Dollars/Mbf) and harvest volume data (MMbf) are in long log scale and were collected from the 2012 Production, Prices, Employment and Trade report (Zhou 2013).

[35] See the discussion in Adams and Haynes (1980). Also, see Adams and Haynes (2007).
[36] See George and King (1971) for a summary of derived demand as it is used here.

Table P-1. Price data and harvest volume data, 2012

Ownership	Harvest Volume (MMbf)	Price (Dollars/Mbf)	Weights	Weighted Price
Private	2,664.2	-	-	-
State	234.4	$301.55	0.362	$109.28
U.S. Forest Service	268.1	$94.65	0.414	$39.23
BLM	144.3	$146.41	0.223	$28.74
Other Public	43.2	-	-	-
Total/Average	**3,354.2**	**$180.87**	**1.000**	**177.26**

In this analysis, the BLM estimated ∂ as 0.838[37] and, from the literature, used values for $\in$ of 0.277 for private timber supply and 0.685[38] for softwood lumber and panels. Using this information, the BLM developed the following supply and demand functions:

$q_s = 2{,}615.84 + 4.1655\ P$
$q_d = 5{,}279.59 - 10.8619\ P$

The solution of these two equations is the equilibrium price and quantity observed in 2012.

[37] The BLM estimated this by estimating the market margin (Equation 7) using lumber price data (**Table P-1**) and BLM stumpage price (Table 96) from Zhou (2013), 1986–2011. The elasticity of price transmission was computed using equation 8.
[38] Both elasticity estimates are weighted averages taken from Table 3.4 and 3.3 in Adams and Haynes (2007).

Outdoor Recreation Demand Elasticity Calculation

Purpose and Background

This section describes the approach to calculating demand elasticity, or responsiveness, to changes in the quantity of BLM-administered outdoor recreation areas. Its purpose is to calculate demand elasticity to estimate how outdoor recreation participation would change under the Proposed RMP and each alternative. The results of this analysis provide district-specific estimates for changes in visitation by alternative, which can then be used to estimate the economic value and market impacts associated with visits. ECONorthwest, as a subcontractor to ERM, prepared this analysis for the BLM.

Because there does not exist a traditional market establishing prices and supply for most outdoor recreation, economists typically base their value estimates on visitation and time-use information (see, for example, Hoteling 1947, McConnell and Strand 1981, Amoako-Tuffour and Martínez-Espiñeira 2012). These methods of valuation often work well when coupled with site visitation and individual socio-economic data but are often insufficient when considering locations that are not currently managed for recreational purposes. A central issue with valuing recreation due to proposed site changes is to understand the interplay of recreation demand and land supply. For instance, Siikamäki (2011) utilized the American Time Use Survey (ATUS) data to value the effect of increases in the supply of State park lands on recreational time use. Results of his model suggest that the addition of approximately 2 million acres of State park lands between 1975 and 2007 contributed to about 600 million hours of nature recreation and $3.85 billion in annual recreational value.

ECONorthwest has developed a model of the effect of recreational land supply on demand for outdoor recreational time use in the western continental United States. Importantly, this model distinguishes between changes in the supply of protected land managed for recreational uses versus other non-recreational land uses (e.g., forestry, biodiversity, and mineral extraction). The data used for this model include recreational time use from the 2007–2013 ATUS, to characterize utilization of recreational resources, and the U.S. Geological Survey Protected Area Database, to define the local supply of recreation. Based upon these sources of data, the model predicts the effect of changes in the supply of recreational lands on time spent recreating.

Data

The U.S. Bureau of Labor Statistics funds ATUS, and the U.S. Census Bureau collects the data. ATUS provides detailed descriptions of daily time use for survey respondents. ATUS provides a representative snapshot of the annual national time budget for Americans 15 years of age or older during a particular year. ATUS respondents are drawn from a sub-sample of individuals exiting the Current Population Survey, used to estimate national employment statistics. Time use categories include activities such as eating, sleeping, working, and driving.[39] In addition, these data provide estimates of the total time the respondent spends engaging in outdoor recreation. The time use categories used to represent outdoor recreation include:

- Biking
- Rock Climbing
- Hunting
- Fishing
- Golfing
- Hiking
- Running/Walking
- Snow Skiing

[39] For a full list of ATUS time use designations see U.S. Bureau of Labor Statistics (2013).

- Team Sports

The sum of the total minutes allocated to these activities is representative of the budget for outdoor recreation for a particular ATUS survey respondent. These estimates are nationally representative using sample weights provided by the U.S. Census Bureau. These weights take into account the day of the week of the interview and the total share of the US population that that the individual represents.
The sample considered for this analysis consists of ATUS respondents from the years 2007–2013 located in western U.S. states.[40] Due to privacy concerns, ATUS does not provide detailed locational information for survey respondents. However, linking this survey with data previously collected from the Current Population Survey can be used to identify the state and core based statistical area (CBSA) the individual is located in, which are the spatial units used for this analysis. Hence, this analysis excludes individuals located outside of a CBSA, which as of 2010, represents approximately 6.3 percent of the U.S. population (U.S. Census Bureau 2010). Overall, there are 33,069 respondents from 78 CBSAs located across the western U.S. Approximately 6 percent of respondents were from the Oregon.

For this analysis, the BLM represented the total supply of government-managed recreational lands using the Protected Area Database—a GIS-based database of land use in the United States, including Federal, State, and local government land holdings. These data also distinguish between land management designations and based upon this information, we determine the total quantity of recreational and non-recreational lands managed by Federal and State/local agencies, respectively, for each CBSA in the western United States. As examples, recreational lands would include National, State and local parks, whereas, non-recreation lands include lands managed for timber production, mining, or habitat management.

The dependent variable for this analysis is the total minutes spent per person per day engaging in outdoor recreation, summarized in **Table P-2**. Explanatory variables include individual controls for gender, age, number of children living at home, race, educational attainment, income, employment, as well as the population of the CBSA and population of the State per year. The analysis also controlled for the day of the week, the month, and if the interview day was on a holiday. Regional fixed effects are included to account for fixed differences in recreational behavior among states.[41] The supply of parkland is represented as the density of parks, measured as the acres of parkland per acre. Alternative models were also run using the total acres of parks and density of parks per acre per person, with no improvement over results reported here. **Table P-2** provides summary statistics for included explanatory variables.

[40] This includes the following states Arizona, California, Colorado, Idaho, Kansas, Montana, Nebraska, New Mexico, North Dakota, Nevada, Oklahoma, South Dakota Texas, Utah, Washington, and Wyoming.
[41] In this analysis, the BLM divides the Western states into three regions: 1) Arizona, Colorado, New Mexico, Kansas, Nebraska, Oklahoma, Utah, and Texas 2) California and Nevada, 3) Idaho, Oregon, Montana, North Dakota, South Dakota, Washington, and Wyoming.

Table P-2. Summary statistics

Variable	Mean	Standard Deviation	Minimum	Maximum
Female	0.552	0.497	-	1
Age	44.834	17.442	15	85
Number of Children at Home	0.978	1.216	-	10
Race				
Black	0.081	0.273	-	1
Hispanic	0.286	0.452	-	1
Asian	0.058	0.233	-	1
Other	0.029	0.168	-	1
Education				
High School	0.208	0.406	-	1
Some College	0.286	0.452	-	1
Bachelors	0.206	0.404	-	1
Professional Degree	0.111	0.315	-	1
Income				
$15k – $30k	0.156	0.363	-	1
$30k – $50k	0.195	0.396	-	1
$50k – $75k	0.175	0.380	-	1
$75k – $100k	0.118	0.323	-	1
$100k – $150k	0.111	0.314	-	1
Over $150k	0.099	0.299	-	1
Missing	0.065	0.247	-	1
Employment				
Unemployed	0.043	0.203	-	1
Not in Labor Force	0.344	0.475	-	1
Population				
CBSA Population (in 100s of Thousands)	36.915	38.361	0.976	130.648
State Population (in 100s of Thousands)	211.772	143.192	9.348	384.314
CBSA Park Density (Acres in Parks ÷ Gross Acres)				
Federal Recreation	7.855	8.236	-	43.723
Federal Non-recreation	17.369	20.779	-	83.552
State Recreation	2.046	2.647	-	11.942
State Non-recreation	5.424	5.902	-	29.294

Econometric Model

Individuals in this analysis include both those who spend at least part of their day recreating outdoors (17 percent of observations) and others who spent no time on recreation during the interview day. Thus, to account for censoring of the dependent variable, the econometric model is a Tobit model of the number of minutes spent on outdoor recreation per day with left hand censoring at zero. In addition, the model is weighted using provided ATUS survey weights for consistent and representative results for the average American in the sample. Let Y be the daily minutes spent on outdoor recreation for individual i in CBSA j, and equation 1 represents the econometric model for this analysis.

(1) $$Y_{ij} = \beta_1 \cdot FR_j + \beta_2 \cdot FNR_j + \beta_3 \cdot LR_j + \beta_4 \cdot LNR_j + X_{ij}A + R_i + \mathcal{E}_{ij}$$

Equation 1 predicts the total budget for outdoor recreation as a function of the supply of protected lands in the vicinity of the individual, along with other individual attributes. The variables FR_j, FNR_j, LR_j and LNR_j represent the density of protected lands managed for Federal recreation, Federal non-recreation, local recreation, and local non-recreation at the CBSA level, respectively. X_{ij} is a vector of other individual and community attributes (e.g., income, education, race, population) and A is a vector of coefficients for these attributes. R_i is a vector of regional fixed effects and $\mathcal{E}_{ij}$ is a normally distributed error term, clustered by CBSA to account for correlation in recreational patterns among individuals located in the same metropolitan area.

Importantly, for individuals with non-zero time allocated to recreation reported in the ATUS data, the analysis cannot determine the precise location where recreation took place. Hence, while some of the budgeted recreation time may occur on Federal and local recreation sites, some time may also be spent at other locations or outside the local CBSA. However, the purpose of the model is to determine the general effect of increases in supply of recreational on recreational demand, rather than a precise accounting of locations and times where recreation occurred.

The coefficients $\beta_1 - \beta_4$ give the marginal effect of an increase in the density of parklands on the budget of time spent on outdoor recreation. For the purpose of this analysis, the BLM assumed that an increase in the supply of recreational lands, be they managed by Federal or local agencies, would have a positive effect on time spent recreating. The effect of non-recreational lands is ambiguous. Because these lands would not be managed explicitly for recreation, recreational opportunities may be limited in these areas. By comparing the marginal effect of an increase in recreational lands and a parallel decrease in non-recreational lands, it is possible to estimate the effect of a shift in lands management from non-recreational to recreational uses.

Results

Table P-3 presents coefficients and standard errors for results of the Tobit model of daily recreational time use for western states during the years 2007–2013. Where statistically significant, coefficients reported in Table 2 generally conform to expectation. On average, males, retired individuals and those with fewer children living at home tend to spend more time on outdoor recreation. Age has a non-linear effect on recreation. For younger individuals, increases in age tend to decrease time spent recreating; whereas, older individuals spend more time on recreation as they age. This result is consistent with the hypothesis that respondents generally have less time to devote to recreation as they enter the work force and raise a family but gradually have more time to spend on recreation as they retire and children leave the house. In addition, respondents with greater income (above $50,000 a year) and a bachelors or post-bachelor's degree tend to spend more time recreating. Individuals located in more populated states also tend to report more spending more time on outdoor recreation. This result may be due to more populated states having larger budgets to spend on maintaining and establishing recreation areas, thus encouraging recreation though higher quality opportunities.

Table P-3. Tobit model of daily time spent on outdoor recreation for western U.S. states in the years 2007–2013, coefficients and standard errors

Variable	Coefficient	Standard Error
Female	-36.36***	3.11
Age	-4.44***	0.67
Age^2	0.04***	0.01
Number of Children at Home	-9.97***	3.08
Number of Children at Home ^2	-0.05	0.63
Race		
Black	-7.23	8.17
Hispanic	-0.02	5.33
Asian	-0.89	6.63
Other	20.19*	10.70
Education		
High School	-20.29***	5.53
Some College	-7.99	6.50
Bachelors	25.18***	6.76
Professional Degree	43.20***	7.49
Income		
$15k – $30k	-2.01	8.06
$30k – $50k	9.27	7.31
$50k – $75k	18.97***	6.52
$75k – $100k	28.16***	8.08
$100k – $150k	44.80***	9.40
Over $150k	45.88***	8.39
Missing	26.42***	8.96
Employment		
Unemployed	6.01	10.61
Not in Labor Force	32.27***	3.91
Population		
CBSA Population (in 100s of Thousands)	0.01	0.03
State Population (in 100s of Thousands)	0.07***	0.02
CBSA Park Density (Acres in Parks ÷ Gross Acres)		
Federal Recreation	0.70***	0.20
Federal Non-recreation	0.14	0.12
State Recreation	2.15**	0.96
State Non-recreation	1.30***	0.33
Fixed Effects		
Region	Yes	
Holiday	Yes	
Day of Week	Yes	
Month	Yes	
Year	Yes	
Sample	33,069	
Core Based Statistical Areas (CBSAs)	78	

* Significant at the 10 percent level
** Significant at the 5 percent level
*** Significant at the 1 percent level

The effect of increases in protected land on recreation varies depending upon location, ownership and the recreational management type. Increases in CBSA-level recreational lands managed by Federal and local agencies have a positive and statistically significant effect on recreational time allocation. For instance, a one percent increase in Federal and local recreational lands increases time spent recreating by an average of 0.98 and 0.90 minutes per day, respectively. By contrast, Federal non-recreational lands have a statistically insignificant and near zero effect on outdoor recreation, and local non-recreational lands have a statistically significant and positive effect on time spent recreating. These results suggest that while Federal non-recreational lands tend to be unappealing for recreational users, local non-recreational lands may offer more opportunities for recreation, even if not explicitly designed for these purposes.

Elasticity of Demand to Recreational Land Supply

These results facilitate an analysis of the potential effect that transitioning lands from non-recreational management to recreational management would have spent on time engaged in outdoor recreation. In particular, this analysis estimated the elasticity of demand for time spent on recreation with respect to the supply of recreation opportunities in terms of acreage of land managed for recreation. Next, the analysis estimated the elasticity of demand with respect to the supply of recreation opportunities on land not managed for recreation. The analysis then combined these two estimates, such that a one percent increase in the supply of recreation on lands managed for recreation is balanced by a commensurate decrease in the supply of recreation on lands not managed for recreation.

In this analysis, acreage of land managed for recreation serves as a proxy for outdoor recreation opportunities. While a comprehensive, spatially explicit dataset of all recreation opportunities is not available, the Protected Areas Database does provide a relatively comprehensive dataset for all recreation area by ownership/administration. Similarly, the specific recreation opportunities associated with new RMAs under the Proposed RMP and alternatives are not defined, and the acreage serves as a proxy for the specific recreation opportunities that the BLM would implement over time. This analysis utilizes elasticity estimates derived from acreage-based relationships, and applies the elasticity estimates to acreage-based changes.

An elasticity represents the ratio of percent change in demand associated with a percent change in a particular explanatory variable. In this case, by estimating an elasticity of demand for a change in recreational land supply, this analysis provides a calculation of elasticity that can be applied to changes in outdoor recreation area on BLM-administered lands to estimate corresponding changes in visitation. This particular elasticity approach is the appropriate method, because it implicitly accounts for several factors including current demand levels, current supply levels, and proportionate relationships between supply and demand that capture scarcity of outdoor recreation opportunities by context.

Table P-4 summarizes the elasticity of demand for an increase in CBSA-level recreation for both federally and locally protected lands in Oregon. These results suggest that a 10 percent increase in Federal and local land managed for recreation would result in an increase in recreational time demand by approximately 1.7 percent and 0.08 percent, respectively.

Table P-4. Elasticity of demand for shift in land from non-recreational to recreational management

	Oregon	
Land Conversion	**Marginal Effect**	**Standard Error**
Federal	0.1770***	0.0597
State	0.0083	0.0113

* Significant at the 10 percent level
** Significant at the 5 percent level
*** Significant at the 1 percent level

ATUS data do not include sufficient sample sizes to limit outdoor recreation to only the most common activities on BLM-administered lands. While including a broader range of activities such as team sports provides sufficient sample size to calculate statistically significant elasticities, it also likely leads to lower elasticity values than otherwise. This is because changes in Federal outdoor recreation areas are unlikely to influence strongly the amount of time respondents to the survey spend on team sports. Because of this data limitation, actual investments by the BLM in increasing the quantity and quality of outdoor recreation facilities would likely generate greater demand response for those targeted activities than these elasticity values predict.

Elasticity Application to the Proposed RMP and Alternatives

To apply these elasticity estimates to changes in total acreage in Recreation Management Areas (RMAs) in the decision area under the Proposed RMP and alternatives, this analysis applied the elasticity to current measures of RMA acreage by district and current outdoor recreation visitation by district. The results are projected changes in visitation by district and activity type for the Proposed RMP and each alternative. **Table P-5** shows the number of visits over time (including long-term participation projections), by district, alternative and implementation scenario. Total visits in 2012 were 5.3 million, as shown for the No Action alternative. Under the Proposed RMP, applying the elasticity corresponding to the proposed change in total RMA acreage, and taking into consideration long term and socioeconomic projections, visits would reach 11.9 million in 2062.

Table P-5. Recreation visitation estimates for the Proposed RMP and alternatives by implementation scenario

Alternative/ Proposed RMP	Phasing	Geography	Year						
			2012	2020	2030	2040	2050	2060	2062
No Action	N/A	**Totals**	5,300,902	5,753,782	6,356,367	6,907,409	7,440,363	7,998,835	8,106,746
		Coos Bay	594,958	645,788	713,420	775,268	835,085	897,766	909,878
		Eugene	937,639	1,017,746	1,124,333	1,221,803	1,316,073	1,414,857	1,433,945
		Klamath Falls	125,260	135,962	150,201	163,222	175,815	189,012	191,562
		Medford	1,144,697	1,242,494	1,372,618	1,491,612	1,606,700	1,727,299	1,750,602
		Roseburg	982,089	1,065,993	1,177,633	1,279,724	1,378,463	1,481,930	1,501,923
		Salem	1,516,259	1,645,800	1,818,162	1,975,781	2,128,226	2,287,970	2,318,837
Alt. A	20 years	**Totals**	5,300,902	5,426,063	5,498,638	5,861,327	6,313,569	6,787,464	6,879,033
		Coos Bay	594,958	605,178	608,573	647,733	697,710	750,080	760,199
		Eugene	937,639	948,389	947,091	1,006,640	1,084,309	1,165,697	1,181,424
		Klamath Falls	125,260	126,737	126,614	134,586	144,970	155,851	157,954
		Medford	1,144,697	1,210,845	1,275,074	1,369,209	1,474,853	1,585,555	1,606,946
		Roseburg	982,089	994,950	995,577	1,058,596	1,140,275	1,225,863	1,242,401
		Salem	1,516,259	1,539,964	1,545,710	1,644,562	1,771,452	1,904,416	1,930,109
	50 years	**Totals**	5,300,902	5,639,043	6,056,062	6,374,680	6,626,153	6,845,459	6,879,033
		Coos Bay	594,958	630,979	675,301	708,617	734,494	756,857	760,199
		Eugene	937,639	991,705	1,058,079	1,107,162	1,144,659	1,176,752	1,181,424
		Klamath Falls	125,260	132,503	141,397	147,980	153,014	157,325	157,954
		Medford	1,144,697	1,237,450	1,352,889	1,446,681	1,524,975	1,595,343	1,606,946
		Roseburg	982,089	1,039,526	1,110,085	1,162,518	1,202,774	1,237,330	1,242,401
		Salem	1,516,259	1,606,878	1,718,313	1,801,723	1,866,236	1,921,851	1,930,109
Alt. B	N/A	**Totals**	5,300,902	5,753,782	6,356,367	6,907,409	7,440,363	7,998,835	8,106,746
		Coos Bay	594,958	645,788	713,420	775,268	835,085	897,766	909,878
		Eugene	937,639	1,017,746	1,124,333	1,221,803	1,316,073	1,414,857	1,433,945
		Klamath Falls	125,260	135,962	150,201	163,222	175,815	189,012	191,562
		Medford	1,144,697	1,242,494	1,372,618	1,491,612	1,606,700	1,727,299	1,750,602
		Roseburg	982,089	1,065,993	1,177,633	1,279,724	1,378,463	1,481,930	1,501,923
		Salem	1,516,259	1,645,800	1,818,162	1,975,781	2,128,226	2,287,970	2,318,837
Alt. C.	20 years	**Totals**	5,300,902	6,670,021	8,754,406	9,832,047	10,590,657	11,385,589	11,539,191
		Coos Bay	594,958	694,162	857,352	953,891	1,027,490	1,104,613	1,119,515
		Eugene	937,639	1,005,720	1,148,235	1,260,814	1,358,094	1,460,033	1,479,730
		Klamath Falls	125,260	137,003	159,481	175,708	189,265	203,471	206,216
		Medford	1,144,697	1,659,789	2,394,991	2,726,066	2,936,401	3,156,807	3,199,395
		Roseburg	982,089	1,445,897	2,105,094	2,398,949	2,584,045	2,778,003	2,815,480
		Salem	1,516,259	1,727,449	2,089,251	2,316,619	2,495,362	2,682,664	2,718,855
	50 years	**Totals**	5,300,902	6,074,572	7,195,959	8,396,812	9,716,733	11,223,446	11,539,191

		Coos Bay	594,958	654,696	747,372	848,538	961,437	1,092,090	1,119,515
		Eugene	937,639	987,872	1,080,146	1,185,103	1,305,912	1,449,495	1,479,730
		Klamath Falls	125,260	133,288	147,228	162,884	180,736	201,787	206,216
		Medford	1,144,697	1,420,945	1,796,812	2,191,572	2,618,609	3,098,924	3,199,395
		Roseburg	982,089	1,229,984	1,565,794	1,917,985	2,298,523	2,726,062	2,815,480
		Salem	1,516,259	1,647,788	1,858,606	2,090,731	2,351,515	2,655,087	2,718,855
Alt. D	20 years	**Totals**	5,300,902	7,102,064	9,885,177	11,211,130	12,076,146	12,982,579	13,157,726
		Coos Bay	594,958	732,915	960,774	1,080,183	1,163,527	1,250,861	1,267,736
		Eugene	937,639	1,036,792	1,240,215	1,374,220	1,480,251	1,591,358	1,612,827
		Klamath Falls	125,260	153,883	201,301	226,248	243,704	261,997	265,531
		Medford	1,144,697	1,897,088	2,976,501	3,429,336	3,693,933	3,971,199	4,024,774
		Roseburg	982,089	1,448,437	2,138,673	2,445,101	2,633,758	2,831,447	2,869,646
		Salem	1,516,259	1,832,948	2,367,712	2,656,041	2,860,973	3,075,717	3,117,211
	50 years	**Totals**	5,300,902	6,225,837	7,591,859	9,099,124	10,790,132	12,743,978	13,157,726
		Coos Bay	594,958	667,016	781,807	911,452	1,058,969	1,231,215	1,267,736
		Eugene	937,639	992,707	1,102,640	1,234,147	1,388,751	1,573,537	1,612,827
		Klamath Falls	125,260	140,222	164,137	191,172	221,952	257,907	265,531
		Medford	1,144,697	1,524,192	2,037,286	2,586,529	3,191,024	3,879,290	4,024,774
		Roseburg	982,089	1,219,060	1,551,747	1,912,663	2,313,305	2,772,503	2,869,646
		Salem	1,516,259	1,682,640	1,954,243	2,263,161	2,616,130	3,029,526	3,117,211
PRMP	20 years	**Totals**	5,300,902	6,775,898	9,031,513	10,170,006	10,954,692	11,776,949	11,935,831
		Coos Bay	594,958	754,662	1,000,206	1,125,351	1,212,180	1,303,166	1,320,747
		Eugene	937,639	1,002,908	1,146,872	1,260,052	1,357,274	1,459,151	1,478,836
		Klamath Falls	125,260	135,939	157,727	173,730	187,135	201,181	203,895
		Medford	1,144,697	1,833,536	2,803,352	3,216,161	3,464,310	3,724,340	3,774,585
		Roseburg	982,089	1,199,706	1,545,055	1,730,891	1,864,441	2,004,385	2,031,426
		Salem	1,516,259	1,849,147	2,378,301	2,663,821	2,869,353	3,084,726	3,126,341
	50 years	**Totals**	5,300,902	6,111,641	7,292,978	8,568,921	9,979,781	11,596,069	11,935,831
		Coos Bay	594,958	683,049	812,091	951,694	1,106,246	1,283,485	1,320,747
		Eugene	937,639	983,849	1,074,076	1,179,125	1,301,521	1,447,903	1,478,836
		Klamath Falls	125,260	132,407	145,650	160,893	178,517	199,471	203,895
		Medford	1,144,697	1,503,758	1,983,613	2,487,515	3,032,892	3,646,008	3,774,585
		Roseburg	982,089	1,104,643	1,289,731	1,491,803	1,717,017	1,976,776	2,031,426
		Salem	1,516,259	1,703,935	1,987,817	2,297,890	2,643,588	3,042,427	3,126,341

Issue 2

How would the alternatives affect economic activity in the planning area derived from BLM-administered lands?

Table P-6. Employment by industry by district model area, 2012 (jobs)

Industry (Sector)	District Model Area Name and Counties							Planning Area Totals	Oregon Totals
	Coos Bay	Eugene	Klamath Falls	Medford	Roseburg	Salem-Other	Salem-Portland MSA		
	Coos, Curry	Lane	Klamath	Jackson, Josephine	Douglas	Benton, Clatsop, Lincoln, Linn, Marion, Polk, Tillamook	Clackamas, Columbia, Multnomah, Washington, Yamhill		
Agriculture	3,237	5,462	2,511	5,479	3,330	23,169	19,389	62,577	90,083
Mining	58	104	46	141	117	1,641	2,686	4,793	5,066
Utilities	95	135	118	342	172	573	2,326	3,760	4,759
Construction	2,089	8,085	1,505	8,154	2,203	17,348	53,287	92,671	105,523
Manufacturing	3,781	12,422	2,132	9,029	4,820	25,976	104,812	162,973	181,427
Wholesale Trade	569	6,201	848	3,659	766	7,196	54,798	74,037	80,548
Retail Trade	4,629	24,783	4,288	20,422	4,845	37,659	108,402	205,027	231,382
Transportation and Warehousing	1,012	2,885	1,251	4,802	1,724	11,998	32,363	56,036	62,888
Information	297	4,209	206	2,612	330	3,114	24,267	35,034	38,482
Finance and Insurance	935	6,041	996	5,722	1,851	9,432	59,627	84,604	92,582
Real Estate and Leasing	525	9,080	492	4,165	1,928	10,394	68,062	94,646	104,672
Professional Services	1,465	10,986	1,159	8,046	1,649	17,638	88,560	129,504	143,216
Management of Companies	341	1,884	624	1,703	434	2,380	22,639	30,005	30,783
Administrative and Waste Services	2,246	10,172	1,587	7,786	2,668	16,440	66,660	107,560	117,952
Education Services	361	3,598	391	2,048	509	7,108	36,728	50,742	53,762
Health and Social Services	4,605	25,433	3,670	21,741	5,276	46,972	121,260	228,956	257,275
Arts, Entertainment, and Recreation Services	902	3,825	858	5,014	626	8,245	25,709	45,178	51,711
Accommodation and Food Services	3,548	13,739	2,319	11,155	3,038	27,496	80,764	142,059	160,824
Other Personal Services	2,295	11,722	2,237	9,162	2,966	19,309	58,908	106,599	119,825
Governments	7,286	25,283	4,643	14,346	7,275	65,321	116,243	240,396	288,801
Totals	**40,276**	**186,049**	**31,881**	**145,525**	**46,527**	**359,408**	**1,147,490**	**1,957,157**	**2,221,563**

Sources: MIG, Inc. (2013); Oregon Forest Resources Institute (2012) (forest products industries within greater Agriculture and Manufacturing throughout planning area)

Table P-7. Earnings by industry by district model area, 2012 (millions of 2012 dollars)

Industry (Sector)	District Model Area Name and Counties							Planning Area Totals	Oregon Totals
	Coos Bay	Eugene	Klamath Falls	Medford	Roseburg	Salem-Other	Salem-Portland MSA		
	Coos, Curry	Lane	Klamath	Jackson, Josephine	Douglas	Benton, Clatsop, Lincoln, Linn, Marion, Polk, Tillamook	Clackamas, Columbia, Multnomah, Washington, Yamhill		
Agriculture	$117.3	$152.5	$89.2	$139.6	$85.4	$822.9	$753.0	$2,160.0	$2,750.4
Mining	$3.8	$6.2	$2.5	$5.2	$3.6	$37.0	$70.6	$129.1	$140.7
Utilities	$12.6	$15.3	$16.6	$51.2	$21.8	$76.6	$435.8	$629.8	$766.7
Construction	$73.6	$443.2	$52.8	$432.9	$89.2	$839.7	$3,756.2	$5,687.7	$6,253.7
Manufacturing	$148.6	$802.8	$122.4	$493.2	$261.0	$1,621.9	$9,827.7	$13,277.7	$14,212.3
Wholesale Trade	$30.6	$368.1	$38.7	$190.5	$32.3	$483.9	$5,434.7	$6,578.9	$6,920.3
Retail Trade	$144.2	$726.6	$108.4	$633.7	$145.0	$1,103.7	$3,713.7	$6,575.1	$7,374.1
Transportation and Warehousing	$51.7	$163.1	$51.9	$209.7	$84.6	$584.9	$1,722.7	$2,868.5	$3,243.2
Information	$13.7	$243.5	$8.9	$117.3	$17.0	$182.5	$2,011.3	$2,594.1	$2,769.1
Finance and Insurance	$42.2	$323.0	$33.3	$222.8	$59.1	$432.4	$3,866.1	$4,978.8	$5,264.0
Real Estate and Leasing	$17.1	$127.2	$14.6	$101.4	$23.5	$285.3	$1,118.3	$1,687.4	$1,910.4
Professional Services	$54.1	$459.8	$36.5	$253.0	$80.6	$779.7	$6,486.0	$8,149.7	$8,741.6
Management of Companies	$22.2	$160.1	$44.1	$126.6	$30.6	$166.9	$2,488.9	$3,039.4	$3,086.4
Administrative and Waste Services	$52.8	$318.6	$43.4	$200.7	$75.9	$462.7	$2,489.2	$3,643.3	$4,004.7
Education Services	$4.5	$73.4	$4.6	$34.5	$7.0	$160.8	$1,057.4	$1,342.4	$1,390.8
Health and Social Services	$175.4	$1,343.0	$170.0	$1,083.3	$265.3	$2,382.9	$7,184.5	$12,604.4	$14,006.6
Arts, Entertainment, and Recreation Services	$10.6	$47.6	$8.9	$63.6	$9.2	$96.6	$592.8	$829.3	$920.4
Accommodation and Food Services	$73.1	$295.0	$45.0	$234.9	$62.1	$581.3	$2,022.5	$3,313.9	$3,703.4
Other Personal Services	$66.5	$349.6	$55.1	$267.4	$78.7	$576.4	$2,564.4	$3,958.3	$4,380.6
Governments	$393.1	$1,315.2	$251.1	$742.6	$357.7	$3,433.6	$7,471.2	$13,964.4	$16,573.0
Totals	**$1,507.7**	**$7,733.7**	**$1,198.0**	**$5,604.1**	**$1,789.7**	**$15,111.7**	**$65,067.0**	**$98,012.0**	**$108,412.3**

Sources: MIG, Inc. (2013); Oregon Forest Resources Institute (2012) (forest products industries within greater Agriculture and Manufacturing throughout planning area)

Table P-8. Employment contribution of BLM programs to district model areas by industry, 2012 (jobs)

Industry (Sector)	District Model Area Name and Counties							Planning Area Totals
	Coos Bay	Eugene	Klamath Falls	Medford	Roseburg	Salem-Other	Salem-Portland MSA	
	Coos, Curry	Lane	Klamath	Jackson, Josephine	Douglas	Benton, Clatsop, Lincoln, Linn, Marion, Polk, Tillamook	Clackamas, Columbia, Multnomah, Washington, Yamhill	
Agriculture	420	272	73	265	272	255	230	1,788
Mining	31	6	-	16	16	12	10	92
Utilities	1	-	-	2	1	1	2	7
Construction	6	6	1	9	8	4	8	42
Manufacturing	132	113	7	70	141	76	88	626
Wholesale Trade	19	25	4	31	27	10	36	153
Retail Trade	17	25	5	33	27	13	34	153
Transportation and Warehousing	87	141	20	135	126	58	150	717
Information	14	10	1	16	9	9	17	75
Finance and Insurance	6	9	2	18	8	5	22	70
Real Estate and Leasing	8	25	3	21	19	11	28	113
Professional Services	18	52	4	52	23	30	33	213
Management of Companies	11	14	1	12	8	9	17	72
Administrative and Waste Services	17	27	3	32	25	12	35	151
Education Services	13	18	2	14	12	14	19	92
Health and Social Services	21	46	8	62	33	27	37	234
Arts, Entertainment, and Recreation Services	72	87	12	81	92	38	115	498
Accommodation and Food Services	135	225	29	165	201	72	340	1,167
Other Personal Services	27	34	5	35	26	21	28	177
Governments	195	227	63	429	287	214	48	1,464
Totals	1,249	1,363	245	1,496	1,362	**891**	**1,297**	**7,904**

Note: Totals may not add due to rounding.

Table P-9. Earnings contribution of BLM programs to district model areas by industry, 2012 (millions of 2012 dollars)

Industry(Sector)	District Model Area Name and Counties							Planning Area Totals
	Coos Bay	Eugene	Klamath Falls	Medford	Roseburg	Salem-Other	Salem-Portland MSA	
	Coos, Curry	Lane	Klamath	Jackson, Josephine	Douglas	Benton, Clatsop, Lincoln, Linn, Marion, Polk, Tillamook	Clackamas, Columbia, Multnomah, Washington, Yamhill	
Agriculture	$20.4	$12.7	$1.6	$10.1	$13.1	$12.6	$12.2	$82.6
Mining	$1.0	$0.2	$0.0	$0.5	$0.2	$0.5	$0.3	$2.7
Utilities	$0.1	$0.0	$0.0	$0.2	$0.1	$0.1	$0.2	$0.8
Construction	$0.3	$0.4	$0.1	$0.5	$0.4	$0.2	$0.7	$2.6
Manufacturing	$7.1	$6.6	$0.4	$3.7	$7.6	$4.6	$5.3	$35.2
Wholesale Trade	$1.1	$1.5	$0.2	$1.7	$1.2	$0.7	$3.3	$9.7
Retail Trade	$0.8	$1.2	$0.2	$1.3	$1.0	$0.7	$2.1	$7.2
Transportation and Warehousing	$2.5	$4.2	$0.6	$4.1	$3.5	$1.7	$4.8	$21.4
Information	$0.6	$0.5	$0.1	$0.7	$0.4	$0.4	$1.1	$3.8
Finance and Insurance	$0.3	$0.5	$0.1	$0.7	$0.3	$0.3	$1.4	$3.6
Real Estate and Leasing	$0.3	$0.5	$0.1	$0.5	$0.3	$0.3	$0.8	$2.7
Professional Services	$1.4	$1.5	$0.3	$2.4	$1.1	$1.3	$2.0	$10.1
Management of Companies	$0.5	$0.7	$0.1	$0.6	$0.4	$0.4	$1.5	$4.0
Administrative and Waste Services	$0.5	$1.0	$0.1	$0.9	$0.8	$0.4	$1.6	$5.2
Education Services	$0.3	$0.5	$0.0	$0.3	$0.3	$0.3	$0.6	$2.4
Health and Social Services	$0.8	$2.4	$0.4	$3.0	$1.6	$1.3	$2.1	$11.6
Arts, Entertainment, & Recreation Services	$1.6	$2.6	$0.3	$2.0	$2.5	$1.3	$3.6	$14.0
Accommodation & Food Services	$2.8	$4.8	$0.6	$3.4	$4.1	$1.5	$9.1	$26.3
Other Personal Services	$0.6	$1.0	$0.1	$1.0	$0.7	$0.5	$1.1	$5.1
Governments	$13.9	$18.0	$4.2	$28.3	$19.2	$16.8	$4.0	$104.4
Totals	**$56.8**	**$60.7**	**$9.4**	**$66.0**	**$58.9**	**$45.9**	**$57.8**	**$355.3**

Note: Totals may not add due to rounding.

Table P-10. Employment and earnings in the Coos Bay District model area for the Proposed RMP and alternatives

Program/Industry	Employment (Jobs)							Earnings (Millions of 2012 Constant Dollars)						
	2012	2018						2012	2018					
	Current-Modified	No Action	Alt. A	Alt. B	Alt. C	Alt. D	PRMP	Current-Modified	No Action	Alt. A	Alt. B	Alt. C	Alt. D	PRMP
BLM Program														
Recreation	276	294	289	294	297	301	307	$7.0	$7.5	$7.3	$7.5	$7.5	$7.6	$7.8
Grazing	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Timber	710	688	443	450	958	229	277	$33.3	$32.4	$20.8	$21.2	$45.1	$10.8	$13.0
Minerals	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Agency Expenditures	192	164	120	149	236	90	115	$13.1	$11.2	$8.2	$10.2	$16.0	$6.1	$3.3
Federal Payments to Counties*	20	51	31	40	73	20	28	$1.0	$2.5	$1.5	$2.0	$3.6	$1.0	$1.4
Payments to Coos	13	32	20	25	47	13	18	$0.6	$1.6	$1.0	$1.2	$2.3	$0.6	$0.9
Payments to Curry	7	18	11	14	26	7	10	$0.4	$0.9	$0.6	$0.7	$1.3	$0.4	$0.5
Totals	**1,198**	**1,196**	**883**	**933**	**1,564**	**641**	**726**	**$54.4**	**$53.6**	**$37.9**	**$40.8**	**$72.4**	**$25.6**	**$25.5**
Timber-Related Industries														
Forestry, Logging, & Support Activities	232	204	145	143	284	75	93	$13.6	$11.9	$8.5	$8.4	$16.6	$4.4	$5.4
Wood Products Manufacturing	131	147	83	88	205	43	50	$7.3	$8.2	$4.6	$4.9	$11.4	$2.4	$2.8
Paper Manufacturing	0	0	0	0	0	0	0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Totals	**363**	**351**	**228**	**231**	**489**	**118**	**143**	**$20.8**	**$20.1**	**$13.1**	**$13.2**	**$28.0**	**$6.8**	**$8.2**
Recreation-Related Industries														
Arts, Entertainment, & Recreation Services	71	73	64	65	83	59	61	$1.6	$1.6	$1.2	$1.3	$2.2	$1.3	$1.4
Accommodation & Food Services	133	140	134	138	148	135	139	$2.7	$2.9	$2.4	$2.8	$3.6	$3.8	$4.0
Totals	**204**	**214**	**198**	**203**	**231**	**194**	**200**	**$4.4**	**$4.5**	**$3.6**	**$4.2**	**$5.8**	**$5.1**	**$5.4**

* Federal payments include only those that would be paid under the O&C formula. Current has been modified as if O&C payments had been made in lieu of SRS payments.
Note: Totals may not add due to rounding.

Table P-11. Employment and earnings in the Eugene District model area for the Proposed RMP and alternatives

Program/Industry	Employment (Jobs)							Earnings (Millions of 2012 Constant Dollars)						
	2012	2018						2012	2018					
	Current-Modified	No Action	Alt. A	Alt. B	Alt. C	Alt. D	PRMP	Current-Modified	No Action	Alt. A	Alt. B	Alt. C	Alt. D	PRMP
BLM Program														
Recreation	527	561	551	561	548	549	546	$16.2	$17.2	$16.9	$17.2	$16.8	$16.9	$16.8
Grazing	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Timber	480	1,156	884	1,164	2,022	664	1,008	$23.2	$56.0	$42.8	$56.4	$97.9	$32.2	$49.0
Minerals	3	3	3	3	3	3	3	$0.2	$0.2	$0.2	$0.2	$0.2	$0.2	$0.2
Agency Expenditures	259	435	284	331	485	279	367	$15.2	$25.5	$16.7	$19.5	$28.5	$16.4	$8.1
Federal Payments to Lane County*	28	71	43	55	102	28	39	$1.9	$4.9	$3.0	$3.8	$7.1	$2.0	$2.7
Totals	**1,297**	**2,226**	**1,764**	**2,115**	**3,160**	**1,524**	**1,963**	**$56.7**	**$103.8**	**$79.5**	**$97.0**	**$150.4**	**$67.6**	**$76.7**
Timber-Related Industries														
Forestry, Logging, & Support Activities	118	260	199	251	453	154	230	$6.8	$15.1	$11.5	$14.6	$26.3	$8.9	$13.3
Wood Products Manufacturing	81	205	155	216	362	111	166	$4.5	$11.3	$8.5	$11.9	$20.0	$6.1	$9.1
Paper Manufacturing	13	38	30	38	65	23	38	$1.2	$3.5	$2.7	$3.5	$6.0	$2.1	$3.5
Totals	**212**	**503**	**383**	**505**	**881**	**288**	**433**	**$12.5**	**$29.9**	**$22.8**	**$30.0**	**$52.3**	**$17.2**	**$25.9**
Recreation-Related Industries														
Arts, Entertainment, & Recreation Services	87	123	108	122	161	98	113	$2.6	$4.3	$3.4	$4.3	$6.5	$3.3	$4.0
Accommodation & Food Services	222	250	236	244	254	233	235	$4.8	$5.3	$4.3	$5.2	$5.6	$5.7	$5.3
Totals	**309**	**373**	**344**	**367**	**415**	**331**	**347**	**$7.4**	**$9.7**	**$7.7**	**$9.6**	**$12.1**	**$9.0**	**$9.3**

* Federal payments include only those that would be paid under the O&C formula. Current has been modified as if O&C payments had been made in lieu of SRS payments.
Note: Totals may not add due to rounding.

Table P-12. Employment and earnings in the Klamath Falls Field Office model area for the Proposed RMP and alternatives

Program/Industry	Employment (Jobs)							Earnings (Millions of 2012 Constant Dollars)						
	2012	2018						2012	2018					
	Current-Modified	No Action	Alt. A	Alt. B	Alt. C	Alt. D	PRMP	Current-Modified	No Action	Alt. A	Alt. B	Alt. C	Alt. D	PRMP
BLM Program														
Recreation	60	64	63	64	63	65	62	$1.60	$1.7	$1.7	$1.7	$1.7	$1.7	$1.6
Grazing	55	55	55	55	55	-	55	0.8	$0.8	$0.8	$0.8	$0.8	-	$0.8
Timber	40	75	25	62	74	49	56	$1.90	$3.5	$1.2	$2.9	$3.5	$2.3	$2.6
Minerals	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Agency Expenditures	71	78	75	87	97	78	89	$4.20	$4.6	$4.4	$5.1	$5.7	$4.6	$2.1
Federal Payments to Klamath County*	4	11	7	9	17	5	6	$0.20	$0.6	$0.4	$0.5	$0.8	$0.2	$0.3
Totals	**231**	**283**	**224**	**277**	**305**	**197**	**268**	**$8.70**	**$11.1**	**$8.3**	**$10.9**	**$12.5**	**$8.9**	**$7.5**
Timber-Related Industries														
Forestry, Logging, & Support Activities	15	23	10	20	24	17	19	$0.90	$1.3	$0.6	$1.2	$1.4	$1.0	$1.1
Wood Products Manufacturing	6	16	4	12	14	8	10	$0.30	$0.9	$0.2	$0.7	$0.8	$0.5	$0.6
Paper Manufacturing	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Totals	**21**	**39**	**13**	**32**	**38**	**26**	**29**	**$1.20**	**$2.2**	**$0.7**	**$1.9**	**$2.2**	**$1.5**	**$1.7**
Recreation-Related Industries														
Arts, Entertainment, & Recreation Services	12	14	12	14	14	13	13	$0.30	$0.3	$0.2	$0.3	$0.4	$0.4	$0.3
Accommodation & Food Services	28	31	30	31	31	30	30	$0.60	$0.6	$0.5	$0.6	$0.7	$0.8	$0.6
Totals	**40**	**45**	**41**	**45**	**45**	**43**	**42**	**$0.80**	**$0.9**	**$0.7**	**$0.9**	**$1.0**	**$1.1**	**$0.9**

* Federal payments include only those that would be paid under the O&C formula. Current has been modified as if O&C payments had been made in lieu of SRS payments.
Note: Totals may not add due to rounding.

Table P-13. Employment and earnings in the Medford District model area for the Proposed RMP and alternatives

Program/Industry	Employment (Jobs)							Earnings (Millions of 2012 Constant Dollars)						
	2012	2018						2012	2018					
	Current-Modified	No Action	Alt. A	Alt. B	Alt. C	Alt. D	PRMP	Current-Modified	No Action	Alt. A	Alt. B	Alt. C	Alt. D	PRMP
BLM Program														
Recreation	425	453	452	453	502	531	525	$12.20	$12.9	$12.9	$12.9	$14.4	$15.2	$15.0
Grazing	40	40	40	40	40	-	40	0.6	$0.6	$0.6	$0.6	$0.6	-	$0.6
Timber	340	1,384	598	931	998	471	739	$15.80	$64.6	$27.9	$43.5	$46.6	$22.0	$34.5
Minerals	1	1	1	1	1	1	1	<$0.0	<$0.0	<$0.0	<$0.0	<$0.0	<$0.0	<$0.0
Agency Expenditures	454	641	560	641	686	514	682	$27.20	$38.4	$33.6	$38.4	$41.1	$30.8	$17.8
Federal Payments to Counties*	66	170	103	133	246	68	93	$2.90	$7.4	$4.5	$5.8	$10.7	$3.0	$4.1
Payments to Jackson	44	114	69	89	165	46	63	$1.60	$4.1	$2.5	$3.2	$5.9	$1.6	$2.2
Payments to Josephine	22	56	34	44	81	22	31	$1.30	$3.3	$2.0	$2.6	$4.8	$1.3	$1.8
Totals	**1,326**	**2,688**	**1,753**	**2,199**	**2,473**	**1,586**	**2,081**	**$58.60**	**$124.0**	**$79.5**	**$101.3**	**$113.4**	**$71.0**	**$71.9**
Timber-Related Industries														
Forestry, Logging, & Support Activities	80	271	122	186	204	96	164	$4.60	$15.9	$7.1	$10.9	$11.9	$5.6	$9.6
Wood Products Manufacturing	59	289	121	192	202	96	139	$3.30	$16.0	$6.7	$10.6	$11.2	$5.3	$7.7
Paper Manufacturing	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Totals	**139**	**560**	**243**	**377**	**406**	**191**	**303**	**$7.90**	**$31.9**	**$13.8**	**$21.5**	**$23.1**	**$10.9**	**$17.3**
Recreation-Related Industries														
Arts, Entertainment, & Recreation Services	80	132	96	112	123	101	112	$2.00	$4.4	$2.5	$3.4	$4.5	$3.9	$4.3
Accommodation & Food Services	159	187	175	183	205	196	199	$3.30	$3.8	$3.4	$3.8	$6.3	$7.4	$7.0
Totals	**239**	**320**	**272**	**295**	**328**	**297**	**311**	**$5.30**	**$8.2**	**$5.9**	**$7.1**	**$10.9**	**$11.3**	**$11.3**

* Federal payments include only those that would be paid under the O&C formula. Current has been modified as if O&C payments had been made in lieu of SRS payments.
Note: Totals may not add due to rounding.

Table P-14. Employment and earnings in the Roseburg District model area for the Proposed RMP and alternatives

Program/Industry	Employment (Jobs)							Earnings (Millions of 2012 Constant Dollars)						
	2012	2018						2012	2018					
	Current-Modified	No Action	Alt. A	Alt. B	Alt. C	Alt. D	PRMP	Current-Modified	No Action	Alt. A	Alt. B	Alt. C	Alt. D	PRMP
BLM Program														
Recreation	507	540	530	540	603	599	554	$13.6	$14.5	$14.2	$14.5	$16.2	$16.1	$14.9
Grazing	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Timber	488	770	323	455	879	267	397	$23.5	$37.0	$15.5	$21.9	$42.2	$12.8	$19.1
Minerals	2	2	2	2	2	2	2	$0.1	$0.1	$0.1	$0.1	$0.1	$0.1	$0.0
Agency Expenditures	176	229	165	214	334	141	232	$12.0	$15.7	$11.3	$14.7	$22.8	$9.6	$5.7
Federal Payments to Douglas County*	51	131	79	103	190	53	72	$2.6	$6.7	$4.0	$5.2	$9.7	$2.7	$3.7
Totals	**1,225**	**1,672**	**1,100**	**1,314**	**2,008**	**1,062**	**1,257**	**$51.8**	**$74.0**	**$45.2**	**$56.4**	**$91.1**	**$41.4**	**$43.3**
Timber-Related Industries														
Forestry, Logging, & Support Activities	147	208	87	135	236	78	124	$8.6	$12.1	$5.0	$7.8	$13.7	$4.5	$7.2
Wood Products Manufacturing	133	235	99	128	269	76	107	$7.4	$13.1	$5.5	$7.1	$15.0	$4.2	$5.9
Paper Manufacturing	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Totals	**280**	**442**	**185**	**263**	**505**	**154**	**231**	**$16.0**	**$25.1**	**$10.5**	**$15.0**	**$28.7**	**$8.8**	**$13.1**
Recreation-Related Industries														
Arts, Entertainment, & Recreation Services	92	107	89	96	121	97	95	$2.5	$3.2	$2.0	$2.6	$4.9	$3.8	$3.1
Accommodation & Food Services	197	214	205	212	243	228	214	$4.0	$4.3	$3.5	$4.3	$8.0	$7.9	$5.7
Totals	**289**	**321**	**294**	**307**	**364**	**325**	**309**	**$6.5**	**$7.5**	**$5.6**	**$6.9**	**$12.9**	**$11.7**	**$8.7**

* Federal payments include only those that would be paid under the O&C formula. Current has been modified as if O&C payments had been made in lieu of SRS payments.
Note: Totals may not add due to rounding.

Table P-15. Employment and earnings in the Salem-Other district model area* for the Proposed RMP and alternatives

Program/Industry	Employment (Jobs)							Earnings (Millions of 2012 Constant Dollars)						
	2012	2018						2012	2018					
	Current-Modified	No Action	Alt. A	Alt. B	Alt. C	Alt. D	PRMP	Current-Modified	No Action	Alt. A	Alt. B	Alt. C	Alt. D	PRMP
BLM Program														
Recreation	133	141	139	141	141	143	145	$3.8	$4.0	$4.0	$4.0	$4.0	$4.1	$4.1
Grazing	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Timber	432	353	459	503	630	425	483	$21.3	$17.5	$22.7	$24.9	$31.2	$21.1	$24.0
Minerals	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Agency Expenditures	271	314	254	255	415	182	247	$17.4	$20.2	$16.3	$16.4	$26.7	$11.7	$15.9
Federal Payments to Counties†	15	37	23	29	54	15	21	$0.9	$2.4	$1.5	$1.9	$3.5	$1.0	$1.3
Totals	**851**	**845**	**874**	**928**	**1,240**	**765**	**896**	**$43.5**	**$44.1**	**$44.5**	**$47.2**	**$65.4**	**$37.8**	**$45.4**
Timber-Related Industries														
Forestry, Logging, & Support Activities	125	101	132	146	182	120	137	$7.4	$5.9	$7.8	$8.6	$10.7	$7.1	$8.0
Wood Products Manufacturing	56	38	52	58	71	46	49	$3.1	$2.1	$2.9	$3.2	$3.9	$2.6	$2.7
Paper Manufacturing	15	17	20	21	28	20	25	$1.3	$1.5	$1.9	$2.0	$2.6	$1.8	$2.3
Totals	**196**	**156**	**204**	**225**	**280**	**187**	**211**	**$11.8**	**$9.6**	**$12.5**	**$13.8**	**$17.2**	**$11.5**	**$13.1**
Recreation-Related Industries														
Arts, Entertainment, & Recreation Services	38	36	40	42	49	38	41	$1.3	$1.2	$1.4	$1.5	$1.9	$1.4	$1.6
Accommodation & Food Services	71	77	73	75	84	72	76	$1.5	$1.6	$1.3	$1.6	$2.0	$1.9	$2.0
Totals	**109**	**113**	**113**	**117**	**133**	**110**	**117**	**$2.8**	**$2.8**	**$2.7**	**$3.1**	**$3.8**	**$3.4**	**$3.6**

* Includes Benton, Clatsop, Lincoln, Linn, Marion, Polk, and Tillamook Counties

† Federal payments include only those that would be paid under the O&C formula. Current has been modified as if O&C payments had been made in lieu of SRS payments.

Note: Totals may not add due to rounding.

Table P-16. Employment and earnings in the Salem-Portland MSA district model area* for the Proposed RMP and alternatives

Program/Industry	Employment (Jobs)							Earnings (Millions of 2012 Constant Dollars)						
	2012	2018						2012	2018					
	Current-Modified	No Action	Alt. A	Alt. B	Alt. C	Alt. D	PRMP	Current-Modified	No Action	Alt. A	Alt. B	Alt. C	Alt. D	PRMP
BLM Program														
Recreation	854	909	893	909	909	923	932	$32.8	$34.9	$34.3	$34.9	$34.8	$35.4	$35.8
Grazing	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Timber	407	295	396	422	532	372	406	$22.8	$16.6	$22.3	$23.7	$29.9	$20.9	$22.9
Minerals	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Agency Expenditures	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Federal Payments to Counties†	14	37	22	29	54	15	20	$1.0	$2.5	$1.5	$1.9	$3.6	$1.0	$1.4
Totals	**1,275**	**1,241**	**1,312**	**1,360**	**1,494**	**1,309**	**1,358**	**$56.5**	**$53.9**	**$58.0**	**$60.5**	**$68.3**	**$57.3**	**$60.0**
Timber-Related Industries														
Forestry, Logging, & Support Activities	78	62	81	90	112	74	84	$4.4	$3.6	$4.6	$5.1	$6.4	$4.2	$4.8
Wood Products Manufacturing	51	30	43	45	56	40	40	$2.8	$1.7	$2.4	$2.5	$3.1	$2.2	$2.2
Paper Manufacturing	13	11	15	15	20	14	16	$1.2	$1.0	$1.3	$1.4	$1.8	$1.3	$1.5
Totals	**142**	**104**	**139**	**150**	**188**	**129**	**141**	**$8.5**	**$6.2**	**$8.3**	**$9.0**	**$11.3**	**$7.8**	**$8.5**
Recreation-Related Industries														
Arts, Entertainment, & Recreation Services	115	118	119	122	127	122	124	$3.6	$3.5	$3.3	$3.8	$4.6	$4.7	$4.8
Accommodation & Food Services	339	361	355	361	363	366	370	$9.1	$9.7	$8.1	$9.7	$11.4	$13.0	$13.0
Totals	**454**	**478**	**474**	**484**	**490**	**488**	**494**	**$12.7**	**$13.2**	**$11.3**	**$13.5**	**$15.9**	**$17.7**	**$17.8**

* Includes Clackamas, Columbia, Multnomah, Washington, and Yamhill Counties

† Federal payments include only those that would be paid under the O&C formula. Current has been modified as if O&C payments had been made in lieu of SRS payments.

Note: Totals may not add due to rounding.

Issue 5

How would the RMP alternatives affect the capacity and resiliency of different types of communities in the planning area?

Census Places Random Selection

Census Places Random Selection for Community Capacity and Resiliency
May 29, 2014

Table P-17. Stratified random sample of communities by population (selected cities highlighted)

Coos Bay	**47,218**	**Roseburg**	**661,130**	**Salem**	
Powers	689	Sutherlin	7,810	Hubbard	3,173
Port Orford	1,133	Roseburg	21,181	Mount Angel	3,286
Lakeside	1,699	**Salem**	**661,130**	Toledo	3,465
Gold Beach	2,253	Johnson City	566	Harrisburg	3,567
Myrtle Point	2,514	Manzanita	598	Aumsville	3,584
Bandon	3,066	Monroe	617	Lafayette	3,742
Coquille	3,866	Gaston	637	Wood Village	3,878
Brookings	6,336	Yachats	690	Philomath	4,584
North Bend	9,695	Maywood Park	752	Tillamook	4,935
Coos Bay	15,967	Garibaldi	779	Warrenton	4,989
Eugene	**39,724**	Scio	838	Sheridan	6,127
Coburg	1,035	Adair Village	840	Seaside	6,477
Lowell	1,045	Halsey	904	Scappoose	6,592
Dunes City	1,303	Aurora	918	Stayton	7,644
Oakridge	3,205	Falls City	947	Lincoln City	7,930
Veneta	4,561	Donald	979	Molalla	8,108
Creswell	5,031	Yamhill	1,024	Independence	8,590
Junction City	5,392	Lyons	1,161	Fairview	8,920
Florence	8,466	Tangent	1,164	Sweet Home	8,925
Cottage Grove	9,686	Siletz	1,212	Silverton	9,222
Lakeview	**23,223**	Bay City	1,286	Astoria	9,477
Chiloquin	734	Rockaway Beach	1,312	Monmouth	9,534
Malin	805	Millersburg	1,329	Sandy	9,570
Merrill	844	Durham	1,351	Newport	9,989
Klamath Falls	20,840	Depoe Bay	1,398	Damascus	10,539
Medford	**101,776**	Gearhart	1,462	Gladstone	11,497
Gold Hill	1,220	Amity	1,614	Cornelius	11,869
Cave Junction	1,883	Brownsville	1,668	St. Helens	12,883
Rogue River	2,131	Cannon Beach	1,690	Happy Valley	13,903
Jacksonville	2,785	Clatskanie	1,737	Dallas	14,583
Shady Cove	2,904	Banks	1,777	Lebanon	15,518
Phoenix	4,538	Turner	1,854	Canby	15,829
Talent	6,066	Mill	1,855	Troutdale	15,962
Eagle Point	8,469	Rainier	1,895	Sherwood	18,194
Central Point	17,169	Columbia City	1,946	Wilsonville	19,509
Ashland	20,078	North Plains	1,947	Milwaukie	20,291
Grants Pass	34,533	Carlton	2,007	Forest Grove	21,083
Roseburg	**49,031**	Willamina	2,025	Newberg	22,068
Glendale	874	Waldport	2,033	Woodburn	24,080
Oakland	927	Vernonia	2,151	West Linn	25,109
Yoncalla	1,047	Gervais	2,464	Tualatin	26,054
Drain	1,151	Dayton	2,534	Oregon City	31,859
Riddle	1,185	Sublimity	2,681	McMinnville	32,187
Canyonville	1,884	Estacada	2,695	Keizer	36,478
Myrtle Creek	3,439	Jefferson	3,098	Lake Oswego	36,619
Reedsport	4,154	King City	3,111		
Winston	5,379	Dundee	3,162	**Grand Total**	**922,102**

Community Capacity/Resiliency Baseline

Table P-18. Community capacity/resiliency baseline inputs

Data Set	What Does This Tell Us?	Community Base Data Availability	
		County	Sub County
Population 2010, 2012	Size, generally = more community capacity	Y	Y
Population change 2000 to 2010/2012	Growing pop, generally = more capacity	Y	Y
Employment/Unemployment, 2012	High employment/low unemployment, generally = more capacity	Y	Y
Employment volatility (diversity) current at place empt by industry (possibly including change over time)	More employment, employment access = more capacity More diversity in disconnected industries (not all in one sector) = more resiliency	Y	Y
Household income 2010 or most recent from American Community Survey (number of households) Median household income or share in plus 3–5 $ income brackets (e.g., $20–34, 35–50)	Higher incomes, generally = more capacity, more resiliency.	Y	Y
Poverty rate	Lower poverty = more capacity	Y	Y
Education (% population with High School certificate; with a 4 year degree)	Higher = more capacity, more resiliency.	Y	Y
Community Health Population with health insurance (available from census)	Healthy Communities have more capacity, more resiliency	Y	Y
Community wealth: Assessable tax base? (needs to be expressed in relative terms (e.g., per capita))	More wealth = more capacity, more resiliency	Y	If available
Recreation indicator? Recreation demand/scarcity? (per Rec. Planning Criteria)	Lower scarcity = more capacity	Y - Specifics to be determined	If available

Selected Socioeconomic Characteristics

Table P-19. Selected socioeconomic characteristics for selected cities in western Oregon

Characteristic	Oregon		Coquille		Drain		Florence	
	Number	%	Number	%	Number	%	Number	%
Population								
Total Population, 2012	3,836,628		3,874		1,142		8,412	
Population, 2000	3,421,399		4,184		1,012		7,263	
Population Change 2000–2012	415,229	12%	-310	-8%	130	13%	1,149	16%
Age Distribution (2012)								
Population 19 years and under	967,636	25%	756	20%	296	26%	1,036	12%
Population 20–64 years	2,328,465	61%	2,312	60%	594	52%	4,293	51%
Population 65 years and older	540,527	14%	806	21%	252	22%	3,083	37%
Totals	**3,836,628**	**100%**	**3,874**	**100%**	**1,142**	**100%**	**8,412**	**100%**
Median age (years)	38.4		47.4		42.2		57.6	
Race								
White alone, 2012	3,272,707	85%	3,460	89%	1,084	95%	7,820	93%
Minority	563,921	15%	414	11%	58	5%	592	7%
Housing								
Total housing units	1,673,593	N/A	1,953	50%	433	38%	5,207	62%
Occupied housing units	1,512,718	100%	1,592	82%	418	97%	4,438	85%
Vacant housing units	160,875	11%	361	18%	15	4%	769	15%
Owner-occupied	945,824	63%	1,104	57%	253	61%	2,766	62%
Renter-occupied	566,894	37%	488	25%	165	39%	1,672	38%
Median housing unit value ($)	246,100		154,100		133,100		201,200	
Median gross rent ($)	854		478		151		1,606	
Employment								
Workers 16 years and over	3,072,774	80%	3,281	85%	921	81%	7,600	90%
In labor force	1,957,085	67%	1,794	46%	501	44%	3,244	39%
Unemployed	210,379	7%	71	2%	115	10%	258	3%
Occupation								
Civilian employed population 16 years and over	1,743,524	57%	1,723	44%	386	34%	2,967	35%
Management, business, science and arts occupations	627,719	36%	399	23%	62	16%	653	22%
Service occupations	315,529	18%	474	28%	82	21%	689	23%
Sales and office occupations	426,554	25%	409	24%	96	25%	637	21%
Natural resources, construction, and maintenance occupations	164,625	9%	343	20%	38	10%	347	12%
Production, transportation, and material moving occupations	209,097	12%	98	6%	108	28%	641	22%
Jobs in a 5-mile Radius of the Community by Sector			**2,086**		**559**		**3,651**	
Accommodation and Food Services	145,131	9%	81	4%	33	6%	1,008	28%
Administration and Support, Waste Management and Remediation	84,402	5%	50	2%	20	4%	141	4%
Agriculture, Forestry, Fishing and Hunting	40,859	3%	182	9%	16	3%	86	2%
Arts, Entertainment, and Recreation	26,407	2%	4	0%	2	0%	89	2%
Construction	71,050	4%	85	4%	46	8%	142	4%
Educational Services	158,758	10%	115	6%	124	22%	171	5%
Finance and Insurance	57,164	4%	87	4%	10	2%	103	3%

Characteristic	Oregon		Coquille		Drain		Florence	
	Number	%	Number	%	Number	%	Number	%
Health Care and Social Assistance	230,433	14%	254	12%	8	1%	702	19%
Information	33,677	2%	12	1%	0	0%	110	3%
Management of Companies and Enterprises	32,692	2%	64	3%	13	2%	21	1%
Manufacturing	167,695	10%	378	18%	139	25%	39	1%
Mining, Quarrying, and Oil and Gas Extraction	1,596	0%	1	0%	8	1%	0	0%
Other Services (excluding Public Administration)	60,136	4%	81	4%	13	2%	154	4%
Professional, Scientific, and Technical Services	77,910	5%	27	1%	2	0%	70	2%
Public Administration	91,242	6%	480	23%	29	5%	93	3%
Real Estate and Rental and Leasing	25,259	2%	5	0%	0	0%	102	3%
Retail Trade	181,165	11%	125	6%	61	11%	525	14%
Transportation and Warehousing	52,036	3%	45	2%	31	6%	43	1%
Utilities	8,692	1%	9	0%	4	1%	27	1%
Wholesale Trade	74,290	5%	1	0%	0	0%	25	1%
Jobs Distribution Variability Compared to Oregon (3)				608%		267%		130%
Jobs by Earnings								
$1,250 per month or less	395,867	24%	458	22%	163	29%	1,240	34%
$1,251 – $3,333 per month	621,915	38%	865	41%	257	46%	1,675	46%
More than $3,333 per month	602,812	37%	763	37%	139	25%	736	20%
Income								
Median household income ($)	50,036		47,714		36,964		35,000	
Persons below poverty level	584,059	15%	185	5%	97	8%	995	12%
Health Insurance Coverage								
Civilian noninstitutionalized population	3,796,881	99%	3,704	96%	1,142	100%	8,377	100%
With health insurance coverage	3,191,034	84%	3,240	84%	911	80%	6,996	83%
No health insurance coverage	605,847	16%	464	12%	231	20%	1,381	16%
Education (highest level obtained)								
High School certificate	635,670	17%	2,371	61%	466	41%	3,541	42%
4 year degree	760,816	20%	682	18%	0	0%	0	0%
Assessed Value of Property								
Total assessed value for tax year 2013–14 ($)			202,372,480		52,373,224		837,548,331	
Assessed Value Per Capita (dollars)			52,239		45,861		99,566	
Recreation								
Outdoor recreation land in the county where the community is located (acres per 1,000 population)	8,605		5,012		16,069		5,098	

Characteristic	Gold Beach		Grants Pass		Junction City		Klamath Falls	
	#	%	#	%	#	%	#	%
Population								
Total Population, 2012	2,563		34,454		5,445		20,943	
Population, 2000	1,897		23,003		4,721		19,462	
Population Change 2000–2012	666	35%	11,451	50%	724	15%	1,481	8%
Age Distribution (2012)								
Population 19 years and under	664	26%	8,918	26%	1,551	28%	5,425	26%
Population 20–64 years	1,401	55%	18,533	54%	3,110	57%	12,989	62%
Population 65 years and older	498	19%	7,003	20%	784	14%	2,529	12%
Totals	**2,563**	**100%**	**34,454**	**100%**	**5,445**	**100%**	**20,943**	**100%**
Median age (years)	41.1		40		36.3		35	
Race								
White alone, 2012	2,334	91%	32,246	94%	5,032	92%	17,985	86%
Minority	229	9%	2,178	6%	413	8%	2,958	14%
Housing								
Total housing units	1,327	52%	15,760	46%	2,250	41%	10,190	49%
Occupied housing units	1,029	78%	14,545	92%	2,049	91%	9,054	89%
Vacant housing units	298	22%	1,215	8%	201	9%	1,136	11%
Owner-occupied	674	66%	7,308	50%	990	48%	4,280	47%
Renter-occupied	355	34%	7,237	50%	1,059	52%	4,774	53%
Median housing unit value ($)	220,100		196,900		179,400		148,600	
Median gross rent ($)	336		6,959		984		4,551	
Employment								
Workers 16 years and over	2,103	82%	27,321	79%	4,188	77%	16,844	80%
In labor force	1,195	47%	14,892	55%	2,747	50%	10,539	50%
Unemployed	123	5%	1,771	6%	386	7%	1,354	6%
Occupation								
Civilian employed population 16 years and over	1,072	42%	13,092	38%	2,361	43%	9,118	44%
Management, business, science and arts occupations	284	26%	3,138	24%	443	19%	2,836	31%
Service occupations	257	24%	3,273	25%	461	20%	2,213	24%
Sales and office occupations	304	28%	3,687	28%	565	24%	2,002	22%
Natural resources, construction, and maintenance occupations	134	13%	1,108	8%	498	21%	937	10%
Production, transportation, and material moving occupations	93	9%	1,886	14%	394	17%	1,130	12%
Jobs in a 5-mile Radius of the Community by Sector	**1,394**		**17,216**		**12,205**		**18,710**	
Accommodation and Food Services	229	16%	2,012	12%	690	6%	1,644	9%
Administration and Support, Waste Management and Remediation	6	0%	778	5%	413	3%	1,143	6%
Agriculture, Forestry, Fishing and Hunting	37	3%	45	0%	488	4%	377	2%
Arts, Entertainment, and Recreation	4	0%	165	1%	86	1%	284	2%
Construction	49	4%	390	2%	641	5%	669	4%
Educational Services	93	7%	848	5%	1,218	10%	2,172	12%
Finance and Insurance	25	2%	690	4%	149	1%	561	3%
Health Care and Social Assistance	154	11%	3,977	23%	912	7%	3,455	18%
Information	42	3%	292	2%	27	0%	195	1%
Management of Companies and Enterprises	0	0%	77	0%	44	0%	506	3%

Characteristic	Gold Beach		Grants Pass		Junction City		Klamath Falls	
	#	%	#	%	#	%	#	%
Manufacturing	103	7%	1,358	8%	3,053	25%	1,497	8%
Mining, Quarrying, and Oil and Gas Extraction	0	0%	0	0%	13	0%	1	0%
Other Services (excluding Public Administration)	38	3%	726	4%	448	4%	660	4%
Professional, Scientific, and Technical Services	60	4%	473	3%	251	2%	563	3%
Public Administration	295	21%	982	6%	202	2%	1,262	7%
Real Estate and Rental and Leasing	15	1%	243	1%	175	1%	201	1%
Retail Trade	188	13%	2,978	17%	2,055	17%	2,506	13%
Transportation and Warehousing	35	3%	228	1%	397	3%	355	2%
Utilities	17	1%	76	0%	42	0%	143	1%
Wholesale Trade	4	0%	878	5%	901	7%	516	3%
Jobs Distribution Variability Compared to Oregon (3)		183%		96%		123%		117%
Jobs by Earnings								
$1,250 per month or less	467	34%	5,043	29%	2,911	24%	5,292	28%
$1,251 – $3,333 per month	565	41%	8,087	47%	5,538	45%	8,219	44%
More than $3,333 per month	362	26%	4,086	24%	3,756	31%	5,199	28%
Income								
Median household income (dollars)	50,958		32,991		35,067		31,971	
Persons below poverty level	370	14%	7,132	21%	1,239	23%	5,131	24%
Health Insurance Coverage								
Civilian non-institutionalized population	2,516	98%	33,614	98%	5,342	98%	20,538	98%
With health insurance coverage	1,865	73%	28,272	84%	4,320	79%	16,245	78%
No health insurance coverage	651	25%	5,342	16%	1,022	19%	4,338	21%
Education (highest level obtained)								
High School certificate	1,176	46%	30,251	88%	1,770	33%	5,634	27%
4 year degree	90	4%	4,617	13%	87	2%	1,173	6%
Assessed Value of Property								
Total assessed value for tax year 2013–14 ($)	226,856,877		2,624,936,968		355,651,839		1,264,904,779	
Assessed Value Per Capita ($)	88,512		76,187		65,317		60,397	
Recreation								
Outdoor recreation land in the county where the community is located (acres per thousand population)	31,208		8,612		5,098		34,321	

Characteristic	Lincoln City		Molalla		Rogue River		St. Helens City	
	#	%	#	%	#	%	#	%
Population								
Total Population, 2012	7,926		8,039		2,265		12,807	
Population, 2000	7,437		5,647		1,847		10,019	
Population Change 2000–2012	489	6%	2,392	42%	418	23%	2,788	22%
Age Distribution (2012)								
Population 19 years and under	1,729	21.8%	2,598	32%	500	22%	3,737	29%
Population 20–64 years	4,575	57.7%	4,654	58%	1,158	51%	8,043	63%
Population 65 years and older	1,622	20.5%	787	10%	607	27%	1,027	8%
Totals	**7,926**	**100%**	**8,039**	**100%**	**2,265**	**100%**	**12,807**	**100%**
Median age (years)	44.6		32		45.6		33.3	
Race								
White alone, 2012	6,931	87.4%	7,520	94%	2,103	93%	11,512	89.9
Minority	995	13%	519	6%	162	7%	1,295	10%
Housing								
Total housing units	5,720	5,720	3,010	37%	1,132	50%	5,123	40%
Occupied housing units	3,932	69%	2,966	99%	997	88%	4,725	92%
Vacant housing units	1,788	31%	44	1%	135	12%	398	8%
Owner-occupied	1,929	49%	2,077	70%	567	57%	3,007	59%
Renter-occupied	2,003	51%	889	30%	430	43%	1,718	34%
Median housing unit value ($)	233,700		204,600		177,900		186,000	
Median gross rent ($)	717		889		420		1,701	
Employment								
Workers 16 years and over	6,500	82%	5,813	72%	1,838	81%	9,842	77%
In labor force	3,963	61%	4,006	69%	877	39%	6,742	53%
Unemployed	505	8%	444	8%	100	4%	1,202	9%
Occupation								
Civilian employed population 16 years and over	3,458	44%	3,562	44%	777	34%	5,540	43%
Management, business, science and arts occupations	649	19%	683	19%	195	25%	1,371	25%
Service occupations	1,091	32%	696	20%	146	19%	852	15%
Sales and office occupations	1,268	37%	819	23%	236	30%	1,669	30%
Natural resources, construction, and maintenance occupations	253	7%	650	18%	102	13%	829	15%
Production, transportation, and material moving occupations	197	6%	714	20%	98	13%	819	15%
Jobs in a Five Mile Radius of the Community by Sector	**5,709**		**3,804**		**1,304**		**3,729**	
Accommodation and Food Services	1,721	30%	266	7%	104	8%	358	10%
Administration and Support, Waste Management and Remediation	240	4%	54	1%	58	4%	151	4%
Agriculture, Forestry, Fishing and Hunting	12	0%	710	19%	62	5%	52	1%
Arts, Entertainment, and Recreation	661	12%	66	2%	19	1%	47	1%
Construction	226	4%	260	7%	117	9%	85	2%
Educational Services	159	3%	427	11%	202	15%	479	13%
Finance and Insurance	48	1%	36	1%	19	1%	126	3%
Health Care and Social Assistance	674	12%	253	7%	141	11%	705	19%
Information	53	1%	47	1%	32	2%	28	1%
Management of Companies and Enterprises	1	0%	5	0%	0	0%	23	1%

Characteristic	Lincoln City		Molalla		Rogue River		St. Helens City	
	#	%	#	%	#	%	#	%
Manufacturing	47	1%	680	18%	198	15%	512	14%
Mining, Quarrying, and Oil and Gas Extraction	0	0%	16	0%	19	1%	0	0%
Other Services (excluding Public Administration)	168	3%	203	5%	52	4%	176	5%
Professional, Scientific, and Technical Services	66	1%	51	1%	49	4%	93	2%
Public Administration	244	4%	102	3%	40	3%	417	11%
Real Estate and Rental and Leasing	233	4%	24	1%	20	2%	58	2%
Retail Trade	1,030	18%	385	10%	132	10%	345	9%
Transportation and Warehousing	46	1%	121	3%	25	2%	45	1%
Utilities	23	0%	0	0%	0	0%	0	0%
Wholesale Trade	57	1%	98	3%	15	1%	29	1%
Jobs Distribution Variability Compared to Oregon (3)		217%		157%		49%		81%
Jobs by Earnings								
$1,250 per month or less	2,147	38%	1,170	31%	465	36%	799	21%
$1,251 – $3,333 per month	2,575	45%	1,653	43%	523	40%	2,079	56%
More than $3,333 per month	987	17%	981	26%	316	24%	851	23%
Income								
Median household income ($)	29,686		52,926		32,426		53,151	
Persons below poverty level	1,616	20%	868	11%	398	18%	2,267	18%
Health Insurance Coverage								
Civilian non-institutionalized population	7,886	99%	7,992	99%	2,265	100%	12,621	99%
With health insurance coverage	6,299	80%	6,664	83%	1,884	83%	10,706	84%
No health insurance coverage	1,587	20%	1,328	17%	381	17%	1,915	15%
Education (highest level obtained)								
High School certificate	1,745	22%	6,930	86%	695	31%	2,420	19%
4 year degree	1,119	14%	780	10%	0	0%	1,288	10%
Assessed Value of Property								
Total assessed value for tax year 2013–14 ($)	1,521,308,480		490,884,897		135,999,651		815,441,324	
Assessed Value Per Capita ($)	191,939		61,063		60,044		63,672	
Recreation								
Outdoor recreation land in the county where the community is located (acres per 1,000 population)	4,906		1,682		4,416		565	

Characteristic	Sublimity		Winston	
	#	%	#	%
Population				
Total Population, 2012	2,683		5,352	
Population, 2000	2,148		4,613	
Population Change 2000–2012	535	25%	739	16%
Age Distribution (2012)				
Population 19 years and under	495	18%	1,674	31%
Population 20–64 years	1,346	50%	3,012	56%
Population 65 years and older	842	31%	666	12%
Totals	**2,683**	**100%**	**5,352**	**100%**
Median age (years)	51		31.9	
Race				
White alone, 2012	2,623	98%	4,980	93%
Minority	60	2%	372	7%
Housing				
Total housing units	1,134	42%	1,927	36%
Occupied housing units	1,085	96%	1,809	94%
Vacant housing units	49	4%	118	6%
Owner-occupied	731	67%	1,074	59%
Renter-occupied	354	33%	735	41%
Median housing unit value ($)	247,300		154,400	
Median gross rent ($)	347		723	
Employment				
Workers 16 years and over	2,292	85%	3,961	74%
In labor force	1,089	48%	2,208	41%
Unemployed	61	3%	388	7%
Occupation				
Civilian employed population 16 years and over	1,016	38%	1,820	34%
Management, business, science and arts occupations	370	36%	335	18%
Service occupations	156	15%	337	19%
Sales and office occupations	276	27%	680	37%
Natural resources, construction, and maintenance occupations	115	11%	183	10%
Production, transportation, and material moving occupations	99	10%	285	16%
Jobs in a Five Mile Radius of the Community by Sector	**17,216**		**4,032**	
Accommodation and Food Services	2,012	12%	264	7%
Administration & Support, Waste Management and Remediation	778	5%	72	2%
Agriculture, Forestry, Fishing and Hunting	45	0%	136	3%
Arts, Entertainment, and Recreation	165	1%	45	1%
Construction	390	2%	252	6%
Educational Services	848	5%	293	7%
Finance and Insurance	690	4%	35	1%
Health Care and Social Assistance	3,977	23%	196	5%
Information	292	2%	6	0%
Management of Companies and Enterprises	77	0%	319	8%
Manufacturing	1,358	8%	1,325	33%
Mining, Quarrying, and Oil and Gas Extraction	0	0%	17	0%
Other Services (excluding Public Administration)	726	4%	106	3%
Professional, Scientific, and Technical Services	473	3%	42	1%
Public Administration	982	6%	48	1%
Real Estate and Rental and Leasing	243	1%	30	1%

Characteristic	Sublimity		Winston	
	#	%	#	%
Retail Trade	2,978	17%	316	8%
Transportation and Warehousing	228	1%	301	7%
Utilities	76	0%	89	2%
Wholesale Trade	878	5%	140	3%
Jobs Distribution Variability Compared to Oregon (3)		96%		174%
Jobs by Earnings				
$1,250 per month or less	5,043	29%	846	21%
$1,251 – $3,333 per month	8,087	47%	1,542	38%
More than $3,333 per month	4,086	24%	1,644	41%
Income				
Median household income ($)	58,708		31,627	
Persons below poverty level	150	6%	1,584	30%
Health Insurance Coverage				
Civilian non-institutionalized population	2,432	91%	5,345	100%
With health insurance coverage	2,229	92%	4,589	86%
No health insurance coverage	203	8%	756	14%
Education (highest level obtained)				
High School certificate	2,519	94%	1,295	24%
4 year degree	816	30%	417	8%
Assessed Value of Property				
Total assessed value for tax year 2013–14 ($)	187,046,485		223,555,844	
Assessed Value Per Capita ($)	69,715		41,771	
Recreation				
Outdoor recreation land in the county where the community is located (acres per 1,000 population)	828		16,069	

Sources:

Assessed Property Value derived from individual County Assessors Offices Summary of Assessment and Tax Rolls.

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U.S. Census Bureau; American Community Survey, 2012 American Community Survey 5-Year Estimates, Tables DP03, DP04, DP05, S1901 and S1701; generated by Joan Huston; using American FactFinder; http://factfinder2.census.gov; (May 2014).

U.S. Census Bureau; American Community Survey, 2009 American Community Survey 5-Year Estimates, Tables DP03, DP04, DP05, S1901 and S1701; generated by Joan Huston; using American FactFinder; http://factfinder2.census.gov; (May 2014).

U.S. Census Bureau; Census 2000, Summary File 1, Table DP05; generated by Joan Huston; using American FactFinder; http://factfinder2.census.gov; (May 2014).

U.S. Census Bureau. 2013. OnTheMap Application. Longitudinal-Employer Household Dynamics Program. http://onthemap.ces.census.gov/; generated by Clive Graham July 3, 2014.

Notes:

(1) All data are for 2012 with the exception of the Coquille Indian Tribe and Cow Creek Band of Umpqua Tribe of Indians. For these two tribes the most recent available data in all categories are the from 2009 five-year estimates.

(2) The population that is 16 years or older and available to work.

(3) A measure of difference in the distribution of jobs by sector in the 5-mile radius compared to the distribution of jobs for the State. A higher number means a larger difference in distribution.

The American Community Survey data is derived from a sample of American households that contains a greater level of detailed socioeconomic data than the decennial census. Where available, we used American Community Survey data from 2012, which is informed by data collected over the prior 5 years and extrapolated for each community (for two tribes, data was only available from 2009). Since the American Community Survey uses data derived from a sample of the population, and is not a true count of the population like the decennial census, margins of error are associated with the extrapolated data. These margins of error vary across the geography sampled; however, smaller populations generally experience larger margins of error when compared to more populated geographies.

Table P-20. Selected socioeconomic characteristics: federally recognized Tribes with land in the planning area, 2009 and 2012 (1)

Characteristic	Oregon		Confederated Tribes of Coos, Lower Umpqua, and Siuslaw Indians		Confederated Tribes of the Grand Ronde		Confederated Tribes of the Siletz Indians	
	Number	%	Number	%	Number	%	Number	%
Population								
Population, 2012, 2009 (1)	3,836,628		24		473		476	
Population, 2000	3,421,399		25		55		308	
Population Change	415,229	12%	-1	-4%	418	760%	168	55%
Age Distribution								
Population 19 years and under	967,636	25%	4	17%	164	35%	193	41%
Population 20–64 years	2,328,465	61%	13	54%	278	59%	243	51%
Population 65 years and older	540,527	14%	7	29%	31	7%	40	8%
Median age (years)	38		62		28		29	
Race								
White alone	3,272,707	85%	12	50%	92	19%	56	12%
Minority (Non-white) population	563,921	15%	12	50%	381	81%	420	88%
Housing								
Total housing units	1,673,593		15		193		173	
Occupied housing units	1,512,718	90%	15	100%	185	96%	160	93%
Owner-occupied	945,824	57%	3	20%	13	7%	88	55%
Renter-occupied	566,894	34%	12	80%	172	93%	72	45%
Vacant housing units	160,875	10%	0	0%	8	4%	13	8%
Median value owner-occupied units ($)	246,100				91,700		79,100	
Median gross rent ($)	854		450		833		458	
Employment								
Population in the labor force (2)	1,953,903	67%	2	10%	176	56%	224	71%
Unemployed	210,379	7%	18	90%	139	44%	40	13%
Occupation								
Civilian employed population 16 years and over	1,743,524	57%	0	0%	37	12%	184	58%
Management, business, science and arts occupations	627,719	36%	0	0%	47	35%	55	30%
Service occupations	315,529	18%	0	0%	58	43%	44	24%
Sales and office occupations	426,554	25%	0	0%	25	19%	45	25%
Natural resources, construction, and maintenance occupations	164,625	9%	0	0%	2	2%	29	16%
Production, transportation, and material moving occupations	209,097	12%	0	0%	2	2%	11	6%
Jobs in a 5-mile Radius of the Community by Sector			**18,273**	**100%**	**2,168**	**100%**	**6,642**	**100%**
Accommodation & Food Services	145,131	9%	2,727	15%	1,331	61%	1,489	22%
Administration & Support, Waste Management and Remediation	84,402	5%	1,347	7%	21	1%	245	4%
Agriculture, Forestry, Fishing and Hunting	40,859	3%	509	3%	107	5%	163	2%
Arts, Entertainment, and Recreation	26,407	2%	214	1%	-	0%	679	10%
Construction	71,050	4%	609	3%	10	0%	266	4%
Educational Services	158,758	10%	1,195	7%	50	2%	280	4%
Finance and Insurance	57,164	4%	415	2%	8	0%	58	1%
Health Care and Social Assistance	230,433	14%	4,169	23%	26	1%	715	11%
Information	33,677	2%	331	2%	2	0%	46	1%
Management of Companies and Enterprises	32,692	2%	184	1%	-	0%	1	0%
Manufacturing	167,695	10%	612	3%	77	4%	419	6%
Mining, Quarrying, and Oil and Gas	1,596	0%	27	0%	-	0%	4	0%

Characteristic	Oregon		Confederated Tribes of Coos, Lower Umpqua, and Siuslaw Indians		Confederated Tribes of the Grand Ronde		Confederated Tribes of the Siletz Indians	
	Number	%	Number	%	Number	%	Number	%
Extraction								
Other Services (excluding Public Administration)	60,136	4%	598	3%	17	1%	190	3%
Professional, Scientific, and Technical Services	77,910	5%	427	2%	7	0%	81	1%
Public Administration	91,242	6%	1,062	6%	370	17%	536	8%
Real Estate and Rental and Leasing	25,259	2%	291	2%	3	0%	160	2%
Retail Trade	181,165	11%	2,439	13%	86	4%	1,035	16%
Transportation and Warehousing	52,036	3%	686	4%	35	2%	200	3%
Utilities	8,692	1%	137	1%	13	1%	13	0%
Wholesale Trade	74,290	5%	294	2%	5	0%	62	1%
Jobs Distribution Concentration Compared to Oregon (3)				51%		554%		99%
Jobs by Earnings								
$1,250 per month or less	395,867	24%	5,611	31%	245	11%	2,272	34%
$1,251 – $3,333 per month	621,915	38%	8,030	44%	1,121	52%	2,728	41%
More than $3,333 per month	602,812	37%	4,632	25%	802	37%	1,642	25%
Income								
Median household income ($)	50,036		15,938		24,861		39,000	
Persons below poverty level	584,059	15%	6	25%	130	28%	81	18%
Health Insurance Coverage								
With health insurance coverage	3,191,034	84%	22	92%	379	80%	335	70%
No health insurance coverage	605,847	16%	2	8%	94	20%	141	30%
Education (highest level obtained)								
High School certificate	635,670	17%	7	29%	157	33%	97	20%
4 year degree	760,816	20%	0	0%	18	4%	25	5%
Recreation								
Outdoor recreation land in the county where the community is located (acres per 1,000 population)	8,605		5,012		18,487		4,906	

Characteristic	Confederated Tribes of Warm Springs Reservation of Oregon		Coquille Indian Tribe		Cow Creek Band of Umpqua Tribe of Indians		Klamath Tribes	
	#	%	#	%	#	%	#	%
Population								
Population, 2012, 2009 (1)	3,960		297		21		17	
Population, 2000	3,314		258		22		9	
Population Change	646	19%	39	15%	-1	-5%	8	89%
Age Distribution								
Population 19 years and under	1,473	37%	103	35%	3	14%	0	0%
Population 20–64 years	2,235	56%	156	53%	12	57%	7	41%
Population 65 years and older	252	6%	38	13%	6	29%	10	59%
Median age (years)	27		30		62		70	
Race								
White alone	303	8%	131	44%	21	100%	6	35%
Minority (Non-white) population	3,657	92%	166	56%	0	0%	11	65%
Housing								
Total housing units	1,157		112		9		14	
Occupied housing units	1,037	90%	102	91%	9	100%	14	100%
Owner-occupied	650	63%	52	16%	7	78%	4	29%
Renter-occupied	387	37%	50	49%	2	22%	10	71%
Vacant housing units	120	10%	10	9%	0	0%	0	0%
Median value owner-occupied units ($)	103,200		152,800		387,500		275,000	
Median gross rent ($)	673		483		N/A		371	
Employment								
Population in the labor force (2)	1,748	64%	108	51%	7	33%	5	29%
Unemployed	474	17%	14	7%	0	0%	1	6%
Occupation								
Civilian employed population 16 years and over	1,274	47%	94	44%	7	33%	4	24%
Management, business, science and arts occupations	267	21%	24	23%	0	0%	2	50%
Service occupations	433	34%	30	28%	5	71%	0	0%
Sales and office occupations	287	23%	22	24%	2	29%	0	0%
Natural resources, construction, and maintenance occupations	86	7%	1	20%	0	0%	0	0%
Production, transportation, and material moving occupations	201	16%	14	15%	0	0%	2	50%
Jobs in a 5-mile Radius of the Community by Sector	**2,250**	**100%**	**17,768**	**100%**	**27,040**	**100%**	**17,418**	**100%**
Accommodation & Food Services	331	15%	2,661	15%	2,682	10%	1,516	9%
Administration & Support, Waste Management and Remediation	29	1%	1,240	7%	1,377	5%	1,076	6%
Agriculture, Forestry, Fishing & Hunting	189	8%	601	3%	899	3%	222	1%
Arts, Entertainment, & Recreation	6	0%	136	1%	222	1%	383	2%
Construction	51	2%	627	4%	954	4%	550	3%
Information	4	0%	221	1%	299	1%	193	1%
Educational Services	102	5%	1,205	7%	1,930	7%	1,447	8%
Finance and Insurance	22	1%	375	2%	760	3%	557	3%
Health Care and Social Assistance	43	2%	3,891	22%	5,051	19%	3,414	20%
Information	4	0%	221	1%	299	1%	193	1%
Management of Companies and Enterprises	-	0%	164	1%	532	2%	499	3%
Manufacturing	273	12%	940	5%	3,106	11%	1,419	8%
Mining, Quarrying, and Oil and Gas Extraction	1	0%	44	0%	91	0%	1	0%

Characteristic	Confederated Tribes of Warm Springs Reservation of Oregon		Coquille Indian Tribe		Cow Creek Band of Umpqua Tribe of Indians		Klamath Tribes	
	#	%	#	%	#	%	#	%
Other Services (excluding Public Administration)	11	0%	538	3%	874	3%	620	4%
Professional, Scientific, and Technical Services	31	1%	414	2%	658	2%	552	3%
Public Administration	890	40%	1,067	6%	2,558	9%	1,404	8%
Real Estate and Rental and Leasing	-	0%	218	1%	339	1%	189	1%
Retail Trade	39	2%	2,343	13%	3,120	12%	2,523	14%
Transportation and Warehousing	13	1%	696	4%	887	3%	313	2%
Utilities	101	4%	83	0%	198	1%	112	1%
Wholesale Trade	114	5%	304	2%	503	2%	428	2%
Jobs Distribution Concentration Compared to Oregon (3)		267%		55%		39%		117%
Jobs by Earnings								
$1,250 per month or less	407	18%	5,351	30%	7,077	26%	4,903	28%
$1,251 – $3,333 per month	1,199	53%	7,779	44%	11,693	43%	7,835	45%
More than $3,333 per month	644	29%	4,638	26%	8,270	31%	4,680	27%
Income								
Median household income ($)	47,526		39,346		22,250		6,944	
Persons below poverty level	1,069	28%	67	23%	0	0%	9	53%
Health Insurance Coverage								
With health insurance coverage	2,535	65%	N/A	N/A	N/A	N/A	14	82%
No health insurance coverage	1,369	35%	N/A	N/A	N/A	N/A	3	18%
Education (highest level obtained)								
High School certificate	664	17%	69	23%	7	33%	0	0%
4 year degree	193	5%	15	5%	2	10%	9	53%
Recreation								
Outdoor recreation land in the county where the community is located (acres per 1,000 population)	1,682		5,012		16,069		34,321	

Notes:
(1) All data are for 2012 with the exception of the Coquille Indian Tribe and Cow Creek Band of Umpqua Tribe of Indians. For these two tribes the most recent available data in all categories are the from 2009 five-year estimates.
(2) The population that is 16 years or older and available to work.
(3) A measure of difference in the distribution of jobs by sector in the 5-mile radius compared to the distribution of jobs for the State. A higher number means a larger difference in distribution.

Sources:
Oregon Parks and Recreation Department. 2011. Oregon Statewide Outdoor Recreation Resource/Facility Bulletin Final Report. A Component of the 2013-2017 Oregon Statewide Comprehensive Outdoor Recreation Plan. http://www.oregon.gov/oprd/PLANS/docs/scorp/2013-2018_SCORP/2013-2017-SCORP_App_B.pdf.
U.S. Census Bureau; American Community Survey, 2012 American Community Survey 5-Year Estimates, Tables DP03, DP04, DP05, S1901 and S1701; generated by Joan Huston; using American FactFinder; http://factfinder2.census.gov; (May 2014).
U.S. Census Bureau; American Community Survey, 2009 American Community Survey 5-Year Estimates, Tables DP03, DP04, DP05, S1901 and S1701; generated by Joan Huston; using American FactFinder; http://factfinder2.census.gov; (May 2014).
U.S. Census Bureau; Census 2000, Summary File 1, Table DP05; generated by Joan Huston; using American FactFinder; http://factfinder2.census.gov; (May 2014).
U.S. Census Bureau. 2013. OnTheMap Application. Longitudinal-Employer Household Dynamics Program. http://onthemap.ces.census.gov/; generated by Clive Graham July 3, 2014.

The American Community Survey data is derived from a sample of American households that contains a greater level of detailed socioeconomic data than the decennial census. Where available, we used American Community Survey data from 2012, which is informed by data collected over the prior 5 years and extrapolated for each community (for two tribes, data was only available from 2009). Since the

American Community Survey uses data derived from a sample of the population, and is not a true count of the population like the decennial census, margins of error are associated with the extrapolated data. These margins of error vary across the geography sampled; however, smaller populations generally experience larger margins of error when compared to more populated geographies.

Community Profiles

The BLM developed brief, introductory geographic and economic profiles of the selected communities to have some familiarity with the communities prior to the interviews. For the tribes, the section contains profiles only for those that opted to participate in the interviews.

Coquille

Coquille is the county seat of Coos County, and is located on Oregon Route 42 along the Coquille River approximately 20 miles downstream from the Pacific Ocean. Deriving its name from the Coquille Indian Tribe, the city's primary economic driver is the timber industry. Other economic activities include healthcare and tourism.
Area: 2.80 square miles. 2012 population: 3,874. http://cityofcoquille.org/

Drain

Drain is in Douglas County, approximately 20 miles south of Eugene on Oregon Routes 99 and 38 at a pass in the coast range created by Pass Creek, a tributary of the Umpqua River. Drain is named after town founder and politician Charles J. Drain. The North Douglas School District is one of the major employers in the city, which is home to both the combined elementary/middle school and the high school.
Area: 0.61 square miles. 2012 population: 1,142. http://www.drainoregon.org/

Florence

Florence is located in Lane County on the Oregon coast at the mouth of the Siuslaw River roughly due east of Eugene, is located along U.S. Highway 101. The Siuslaw Tribe of Native Americans formerly inhabited the Florence area. The city's traditional economy was based on timber and fishing, but both have declined, and the city now focuses on tourism. The Confederated Tribes of Coos, Lower Umpqua and Siuslaw Indians own the Three Rivers Casino located just east of the city.
Area: 5.87 square miles. 2012 population: 8,412. http://www.ci.florence.or.us/

Gold Beach

Gold Beach is the county seat of Curry County and is located on the Oregon coast approximately 50 miles north of the California border. The community was originally named Ellensburg in the 1850s, but later took the name Gold Beach after a beach near the mouth of the Rogue River where placer mines extracted gold. Gold Beach is a center for fishing, ocean charters, and outdoor recreation. The primary industries in the city are tourism and government.
Area: 2.76 square miles. Population 2012: 2,563. http://www.goldbeachoregon.gov/

Grants Pass

Grants Pass is the county seat of Josephine County and is located on Interstate 5, northwest of Medford. Incorporated in 1887, the city was named in honor of General Ulysses S. Grant. Attractions include the Rogue River and the nearby Oregon Caves National Monument. Once a timber-based community, the economy is currently a mix of light manufacturing, secondary wood products, retail trade, tourism, recreation, and service-based industries.
Area: 11.03 square miles. Population 2012: 34,454. https://www.grantspassoregon.gov/

Klamath Falls

Klamath Falls is the county seat of Klamath County, and is located on the southeast shore of the Upper Klamath Lake, about 25 miles north of California. Founded in 1867 under the name Linkville, the city was renamed Klamath Falls in 1893. Logging was Klamath Falls' first major industry, while tourism and recreation have become current economic mainstays. The nearby Lava Beds National Monument and Crater Lake National Park are common tourist destinations.
Area: 20.66 square miles. Population 2012: 20,943. http://ci.klamath-falls.or.us/

Junction City

Junction City is located in Lane County on U.S. Route 99 west of the Willamette River, approximately 15 miles northwest of Eugene. Agricultural land surrounds the city, which has a strong manufacturing base including historic ties with the recreational vehicle industry. Incorporated in 1872, Junction City is also a gateway to Oregon wine country.
Area: 2.36 square miles. 2012 population: 5,445. http://www.junctioncityoregon.gov/

Lincoln City

Lincoln City is located in Lane County on the Oregon coast approximately 60 miles from Salem and 90 miles from Portland. Lincoln City incorporated in 1965, uniting the cities of Delake, Oceanlake and Taft, and the unincorporated communities of Cutler City and Nelscott. It is a beach and resort community; tourism is the city's primary industry. Lincoln City is also home to the Chinook Winds Casino operated by the Confederated Tribes of the Siletz.
Area: 5.68 square miles. Population 2012: 7,926. http://www.lincolncity.org/

Molalla

Molalla is located in Clackamas County, 30 miles southeast of Portland. The city was named after the Molalla River, which in turn was named for the Molalla, a Native American tribe that inhabited the area. Descendants of the Molalla tribe are members of the Confederated Tribes of Grand Ronde. Historically, lumber production was the community's biggest industry. In recent years, the city has diversified its economic base with manufacturing, commercial, tourism, and recreation, with Molalla as the gateway to the Molalla River Recreation Corridor.
Area: 2.26 square miles. Population 2012: 8,039. http://www.cityofmolalla.com/

Rogue River

Rogue River is located in the western edge of Jackson County along U.S. Route 5. Formerly known as Woodville the settlement changed to Rogue River. During the 1830s and 1840s, the area had become a stopover for trappers and traders traveling from Fort Vancouver on the Columbia River south to California along the Siskiyou Trail. Today's Interstate 5 traces the route of that trail. Rogue River was closely tied to the timber industry but is now seeing a shift to service and retail jobs.
Area: 0.97 square miles. Population 2012: 2,265. http://cityofrogueriver.org/

St. Helens

St. Helens is the county seat of Columbia County and is located about 30 miles north of Portland along the Oregon-Washington border. Bounded by the Columbia River to the east, St. Helens is named for its view of Mount St. Helens in Washington, approximately 40 miles away. The city has a strong focus on business development, especially in its Downtown Historic District and through its Main Street Program. St. Helens also offers a variety of tourism and recreation activities along the Columbia River.
Area: 5.51 square miles. Population 2012: 12,807. http://www.ci.st-helens.or.us/

Sublimity

Sublimity is located in Marion County, about 15 miles east of Salem on a plateau on the western foothills of the Oregon Cascades. The town incorporated in 1903. Sublimity was a center for the timber industry through the 1980s, but is now a bedroom community for Salem.
Area: 0.93 square miles. Population 2012: 2,683. http://www.cityofsublimity.org/

Winston

Winston is located in Douglas County less than 10 miles south of Roseburg along the South Umpqua River. Although separated by the river, Winston is often regarded as part of a single entity with nearby Dillard and Willis Creek. Winston experienced significant growth when lumber mills began to open towards the middle of the twentieth century, and it remains timber-dependent today.
Area: 2.65 square miles. Population 2012: 5,352. http://www.winstoncity.org/

Confederated Tribes of the Grand Ronde Community of Oregon

The Confederated Tribes of the Grand Ronde's reservation and other owned lands cover approximately 10,700 acres in Yamhill and Polk Counties. The population on these lands is approximately 470 (2012 Census), but tribal membership across Western Oregon is 5,000–6,000.

The Tribes' vision is to be a tribal community providing responsible stewardship of human and natural resources http://www.grandronde.org/ikanum/index.html (June 27, 2014). The Tribes' sources of income include the Spirit Mountain Casino, timber sales from tribal lands, and tourism. The Grand Ronde is involved in community building functions such as housing, education, and health care. http://www.grandronde.org/.

Coquille Indian Tribe of Coos County, Oregon

The Coquille Indian Tribe's reservation and its tribal service area covers approximately 15,600 square miles of Coos, Curry, Douglas, and Lane counties, with its main tribal campus in Southeastern Coos County.

The Tribe is the second largest employer in Coos County, Oregon, with successful business ventures in forestry, arts and exhibits, gaming and hospitality, assisted living and memory care, high-speed telecommunications, and renewable energy. The Tribe also operates the Mill Resort & Casino in Coos Bay and manages the Coquille Forest, comprised of 14 separate parcels of formerly BLM-administered timberlands in eastern Coos County, totaling 5,410 acres. http://www.coquilletribe.org/.

Environmental Resources Management (ERM) sent letters to the Tribal Work Group of the Cooperating Agencies Advisory Group, as well as to city officials of selected cities in the planning area. The BLM included copies of these letters in the Draft RMP/EIS (pp. 1329–1331), and they are hereby incorporated by reference.

Interview Summaries

This appendix contains summaries of the interviews that the BLM conducted with communities in the planning area.

Please note that, while the interviewees participated as representatives of their city or Tribe, they spoke as individuals and not formally on behalf of the city elected officials or of the Tribal leaderships.

City of Coquille

Date: July 16, 2014

Participants:
Ben Marchant, City Manager; Coquille
Clive Graham, Principal; ERM
Jill Bellenger, Associate Consultant; ERM

Table P-21. City of Coquille interview

Question	Discussion/ Response
How do you view your community's 'capacity,' that is your community's ability to face changes, respond to external and internal stresses, create, and take advantage of opportunities, and meet its needs?	Coquille is challenged because its capacity is bound up with the economy of southwestern Oregon, which has been in malaise since the mid-1980s. Ben has been City Manager for two years and was hired in part to increase the city's capacity by, for example, diversifying the economy and attracting families with children to move to the city. His sense of the history is that the city's economic heyday was in the early1980s; there were three mills, car dealers, large retail stores. Now there is only one mill and many of the stores are gone – in that sense the city is depressed. For a while, the city was under development moratorium, but has since expanded its sewer treatment plant. The capacity data are somewhat inconsistent. The city lost population (approximately 8%) between 2000 and 2012. The population is older and there has been a decline in the 18 and under age cohort. Coquille had the third lowest assessed value per capita among the 13 cities surveyed. On the other hand, Ben said the tax base was healthy and household incomes are relatively high such that the city does not meet the criteria for State Community Development Block Grant funding because the city is above the 50% low- to moderate-income threshold for eligibility. Ben feels that the growing elderly and retiree population require expensive services from the city and that this has affected the schools budget (he commented that the physics program had been cut). The city's remaining mill is a major employer (between 1/3 to 1/2 of all jobs in the city). The other major employment sectors are government (Coquille is the county seat) and institutional—employment at the area's hospital. Although Coquille is 10 miles off U.S. 101 (the coast highway), it does attract visitors. The city offers a variety of options including summer festivals, theatre, and antiquing.

Question	Discussion/ Response
How do you view your community's 'resiliency,' that is your community's ability to adapt to change over time?	Ben feels that Coquille has a great sense of community with very strong volunteer programs and ability to raise funds for charity. This undercurrent of community is a testament to the city's capacity to weather economic challenges and work together to find solutions to problems. As timber production has declined, the community is somewhat divided between those who see the potential for a timber-based economy to come back, and others who think that timber is not coming back and that the city needs to adapt to the "new normal." The latter group sees some hope in the proposed Jordan Cove Energy Project in Coos Bay to export liquefied natural gas. Ben feels that Oregon's citizen-driven tax cap initiatives (Measure 5 and Measure 50) limit government revenues and, as a result cities' capacity to provide services. For example, Ben said that important services like the ambulance program were operating in the red. Coquille needs to become less dependent on property tax revenues. Ben said that Curry County was in the worst financial condition, with Coos, Josephine, and Douglas close behind. The city's one timber mill is sustained by logging on private land. The City of Coquille owns approximately 800 acres of forestland on two parcels in separate locations east and west of the city. The city plans a timber sale on part of this land. All cities in Coos County are members of watershed associations to sustain and improve water quality. The associations focus on habitat restoration, preventing silt and runoff, and best practices around the watershed. Ben sees a sociopolitical divide between rural and urban areas in Western Oregon; the urban areas progressing economically and the rural areas much less. This could impact the resiliency of cities like Coquille in the future.
How do the ways the BLM manages its resources affect your community (its capacity and resiliency)?	Ben said that the BLM's management has a great effect on the community. Coquille, like many cities in Western Oregon, sees restoring the O&C lands to local management or to be managed for the benefit of local communities as a major issue, because they see the effects of millions of dollars of potential income that are lost every year. Local management would benefit communities by helping to offset the property tax revenue caps.
Have changes in the BLM's resource management over time affected your community? In what ways?	Ben said he had seen harvest studies from the 1930s that would have allowed for 10% of the forest to be harvested at a sustainable rate. In his view, the steep decline in harvest since the 1990s has resulted in forests that are overgrown, begging questions about how to manage this enormous resource.
Are there changes in the ways that the BLM manages its resources that would increase your community's capacity and resiliency?	Ben feels that there has been a transition within the BLM from a pragmatic management approach to a more "idealistic" (let the forest be) mindset. He sees this as flawed and somewhat inconsistent, for example, managed hunts for some species and protections for others. Ben said that if the BLM opened up more timberland for harvest it would have positive direct and spillover effects on the local economy.

Question	Discussion/ Response
	BLM has very few trails and campgrounds near Coquille – Ben felt there are more in the eastern part of the planning area. Ben feels that Coquille residents would benefit from the availability of more access into the forest. It could also be another attractor for tourists. The Coquille River provides opportunities for recreational fishing.

City of Gold Beach

Date: July 10, 2014

Participants:
Jodi Fritts-Matthey, City Administrator; City of Gold Beach
Will Newdall, Public Works Superintendent; City of Gold Beach
Clive Graham, Principal; ERM
Jill Bellenger, Associate Consultant; ERM

Table P-22. City of Gold Beach interview

Question	Discussion/Response
How do you view your community's 'capacity,' that is your community's ability to face changes, respond to external and internal stresses, create, and take advantage of opportunities, and meet its needs?	Gold Beach is a small city with limited capacity. Its population is approximately 2,500 and it is located in Curry County, which has the smallest population among Western Oregon counties – 22,300. Gold Beach is the County seat, which provides some stability but, overall, there are only approximately 1,400 jobs in a 5-mile radius of the city. According to the Census, the city added approximately 660 people between 2000 and 2012. Jodi Fritts (Jodi) stated that Gold Beach used to be totally timber dependent. In the mid-1980s, the city experienced a major economic setback when its only timber mill burned down and was not rebuilt. The mill had provided jobs for many residents, and its loss left a significant "economic hole that has not been filled." There are no longer means to process timber in Gold Beach, and the closest mill is in Brookings, OR, roughly 30 miles away. Jodi said that during the recession of the mid to late 2000s, the public sector took a huge employment hit in the city and in the County, especially considering their relatively low populations. She said that Gold Beach "lost hundreds of Federal, State, local and school district jobs." These job losses have resulted in a severely stressed level of economic capacity. The Census data state an unemployment rate of 5% for the city, but Jodi believes this is low. Data from the Bureau of Labor Statistics (June 2013–May 2014) indicate Curry County's unemployment rate is between 10.0 and 11.9%, putting the County's rate above the State's (7%). Currently, the city's major economic drivers are tourism and government. Tourism is based on the beaches, hiking, horseback riding, and boating and rafting.

Question	Discussion/Response
How do you view your community's 'resiliency,' that is your community's ability to adapt to change over time?	Gold Beach has struggled to adapt from its former timber-reliant economy. Jodi says that the city's basket essentially had only one egg (the timber egg) and that tourism jobs have not been equivalent replacements. She added that the city has not recovered from the job losses during the recession; to her, it was, and remains a "depression." (Jodi cited the Grapes of Wrath in describing the recession's impacts). Jodi states that the city is trying to grow its tourism economy. But, it is not easy for a small, relatively isolated place with limited options and opportunities. Growing tourism has been a "tough sell" among some residents who hold on to the possibility of a return to a better economy through logging. In short, the city's resiliency is extremely low.
How do the ways the BLM manages its resources affect your community (its capacity and resiliency)?	The BLM only owns a small portion of land in the upper portion of Gold Beach at the Rogue River National Recreation Trail. As such, the BLM's management has no effects on the city. The U.S. Forest Service has much larger land holdings, approximately 70% of the land; but, to Jodi's knowledge, there have been no timber sales in recent years from U.S. Forest Service land. Some city residents look back fondly at the older timber-dependent economy. But, in Jodi's view, any effort by the BLM to contribute to the city's capacity is 30 years late. The BLM has some land near Cape Blanco State Park (Cape Blanco lighthouse), which is managed by the Oregon Parks and Recreation Department, but this is some 30 miles north of Gold Beach.
Have changes in the BLM's resource management over time affected your community? In what ways?	Any small role the BLM had when the city's mill was operating has now gone. The city is responsible for providing nearly all services within the city. The city does not benefit directly from timber payments to counties. The only services the county provides in the city are the jail and maintaining county roads in the city (approximately 15% of the roads). The jail is important because if it exceeds capacity inmates are released into Gold Beach.
Are there changes in the ways that the BLM manages its resources that would increase your community's capacity and resiliency?	If BLM's management could result in increased payments to Curry County then pressure on the County's budget would decrease and make it more likely that county services in the city are maintained.

City of Drain

Date: July 25, 2014

Participants:
Suzanne Anderson, Mayor; City of Drain
Clive Graham, Principal; ERM
Jill Bellenger, Associate Consultant; ERM

Mayor Anderson provided written responses to the questions. These are provided verbatim, followed by input from the personal interview.

Table P-23. City of Drain interview

Question	Discussion/Response
How do you view your community's 'capacity,' that is your community's ability to face changes, respond to external and internal stresses, create, and take advantage of opportunities, and meet its needs?	*Written response* In times of sustainable economic growth, our community has the ability to take advantage of opportunities to create new jobs, businesses and focus on increasing the overall health and prosperity of our community. Also, we can focus on infrastructure improvements, including streets and utilities (electric, water, sewer & communications). *Interview* Mayor Anderson (Suzanne) said she had lived in Douglas County all her life. She said that unemployment in Drain was around 40% versus the 10% figure cited in the data from the Census. She said the logging population had fallen drastically, due to lack of demand and mechanization of the logging industry. Drain is down to only one working mill, Emerald Forest Products, which trucks veneer in to be dried, and then ships the dried veneer back to other plants to make plywood. Drain's population is not growing and enrollment at the city's combined elementary/middle school and high school has declined from about 500 to 345. Nevertheless, the school district remains one of the largest employers.
How do you view your community's 'resiliency,' that is your community's ability to adapt to change over time?	*Written response* DIFFICULT! Significant changes (governmental policies, recession, etc.) resulting in job loss and less income flows significantly affects our ability to maintain community stability. When these changes occur the overall socio-economic health of our community declines and it is very difficult to adapt to changes without corresponding changes in governmental policies that create opportunities for socio-economic growth. *Interview* It is difficult for a small city to actively "adapt." The city did however have a recent success— as much by chance as by effort. Malcolm Drilling, a specialty-drilling contractor in the deep foundation industry, purchased

Question	Discussion/Response
	Drain's former North Douglas Wood Products facility in 2013, and is now one of the city's major employers. Local colleges are gearing more programs to help former loggers find the assistance they need to start new careers, though the older generation loggers are finding it difficult to transfer their skills into new trades or professions. Mayor Anderson has seen the city of Drain struggle as mills closed and Douglas County lost funding from timber receipts. The city is unable to fund a police force and therefore contracts with the County's deputies to fill this need. The countywide library system has also suffered, and lacks funding to upgrade computers and other services. Other services the county provides that affect the city are the jail, health and social services, and juvenile services.
How do the ways the BLM manages its resources affect your community (its capacity and resiliency)?	*Written response* It has a direct effect on our community. BLM's statutory authority for managing resources on O&C and Coos Bay Wagon Road (CBWR) lands is the O&C Act of 1937. This law dedicates the O&C and CBWR lands to permanent timber production through long-term sustained forestry to help support local communities and O&C county governments with revenues from the sale of timber and by supplying timber to local industries for the purpose of creating jobs and income. BLM's management direction must, therefore, give the highest priority to achieving those results. Planning decisions for the management of these lands must be designed to: (1) create jobs and income flow within the O&C Counties; (2) create opportunities for growth in the timber and related industries; (3) provide a sustainable source of revenues to O&C Counties based on the principles of sustained yield timber production; (4) increased tax revenue to the State of Oregon; and (5) contribute to the stability of communities in Western Oregon. Fifty percent of the receipts from the sale of timber from the O&C lands are distributed to the 18 O&C Counties in which the lands are located. That 50% is distributed to the Counties according to their proportion of the total assessed value of the lands and timber that existed in each of the Counties in 1915. These percentages range from 0.36% to 25.05% for the 18 Counties. It does not matter in which Counties the timber is harvested. All Counties get their assigned percentages of whatever receipts are available each year. In Douglas County, we receive about 25%. The receipts are available to O&C Counties without restriction to be used for essential services, including especially public safety programs such as sheriff's patrols and corrections, as well as health and social services, libraries and programs for juveniles and seniors. These services have both a direct and indirect effect on residents of my community. *Interview* Suzanne said that historically Douglas County has been one of the highest recipients of payments to counties, making it more dependent and more

Question	Discussion/Response
	vulnerable. Suzanne said the city did not benefit from the BLM's recreational resources.
Have changes in the BLM's resource management over time affected your community? In what ways? Are there changes in the ways that the BLM manages its resources that would increase your community's capacity and resiliency?	Major changes in forest policies occurred in 1995 and continue today that significantly reduced BLM's ability to manage the O&C and CBWR lands for permanent timber production through sustained yield forestry. Significant negative socio-economic impacts have occurred in the form of job loss and increased unemployment; reduced income flow; business closure and/or reduction in operations; and reduced County and community services. In addition, significant increases have occurred in crime activities, mental health and drug addiction issues, and other social impacts that have affected the quality of life for residents living within communities. The healthy functioning of O&C County governments and communities they serve depends in substantial part on the BLM's compliance with the O&C Act. Changes in the way BLM manages O&C forests to comply with its mandatory O&C statutory authority must be addressed in a land use planning revision for O&C and CBWR lands. Simply stated, BLM plan revisions must significantly identify the availability of more forestlands for timber production that can be sold, cut and removed on a sustained yield basis. This in turn will create sustainable economic growth in communities by taking advantage of opportunities to create more jobs and increase income flows; develop new businesses and revive old ones, and increase the overall health and prosperity of communities. If, on the other hand, BLM chooses to maintain the status quo or further reduce the availability of timber that can be sold and harvested on a sustained yield basis, communities will continue to decline from a socio-economic perspective. Without major changes in the way BLM manages these lands, some O&C Counties will become incapable of providing essential County services and, therefore, cause communities residing within the O&C Counties to continue to suffer and decline, which we have already recently experienced. *Interview* Drain currently only has logging rights on private lands, and the Mayor feels that the area could significantly benefit from gaining access to logging on Federal lands. There have been clashes between cities and environmentalists, making it difficult for the cities to move forward in a way that could be mutually beneficial. Cities are required to agree to numerous environmental regulations, which the Mayor feels that Drain goes above and beyond these regulations and is still experiencing push back from environmentalist groups. The Mayor points out that the BLM should have a leadership role in these timber disputes and considers all possibilities and outcomes.

City of Florence

Date: July 31, 2014

Participants:
Larry Patterson, City Manager Pro Tem; City of Florence
Clive Graham, Principal; ERM
Jill Bellenger, Associate Consultant; ERM

Table P-24. City of Florence interview

Question	Discussion/Response
How do you view your community's 'capacity,' that is your community's ability to face changes, respond to external and internal stresses, create, and take advantage of opportunities, and meet its needs?	Larry Patterson (Larry) moved to the State of Oregon in 1986 and served in city administration in Bend and Oregon City, retiring in 2010. Larry recently joined the City of Florence as an interim City Manager. Florence is a coastal resort town with a large elderly population. Recreational tourism is important to the City, with the coast, golf, fishing, and a casino as major draws. Larry sees Florence's capacity being challenged, as the city experiences a weak overall economy and more and more costs forced upon it because of declining intergovernmental fund transfers. The City had about a 16% population increase between 2000 and 2012. The city's 65 years and older population (37%) is more than triple the share for the state of Oregon. Larry sees this high retiree population as posing some limits to contributing to the city's capacity—indeed the city's median household income is $35,000, at the lower end of the cities that were interviewed. Larry pointed out retirees with higher incomes (like in Bend, OR) have a greater positive fiscal impact for a city. The city's hospital and ambulance services are important to the large elderly population, and in tandem with these services is the higher demand for public transportation. The city ambulance service is provided by a private company, and supplemented with first responder service from the fire department. The Three Rivers Casino, owned and operated by the Siuslaw tribe of Native Americans, is located just east of the city. Larry feels that spillover spending in the city by casino guests is small though he thinks there are opportunities for stronger, mutually beneficial connections between the city and the casino. For example, he thinks both could benefit from more hotel rooms.
How do you view your community's 'resiliency,' that is your community's ability to adapt to change over time?	The city's traditional economy was based on timber and fishing. Both have declined. Florence had an icehouse but it was moved down the coast to Coos Bay (to a more direct location), and the city lost the jobs and associated business activity. The city has sought to adapt to changing circumstances by focusing on tourism but tourism does not provide the stability of the traditional industries. Tourism in Florence is very seasonal and though tourism

Question	Discussion/Response
	provides a continuum of jobs, many are lower paying jobs. Florence's main draw is its location on the Oregon Coast, but it has limited accessibility. It is on the Oregon Coast Highway (US Highway 101) but is not close to I-5. Larry feels that the city needs a vision and plan to grow its tourism industry. The city needs more hotel capacity and development of the "shoulder" seasons (extending the visitor season later into the Fall and Winter when the weather from time to time can be very pleasant). Florence has far less resiliency compared to larger cities; larger cities can recover more quickly from adversity. There is a budget proposal for a local gas tax increase in Florence in an effort to increase revenue for street improvements. Larry feels that, like all money measures, passage of such a measure will always be a challenge. A five-year moratorium imposed by the State legislature was recently lifted, meaning local governments are now able to seek voter approval for such gas tax increases.
How do the ways the BLM manages its resources affect your community (its capacity and resiliency)?	Larry sees the direct day-to-day impact from the BLM as small. He did point out that the BLM administers property with sand dunes on the north side of town. The BLM's lack of maintenance has meant that the city has had to take responsibility for removing sand. Sand removal affects roads and also affects local business such as Fred Meyer and the Sandpines Golf Links. In the bigger picture he thinks that the BLM's management affects the counties, and, in turn, the cities. As timber receipts have declined, jobs have been lost and discretionary funds for cities, streets, social services watershed enhancements along with other services have been cut. Larry sees the cost of fighting forest fires are a significant issue for Western Oregon. The costs are huge (one fire he cited cost $70 million) impacting State budgets and subsequently impacting Counties and cities as resources are directed away from other priorities. These cuts affect the entire State and therefore affect cities like Florence.
Have changes in the BLM's resource management over time affected your community? In what ways? Are there changes in the ways that the BLM manages its resources that would increase your community's capacity and resiliency?	Larry does not have answers to how to manage the forest. However, he feels strongly that a healthy forest industry is needed. The healthier the forest is the greater its ability to bring about positive economic effects on communities. An increase in the timber yield would benefit the local communities like Florence as well as the counties.

City of Grants Pass

Date: July 30, 2014

Participants:
Simon Hare, County Commissioner; Josephine County
Aaron Cubic, City Administrator: City of Grants Pass
Clive Graham, Principal; ERM
Jill Bellenger, Associate Consultant; ERM

Table P-25. City of Grants Pass interview

Question	Discussion/Response
How do you view your community's 'capacity,' that is your community's ability to face changes, respond to external and internal stresses, create, and take advantage of opportunities, and meet its needs?	Aaron Cubic (Aaron) has been with the city for two years having previously served in Roseburg. Commissioner Hare (Simon) is a south Oregon native. He lived elsewhere for around 10 years, including a stint with the Federal government in Washington DC. He returned to Oregon and been a Josephine County Commissioner since 2011. Aaron said that Grants Pass overall is doing relatively well based on several measures of capacity (such as population growth, employment diversity, per capita assessed property value). The city ranks high for livability. The city had a 50% population increase between 2000 and 2012. However, the poverty rate in 2012 was 21%. Aaron said the city has been striving to retain existing businesses and maintain a viable workforce, as it has navigated a shift from a timber and natural resource-based economy to a more diversified economy. He said that tourism and healthcare were important sectors of the local economy. The government sector is also important since Grants Pass is the county seat. Aaron praised the community college for doing a great job of matching people with the skills they need to find work, especially former timber employees. Simon added that he feels the city is at a "tipping" point with respect to responding to the impacts and effects of the management of forest resources. As an example he recounted that the last sawmill in Josephine County (Rough and Ready) had to close in 2012 for lack of inventory. It had been in the county for 92 years and had provided 85 jobs, historically as high as 225. Fortunately, it is expected to reopen with approximately 70 jobs in the near future. State funds have helped the mill with retooling. Recreation is important to the city and the county. The Rogue River is a particularly important resource.

Question	Discussion/Response
How do you view your community's 'resiliency,' that is your community's ability to adapt to change over time?	Grants Pass benefits from its relative size and capacity, but the city is highly dependent on the county. Simon said the city and county were "tied at the hip." Aaron feels that as the rural area has struggled economically due to the decline in the timber industry, the city has felt these effects both directly in strain on city services (public safety and social services) and indirectly due to reduced county funding. As the county struggles to fund programs, the effects are felt by the city which lacks the resources to make up shortfalls. Ballot measures that would increase tax levies had majority support in the city, but failed overall due to insufficient support in the rural areas. Josephine County administers services that are important to the city including juvenile services, the jail, the court system and district attorneys, and public health. Aaron says the city has been hit harder than other areas with the reduction of Secure Rural Schools (SRS) funding because of the decline in county resources that are now passed down from the county.
How do the ways the BLM manages its resources affect your community (its capacity and resiliency)?	Aaron and Simon said that the ways the BLM manages its timber resources directly affect the city. The BLM administers approximately 300,000 acres land in Josephine County, close to 30% of the county land area. This includes one of the largest contiguous O&C land areas in Western Oregon along the Rogue River in the northwest part of the County. If more Federal land were opened up for logging the timber industry would benefit and result in more timber-related jobs with direct beneficial impacts to the city, especially to former timber workers who are struggling to transition to new employment. Simon said that when there was more logging on Federal lands Josephine county was receiving $10 to $12 million annually in shared timber receipts, whereas payments under the SRS are currently approximately $5 million. Of these monies, a good deal is spent on roads. Simon said the county spent $1.5 million helping to maintain roads needed to access Federal lands. Fire is a huge concern for Grants Pass. Large fires in 2013 (such as the 54,000-acre Douglas Complex and Big Windy) effectively shut down the city causing economic losses, heat, human health effects, and negative reputational impacts. Reportedly, the Rogue River rafting companies lost $100,000 per day when they were unable to operate. Simon estimated that 25% of the fires in Oregon are in the BLM's Medford District.
Have changes in the BLM's resource management over time affected your community? In what ways? Are there changes in the ways that the	Simon acknowledges that there are no simple answers to the forestland management questions. He served on Governor Kitzhaber's O&C lands task force and has some familiarity with the issues. He thinks that the management is unbalanced; 300% of the Northwest Forest Plan's conservation goals were being achieved, but only 8% of the timber industry's goals. He is looking to the new round of RMP's for more balance. In Simon's view, if plans are written solely from the perspective of ecology, they will not be effective; ecological set-asides with no management will lead to

Question	Discussion/Response
BLM manages its resources that would increase your community's capacity and resiliency?	more fires. He is interested in water quality, but not just for its own sake; the Rogue River, for example, supports a $15 million economy based on fishing (salmon, steelhead) and other recreation (Josephine County Parks Dept. Study). Simon reiterated his feeling that Grants Pass/Josephine County are at a tipping point with respect to their resiliency. Absent change, the communities' inability to deliver services will create a failed situation that will affect their reputation and send them into an economic spiral they will have great difficulty recovering from. The county's tax rate (58 cents per $1,000 of assessed value) is the lowest in the State of Oregon. O&C Payments as proportion of the county budget is 13% (only in Douglas County is the share higher). Simon acknowledged that the property tax rate is low but added that this low number should not be taken out of context because other taxes and fees make up the total tax burden. There is strong community support for putting more forestland back into production and for clearing the dead/dying timber. Simon serves on the Interagency Salvage Committee. What, he asks, are they going to do with the 75,000 acres that burnt in the fire? He finds it very frustrating that a new plan has to be prepared after each fire. There should be an overall plan that is mutually agreed upon under which actions can be taken without unnecessary "reinventing the wheel." Simon feels that in the past when there were more people (including loggers) in the forest and the roads were more actively managed, these people in a sense were the first responders and were able to provide faster response times to emergencies. Now he sees fires escalating more rapidly as first responders are faced with overgrowth and blocked access roads.

City of Klamath Falls

Date: July 23, 2014

Participants:
Nathan Cherpeski, City Manager; City of Klamath Falls
Clive Graham, Principal; ERM
Jill Bellenger, Associate Consultant; ERM

Table P-26. City of Klamath Falls interview

Question	Discussion/Response
How do you view your community's 'capacity,' that is your community's ability to face changes, respond to external and internal stresses, create, and take advantage of opportunities, and meet its needs?	Nathan feels that Klamath Falls is challenged in terms of capacity. Traditionally the city was a natural resource-heavy, resource dependent community, with lots of lumber mills. Workers were able to get decent, well-paying jobs without having, necessarily, a high level of education. With the decline in the timber industry, much of the supporting timber infrastructure has disappeared and the city has struggled. Today the census data indicate the challenges: poverty rate of 24% (compared to 15% for Oregon); high number of lower paying jobs, relatively low rate of homeownership (42%), only 8% of jobs in manufacturing, unemployment rate of 10–12% (Bureau of Labor Statistics Klamath county data for June 2013–May 2014). Nathan cites as factors the loss of resource-based jobs and an influx of lower income retirees. While the population of the city is approximately 21,000, the area population is around 40,000. The city is surrounded by forest and recreation land. The city is the closest community to Crater Lake National Park, making it a destination. Klamath County has the highest per capita amount of outdoor recreation land (34,300 acres) compared to the other counties in the capacity/resiliency assessment. Tourism is important to the economy, but jobs in the tourism sector do not pay as well as those in manufacturing. The city's interior location off the interstate highway grid makes it hard to attract new industries. The city's largest job sectors are Health Care and Social Assistance, Education, and Retail. Oregon Institute of Technology, the only public institute of technology in the Northwest U.S., is a strong city asset.
How do you view your community's 'resiliency,' that is your community's ability to adapt to change over time?	Nathan says that the city is still a timber town at heart – the wild west. Opinions vary; some residents look back fondly at the older timber-dependent economy and yearn for a return. Others see the need to forge a new path. Nathan points out that the city is seeking to adapt from its former timber-reliant economy to a more diversified economy, but the challenges make this difficult. In that sense, the city has not turned around. He feels that some of the city's adaptation efforts have been stymied by an environmental interests/interest groups who are not from the area and do not have to live with the consequences of failed economic initiatives. Nathan gave as an example, a private developers interests/efforts to develop a ski resort (following the example of Bend) – which failed due to red tape and environmental concerns.

Question	Discussion/Response
	Nathan questions whether the city is being given the tools (or conversely is being denied the tools) to be resilient and allow it to adapt. The types of jobs that are interested in coming to the city are lower paying jobs such as call centers. Nathan spoke about the significant loss that the community felt about the Jeld-Wen's decision to move its corporate, global headquarters from Klamath Falls to Charlotte, North Carolina. Jen-Weld, windows and doors manufacturer, was Oregon's largest private company. As a result, manufacturing jobs remained while corporate executive jobs were lost. As another example, Nathan cited Collins, a wood products company, where employment at its Klamath plant was once as high as 1,200 but has fallen to 300. Industry consolidations have left the city with old mill redevelopment sites.
How do the ways the BLM manages its resources affect your community (its capacity and resiliency)?	While Nathan did not single out the BLM, he felt that its decisions are part of a larger decision-making environment that has resulted in the city's loss of capacity. The rules and regulations, which are formulated in metropolitan areas, have hurt and continue to hurt small rural cities. The overall result is pressure on the city's resources and strain on the social safety network. The BLM and the U.S. Forest Service manage some of the access roads around Klamath Falls that connect residents and tourists with forestlands and natural areas. There is strong support among residents for more access to public lands (off-road vehicles) to allow the public to use the resources. BLM's management of other resources such as minerals have a minimal effect on Klamath Falls.
Have changes in the BLM's resource management over time affected your community? In what ways? Are there changes in the ways that the BLM manages its resources that would increase your community's capacity and resiliency?	Nathan believes the supply should be increased – allowing a "reasonable" amount of logging. His view is that as the timber harvest continues to decline, trees tend to be smaller and grow closer together, dying in the forest as opposed to being harvested. This results in unhealthy forest land which is prime tinder for forest fires, which the area experiences on an annual basis. Nathan cited the Moccasin Hill Fire as a recentJuly 2014) example. Nathan sees the importance for the BLM to manage the city's public lands for more than only recreation and to provide more resource products. These changes would positively impact Klamath Falls and increase its capacity and resiliency

City of Junction City

Date: August 14, 2014

Participants:
Jason Knope, Public Works Director; City of Junction City
Clive Graham, Principal; ERM
Jill Bellenger, Associate Consultant; ERM

Table P-27. Junction City interview

Question	Discussion/Response
How do you view your community's 'capacity,' that is your community's ability to face changes, respond to external and internal stresses, create, and take advantage of opportunities, and meet its needs?	Jason Knope (Jason) is a lifelong Oregonian. He thinks that Junction city's capacity is fairly high which he attributes in part to strong community engagement that has broadened the city's ability to meet its needs and face change. Junction City is located approximately 15 miles northwest of Eugene and is surrounded by agricultural land in the Willamette River valley. The city benefits from its proximity to both rural and urban environments and opportunities. The city had a 15% population increase between 2000 and 2012. The city has a strong manufacturing economic sector comprising approximately 3,000 jobs, 25% of the jobs in a five mile radius (the largest in number of any of the cities in the sample— and Jason thinks the number may be closer to 35%). Historically this was due in part to the city housing the Country Coach Recreational Vehicle manufacturing plant. At its height, the company had between 500 and 600 employees. It went bankrupt in November 2009, but has recently reopened under the same name, though now with approximately 100 employees focusing on refurbishing and modernizing RV interiors. Jason said that the economy in Junction City is fairly diverse, though it has little today in the way of timber-related industries. He estimates that about 5% of the city's workforce is directly related to the timber industry, or indirectly in a support capacity. Jason added that some of the city's labor force work in Eugene. There is a small tourism and visitation economic component, Junction City being in Oregon wine country—the city is gateway to the Long Tom agri-tourism trail.
How do you view your community's 'resiliency,' that is your community's ability to adapt to change over time?	The city's traditional economy was based on timber and farming, but as noted above is now quite diverse. Jason feels the city has done a good job in diversifying after the decline of the timber industry. He attributes this in part to geography and locational opportunities (the city is located on Oregon Route 99 truck route) but also, in his opinion, to unusually strong community engagement and involvement that has led to development of a strong community vision. For example, Jason points out that the city currently has three different committees dealing with community development, looking at the potential ripple effects of different community development options in different locations in relation to the vision for the city's future. These committees engage in "what ifs" – helping the city decide its investment and development policy.

Question	Discussion/Response
	Agriculture in the area has also changed. Agriculture has always been an integral part of Junction City's economic landscape, but Jason explains that there has been a shift from the traditional grass, hay and seed crops to organic crops; wheat and barley, and to biofuels. He estimates this sector now makes up between 40% and 50% of agricultural production. Jason believes the city learnt lessons through its experience with Country Coach, primarily to push to broaden its horizons. It expanded its Urban Growth Boundary, examined its fees and rates schedules to ensure the city was attractive to development, invested in infrastructure, engaged the community, explored development scenarios, and looked for opportunities to diversify. This included a prison, which did not move forward, and a new psychiatric hospital, part of the Oregon State Hospital system, which is scheduled to open in 2015.
How do the ways the BLM manages its resources affect your community (its capacity and resiliency)?	Jason feels the direct day-to-day impact from the BLM on Junction City is relatively small. The city has moved on compared to 10–15 years ago when it was more timber-dependent. He thinks there are two or three lumber mills outside town, inside the Urban Growth Boundary - Seneca Sawmill, Lane Forest Products, and Weyerhaeuser - and perhaps one mill in town, a processing packing business that relocated from Eugene. However, as noted above, overall employment in timber industries is small. In the bigger picture, he thinks that the BLM's management affects the counties, and, in turn, the cities. Specifically, as timber receipts have declined, discretionary funds have been cut. Jason explains that until 2008 Junction City was receiving between $60,000 and $65,000 a year in timber receipts funds from Lane County for the city's street fund. This was the second largest source of funding after gas tax receipts (approximately $300,000). The city no longer receives these monies, which is regrettable as the city was using them for pedestrian-related projects.
Have changes in the BLM's resource management over time affected your community? In what ways? Are there changes in the ways that the BLM manages its resources that would increase your community's capacity and resiliency?	Jason believes that an increase in timber production would have a positive effect on Junction City. Over time, the timber-related industries have shrunk to some degree, though he notes that they have not gone away entirely. More timber opportunities would certainly provide the community with more options and he sees a more reliable timber resource as a benefit to the area overall.

City of Lincoln City

Date: July 11, 2014

Participants:
David Hawker, City Manager; Lincoln City
Clive Graham, Principal; ERM
Jill Bellenger, Associate Consultant; ERM

Table P-28. Lincoln City interview

Question	Discussion/Response
How do you view your community's 'capacity,' that is your community's ability to face changes, respond to external and internal stresses, create, and take advantage of opportunities, and meet its needs?	Lincoln City has an interesting capacity mix. The assessed value of property in the city is high but residents' incomes are low. This is due to the nature of the city as a vacation and second home destination on the Oregon Coast. Roughly, a third of the housing stock in the city is second homes, owned mostly by residents of Portland and Salem. It is the premiere beach town destination within driving distance of these larger municipalities. Lincoln City serves a variety of residential and visitor markets. The city has a large number of short-term rental units (hotel, motel vacation rental dwellings); about 4,000. This helps make it a fairly inexpensive place to visit. A variety of well-priced long-term rentals are also available. With its low cost of living, it also attracts retirees. This variety provides a high flux of visitors and seasonal residents over the course of the year, and the city accommodates and benefits from this variety. The city is home to a retail outlets mall and the Chinook Winds Casino, operated by the Confederated Tribes of the Siletz. Low resident incomes are due to the concentration of employment in retail, accommodation, and food service jobs. This includes seasonal employment. David feels that Lincoln City has high capacity because its economic diversity makes is less sensitive to economic ups and downs. Low resident income is a concern but is offset to some degree by the property tax base and visitor spending.
How do you view your community's 'resiliency,' that is your community's ability to adapt to change over time?	Resiliency was to some extent thrust on the city. During the 1960s, partially as a result of the Clean Water Act, three cities and three unincorporated areas became incorporated as the City of Lincoln City. This created rational, consolidated boundaries for efficient delivery of city services.
How do the ways the BLM manages its resources affect your community (its capacity and resiliency)?	The BLM has very little direct effect on the city. Approximately 60% of Lincoln City's watershed is in Federal ownership, but the BLM owns very little compared to the USFS. Water quality could be a major concern, but the decline in logging since the 1990s on all Federal lands has meant that potentially impactful logging practices have not occurred.
Have changes in the BLM's resource	Recreation is a major component of Federal land management in the area. What drives tourism in Lincoln City is the beach but, increasingly, opportunities to

Question	Discussion/Response
management over time affected your community? In what ways? Are there changes in the ways that the BLM manages its resources that would increase your community's capacity and resiliency?	experience the spectacular landscape and natural areas by hiking, trails, and scenic viewing, hunting and fishing. For example, the U.S. Forest Service maintains the Cascade Head National Scenic Research Area in the Siuslaw National Forest, which has congressional legislative limits for activities. While logging on private lands occurs, David was not aware of Federal timber sales. Whatever the BLM can do to maintain and increase access to this landscape for recreation would benefit Lincoln City. David speculated that if land swaps between the BLM and the USFS could be affected, this could provide opportunities for better management. The city does not benefit directly from timber payments to counties. David thought that payments to Lincoln County were earmarked for social services, so increases in payments could have an indirect beneficial effect on city residents.

City of Molalla

The City of Molalla was unavailable for an interview. However, Molalla City Manager, Dan Huff, provided written responses to the questions. These are provided verbatim below, followed by some additional observations by ERM.

Table P-29. City of Molalla interview

Question	Discussion/ Response
How do you view your community's 'capacity,' that is your community's ability to face changes, respond to external and internal stresses, create, and take advantage of opportunities, and meet its needs?	*Dan Huff written response* Today, Molalla is in a fairly strong position to react to change and respond to opportunities. Molalla never really grew up when the mills closed in the 1980s due to a large influx of residents that were commuting to Portland and Salem area employment. Because of that change, the city did not have to face that changing economy until the late 2007–2012. Today our capacity and infrastructure is managed for growth and expansion, capitalizing on the recreation and agriculture in the region. *Additional observations* The city benefits from its proximity to both Portland and Salem, which are about 30 and 40 miles away, respectively. Molalla has experienced a significant population increase (42%) between 2000 and 2012. At just over 8,000 residents, the city has a relatively low percentage of its population below the poverty level (11%) compared to the State percentage (15%). Molalla is the gateway to the Molalla River Recreation Corridor, attracting visitors year-round for sightseeing, fishing, hunting, water sports, camping, mountain biking, and horseback riding.
How do you view your community's 'resiliency,' that is your community's ability to adapt to change over time?	*Written response* Molalla is a tough town and people choose to live here today. The economic and fiscal storms have not changed the longtime resident's belief in their community as a great place to live or come home to. Molalla has adapted and accepted that part of its role is as a commuter city but with a vibrant past that is connected to timber.
How do the ways the BLM manages its resources affect your community (its capacity and resiliency)?	*Written response* BLM's management of resources in the Molalla River corridor have not impacted the recreation component of this area recently. We do have some timber related jobs but there is not much timber-related activity in town today. Four in-town mills have closed since the mid-eighties and periphery businesses like saw shops, and equipment dealers go with the mills. There are two mills north of town, and the former in-town mills are redevelopment sites today. The old sites are now being looked at for redevelopment - one redevelopment area at the south end of town is now a bark and chip mobile unit.
Have changes in the BLM's resource	*Written response*

Question	Discussion/ Response
management over time affected your community? In what ways? Are there changes in the ways that the BLM manages its resources that would increase your community's capacity and resiliency?	Resource management has removed the historic job market from the area. However, Molalla continues to pursue other opportunities as a bedroom community to Salem and Portland. Because the farm or mill to market transportation corridors are not as high volume with trucks highway maintenance dollars have decreased in the area over the years at the State level. At this point probably not. Other than promotion of recreation, I am not sure how resource management would greatly impact the community today.

City of Rogue River

Date: July 22, 2014

Participants:
Pam VanArsdale, Mayor; City of Rogue River
Mark Reagles, City Administrator: City of Rogue River
Clive Graham, Principal; ERM
Jill Bellenger, Associate Consultant; ERM

Table P-30. City of Rogue River interview

Question	Discussion/Response
How do you view your community's 'capacity,' that is your community's ability to face changes, respond to external and internal stresses, create, and take advantage of opportunities, and meet its needs?	Mark has been with city for 20 years. He is a 4th generation Oregonian. Both he and his father worked in the timber industry and lost their jobs (Roseburg Lumber). He said that the City of Rogue River's capacity is closely tied to the timber industry. As the fortunes of the timber industry have ebbed and flowed, so have the city's fortunes – wreaking havoc with its economy and capacity. Before the 1970s, Rogue River had more than one mill. The city's one remaining mill (owned by Medford Corp) burned to the ground in 1990. It was rebuilt then sold, and resold, closing for long periods during transitions. The mill, located by I-5, is now owned by Murphy Plywood. It employs approximately 150 people – and is the largest employer, and taxpayer in the city. Murphy plans to add another shift, which could increase the number of jobs to about 250. Mark pointed out that timber-related employment is more widespread including truck drivers, loggers, construction workers, and machinists. The Rogue River School District is the second largest employer. The city lost over 400 residents (18%) between 2000 and 2012 and has an 18% poverty rate. Mark said that the city has seen an increase in retirement-aged residents and a decline in the school-aged population, to the point where one of the city's four schools had to close. In the late 1980s and 1990s retirees were coming from California; people interested in enjoying Oregon's great quality of life. Mayor VanArsdale (Pam) said that the city has seen a shift to service and retail jobs, but these jobs tend to be low wage compared to the higher, family-supporting wage jobs in the timber industry. Recreational tourism is a small portion of the city's economy. While the Rogue River is well known for rafting, that activity takes place upstream of the city. In 2009, the Savage Rapids (irrigation) Dam between Grants Pass and Rogue River was removed. While this benefitted fishes and fishing in the Rogue River, the city lost the lake behind the dam, which was used for boating. The city considered it a loss –the city gets little economic benefit from fishing.
How do you view your community's 'resiliency,' that is your community's ability to adapt to	Rogue River has struggled to adapt from a timber-reliant economy to a more diversified economy. The lack of diversity makes the city less resilient. Mark pointed out that because the city is small the ebbs and flows in timber-related employment have major direct and ripple impacts on the community. Rogue River cannot compete with the larger cities.

Question	Discussion/Response
change over time?	For example, he noted that during the 2007–2009 recession, the mill's assessed value fell from $13 million to $3 million—with severe effects on city tax revenues. The city's loss of population is an indication of the city's resiliency challenges.
How do the ways the BLM manages its resources affect your community (its capacity and resiliency)?	Mark feels that the way the BLM manages its timber resources directly affects the City. If more Federal land were opened up for logging the timber industry would benefit and result in more timber-related jobs with direct beneficial impacts to the City. With a stronger timber industry, more stable jobs could be offered and more people would set up roots in the community. This would result in more school-aged children being added to the school system, creating the need for hiring more education jobs. In places where the BLM has cut roads into the forestlands and properly managed these roads, it is easier for emergency vehicles to access particularly in the case of a forest fire. The BLM management of recreation resources has limited effects on the City. However, Mark did note that the BLM is working with a local group to open up an area for mountain biking approximately two miles from the City on the Rogue River Greenway, a 30-mile partially complete greenway between the Cities of Grants Pass and Central Point.
Have changes in the BLM's resource management over time affected your community? In what ways? Are there changes in the ways that the BLM manages its resources that would increase your community's capacity and resiliency?	In Mark's and the Mayor's view, the BLM should actively "manage" its lands and "use" the resource. Enough land has been preserved and timber should be cut which would have multiple benefits: economic (as described above); help manage the risk of fire, and, as a side benefit open up areas for hunting – for food and for recreation. Mark said he is a hunter and hunts on private and public land – he finds the hunting is better on private lands that are managed. Mayor VanArsdale felt that the forestland can be managed to meet both the environmental interests and economic interests, which will make for a more well-rounded economy. Mark feels that the BLM should allow more timber sales and boost the supply. He thinks the decline of timber is a supply issue – not an issue of jobs moving overseas.

City of St. Helens

Date: August 26, 2014

Participants:

John Walsh, City Administrator; City of St. Helens
Susan Conn, City Councilor; City of St. Helens
Clive Graham, Principal; ERM
Jill Bellenger, Associate Consultant; ERM

Table P-31. City of St. Helens interview.

Question	Discussion/ Response
How do you view your community's 'capacity,' that is your community's ability to face changes, respond to external and internal stresses, create, and take advantage of opportunities, and meet its needs?	John Walsh has served as City Administrator for St. Helens since 2012. Susan Conn has served as a City Councilor since 2012, and is a long-time resident. John had previously worked in Coos County and is familiar with timber issues. John noted that the city's capacity numbers look good with high population growth, a high working-age population cohort, and high median household income. However, he said that the numbers don't tell the whole story. John and Susan said that historically the city was a mill town and had several mills but the city has experienced a steady drop-off in timber-related employment in recent decades culminating in the closure of a Boise Paper plant in 2012; the plant had been winding down over time, but all told, the job losses totaled approximately 900. John said this was a devastating social blow for the city. The one remaining mill is the Cascade Tissue plant, which has approximately 60 jobs—a huge change for the city. John described St. Helens as a healthy, middle-class town, but essentially a bedroom community for Portland and Hillsboro, both approximately 30 miles away. Hillsboro is the location of one of Intel's product development and manufacturing campuses, and is the largest private employer in the State. John estimated that about three-quarters of St. Helens' residents commute out of the city to work. John and Susan said that while the city is fortunate to have this proximity to jobs, the jobs are not "in the city" and the result has been a loss of social cohesion. As examples, John cited the decline in participation in charitable organizations and social clubs such as the Kiwanis. Susan noted that three bookstores, including her own, had closed. St. Helens is the county seat of Columbia County and public administration is one of the larger job sectors (11%). St. Helens owns a 2,500-acre tree farm which it harvests for sale; no old growth.
How do you view your community's 'resiliency,' that is your community's ability to adapt to change over time?	John noted that change has been thrust on the city. The mills had provided commercial tax base and had supported the public utilities. With the mills' decline and the city's loss of income and inability to raise revenue due to tax caps, the city has had to enact double-digit rate utility increases over the past five years and has reduced its workforce by 30%. He noted that the tax rate, $1.90 per $1,000, is unchanged since 1995. As a result, revenues only increase if

Question	Discussion/ Response
	the assessed value goes up, but this too is capped. John said that the State has been doing a good job of retraining the workforce as fewer Oregonians are employed in the timber industry. Susan said that older generations have been especially affected by changes in the economic landscape in St. Helens. John said that the city is fortunate in that residents have alternative job options in Portland and Hillsboro. He thought that total employment was back to pre-recession levels, but not the same jobs. The city is working to adapt to the new economic environment. John said that the large mills were located along the Columbia River waterfront, which limited public access to this area. The city is working with Boise in order to acquire those properties and transition to new uses. The planning effort includes design collaborations between the city, Portland State University, and the American Institute of Architects. However, both he and Susan acknowledged that lack of a bridge over the Columbia river to I-5 is a major impediment to the city's economic development. John felt that generally cities had more resiliency compared to counties because the counties were tasked with more services and the cities had more options to raise revenues.
How do the ways the BLM manages its resources affect your community (its capacity and resiliency)?	There is relatively little BLM land near St. Helens, compared to many of the other cities in the sample, but the city is affected by the way the BLM manages its resources in that the county has cut services. Susan noted that the county got close to closing the jail in the city. John said that the city had never received pass-through Federal timber funds from Columbia County, and so had not relied on such funds.
Have changes in the BLM's resource management over time affected your community? In what ways? Are there changes in the ways that the BLM manages its resources that would increase your community's capacity and resiliency?	John sees a sustainable timber harvest as the key to increasing community capacity and resiliency. He did not think the entire decline of the timber industry was attributable to the BLM; there were many other factors to consider. He noted that St. Helens had not been affected by the forest fires that had affected other parts of the State.

City of Sublimity

Date: July 28, 2014

Participants:
Sam Brentano, County Commissioner; Marion County Board of Commissioners, former Mayor of Sublimity
Hitesh Parekh, Management Analyst; Marion County
Clive Graham, Principal; ERM
Jill Bellenger, Associate Consultant; ERM

Table P-32. City of Sublimity interview

Question	Discussion/Response
How do you view your community's 'capacity,' that is your community's ability to face changes, respond to external and internal stresses, create, and take advantage of opportunities, and meet its needs?	Commissioner Brentano (Sam) is a former Mayor of Sublimity (1983–1993) and understands its unique needs and challenges. He recalls that Sublimity was formerly an almost entirely agricultural- and timber-based economy, which has shifted dramatically in recent decades as all the mills in Marion County have closed. He recalled that in the 1970s and 1980s there were mills in many of the nearby towns and many mill owners lived in Sublimity; at that time, he said, the city had a high per capita income. Today he described Sublimity as a healthy, middle-class town – but essentially a bedroom community for Salem. There is little or no involvement by the city's residents in forest-related industries, whereas these used to be a key source of economic vitality. In spite of high household incomes (Sublimity's was the highest among the cities interviewed) its tax base is too low to cover many necessary services. The city contracts with Marion County for public safety (Sheriff), and relies on the county for many services including public safety, courts, and solid waste. The county spends 80% of its general fund on these services. The city depends on the county for so many services that as the county's ability to provide services is strained, the city's capacity is reduced.
How do you view your community's 'resiliency,' that is your community's ability to adapt to change over time?	The city has changed over time as described above. Sam said that Marion County, by having less BLM acreage, is not as dependent as other O&C Counties on timber. The county payments (Secure Rural Schools and PILT) help, but they currently total $5 to $6 million a year and make up a small share of the county budget.
How do the ways the BLM manages its resources affect your community (its capacity and resiliency)?	Sam said that the BLM owns approximately 20,000 acres of land in Marion County while the U.S. Forest Service owns 200,000 acres making the BLM's impact on the county lower than in other counties. Sam's concern is with the way the BLM (and other agencies) manages the timber resources. In his view, it should be treated like a crop and managed to help communities. This is not how the timberlands are currently being managed, and as a result, they contribute little to the community's capacity. In some respects, lack of management is a drain on resources. For example, the county has to spend timber dollars to pay for Sheriff's deputies to patrol around the

Question	Discussion/Response
	forest. Sam thought there was more Federal patrol oversight in the past. Sam also believes that the mismanagement contributes to the number and extent of forest fires. The BLM has some small recreation areas near Sublimity, which are used by residents, namely the Elkhorn Valley Recreation Site (Little North Santiam Recreation Area, Yellowbottom Recreation Site, and Fishermen's Bend). These are small and contribute little to overall community capacity.
Have changes in the BLM's resource management over time affected your community? In what ways? Are there changes in the ways that the BLM manages its resources that would increase your community's capacity and resiliency?	In Sam's view, the key to increasing community capacity and resiliency is a sustainable timber harvest. The lack of timber harvest has hurt communities by reducing income and leaving a resource that is simply waiting to burn – this is bad policy. The market is there for Oregon. Canada stepped in and took market share as the U.S. stopped producing.

City of Winston

Date: August 25, 2014

Participants:
Sharon Harrison, Mayor; City of Winston
Ken Harrison, former U.S. Forest Service employee
Kevin Miller, Superintendent; Winston-Dillard School District
David M. Van Dermark, City Manager; City of Winston
Clive Graham, Principal; ERM
Jill Bellenger, Associate Consultant; ERM
Kristina Higgins, Intern; ERM

Table P-33. City of Winston interview

Question	Discussion/Response
How do you view your community's 'capacity,' that is your community's ability to face changes, respond to external and internal stresses, create, and take advantage of opportunities, and meet its needs?	Both Mr. (Ken) and Mayor (Sharon) Harrison are long-time residents of Winston, having owned and operated the Harrison Hardware store for over 20 years prior to its sale in 2013. Ken is also a former timber industry employee; he worked for the U.S. Forest Service as well as private timber companies that worked with the BLM and the U.S. Forest Service. The city's population increased by 16% between 2000 and 2012 (from 4,613 to 5,352), but Winston's poverty rate in 2012 was 30%, twice the rate for the State as a whole. Kevin said that Winston struggles with economic resources and is "living close to the bone." The city is becoming a retirement community. While retirees help the city fiscally to some degree—paying property taxes, for example—they don't tend to spend much and as a result do not contribute to the local economy as much as the family-wage jobs that used to be more prevalent. Kevin pointed out that the nearest major medical center is in Roseburg (roughly 10 miles north) where there is a VA hospital. Winston residents may spend their dollars in Roseburg when attending medical appointments. David says that the city is open to development and is very business-friendly. It has capacity for growth and is ready to grow. The Cow Creek Band of Umpqua Tribe of Indians owns land near Winston in the city's growth area, but it has little impact on the city's capacity. The Tribe raises alfalfa and beef cattle. The Tribe owns a casino in Canyonville approximately 25 miles south of Winston along Interstate 5.

Question	Discussion/Response
How do you view your community's 'resiliency,' that is your community's ability to adapt to change over time?	Sharon says that Winston was and remains a timber-dependent community. Roseburg Forest Products, which is in Dillard about 3 miles south of Winston, employs 1,200–1,500 people at several mills. (This accounts for the high number of jobs in the manufacturing sector in a 5-mile radius around the City in the Census data). There were many layoffs there in 2008 but employment has almost recovered. Kevin added that mechanization has affected employment. A shift that used to require 100 people now needs only 30. The city has struggled to adapt to a changing economy and demographics. Kevin said that in 1980s the school district had some 2,000 children; today there are approximately 1,400. There is a sense that the job growth is in Portland. The Winston community today is very mobile and people move to the jobs. The community has also lost truck farms. New businesses such as wineries have opened but the wages, relatively speaking, are lower. Sharon feels the overall income in Winston has been reduced.
How do the ways the BLM manages its resources affect your community (its capacity and resiliency)?	Ken said that the BLM's management practices affect the community greatly. He said that recent policy is marked by lack of management. The only tree cutting is thinning which leaves the old growth trees that can't be touched due to the Endangered Species Act. Winston and the surrounding Douglas County have a huge forestland base – which is a renewable resource, unlike minerals, which are a one-time extraction. However, unlike 20 years ago when the BLM was more actively managing these lands and timber harvests were putting dollars into the county budgets, today the city does not get the benefits it used to. David points out that in the past the cities were given pass-through funds from Secure Rural Schools to help manage their road maintenance. Winston received $100,000 annually (a quarter of its $400,000/year road budget) until these funds were stopped in 2010. The lack of O&C funds has resulted in raised costs to the city, such as IT, jail beds, and radio communication. He does not blame the BLM; rather he puts the blame on environmental interests who file frequent lawsuits against the BLM. Kevin noted a recent lawsuit regarding the Elliott State Forest. The forest is part of the Common School Fund Lands to be managed for the benefit of the schools under the Oregon Constitution. A portion of the forestland, under the instruction of the State Land Board, is slated to be sold to a private entity, though environmental groups have claimed that this sale should not be allowed to take place. The Winston-Dillard School District has filed an amicus brief in support of the sale, as this will result in a harvest and sales benefits for schools. Kevin said that the BLM is decommissioning roads – creating a more natural environment but limiting access to the forest. This is a serious problem with respect to access for first responders in the event of a forest fire, preventing access for emergency vehicles. In addition, this reduces forest access from a recreation standpoint. Kevin did wish to point to an alternative education program; a collaboration with the BLM that teaches children about working in the forests and on stream

Question	Discussion/Response
	restoration. He sees this as a very beneficial program.
Have changes in the BLM's resource management over time affected your community? In what ways? Are there changes in the ways that the BLM manages its resources that would increase your community's capacity and resiliency?	David feels that if the BLM should get back to timber harvest and land management in the manner in which it did in the past. This would provide revenues and reduce the incidence of large forest fires and other problems. In his view, the BLM is not in compliance with the O&C Act - requiring that the lands be managed to contribute to the economic stability of local communities and industries. He feels that there is worldwide market demand for timber products, as well as a need to harvest the timber in an efficient and economically viable way. Oregon produces Douglas-fir, a great tree for framing houses. As Oregon scaled down its harvest, Canada has been increasing its timber exports and sends logs to the U.S. to be milled.

Confederated Tribes of the Grand Ronde Community of Oregon

Date: July 8, 2014

Participants:
Heather Ulrich, District Archaeologist; Bureau of Land Management
Michael Wilson, Natural Resources Department Manager; Confederated Tribes of the Grand Ronde Community of Oregon
Clive Graham, Principal; ERM
Jill Bellenger, Associate Consultant; ERM

Table P-34. Confederated Tribes of the Grand Ronde Community of Oregon interview

Question	Discussion/ Response
How do you view your community's 'capacity,' that is your community's ability to face changes, respond to external and internal stresses, create and take advantage of opportunities, and meet its needs?	The word "community" needs to be understood broadly. It needs to consider the greater membership of the Grand Ronde tribes, not just those living on the reservation or in the tribally owned lands in the (unincorporated) town of Grand Ronde. The tribes have 5,000–6,000 members spread out over the lands that were ceded to the U.S. including, for example, in the BLM's Roseburg and Medford districts. Mike said he would look for membership data to supplement the census data that is specific to tribally owned lands. The Grand Ronde's capacity has increased over time, for example, since the Northwest Forest Plan, but the Community still faces challenges in serving its members and meeting its mission. There are more jobs today than back then but this is not attributable to the BLM. Funding for tribal functions comes from a variety of sources. Mike estimated the income from timber sales at approximately $2 to $3 million a year. The Tribes get the majority of their funds from the casino. The Tribe does not levy a property tax. Mike said he would look into measures of community income/wealth that might be comparable to, for example, the tax base of a city or county, in order to help the BLM understand the Tribes' financial capacity. The Grand Ronde has taken on community building functions such as housing, education, and health care. The State passed legislation allowing tribes to create their own police departments. Grand Ronde has a police department in the town of Grand Ronde (unincorporated), and has developed its own fire station. The members living in this area wanted to make sure they had these services (where county services were lacking). The Tribes have established a "Spirit Mountain Community Fund" to support members and projects throughout the Tribes' geographical areas of interest. The fund is supported by revenues from the casino. It has helped fund, for example, a charter school and an environmental project on the Willamette River.
How do you view your community's 'resiliency,' that is your community's ability to adapt to change over time?	The Tribes have shown their resiliency in the way they have diversified their economy; the Spirit Mountain Casino, for example, being a major economic driver. The diversification has helped the Tribe's resilience. During the recession, there was a significant drop in casino revenues.

Question	Discussion/ Response
How do the ways the BLM manages its resources affect your community (its capacity and resiliency)?	Members have an interest in gathering plants when needed on BLM land, hunting, and access to places of spiritual significance. Mike felt the BLM has done a good job in meeting those needs and interests. The way the BLM manages its timber resources affects the community. Many tribal members live in timber-dependent communities. The Grand Ronde sells timber from its reservation. The Tribes understand the need for mills, loggers, and competition. The BLM can play a role in maintaining the industry. A healthy industry is important to support the services that are important to tribal members such schools, police, fire, and roads. As Mike talks to people in the timber industry, the importance of having a predictable supply of raw material is very important. In addition, if the mills are too far away the logs lack value; competition is important. Mike said he would send the forest management plan (10-year plan) for the Grand Ronde's forest. Mike did not see a direct correlation between the BLM's resource management and the casino revenues that are driven by broader economic trends. There are management issues on the micro level. For example, there is about a mile of boundary sharing on the eastern side of the Grand Ronde reservation, where the tribes share a road with the BLM.
Have changes in the BLM's resource management over time affected your community? In what ways? Are there changes in the ways that the BLM manages its resources that would increase your community's capacity and resiliency?	The lack of predictability in the timber market and sales has affected tribal members in that timber supports the broader economy. If the broader economy is doing well then the Tribes will benefit too. The ways BLM manages cultural resources and natural resources/habitat affects the community. The BLM could work with the Tribes to find the right balance in protecting these resources, and provide more resource-based jobs to help industry. With respect to hunting, there is disappointment over declining opportunities to hunt deer and elk - fewer openings and meadows due to lack of active management, so the hunting areas for those species have declined. But Mike thought this was more of a U.S. Forest Service issue than a BLM issue.

Coquille Indian Tribe

Date: July 14, 2014

Participants:
Brenda Meade, Tribal Chairperson, Coquille Indian Tribe
George Smith, Executive Director, Coquille Indian Tribe
Mark Johnston, Deputy Executive Director, Coquille Indian Tribe
Clive Graham, Principal; ERM
Jill Bellenger, Associate Consultant; ERM
Heather Ulrich, District Archaeologist; Bureau of Land Management

Table P-35. Coquille Indian Tribe interview

Question	Discussion/Response
How do you view your community's 'capacity,' that is your community's ability to face changes, respond to external and internal stresses, create, and take advantage of opportunities, and meet its needs?	George gave a little background recent history about the Coquille Indian Tribe. The Coquille Indian Tribe was terminated in 1954, but the United States reinstituted Federal recognition to the Tribe and restored its full sovereignty rights in 1989. Tribal membership is now approximately 1,000 across five counties in southwest Oregon. The 297 number in the Census data only reflects the population on the approximately 6,500 acres in the Census Bureau's boundary maps – mostly in the North Bend/Coos Bay area. The 1954 termination "cut loose" the membership resulting in more assimilation into local communities compared to reservations such as Warm Springs. This means that the socioeconomic state of the Tribe is closely bound up with local communities; the counties and cities, such as Coos Bay and North Bend. For example, Coquille children attend community schools so when these schools are affected by cutbacks, tribal children and families are equally affected. Southwestern Oregon was historically heavily dependent on timber and fishing. Coos Bay was an export center for the Oregon coast. Since the 1990s, there has been an 80% reduction in timber sales. As a result, Coos County and the Coos Bay area became economically stressed. The recession that began in 2007 was one more blow and the area has not recovered. Brenda added that the Tribe is currently facing the strain of responding to increasing needs of the tribal membership; increased population and healthcare costs. Census data indicate a tribal poverty rate of 23% compared to 15% for the State as a whole. The Coquille Indian Tribe is the second largest employer in Coos County, making it a vital part of the wider economic landscape. In summary, the Tribe has internal capacity and resources but is located in a region of Oregon with macro level economic challenges that strain the Tribe's capacity to meet its needs.
How do you view your community's 'resiliency,' that is your community's	The Tribe has shown its resiliency by its survival, resurgence, and recent population growth. The Tribe has adapted and continues to adapt to economic realities. The Mill Resort and Casino in Coos Bay is an important source of income for the Tribe, but revenues were significantly affected by the recession,

Question	Discussion/Response
ability to adapt to change over time?	and only now are they beginning to climb back to pre-recession numbers. Overall, economic recovery in southwest Oregon has been much slower than in the metropolitan parts of the State. The Tribe is engaged in economic development initiatives through the Coquille Economic Development Corporation. These include business ventures in forestry, arts and exhibits, gaming and hospitality, assisted living and memory care, high-speed telecommunications (Optical Rural Community Access Communications) and renewable energy. Because tribal and tribal members' fortunes are closely tied to the local communities, resiliency is also affected by the communities' lack of resiliency. For example, Brenda pointed out that in attempting to address budget constraints, the Coos Bay School District went to a 4-day school week during the 2013–14 school year. This type of action affects tribal members' lives.
How do the ways the BLM manages its resources affect your community (its capacity and resiliency)?	The timber industry is a major driver for Coos County and so that the way BLM manages its resources has a great effect on the community. The Tribe owns the Coquille Forest, comprised of 14 separate parcels of former BLM timberlands in eastern Coos County, totaling approximately 5,410 acres. The Tribe is legally mandated to manage the forest consistent with BLM's management practices. This places a financial management burden on the Tribe. Bureau of Indian Affairs funding covers some the need, but the Tribe has to supplement. The Tribe believes that the BLM's practices are not all in the Tribe's economic interests. For example, George said that BLM's practices follow guidelines in the Northwest Forest Plan but that these guidelines go beyond the requirements of the Endangered Species Act and NEPA. As a result, the forests are becoming overgrown and are not being given the opportunity to regenerate. The Tribe is proud of its management practices. The Coquille Forest is Forest Stewardship Council (FSC) certified. The Tribe is very concerned about habitat, water resources, and water quality – such as for salmon runs. George said that Tribal monitoring has been held up as a national model. Mark said that BLM's management of recreation resources had little effect on the Tribe. He did note BLM's role in helping manage the local Dunes National Recreation Area at the mouth of the Umpqua River that attracted visitors and some spinoff visitation to tribal facilities near Coos Bay.
Have changes in the BLM's resource management over time affected your community? In what ways? Are there changes in	Brenda feels that the Federal lands have not been managed well; very few jobs are generated. George added that the biggest change in resource management has been the decrease in the timber harvest. Practices have changed from allowing sales, Survey and Manage, then to only allowing thinning – all triggering lawsuits. George feels that BLM's forest management is driven more by risk aversion to lawsuits than by its obligations to manage for sustained yield. As noted above, he believes this has led the BLM to go over and above its obligations under the

Question	Discussion/Response
the ways that the BLM manages its resources that would increase your community's capacity and resiliency?	ESA and NEPA. A more balanced, science driven approach would increase the Allowable Sale Quantity (ASQ) which would result in higher timber sales and a stronger local economy; which would help the Tribe. The timber capacity is there; the forest is very productive. Most of the Coquille land is in a trust from the Federal government, and the Tribe has been constrained by economic stress from litigations in the timber industry and increasing restrictions and requirements incurred by the BLM and other agencies related to how the Tribe is required to manage its timber. The way the BLM has been writing its management plans goes above and beyond, as George points out, what is required for endangered species protection and NEPA regulations. The Tribe supports Federal legislation that would decouple management of the Coquille Forest from BLM management. Brenda added that the Tribe is very concerned about fire; she believes that BLM's management has been "cookie cutter" easy to administer but having negative consequences such as allowing the buildup of material that is fuel for fire. Tribal lands are open to the public. The Tribe would like to work with the BLM to allow it to erect fences and gates to protect access to certain areas.

Issue 6

Would the alternatives result in environmental justice impacts (disproportionally high and adverse effects on minority, low-income, or Tribal populations or communities)?

Minority Populations Meeting Environmental Justice Criteria

Table P-36. Minority populations meeting environmental justice criteria

Geography	Total Population	All Minorities		Hispanic	
		Number	Percent	Number	Percent
Oregon	3,836,628	563,921	15%	449,888	12%
Benton County					
Summit CDP	66	33	50%	0	0%
Clackamas County					
Barlow City	302	24	8%	87	29%
Canby City	15,770	1,264	8%	3,735	24%
Happy Valley City	14,050	3,900	28%	697	5%
Johnson City	657	50	8%	244	37%
Coos County					
Glasgow CDP	1,057	232	22%	14	1%
Powers City	890	179	20%	83	9%
Jackson County					
White City CDP	7,392	1,027	14%	2,301	31%
Josephine County					
Merlin CDP	1,484	353	24%	65	4%
Selma CDP	579	56	10%	117	20%
Klamath County					
Bonanza Town	418	51	12%	76	18%
Chiloquin City	766	603	79%	44	6%
Malin City	712	156	22%	555	78%
Merrill City	805	110	14%	416	52%
Lincoln County					
Lincoln Beach CDP	1,982	482	24%	358	18%
Siletz City	1,400	441	32%	42	3%
Linn County					
Crabtree CDP	308	49	16%	66	21%
Waterloo Town	320	35	11%	73	23%
West Scio CDP	163	40	25%	21	13%
Marion County	315,391	61,715	20%	76,429	24%
Brooks CDP	665	173	26%	88	13%
Four Corners CDP	16,472	4,555	28%	6,360	39%
Gervais City	2,475	754	30%	1,700	69%
Hayesville CDP	18,224	6,383	35%	6,891	38%
Hubbard City	3,154	920	29%	1,221	39%
Keizer City	36,402	4,673	13%	7,015	19%
Labish Village CDP	195	113	58%	128	66%
Mount Angel City	3,347	603	18%	953	28%
Salem City (1)	154,835	28,403	18%	30,565	20%

Geography	Total Population	All Minorities		Hispanic	
		Number	Percent	Number	Percent
St. Paul City	310	31	10%	73	24%
Stayton City	7,637	1,234	16%	1,535	20%
Woodburn City	23,879	9,067	38%	13,444	56%
Multnomah County	737,110	158,601	22%	79,791	11%
Fairview City	8,884	1,807	20%	1,268	14%
Gresham City	105,612	20,891	20%	21,074	20%
Maywood Park City	1,008	226	22%	4	0%
Portland City	585,888	131,729	22%	54,420	9%
Wood Village City	3,870	644	17%	1,160	30%
Polk County					
Independence City	8,535	1,724	20%	3,271	38%
Tillamook County					
Bayside Gardens CDP	804	156	19%	0	0%
Washington County	531,818	122,803	23%	83,085	16%
Aloha CDP	50,710	15,057	30%	10,664	21%
Beaverton City	90,254	25,072	28%	14,310	16%
Bethany CDP	20,505	7,914	39%	960	5%
Bull Mountain CDP	8,990	1,847	21%	224	2%
Cedar Hills CDP	9,273	1,919	21%	1,205	13%
Cedar Mill CDP (1)	15,118	2,919	19%	529	3%
Cornelius City	11,867	4,039	34%	5,916	50%
Forest Grove City	21,245	3,609	17%	5,338	25%
Hillsboro City	91,998	26,243	29%	22,885	25%
Oak Hills CDP	11,005	3,065	28%	418	4%
Rockcreek CDP	9,488	1,888	20%	572	6%
Tualatin City (1)	26,106	3,814	15%	4,852	19%
Yamhill County					
Dayton City	2,537	820	32%	1,021	40%
Grand Ronde CDP (1)	1,451	677	47%	115	8%
Lafayette City	3,709	445	12%	904	24%
McMinnville City	32,092	5,672	18%	6,324	20%
Sheridan City	6,086	966	16%	974	16%
Tribes					
Coos, Lower Umpqua, and Siuslaw Reservation and Off-Reservation Trust Land, OR	24	12	50%	0	0%
Coquille Reservation and Off-Reservation Trust Land, OR (2)	297	166	56%	15	5%
Grand Ronde Community and Off-Reservation Trust Land, OR	473	381	81%	7	1%
Klamath Reservation, OR	17	11	65%	0	0%
Siletz Reservation and Off-Reservation Trust Land, OR	476	420	88%	19	4%
Warm Springs Reservation and Off-Reservation Trust Land, OR	3,960	3,657	92%	372	9%

Notes: Geographies meeting the 50 percent criterion shown in gray with black border; Geographies meeting the meaningfully greater criterion shown in gray

(1) Where a city or Census Designated Place (CDP) spans more than one county, the BLM assigned it to the county with largest share of population.
(2) Shows 2009 American Community Survey 5-Year Data since 2012 data not available

Sources:

U.S. Census Bureau; American Community Survey, 2012 American Community Survey 5-Year Estimates, Tables DP03, DP04, DP05, S1901 and S1701; American FactFinder; http://factfinder2.census.gov; (July 2014).

U.S. Census Bureau; American Community Survey, 2011 American Community Survey 5-Year Estimates, Tables DP03, DP04, DP05, S1901 and S1701; American FactFinder; http://factfinder2.census.gov; (July 2014).

U.S. Census Bureau; American Community Survey, 2010 American Community Survey 5-Year Estimates, Tables DP03, DP04, DP05, S1901 and S1701; American FactFinder; http://factfinder2.census.gov; (July 2014).

U.S. Census Bureau; American Community Survey, 2010 Census Restricting Data, Table DP05; American FactFinder; http://factfinder2.census.gov; (July 2014).

U.S. Census Bureau; American Community Survey, 2009 American Community Survey 5-Year Estimates, Tables DP03, DP04, DP05, S1901 and S1701; American FactFinder; http://factfinder2.census.gov; (July 2014).

Low-income Populations Meeting Environmental Justice Criteria

Table P-37. Low-income populations meeting environmental justice criteria

Geography	Type	Total Population	Poverty Population (Shaded Cells are ≥ 25% of State Percentage)		Total Households	Median Household Income	Low-Income Households (Shaded Cells are ≥ 25% of State Percentage)	
			Number	Percent			Number	Percent
Oregon		3,836,628	584,059	15%	1,512,718	$50,036	366,078	24%
Benton County	County	85,501	17,418	20%	33,502	$48,635	9,716	29%
Alpine CDP	CDP	114	37	32%	45	$19,750	24	53%
Alsea CDP	CDP	126	22	17%	52	$33,654	20	39%
Corvallis City	City	54,341	14,355	26%	21,391	$37,793	7,765	36%
Monroe City	City	635	73	11%	243	$36,328	78	32%
Clackamas County	County	377,206	36,265	10%	145,004	$63,951	24,506	17%
Estacada City	City	377,206	674	25%	1,071	$39,844	380	36%
Government Camp CDP	CDP	131	4	3%	64	$250,000	29	45%
Johnson City	City	657	176	27%	295	$33,456	120	41%
Clatsop County	County	37,068	5,725	15%	15,757	$44,330	4,286	27%
Astoria City	City	9,510	1,896	20%	4,171	$40,603	1,360	33%
Cannon Beach City	City	1,373	344	25%	650	$39,559	222	34%
Warrenton City	City	4,991	811	16%	2,047	$35,325	643	31%
Westport CDP	CDP	483	56	12%	227	$26,435	98	43%
Columbia County	County	49,317	6,797	14%	19,060	$55,358	4,289	23%
Clatskanie City	City	1,788	391	22%	723	$35,875	257	36%
Deer Island CDP	CDP	269	57	21%	140	$48,182	53	38%
Prescott City	City	34	5	15%	19	$23,750	12	63%
Coos County	County	62,937	10,661	17%	26,567	$37,853	8,581	32%
Bandon City	City	3,053	443	15%	1,684	$34,279	635	38%
Barview CDP	CDP	1,832	803	44%	752	$20,133	456	61%
Bunker Hill CDP	CDP	1,892	396	21%	573	$21,305	319	56%
Coos Bay City	City	15,938	2,899	18%	6,659	$38,820	2,224	33%
Lakeside City	City	1,444	230	16%	675	$36,779	213	32%
Myrtle Point City	City	2,496	635	25%	1,007	$29,702	391	39%
Powers City	City	890	192	22%	313	$28,750	146	47%
Curry County	County	22,344	3,048	14%	10,320	$38,401	3,488	34%
Gold Beach City	City	2,563	370	14%	1,029	$50,958	330	32%
Harbor CDP	CDP	2,098	384	18%	1,251	$26,629	589	47%
Langlois CDP	CDP	218	76	35%	92	$33,906	28	31%
Nesika Beach CDP	CDP	352	40	11%	200	$26,813	71	36%
Port Orford City	City	1,198	328	27%	568	$30,667	238	42%
Douglas County	County	107,391	18,777	17%	43,678	$40,096	12,667	29%
Gardiner CDP	CDP	94	25	27%	45	$85,625	9	20%
Glendale City	City	854	243	28%	323	$34,226	111	34%
Glide CDP	CDP	1,867	466	25%	698	$49,940	161	23%
Lookingglass CDP	CPD	1,227	371	30%	424	$41,802	126	30%

Geography	Type	Total Population	Poverty Population (Shaded Cells are ≥ 25% of State Percentage)		Total Households	Median Household Income	Low-Income Households (Shaded Cells are ≥ 25% of State Percentage)	
			Number	Percent			Number	Percent
Melrose CDP	CDP	743	62	8%	323	$50,938	98	30%
Myrtle Creek City	City	3,446	805	23%	1,388	$37,650	557	40%
Reedsport City	City	4,165	903	22%	1,864	$28,293	805	43%
Riddle City	City	921	209	23%	409	$39,034	140	34%
Roseburg City	City	21,542	3,892	18%	9,454	$39,621	3,101	33%
Roseburg North CDP	CDP	6,493	1,462	23%	2,700	$30,951	948	35%
Tri-City CDP	CDP	3,866	829	21%	1,317	$43,220	302	23%
Winchester Bay CDP	CDP	243	19	8%	104	$55,652	46	44%
Winston City	City	5,352	1,584	30%	1,809	$31,627	662	37%
Yoncalla City	City	1,145	310	27%	486	$32,813	189	39%
Jackson County	County	203,613	33,346	16%	83,370	$43,664	23,093	28%
Butte Falls Town	Town	516	129	25%	179	$39,267	50	28%
Foots Creek CDP	CDP	861	105	12%	392	$37,917	153	39%
Gold Hill City	City	1,087	208	19%	470	$37,375	146	31%
Phoenix City	City	4,550	765	17%	2,126	$31,267	746	35%
Shady Cove City	City	2,893	502	17%	1,348	$35,695	506	38%
Talent City	City	6,086	1,156	19%	2,797	$32,961	1,108	40%
Trail CDP	CDP	203	26	13%	124	$28,125	44	36%
White City CDP	CDP	7,392	1,584	21%	2,338	$42,163	592	25%
Wimer CDP	CDP	708	149	21%	313	$18,375	173	55%
Josephine County	County	82,636	16,301	20%	34,373	$36,699	11,446	33%
Cave Function City	City	1,817	613	34%	740	$22,016	433	59%
Fruitdale CDP	CDP	900	229	25%	348	$39,231	120	35%
Grants Pass City	City	34,454	6,962	20%	14,545	$32,991	5,353	37%
Kerby CDP	CDP	397	219	55%	189	$18,250	145	77%
O'Brien CDP	CDP	143	38	27%	106	$25,987	38	36%
Selma CDP	CDP	579	300	52%	214	$23,438	117	55%
Takilma CDP	CDP	175	11	6%	99	$13,264	74	75%
Williams CDP	CDP	1,195	372	31%	492	$37,264	143	29%
Klamath County	County	66,350	12,143	18%	27,747	$41,066	8,740	32%
Bonanza Town	Town	418	90	22%	149	$35,179	51	34%
Chiloquin City	City	766	259	34%	281	$34,141	90	32%
Klamath Falls City	City	20,943	5,131	24%	9,054	$31,971	3,685	41%
Malin City	City	712	205	29%	207	$33,594	86	42%
Merrill City	City	805	116	14%	294	$37,500	99	34%
Lane County	County	351,794	64,705	18%	145,474	$42,628	42,478	29%
Cottage Grove City	City	9,671	1,833	19%	3,876	$35,158	1,430	37%
Eugene City	City	156,222	34,671	22%	65,907	$41,525	20,958	32%
Florence City	City	8,412	995	12%	4,438	$35,000	1,611	36%

Geography	Type	Total Population	Poverty Population (Shaded Cells are ≥ 25% of State Percentage)		Total Households	Median Household Income	Low-Income Households (Shaded Cells are ≥ 25% of State Percentage)	
			Number	Percent			Number	Percent
Junction City	City	5,445	1,239	23%	2,049	$35,067	770	38%
Oakridge City	City	3,211	667	21%	1,514	$41,284	527	35%
Springfield City	City	59,347	12,143	20%	23,972	$38,315	7,455	31%
Lincoln County	County	45,992	7,262	16%	21,039	$41,996	6,480	31%
Lincoln City	City	7,926	1,616	20%	3,932	$29,686	1,687	43%
Newport City	City	9,989	1,815	18%	4,455	$47,270	1,417	32%
Siletz City	City	1,400	310	22%	495	$37,188	159	32%
Waldport City	City	1,818	263	14%	924	$35,889	398	43%
Linn County	County	116,871	19,237	16%	44,566	$47,129	11,364	26%
Cascadia CDP	CDP	20	15	75%	17	$6,417	15	88%
Crabtree CDP	CDP	308	33	11%	151	$72,526	50	33%
Halsey City	City	1,015	206	20%	295	$50,804	47	16%
Lacomb CDP	CDP	345	40	12%	129	$51,193	43	33%
Mill City (1)	City	1,625	393	24%	569	$40,313	177	31%
Shedd CDP	CDP	607	236	39%	183	$61,599	17	9%
Sweet Home City	City	8,938	1,930	22%	3,645	$36,205	1,185	33%
Waterloo Town	Town	320	78	24%	88	$48,750	24	27%
West Scio CDP	CDP	163	52	32%	111	$16,845	61	55%
Marion County	County	315,391	55,223	18%	113,227	$46,654	27,514	24%
Brooks CDP	CDP	665	160	24%	175	$11,161	95	54%
Four Corners CDP	CDP	16,472	3,754	23%	5,467	$45,372	1,438	26%
Gates City	City	675	161	24%	271	$39,750	91	34%
Gervais City	City	2,475	685	28%	629	$45,063	140	22%
Hayesville CDP	CDP	18,224	4,671	26%	6,437	$39,587	1,944	30%
Labish Village CDP	CDP	195	44	23%	70	$34,015	15	21%
Mehama CDP	CDP	238	56	24%	86	$56,406	22	26%
Woodburn City	City	23,879	5,362	22%	7,517	$41,818	2,195	29%
Multnomah County	County	737,110	123,434	17%	303,654	$51,582	74,699	25%
Wood Village City	City	3,870	1,211	31%	1,281	$42,917	369	29%
Polk County	County	75,448	10,788	14%	27,973	$52,365	6,658	24%
Falls City	City	1,089	251	23%	383	$36,083	148	39%
Independence City	City	8,535	2,244	26%	2,848	$40,719	946	33%
Monmouth City	City	9,549	2,167	23%	3,358	$29,697	1,461	44%
Tillamook County	County	25,254	4,197	17%	10,843	$41,869	3,123	29%
Bayside Gardens CDP	CDP	804	182	23%	365	$37,566	110	30%
Beaver CDP	CDP	189	6	3%	84	$45,750	39	46%
Cape Meares CDP	CDP	74	21	28%	45	$85,417	21	47%
Cloverdale CDP	CDP	337	124	37%	106	$41,429	11	10%
Garibaldi City	City	736	150	20%	353	$38,750	118	33%

Geography	Type	Total Population	Poverty Population (Shaded Cells are ≥ 25% of State Percentage)		Total Households	Median Household Income	Low-Income Households (Shaded Cells are ≥ 25% of State Percentage)	
			Number	Percent			Number	Percent
Idaville CDP	CDP	395	79	20%	153	$23,444	107	70%
Neahkahnie CDP	CDP	115	41	36%	79	$9,659	41	52%
Neskowin CDP	CDP	91	1	1%	61	$32,566	30	49%
Pacific City CDP	CDP	1,078	250	23%	408	$31,348	106	26%
Rockaway Beach City	City	1,082	154	14%	555	$36,318	190	34%
Tillamook City	City	4,934	1,473	30%	2,100	$31,832	848	40%
Wheeler City	City	280	25	9%	139	$30,893	44	32%
Washington County	County	531,818	57,466	11%	200,160	$64,375	31,825	16%
King City	City	3,138	293	9%	1,967	$36,446	661	34%
Yamhill County	County	99,119	13,068	13%	33,920	$53,950	7,089	21%
Amity City	City	1,636	302	18%	557	$48,750	174	31%
Fort Hill CDP (1)	CDP	110	17	15%	97	$21,514	84	87%
Grand Ronde CDP (1)	CDP	1,451	257	18%	573	$35,240	225	39%
Willamina City (1)	City	1,685	319	19%	633	$34,844	201	32%
Tribes								
Coos, Lower Umpqua, and Siuslaw Reservation and Off-Reservation Trust Land, OR	Tribe	24	6	25%	15	$15,938	10	67%
Coquille Reservation and Off-Reservation Trust Land, OR (2)	Tribe	297	67	23%	102	$28,750	49	48%
Cow Creek Reservation, OR (2)	Tribe	21	-	0%	9	$22,250	5	56%
Grand Ronde Community and Off-Reservation Trust Land, OR	Tribe	473	130	27%	185	$24,861	95	51%
Klamath Reservation, OR	Tribe	17	9	53%	14	$6,944	12	86%
Warm Springs Reservation and Off-Reservation Trust Land, OR	Tribe	3,960	1,069	27%	1037	$47,526	209	20%

Notes:

(1) Where a city or Census Designated Place (CDP) spans more than one county, the BLM assigned it to the county with largest share of population.

(2) Shows 2009 American Community Survey 5-Year data since 2012 data not available.

Sources:

U.S. Census Bureau; American Community Survey, 2012 American Community Survey 5-Year Estimates, Tables DP03, DP04, DP05, S1901 and S1701; American FactFinder; http://factfinder2.census.gov; (July 2014).

U.S. Census Bureau; American Community Survey, 2011 American Community Survey 5-Year Estimates, Tables DP03, DP04, DP05, S1901 and S1701; American FactFinder; http://factfinder2.census.gov; (July 2014).

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Appendix Q – Public Motorized Access Designation Guidelines

This section provides guidelines for public motorized access designations that the BLM would implement following adoption of the RMP until the BLM completes implementation-level travel management planning. The BLM has developed these interim guidelines at the district level, for designations that contain travel management opportunities (i.e., Class I, II, III, and IV motorized, mechanized, pedestrian, and equestrian travel).

Consistent with current BLM policy (USDI BLM 2011), the BLM is deferring implementation-level travel management planning during this RMP revision process. This appendix outlines the decision-making process that would be used to develop the initial transportation network, would provide the basis for future management decisions, and would set guidelines for making transportation network adjustments through the life of the RMP.

The BLM has developed these management guidelines consistent with BLM Manual H-8342 – Travel and Transportation Handbook (USDI BLM 2012). This handbook provides specific guidance for preparing, amending, revising, maintaining, implementing, monitoring, and evaluating BLM land use and travel management plans.

Designation for Public Motorized Access

All Federal lands are required to have designations for public motorized access (as defined in 43 CFR 8340.0–5 (a)). These designations must be determined in resource management plans and classified as *open*, *limited*, or *closed* to public motorized travel activities. The BLM bases these designations on protecting natural and cultural resources and public safety, limiting visitor conflicts, and providing diverse recreational opportunities. Criteria for *open*, *limited*, and *closed* are designations are established in 43 CFR 8340.0–5 (f, g, h). The designations for public motorized access are defined as:

- ***Open***– Areas where the BLM does not limit public motorized travel activities since there are no issues regarding resources, visitor conflicts, or public safety to warrant limiting cross-country travel
- ***Limited***– Areas where the BLM has restricted public motorized travel activities in order to meet recreational and resource management objectives[42]
- ***Closed***– Areas that the BLM has closed to all public motorized vehicle activities to protect resources, ensure visitor safety, or reduce visitor conflicts

Table Q-1 displays the current public motorized access designations within the decision area.

[42] Restrictions may include the number or types of vehicles, the time or season of use, permitted or licensed use only, or limiting use to existing or designated roads and trails.

Table Q-1. Current public motorized access designations within the decision area

Travel Management Area Designation (1995 RMP)	Coos Bay (Acres)	Eugene (Acres)	Klamath Falls (Acres)	Medford (Acres)	Roseburg (Acres)	Salem (Acres)	Totals (Acres)
Open	562	59	29,495	133,043	43	156,460	**319,661**
Limited	321,185	308,169	179,413	644,283	419,357	216,539	**2,088,946**
Closed	3,486	3,461	3,874	32,466	3,277	16,975	**63,539**
Totals	**325,233**	**311,689**	**212,781**	**809,792**	**422,677**	**392,159**	**2,472,147**

Table Q-2 displays the acres of public motorized access designations by alternative and the Proposed RMP.

Table Q-2. Public motorized access designations in the decision area

Trails and Travel Management	No Action (Acres)	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)	PRMP (Acres)
Open	319,661	-	-	-	-	-
Limited	2,088,946	2,345,575	2,325,663	2,296,313	2,320,987	2,322,820
Closed	63,539	128,757	148,551	178,001	153,305	156,036

The designations for public motorized access do not apply to non-motorized uses (e.g., hiking, biking, equestrian), though areas can be designated for non-motorized transportation systems in the land use planning process.[43] In the designations for public motorized access, the BLM would consider the needs for a variety of road and trail systems tailored to a variety of users including non-motorized recreational uses. These designations would be refined through implementation-level travel management planning.

Management of Areas Designated for Public Motorized Access

The BLM will make final route designations within the decision area in comprehensive, interdisciplinary Travel and Transportation Management Plans, which are scheduled to be completed within five years after the completion of the western Oregon RMPs. Until implementation-level Travel Management Planning is complete, routes and trails would be managed in accordance with their designation of *closed* or *limited* to existing routes for public motorized travel activities, as described for each district.

[43] To restrict non-motorized travel to specific routes, the BLM must develop supplemental rules through a Federal Register process, consistent with 43 CFR 8365.1–6 Supplementary Rules.

Coos Bay District Public Motorized Access Designations

Table Q-3. Coos Bay District public motorized access designations

Designation	No Action (Acres)	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)	PRMP (Acres)
Open	562	-	-	-	-	-
Limited to Existing Routes	321,185	318,500	319,565	319,565	318,469	316,423
Limited to Designated Routes	-	-	1,401	1,401	1,401	4,072
Closed	3,486	5,191	2,724	2,724	3,821	3,741

Description: Includes all BLM-administered lands within the Coos Bay District. See additional guidelines for the Blue Ridge OHV Travel Management Area.

***Limited* Area Management Guidelines:**

- The BLM will manage *limited* areas in accordance with all applicable Federal and State motorized vehicle regulations.
- The BLM will limit motorized vehicle use to administrative, commercial, and passenger vehicle traffic where not specifically signed or gated.
- Until road and trail designations are complete, all public motorized travel activities would be limited in the interim to the existing road and trail network unless closed or restricted under a previous planning effort or due to special circumstances as defined below:
  - The BLM may close or limit routes under seasonal or administrative restrictions. These restrictions may include, but are not limited to, fire danger, wet conditions, special requirements for wildlife species, protection of cultural resources, or for public safety.
- Vehicles may pull off roads or trails to park or allow others to pass, up to 25 feet from the centerline of the road or up to 15 feet from the centerline of a trail.
- Limitations apply to all Class I (all-terrain vehicles), Class II (four-wheel drive vehicles), and Class III (motorcycles) public motorized vehicles and to all activity types (e.g., recreational and commercial) unless authorized by the BLM for administrative purposes.

***Closed* Area Management Guidelines:** All motorized vehicles are prohibited from entering *closed* areas unless authorized by the BLM for administrative purposes

Process for ongoing public collaboration and outreach:

- The principal venue for public collaboration is through public outreach and scoping during future implementation-level travel management planning efforts, special projects, and local partnership.
- The BLM would send press releases as needed informing the public of motorized travel opportunities and restrictions. The BLM would post signs where appropriate.
- Upon completion of the implementation-level transportation management plan, maps and brochures will be available to the public at the Coos Bay District office illustrating designations, describing specific restrictions, and defining opportunities.

Process for selecting a final road and trail network: The BLM has completed route designations for the New River ACEC and the Blue Ridge OHV Travel Management Area. The BLM would accomplish final route designations for the rest of the district though comprehensive and interdisciplinary

implementation-level travel and transportation management planning scheduled to be completed no later than 5 years after completion of the RMP revision.

The BLM's geo-database would provide information for identifying roads and trails for both motorized and non-motorized activities. The BLM would continue to conduct on-the-ground inventories if roads and trails cannot be identified using remote-sensing techniques. The BLM would evaluate proposed designations through public scoping and a NEPA analysis. The BLM would consider changes to the designated system during the implementation-level travel management planning process.

Road and trail construction and maintenance standards: The BLM will construct and maintain roads and trails in accordance with the standards in BLM Manual H-9114-1 – Trails (USDI BLM 1987) and other professional sources.

Blue Ridge OHV Travel Management Area

The BLM completed route designations within the Blue Ridge OHV Travel Management Area through the Blue Ridge Multiple Use Trail System environmental assessment (EA OR-125-98-18). The BLM would continue to manage the Blue Ridge OHV Travel Management Area in the Coos Bay District as a Recreation Management Area with an off-highway vehicle focus. The following management guidelines apply to the Blue Ridge OHV Travel Management Area on the Coos Bay District:

Acres: 1,609

OHV Designation: Limited to designated roads and trails

Niche: Offers a multiple-use, single-track trail riding experience for hikers, equestrians, mountain bikers, and motorcycle riders.

Management Guidelines:

- The single-track trail system is available to Class III (motorcycles) vehicles with Oregon all-terrain vehicle permits and all non-motorized modes of travel.
- Motorized, mechanized, and equestrian use is prohibited between December and April to prevent excessive damage to the trail tread when soil moisture conditions are high. Motorized use on the trail system may be restricted during summer months due to fire hazard conditions.

Process for ongoing public collaboration/outreach: The principal venue for public collaboration on the trail system is through local partnership relationships. A printed trail map is available to the public at the Coos Bay District office and on the Coos Regional Trail Partnership webpage. The trail system is marked on the ground with regulatory and directional signage.

Process for selecting a final road and trail network: The BLM completed route designations through the Blue Ridge Multiple Use Trail System environmental assessment (EA OR-125-98-18). The BLM would use adaptive management to adjust the system for commercial timber production demands, user needs and resource protection. The BLM would accomplish these modifications in collaboration with trail partners and users and through changes to the Blue Ridge Trail system plan and an environmental assessment.

Road and trail construction and maintenance standards: The BLM would construct and maintain roads and trails in accordance with the design features identified in the environmental assessment, standards in BLM Manual H-9114-1 – Trails (USDI BLM 1987), and other professional sources. Trail

maintenance would be a priority within this Travel Management Area to ensure a quality riding experience for trail users and to conserve natural resource values.

Eugene District Public Motorized Access Designations

Table Q-4. Eugene District public motorized access designations by alternative and the Proposed RMP

Designation	No Action (Acres)	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)	PRMP (Acres)
Open	59	-	-	-	-	-
Limited to Existing Routes	308,169	289,796	283,963	281,750	279,757	307,503
Limited to Designated Routes	-	-	5,728	5,727	5,727	-
Closed	3,461	20,601	20,707	22,921	24,915	3,561

Description: Includes all BLM-administered lands within the Eugene District. See additional guidelines for the Shotgun Creek OHV Travel Management Area.

***Limited* Area Management Guidelines:**

- The BLM will manage *limited* areas in accordance with all applicable Federal and State motorized vehicle regulations.
- The BLM will limit motorized vehicle use to administrative, commercial, and passenger vehicle traffic where not specifically signed or gated.
- Until road and trail designations are complete, all public motorized travel activities would be limited to the existing road and trail network unless closed or restricted under a previous planning effort or due to special circumstances as defined below:
  - The BLM may close or limit routes under seasonal or administrative restrictions. These restrictions may include, but are not limited to, fire danger, wet conditions, special requirements for wildlife species, protection of cultural resources, or for public safety.
- Vehicles may pull off roads or trails to park or allow others to pass, up to 25 feet from the centerline of the road or up to 15 feet from the centerline of a trail.
- Limitations apply to all Class I (all-terrain vehicles), Class II (four-wheel drive vehicles), and Class III (motorcycles) public motorized vehicles and to all activity types (e.g., recreational and commercial) unless authorized by the BLM for administrative purposes.

***Closed* Area Management Guidelines:** All motorized vehicles are prohibited from entering *closed* areas unless authorized by the BLM for administrative purposes

Process for ongoing public collaboration/outreach:

- The principal venue for public collaboration is through public outreach and scoping during future implementation level travel management planning efforts, special projects, and local partnership.
- The BLM would send press releases as needed informing the public of motorized travel opportunities and restrictions. The BLM would post signs where appropriate.
- Upon completion of the implementation-level transportation management plan, maps and brochures shall be available to the public at the main office illustrating designations, describing specific restrictions, and defining opportunities.

Process for selecting a final road and trail network: The BLM has completed route designations for the Upper Lake Creek Special Recreation Management Area and the Shotgun Creek OHV Travel Management Area. The BLM would accomplish final route designations for the rest of the district through comprehensive, interdisciplinary implementation-level travel and transportation planning, which is scheduled to be completed no later than 5 years after completion of the RMP revision.

BLM's geo-database would provide information for identifying roads and trails for both motorized and non-motorized activities. The BLM would continue to conduct on-the-ground inventories if roads and trails cannot be identified using remote-sensing techniques. The BLM would evaluate proposed designations through public scoping and a NEPA analysis. The BLM would consider changes to the designated system during the transportation management planning process.

Road and trail construction and maintenance standards: The BLM will construct and maintain roads and trails in accordance with the standards in BLM Manual H-9114-1 – Trails (USDI BLM 1987) and other professional sources.

Shotgun Creek OHV Travel Management Area

Acres: 5,755

OHV Designation: Limited to existing roads and trails

Niche: Offers a multiple-use trail riding experience for motorcycle riders, all-terrain vehicle riders, and four-wheel drive enthusiasts.

Management Guidelines:

- The trail system is available to Class I (all-terrain vehicles), Class II (four-wheel drive vehicles), and Class III (motorcycles) motorized vehicles with Oregon all-terrain vehicle permits.
- The BLM will sign and map routes open to OHV use.
- Routes available for OHV use may change periodically due to timber harvest activity or trail rehabilitation.

Process for ongoing public collaboration/outreach: The principal venue for public collaboration on the trail system is through local partnership relationships. A trail map is available to the public at the Eugene District Office and is updated as trail routes change. The trail system is marked on the ground with regulatory and directional signs.

Process for selecting a final road and trail network: The BLM completed route designations through two Shotgun OHV Trail System environmental assessments (EA OR 090-00-04 and EA OR 090-06-04). The BLM would consider changes to the transportation system during the route designation planning process. The BLM will accomplish these modifications in collaboration with trail partners and users.

Road and trail construction and maintenance standards: Trail maintenance will be a priority within this OHV area to ensure quality riding experiences for trail users and to conserve natural resource values.

Klamath Falls Field Office Public Motorized Access Designations

Table Q-5. Klamath Falls Field Office public motorized access designations by alternative and the Proposed RMP

Designation	No Action	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)	PRMP (Acres)
Open	29,495	-	-	-	-	-
Limited to Existing Routes	132,191	213,266	209,559	200,501	202,759	200,312
Limited to Designated Routes	47,222	-	-	-	-	2
Closed	3,874	494	4,201	13,260	11,001	13,771

Description: Includes all BLM-administered lands within the Klamath Falls Field Office.

***Limited* Area Management Guidelines:**

- The BLM will manage *limited* areas in accordance with all applicable Federal and State motorized vehicle regulations.
- The BLM would limit motor vehicle use to administrative, commercial, and passenger vehicle traffic where not specifically signed or gated.
- Until road and trail designations are complete, all public motorized travel activities will be limited in the interim to the existing road and trail network unless closed or restricted under a previous planning effort or due to special circumstances as defined below:
    - The BLM may close or limit routes under seasonal or administrative restrictions. These restrictions may include, but are not limited to, fire danger, wet conditions, special requirements for wildlife species, protection of cultural resources, or for public safety.
- Vehicles may pull off roads or trails to park or allow others to pass, up to 25 feet from the centerline of the road or up to 15 feet from the centerline of a trail.
- Limitations apply to all Class I (all-terrain vehicles), Class II (four-wheel drive vehicles), and Class III (motorcycles) public motorized vehicles and to all activity types (e.g., recreational and commercial) unless authorized by the BLM for administrative purposes.

Seasonal restrictions:

- The Eastside seasonal OHV closure is in effect from November 1 to April 15 and applies to all BLM-administered lands within deer winter range cooperative wildlife areas, including the majority of Stukel and Bryant Mountain and portions of the Gerber Block as mapped.
- The Pokegama wildlife area seasonal OHV closure is in effect from November 20 to April 1.
- For designated snowmobile trails, wheeled vehicles are prohibited once grooming of trails begins for winter season.
- The OHV use may be limited in other areas on a seasonal basis due to special conditions such as temporary fire restrictions, special wildlife requirements, etc.

***Closed* Area Management Guidelines:** All motorized vehicles are prohibited from entering *closed* areas unless authorized by the BLM for administrative purposes

Process for ongoing public collaboration/outreach:

- The principal venue for public collaboration is through public outreach and scoping during future implementation-level travel management planning efforts, special projects, and local partnerships.

- The BLM would send press releases as needed informing the public of OHV opportunities and restrictions. The BLM would post signs where appropriate.
- Upon completion of the transportation management plan, maps and brochures shall be available to the public at the main office illustrating designations, describing specific restrictions, and defining opportunities.
- The BLM would continue to participate with other land managers in the cooperative management of the Pokegama wildlife area and deer winter range areas.

Process for selecting a final road and trail network: The BLM will accomplish final route designations for the rest of the district in a comprehensive, interdisciplinary travel and transportation management plan, which is scheduled to be completed no later than 5 years after completion of the RMP revision.

The BLM's geo-database would provide information for identifying roads and trails for both motorized and non-motorized activities. The BLM would continue to conduct on-the-ground inventories if roads and trails cannot be identified using remote-sensing techniques. The BLM will evaluate proposed designations through public scoping and a NEPA analysis. The BLM will consider changes to the designated system during the transportation management planning process.

Road and trail construction and maintenance standards: The BLM would construct and maintain roads and trails in accordance with the standards in BLM Manual H-9114-1 – Trails (USDI BLM 1987) and other professional sources.

Medford District Public Motorized Access Designations

Table Q-6. Medford District public motorized access designations by alternative and the Proposed RMP

Designation	No Action (Acres)	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)	PRMP (Acres)
Open	133,043	-	-	-	-	-
Limited to Existing Routes	26,514	715,439	730,596	734,121	769,047	695,115
Limited to Designated Routes	617,769	-	-	-	-	-
Closed	32,466	89,889	74,719	71,195	36,246	111,517

Description: Includes all BLM-administered lands within the Medford District.

***Limited* to Existing Area Management Guidelines:**

- The BLM will manage *limited* areas in accordance with all applicable Federal and State motorized vehicle regulations.
- Paved roads are limited to licensed, street-legal vehicles only.
- Road Maintenance Level 1 and 2 routes[44] are open to Class I (all-terrain vehicles), Class II (four-wheel drive vehicles), and Class III (motorcycles) vehicles. Trails less than 50 inches in width are restricted to all-terrain vehicles and motorcycles.
- Roads on private property that do not have a secured public right-of-way are not necessarily open to public or recreational vehicle traffic, even if they are a "continuation" of the BLM road system or a road shown on the preliminary maps.
- Until road and trail designations are complete, all motorized vehicles will be limited in the interim to the existing road and trail network unless closed or restricted under a previous planning effort or due to special circumstances:
    - The BLM may close or limit routes under seasonal or administrative restrictions. These restrictions may include, but are not limited to, fire danger, wet conditions, special requirements for wildlife species, to protect cultural resources, or for public safety.
- In the Butte Falls Resource Area, the Jackson Access and Cooperative Travel Management Area closure (32,822 acres) is in effect from mid-October through April 30. Only those roads shown in green on Oregon Department of Fish and Wildlife maps or posted with green reflectors are open to motorized vehicles during the period of the restriction.
- Vehicles may pull off roads or trails to park or allow others to pass, up to 25 feet from the centerline of the road or up to 15 feet from the centerline of a trail.
- Limitations apply to all Class I (all-terrain vehicles), Class II (four-wheel drive vehicles), and Class III (motorcycles) public motorized vehicles and to all activity types (e.g., recreational and commercial) unless authorized by the BLM for administrative purposes.
- Non-motorized travel (e.g., horseback riding, hiking, and mountain biking) is allowed on all access routes.

[44] **Level 1** – This level is assigned to roads where minimum maintenance is required to protect adjacent lands and resource values. Emphasis is given to maintaining drainage and runoff patterns as needed to protect adjacent lands. Grading, brushing, or slide removal is not performed unless roadbed drainage is being adversely affected, causing erosion. Closure and traffic restrictive devices are maintained as needed.
Level 2 – This level is assigned to roads that are passable by high clearance vehicles. Drainage structures are to be inspected within a 3-year period and maintained as needed. Grading is conducted as necessary to correct drainage problems. Brushing is conducted as needed to allow access. These are typically low standard, low volume; single lane, natural and aggregate surfaced, and are functionally classified as a resource road.

***Closed* Area Management Guidelines:** All motorized vehicles are prohibited from entering *closed* areas unless authorized by the BLM for administrative purposes

Process for ongoing public collaboration/outreach:

- The principal venue for public collaboration is through public outreach and scoping during future implementation-level travel management planning efforts, special projects, and local partnership.
- The BLM would send press releases as needed informing the public of motorized travel opportunities and restrictions. The BLM would post signs where appropriate.
- Upon completion of the transportation management plan, maps and brochures shall be available to the public at the main office illustrating designations, describing specific restrictions, and defining opportunities.

Process for selecting a final road and trail network: The BLM would accomplish final route designations for the rest of the district through comprehensive and interdisciplinary implementation-level travel and transportation management planning scheduled to be completed no later than 5 years after completion of the RMP revision.

The BLM's geo-database would provide information for identifying roads and trails for both motorized and non-motorized activities. The BLM has been and would continue to conduct on-the-ground inventories if roads and trails cannot be identified using remote-sensing techniques. The BLM would evaluate proposed designations through public scoping and a NEPA analysis. The BLM would consider changes to the designated system during the transportation management planning process.

Road and trail construction and maintenance standards: The BLM would construct and maintain roads and trails in accordance with the standards in BLM Manual H-9114-1 – Trails (USDI BLM 1987) and other professional sources.

Roseburg District Public Motorized Access Designations

Table Q-7. Roseburg District public motorized access designations by alternative and the Proposed RMP

Designation	No Action (Acres)	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)	PRMP (Acres)
Open	43	-	-	-	-	-
Limited to Existing Routes	412,626	418,978	412,196	400,259	398,863	413,420
Limited to Designated Routes	6,731	-	-	-	-	-
Closed	3,277	3,808	10,591	22,528	23,924	10,220

Description: Includes all BLM-administered lands within the Roseburg District.

***Limited* Area Management Guidelines:**

- The BLM will manage *limited* areas in accordance with all applicable Federal and State motorized vehicle regulations.
- The BLM will limit motorized vehicle use to administrative, commercial, and passenger vehicle traffic where not specifically signed or gated.
- Until road and trail designations are complete, all public motorized travel activities will be limited in the interim to the existing road and trail network unless closed or restricted under a previous planning effort or due to special circumstances as defined below.
    - The BLM may close or limit routes under seasonal or administrative restrictions. These restrictions may include, but are not limited to, fire danger, wet conditions, special requirements for wildlife species, protection of cultural resources, or for public safety.
- Vehicles may pull off roads or trails to park or allow others to pass, up to 25 feet from the centerline of the road or up to 15 feet from the centerline of a trail.
- Limitations apply to all Class I (all-terrain vehicles), Class II (four-wheel drive vehicles), and Class III (motorcycles) public motorized vehicles and to all activity types (e.g., recreational and commercial) unless authorized by the BLM for administrative purposes.

***Closed* Area Management Guidelines:** All motorized vehicles are prohibited from entering *closed* areas unless authorized by the BLM for administrative purposes

Process for ongoing public collaboration/outreach:

- The principal venue for public collaboration is through public outreach and scoping during future implementation-level travel management planning efforts, special projects, and local partnership.
- The BLM would send press releases as needed informing the public of motorized travel opportunities and restrictions. The BLM would post signs where appropriate.
- Upon completion of the implementation-level transportation management plan, maps and brochures shall be available to the public at the Roseburg District office illustrating designations, describing specific restrictions, and defining opportunities.

Process for selecting a final road and trail network: The BLM would accomplish final route designations for the rest of the district through a comprehensive and interdisciplinary implementation-level travel and transportation management plan, which is scheduled to be completed no later than 5 years after completion of the RMP revision.

The BLM's geo-database would provide information for identifying roads and trails for both motorized and non-motorized activities. The BLM would continue to conduct on-the-ground inventories if roads and trails cannot be identified using remote-sensing techniques. The BLM will evaluate proposed designations through public scoping and a NEPA analysis. The BLM would consider changes to the designated system during the implementation-level transportation planning.

Road and trail construction and maintenance standards: The BLM would construct and maintain roads and trails in accordance with the standards in BLM Manual H-9114-1 – Trails (USDI BLM 1987) and other professional sources.

Salem District Public Motorized Access Designations

Table Q-8. Salem District public motorized access designations by alternative and the Proposed RMP

Designation	No Action (Acres)	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)	PRMP (Acres)
Open	156,460	-	-	-	-	-
Limited to Existing Routes	48,771	389,595	361,780	346,806	340,067	378,497
Limited to Designated Routes	167,768	-	6,684	6,185	10,626	7,434
Closed	16,975	8,774	29,881	45,374	47,672	13,226

Description: Includes all BLM-administered lands within the Salem District. See additional guidelines for the Upper Nestucca OHV Area.

***Limited* to Existing Area Management Guidelines:**

- The BLM will manage *limited* areas in accordance with all applicable Federal and State motorized vehicle regulations.
- The BLM would limit motorized vehicle use to administrative, commercial, and passenger vehicle traffic where not specifically signed or gated.
- Until road and trail designations are complete, all public motorized travel activities would be limited in the interim to the existing road and trail network unless closed or restricted under a previous planning effort or due to special circumstances:
    - The BLM may close or limit routes under seasonal or administrative restrictions. These restrictions may include, but are not limited to, fire danger, wet conditions, special requirements for wildlife species, protection of cultural resources, or for public safety.
- Vehicles may pull off roads or trails to park or allow others to pass, up to 25 feet from the centerline of the road or up to 15 feet from the centerline of a trail.
- Limitations apply to all Class I (all-terrain vehicles), Class II (four-wheel drive vehicles), and Class III (motorcycles) public motorized vehicles and to all activity types (e.g., recreational and commercial) unless authorized by the BLM for administrative purposes.

***Closed* Area Management Guidelines:** All motorized vehicles are prohibited from entering *closed* areas unless authorized by the BLM for administrative purposes

Process for ongoing public collaboration/outreach:

- The principal venue for public collaboration is through public outreach and scoping during future implementation-level travel management planning efforts, special projects, and local partnership.
- The BLM would send press releases as needed informing the public of motorized travel opportunities and restrictions. The BLM would post signs where appropriate.
- Upon completion of the implementation-level management plan, maps and brochures shall be available to the public at the main office illustrating designations, and describing specific restrictions.

Process for selecting a final road and trail network: Route designations have been completed for the Upper Nestucca Travel Management Area. The BLM would accomplish final route designations for the rest of the district through a comprehensive and interdisciplinary implementation-level travel and

transportation management plan scheduled to be completed no later than 5 years after completion of the RMP revision.

The BLM's geo-database would provide information for identifying roads and trails for both motorized and non-motorized activities. The BLM has been and would continue to conduct on-the-ground inventories if roads and trails cannot be identified using remote-sensing techniques. The BLM would evaluate proposed designations through public scoping and a NEPA analysis. The BLM would consider changes to the existing system during implementation-level travel planning.

Road and trail construction and maintenance standards: The BLM would construct and maintain roads and trails in accordance with the standards in BLM Manual H-9114-1 – Trails (USDI BLM 1987) and other professional sources.

Upper Nestucca OHV Travel Management Area

Acres: 9,579

Designation: Limited to existing roads and trails

Niche: Located 20 miles northwest of McMinnville, Oregon, this area provides Class I (all-terrain vehicles), and Class III (motorcycles) OHV riding experience along a designated road and trail network.

Management Guidelines:

- Designated trails and maintained roadways are limited to Class I and Class III motor vehicle use within the boundaries of the OHV area.
- All Class I and Class III vehicles must be equipped with approved spark arresters, an Oregon all-terrain vehicles sticker for the appropriate vehicle class, and must meet posted noise requirements.
- Class II vehicle use is only authorized on Road Maintenance Level 3 and Level 4 roadways[45].
- The BLM may restrict motorized use on the trail system during summer months due to fire hazard conditions.
- The BLM may be permanently or temporarily close areas or trails for administrative use, extreme wet conditions, construction and reconstruction requirements, or other environmental concerns.

Process for ongoing public collaboration/outreach: The principal venue for public collaboration on the trail system is through local partnership with the Applegate Rough Riders Motorcycle Club. Trail maps are available to the public at the Salem District Office and Tillamook Field Office. The trail system is marked on the ground with regulatory and directional signage.

Process for selecting a final road and trail network: The BLM has completed route designations

[45] **Level 3** – This level is assigned to roads where management objectives require the road to be open seasonally or year-round for commercial, recreational, or administrative access. Typically, these roads are natural or aggregate surfaced, but may include low use bituminous surfaced road. These roads have a defined cross section with drainage structures (e.g., rolling dips, culverts, or ditches). These roads may be negotiated by passenger cars traveling at prudent speeds. User comfort and convenience are not considered a high priority. Drainage structures are to be inspected at least annually and maintained as needed. Grading is conducted to provide a reasonable level of riding comfort at prudent speeds for the road conditions. Brushing is conducted as needed to improve sight distance.
Level 4 – This level is assigned to roads where management objectives require the road to be open all year (except may be closed or have limited access due to snow conditions) and which connect major administrative features (recreational sites, local road systems, administrative sites, etc.) to County, State, or Federal roads. Typically, these roads are single or double lane, aggregate, or bituminous surface, with a higher volume of commercial and recreational traffic than administrative traffic.

through the Upper Nestucca Motorcycle Trail System Environmental Assessment (EA OR 086-97-05). The BLM will use adaptive management to adjust the system for timber management, user needs, and resource protection.

Road and trail construction and maintenance standards: The BLM will construct and maintain roads and trails in accordance with the design features identified in the Monitoring and Maintenance Plan for the Upper Nestucca OHV Trail System. Trail maintenance will be a priority within this OHV area to ensure a quality riding experience for trail users and to conserve natural resource values.

Implementation-Level Travel Management Planning

Implementation-level TMP is the process of establishing a final travel and transportation network that includes route-specific designations within the broader land use planning level designations for public motorized access. In accordance with current BLM policy, the delineation of the BLM's final travel and transportation network is being deferred. The BLM would complete this process in the planning area within 5 years of completion of this RMP revision.

As part of this process, the BLM may additionally delineate Travel Management Areas to address particular concerns and prescribe specific management actions for a defined geographic area. The BLM typically identifies Travel Management Areas where travel and transportation management (either motorized or non-motorized) requires particular focus or increased intensity of management. While designations for public motorized access are a mandatory land use plan allocations, Travel Management Areas are an optional planning tool to frame transportation issues and help delineate travel networks that address specific uses and resource concerns. Dividing an area into Travel Management Areas can allow for higher priority areas to go through the implementation-level travel management process first, deferring areas with lower resource or user conflict concerns for later travel planning efforts. Travel Management Areas also provide the opportunity to establish a link between Recreation and Transportation Management Areas. To help ensure that that travel decisions support program-specific management objectives, the BLM may identify Travel Management Area boundaries that correspond with the Recreation Management Areas defined for various outcomes.

Travel Management Land Use Planning

While delineation of Travel Management Areas is optional, designation of all lands public motorized access is a required to occur when conducting land use planning. The BLM will base all designations for public motorized access on the protection of resources, the promotion of safety for all users, and the minimization of conflicts among various users of BLM-administered lands. Additionally, areas and trails for all types of travel must support the goals, objectives, and management actions contained in the resource management plan, and applicable laws and policies. The BLM has designated all lands within the decision area as *open*, *limited*, or *closed* for the management of public motorized vehicle areas and trails under the alternatives and the Proposed RMP in accordance with the following criteria (43 CFR 8342.1):

a) Areas and trails shall be located to minimize damage to soil, watershed, vegetation, air, or other resources of the public lands, and to prevent impairment of wilderness suitability.
b) 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.
c) 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.

d) 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 their natural, esthetic, scenic, or other values for which such areas are established.

Travel designations in the action alternatives and the Proposed RMP include *limited* and *closed*. Lands designated as *open* areas only occur under the No Action alternative.

Limited designations restrict travel in specified areas and/or on designated routes, roads, vehicle ways, or trails. This designation is used where public travel use must be restricted to meet specific resource management objectives. Examples of limitations include number or type of conveyance; time or season of use; permitted or licensed use only; use limited to existing roads and trails; use limited to designated roads and trail; or other limitations if restrictions are necessary to meet resource management objectives, including certain competitive or intensive use areas that have special limitations (see 43 CFR 8340.0–5).

There are three distinct uses of the *limited* designation in the RMPs for Western Oregon. The three types of limited designations are:

- Travel limited to existing roads and trails; areas where public travel is restricted to existing roads and trails. This designation is an interim designation until route-specific planning can occur. At the point at which travel planning occurs, motorized travel in the area would be refined to identify appropriate areas, seasons, or types of conveyance for which to limit public travel uses.
- Travel limited to designated roads and trails; areas where specific types of public travel (e.g., motorized, mechanized, pedestrian) are restricted to designated roads and trails. Areas with this designation are identified where implementation-level travel management planning has occurred prior to this plan revision.
- Travel limited to designated roads and trails and limited seasonally; in these areas, specific types of public travel (e.g., motorized, mechanized, pedestrian) are restricted to seasonal use periods and to designated roads and trails. Areas with this designation are identified where implementation-level travel management planning has occurred prior to this plan revision.

Closed designations identify areas where public motorized vehicle travel is prohibited. Access by means other than motorized vehicle, such as mechanized or non-motorized use is permitted. Areas are designated *closed* if closure to all public motorized vehicular use is necessary to protect resources, promote visitor safety, or reduce use conflicts (see 43 CFR 8340.0–5).

Future Implementation Planning Guidance

The designations defined above require an additional level of effort and planning prior to implementation. Implementation-level decisions generally constitute the BLM's final approval allowing on-the-ground actions to proceed. These types of decisions require site-specific planning and environmental (e.g., NEPA) analysis. The implementation-level travel management planning will be conducted using an interdisciplinary team approach to address all resource uses, including administrative, recreation, commercial and associated modes of travel (motorized, mechanized and non-motorized types).

The designation of the individual roads, primitive roads and trails are addressed as an implementation-level plan tiered from the RMP. Travel and transportation decisions can be developed as a stand-alone Travel Management Plan (TMP) or incorporated into activity management plans, such as those for recreation or energy. A TMP is the document that describes the decisions related to the selection and management of the transportation network. Route-specific decisions in a TMP support the RMP goals, objectives, and management actions, and the designation criteria in 43 CFR 8342.1. Individual route

designations would occur during subsequent implementation-level travel management planning efforts. Upon the completion of implementation level travel management plans OHV management areas designated as *limited* to existing roads and trails would transition to *limited* to designated roads and trails as identified through the implementation level travel management analysis.

In western Oregon, district staff would complete implementation-level travel planning and would delineate route-specific decisions to support RMP goals, objectives, and management direction, and the designation criteria in 43 CFR 8342.1. In addition, districts would consider the following criteria:

- The BLM would consider public land roads or trails determined to cause considerable adverse effects or to continue a nuisance or threat to public safety for relocation or closure and rehabilitation after appropriate coordination with applicable agencies and partners.
- Routes that are duplicative, parallel, or redundant would be considered for closure. Eliminate parallel roads travelling to the same destination when the destination can be accessed from the same direction and topography and user experience.
- All routes would undergo a route evaluation to determine its purpose and need and the potential resource and/or user conflicts from motorized travel. Where resource and/or user conflicts outweigh the purpose and need for the route, the route would be considered for closure or considered for relocation outside of sensitive habitat.
- Routes that do not have a purpose and need would be considered for closure.
- Consider limiting over snow vehicles (OSV) designed for use over snow and that run on tracks and/or skis, while in use over snow to designated routes or consider seasonal closures on routes in sensitive areas.
- Routes not required for public access or recreation with a current administrative/agency purpose or need would be evaluated for administrative access only.
- Consider prioritizing restoration of routes not designated in a Travel Management Plan.
- Consider using seed mixes or transplant techniques that would maintain or enhance habitat when rehabilitating linear disturbances.
- Temporary closures would be considered in accordance with 43 CFR 8364 (Closures and Restrictions); 43 CFR 8351 (Designated National Areas); 43 CFR 6302 (Use of Wilderness Areas, Prohibited Acts, and Penalties); 43 CFR 8341 (Conditions of Use).
- Temporary closure or restriction orders under these authorities are enacted at the discretion of the authorized officer to resolve management conflicts and protect persons, property, and public lands and resources. Where an authorized officer determines that off-highway vehicles are causing or would cause considerable adverse effects upon soil, vegetation, wildlife, wildlife habitat, 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 implemented to prevent recurrence. (43 CFR 8341.2) A closure or restriction order shall be considered only after other management strategies and alternatives have been explored. The duration of temporary closure or restriction orders shall be limited to 24 months or less; however, certain situations may require longer closures and/or iterative temporary closures. This may include closure of routes or areas.

When developing implementation-level Travel Management Plans, the BLM would consider the following when determining the compatibility of different types of public travel opportunities:

- Other resource values and uses
- Primary travelers
- Emerging uses such as growing recreational-use types
- Setting characteristics that are to be maintained, including recreation setting characteristics and VRM settings

- Primary means of travel allowed to accomplish the objectives and to maintain the setting characteristics
- Social conflicts between different travel types
- Social conflicts between public land visitors and adjacent property owners
- Number and types of access points
- Existing right-of-ways (ROWs) and future ROW requests
- Existing geographic identify and public knowledge of the area
- Identifiable boundaries of the Travel Management Area based on topography, major roads, or other easily discernible elements

Implementation-level travel management planning would be completed within 5 years of completion of these RMP revisions. Districts would be responsible for identifying timelines to complete travel planning efforts. These timelines would identify areas in order of priority for completion, and would be updated regularly in all relevant planning areas to accelerate the accomplishment of data collection, route evaluation and selection, and on the ground implementation efforts including signing, monitoring and rehabilitation. Prioritization of areas for completion of implementation-level travel management planning would follow the criteria included in this appendix.

The implementation-level travel management planning process includes development of a public outreach strategy. Consultation with interested user groups, Federal, State, county and local agencies, local landowners, and other parties would be done in a manner that provides an opportunity for the public to express itself and have its views given consideration. A public outreach strategy to engage fully all interested stakeholders would be incorporated into future travel management plans.

A complete TMP includes or addresses—

- Criteria to select or reject specific transportation linear features in the final travel management network; to add new roads, primitive roads or trails; and to specify limitations. The criteria must include those identified in 43 CFR 8342.1
- A map of roads, primitive roads, and trails for all travel modes and uses, including motorized, non-motorized, and mechanized travel
- Definitions and additional limitations for specific roads, primitive roads, and trails
- Guidelines for managing and maintaining the travel management system. This includes, at a minimum, the development of route-specific roads, primitive roads, and trail management objectives, a sign plan, and education/public information plan, an enforcement plan, and a process requiring the application of engineering best management practices; and
- Indicators to guide plan maintenance, amendments, or revisions related to the travel management network.
- Needed easements and rights-of-way (ROW) (to be issued to the Bureau of Land Management [BLM] or others) to maintain the existing road, primitive road, and trail network providing public land access
- Provisions for new route construction or adaptation or relocation of existing routes
- A plan for decommissioning and rehabilitating closed or unauthorized routes
- A monitoring plan
- Classification of all roads, primitive roads, and trails, designated for travel in a TMP, as assets in the Facility Asset Management System. All roads, primitive roads, and trails will also be identified as such in the Ground Transportation Linear Feature geospatial database.

Existing Motorized and Non-Motorized Trails

The BLM is currently working on an inventory of all user-created motorized and non-motorized routes within the decision area. The BLM will use this inventory as a baseline to guide future route designations through implementation-level travel management planning within the areas that are designated *limited* to existing routes.

Recreation routes (authorized and unauthorized) have been created in response to demand for trail-based recreation. **Table Q-9** displays the current authorized trails within the decision area. As demand for trail-based recreation (especially OHV riding) increased, the number of routes increased. The routes developed for administrative and resource uses provide primary access routes throughout most of the decision area. These primary access routes were created for administrative and resource uses, not for recreation. As a result, the routes are not always providing the recreation experience users are looking for. Over time, recreation use extended, connected, or pioneered new routes from the administrative and resource use routes. This pattern of route development has resulted in high route densities where the administrative and resource use routes provided access for recreation use.

Table Q-9. Current authorized motorized and non-motorized trails within the decision area

District/Field Office	Recreation Trail	Miles
Coos Bay	Blue Ridge	10.0
	Doerner Fir	0.5
	Euphoria Ridge OHV Trail System	4.0
	Floras Lake	1.0
	Four Mile Creek	0.3
	Loon Lake Waterfall	0.5
	Lost Lake	1.0
	New River/Storm Ranch	2.0
	New River Water Trails	5.0
	New Fork Hunter Creek	2.0
	North Spit Trail System	9.0
	Subtotal	**35.3**
Eugene	Clay Creek Trail	0.6
	Eagles Rest Trail	0.2
	Lake Creek Falls Trail	0.2
	Row River Trail	13.5
	Shotgun Creek Non-Motorized Trails	6.2
	Shotgun Creek OHV Trail System	23.2
	Tyrrell Forest Succession Trail	1.0
	Whittaker Creek Trail	1.0
	Subtotal	**45.9**
Klamath Falls	Gerber-Miller Creek Potholes Trail	13.0
	Keno Spencer Snowmobile Trail	6.0
	Pacific Crest National Scenic Trail	1.0
	Pederson Snowmobile Trail	5.0
	Surveyor Peak Snowmobile Trail	3.0
	Wood River Wetland Trail	1.0
	Subtotal	**29.0**
Medford	Armstrong Gulch Trail	1.0
	Baker Cypress	< 1.0
	Beacon Hill	1.0
	Bolt Mountain	3.0
	Buck Prairie Cross Country Trails	17.0
	Cathedral Hills Trail System	11.0
	Eight Dollar Mountain Boardwalk/Trail	0.3
	Enchanted Mountain/Felton	5.0
	Grayback Mountain Trails	6.5
	Grizzly Peak	5.0
	Hidden Creek	1.0
	Jacksonville Woodlands	2.5
	Jeffrey Pine Loop	1.0
	Kelsey Peak	3.0
	Kerby Peak	4.0

District/Field Office	Recreation Trail	Miles
	King Mountain	1.0
	Lake Selmac	3.0
	Layton Ditch	2.0
	London Peak Accessible	0.3
	Lower London Peak	2.0
	Lower Table Rock	2.0
	Mountain of the Rogue Trail System	8.0
	Mule Creek	3.0
	Pacific Crest National Scenic Trail	22.4
	Rainie Falls	2.0
	Rogue River National Recreation Trail	23.0
	Rough and Ready	0.5
	Sterling Mine Ditch Trail	21.0
	Tunnel Ridge	1.0
	Upper Table Rock	2.0
	Wagner Creek	0.5
	Wolf Gap	4.0
	Subtotal	**159.5**
Roseburg	China Ditch Trail	0.4
	Emerald Trail	1.3
	Miner-Wolf Creek WW Trail	0.2
	North Bank Ranch Trail System	8.0
	North Umpqua Trail	12.3
	Sawmill Trail	12.3
	Susan Creek Trails	2.0
	Susan Creek Falls Trails	1.0
	Wolf Creek Falls Trails	1.2
	Subtotal	**38.7**
Salem	Alsea Falls Trail System	8.0
	Baty Butte-Silver King Trail	3.4
	Boulder Ridge Trail	0.2
	Eagle Creek Trail	0.5
	McIntyre Ridge Trail	0.5
	Molalla River Trail System	24.6
	Nasty Rock Trail	1.0
	Sandy Ridge Trail System	15.4
	Table Rock Wilderness Trails	20.4
	Upper Nestucca OHV Trail System	25.0
	Valley of the Giants Trail	0.8
	Subtotal	**99.8**
	Grand Total	**395.1**

The BLM still requires additional data and information on site-specific travel routes to be able to complete implementation-level travel management planning across the entire planning area. Route

identification and comprehensive route inventories have been and are continuing to be collected to have this complete information available to complete all implementation-level travel management planning within 5 years after the completion of these RMP revisions.

Criteria to Prioritize Implementation Level Travel Planning

The BLM would prioritize implementation-level travel management planning by reviewing lands within each district at the scale of areas designated for public motorized access or Travel Management Areas. The BLM would prioritize the order for completion of implementation-level travel management planning by prioritizing those areas meeting most of the following criteria first:

- Areas where damage to soil watershed, vegetation, air, or other resources of the public lands, and to prevent impairment of wilderness suitability is occurring
- Areas where harassment to wildlife or substantial disruption to wildlife habitats are occurring; Prioritize areas where harassment to threatened and endangered species and their habitats are occurring
- Areas where conflicts between motorized and non-motorized recreational uses are occurring
- Areas where route, type of use, or season of use designations are necessary to support management objectives or management direction for the RMP-designated land use allocations
- Areas that have secured legal public access
- Areas also identified as Special Recreation Management Areas where a strong linear asset component is identified (e.g., mountain biking, hiking, equestrian, OHV)
- Areas with completed route inventories

Areas not meeting any of these criteria would be scheduled to be completed last, but not more than 5 years after completion of these RMP revisions. Where multiple areas meet an equal number of criteria for prioritization listed above, BLM districts would apply local knowledge of public concerns, interests, or controversies to prioritize areas to respond to local stakeholders and interested publics.

Plan Maintenance and Changes to Route Designations

The RMP would include indicators that would guide plan maintenance, amendments, or revisions related to designations for public motorized access or the approved road and trail systems within *limited* to existing areas. Future conditions may require the designation or construction of new routes or closure of routes to better address resources and resource use conflicts. The BLM would be able to modify actual route designations within the *limited* category through implementation-level travel management planning without necessitating an RMP amendment, although compliance with NEPA would still be required.

The BLM would accomplish implementation-level travel management planning through plan maintenance. The BLM would collaborate with affected and interested parties in evaluating changes to the existing and designated road and trail network in *limited* area designations and changes to the broader Recreation Management Area designations that emphasize motorized OHV recreation. In conducting such evaluations, the BLM would consider the following:

- Routes suitable for various categories of OHVs and opportunities for shared trail use
- Needs for parking, trailheads, informational and directional signs, mapping and route profiles, and development of brochures or other materials for public dissemination
- Opportunities to tie into existing or planned route networks
- Measures needed to meet other resource objectives in the RMP

References

USDI BLM. 1987. BLM Manual Handbook H-9114-1 – Trails. Available at BLM district offices.

---. 2012. BLM Manual Handbook H-8342-1 – Travel and Transportation Management. 146 pp. http://www.blm.gov/pgdata/etc/medialib/blm/ca/pdf/cdd/west_mojave_plan_updates.Par.33567.File.dat/Travel%20and%20Transportation%20Management%20Handbook.pdf.

Appendix R – Tribal

Biographies and Maps

The BLM compiled data and text from five of the seven Tribes with Tribal lands and varying interests within the planning area, or portions of it. Each Tribe wrote and submitted their individual Tribal biography. The BLM did not alter or edit the text in any way. The BLM created the maps using data provided by each of the Tribes in order to show those lands of interest to each Tribe. The maps and biographies do not reflect a BLM endorsement of tribally stated territories or histories. In addition, the nomenclature used on each map came from the Tribes as well. The BLM has included these biographies and maps as context for the Tribal Interests section as well as to allow the Tribes to state who they are and how they define their interest in the lands administered by the BLM in western Oregon. It also provides managers and others who implement this RMP with valuable information about the history and interests of Tribes within the planning area. All seven tribes listed below are federally recognized Tribes and interact with the BLM as sovereign Nations.

- The Confederated Tribes of Coos, Lower Umpqua, and Siuslaw Indians
- The Confederated Tribes of the Grand Ronde Community of Oregon
- The Confederated Tribes of Siletz Indians
- The Confederated Tribes of the Warm Springs Indian Reservation
    - (The BLM did not receive documents from the Confederated Tribes of the Warm Springs.)
- The Coquille Indian Tribe
- The Cow Creek Band of Umpqua Tribe of Indians
- The Klamath Tribes

The Confederated Tribes of the Coos, Lower Umpqua, and Siuslaw Indians

We, the Coos, Lower Umpqua, and Siuslaw, are coastal people. We still live on lands that once were managed by our ancestors. We have always strived to live in balance with the land and waters, using their gracious bounties and sustaining them for future generations. We have always held sacred the land and the resources that rely on that land, water, and air. We have always lived using what the Creator has provided. We have endured many hardships to our land, people and culture over the last 150 years. Thousands of our ancestors lost their lives to relocation, sickness, and moral. Over the last century we have worked to sustain our people and culture by protecting the environment, natural resources and trying to find ways to balance our traditions and philosophy with the dynamic and developing viewpoints communities that share our coasts and lands.

A Historical Record

In 1855, members of the Coos, Lower Umpqua, and Siuslaw Tribes, along with members of the other coastal Oregon tribes, signed a treaty with the United States of America. This treaty would have ceded lands west of the summit of the Coast Range. This treaty was introduced in the United States Senate and read once, but whether through negligence or whether due to concerns arising from what is commonly known as the Rogue River War, it was never read a second time nor ratified by the Senate. Despite the lack of ratification, the Coos and Lower Umpqua Tribes were held captive beginning in 1856, the Coos were confined on the sand spit known as Ki:we'et (now commonly known as Sitka Dock) just south of Empire, the Lower Umpqua moved to Fort Umpqua on the north spit of the Umpqua River, then at the

Alsea Sub-Agency of the Coast Reservation and the Siuslaw were confined within the Coast Reservation, the boundary of which included most of the western portion of their Ancestral Territory.

In 1871, the federal Appropriations Act ended treaty making between the federal government and tribes. The relationship between sovereigns was continued by the United States through "agreements," statutes, and Executive Orders in lieu of treaties. The passage of this act ended the prospects of the Tribes' treaty being ratified.

In 1875, the Alsea Sub-Agency of the Coast Reservation was opened to Euro-American settlement. This occurred against the will and heartfelt testimony of the Coos and Lower Umpqua confined at the sub-agency. These Tribal Members were ordered to relocate to the remaining portion of the Coast Reservation centered around the Siletz Agency. Most if not all of the Coos and Lower Umpqua refused and relocated around the remnant Siuslaw population centered around the traditional village of Qa'ich (now commonly known as the area around the Hatch Tract, the site of the Confederated Tribes Three Rivers Casino and Hotel); centered around the area of Gardner and the confluence of the Smith and Umpqua Rivers, or centered around South Slough and other areas around Coos Bay.

In 1887, the General Allotment (Dawes) Act authorized allotments to Indian People. Most of these passed out of Indian tenure due to financial hardship, lack of familiarity of the applicable land tenure laws and regulations, and/or due to scheming by non-Indian land investors. Some allotments remain in Tribal Member ownership in fee status or have been sold to the Confederated Tribes government.

In 1917, the Coos, Lower Umpqua and Siuslaw Indians, in reflection of millennia of shared cultural and political ties, and in response to sixty years of common adversity, formally confederated to form the Confederated Tribes of the Coos, Lower Umpqua and Siuslaw Indians. The primary purpose of this confederation was to pursue land claims. Since according to United States Law in order to take lands a ratified treaty agreement had to take place and there was no such ratified treaty.

In 1929, the United States government waived its sovereign immunity (45 Stat.1256, as amended by 47 Stat. 307) and allowed the Confederated Tribes to sue the federal government in the United States Court of Claims for settlement of land claims. Testimony from several Tribal Members and members of the broader community was taken over the next several years. In 1935, the testimony of George Bundy Wasson (of Coos and Coquille descent) in the Court of Claims described the boundary of Ancestral Territory as extending from Fivemile Point (Coos County) north to Tenmile Creek (Lane County) thence east to the crest of the Coast Range, including the Coos, Umpqua (to the head of tide), Smith, and Siuslaw Watersheds. (This description has been carried forward and appears on the enrollment cards of members of the Confederated Tribes and was adopted in Tribal Council Resolution No. 90-010.) In 1938, the United States Court of Claims ruled against the Confederated Tribes, describing Indian testimony as hearsay and self-interested. Later in1938 the United States Supreme Court refused to hear Confederated Tribes appeal of this Court of Claims ruling. In 1947, the Confederated Tribes filed claim to the reorganized Indian Claims Commission, which in 1952 rejected the Confederated Tribes claim, ruling that the matter was *res judicata*, or a case already decided by the Court of Claims.

Following World War II, the United States government pursued the goal of Indian assimilation into the "melting pot" and promoted the termination of federal recognition of several tribes. In 1951, the Confederated Tribes of the Coos, Lower Umpqua and Siuslaw Indians refused to endorse termination of federal recognition. In 1954, Public Law 588 terminated federal recognition of forty-three bands and tribes in Oregon effective 13 August 1956, including, without consent, the Confederated Tribes of the Coos, Lower Umpqua and Siuslaw Indians.

In 1956, the Confederated Tribes of the Coos, Lower Umpqua and Siuslaw Indians petitioned the United Nations for membership "to the end that truth and justice may be raised up and accorded their proper place." The petition was ignored.

The period of termination was a dismal time. Tribal Members continued to know who they were, continued to remember their Ancestors, continued to honor their Elders, continued to meet among themselves as a Tribe, continued to raise their children to be Coos, Lower Umpqua, and Siuslaw, and continued to fight for their rights. Despite the dismissal of their Tribal identity by the United States government, the Confederated Tribes of the Coos, Lower Umpqua and Siuslaw Indians maintained continuous government of, by, and for the Tribes, and exercised the rights and fulfilled the responsibilities of any government to its People.

From 1954 through 1984, the Confederated Tribes expended three decades of human energy, money, and political capital working to have federal recognition restored. Through the sacrifices of many who lived to see the day, and through the sacrifices of many others who did not, federal recognition was restored to the Confederated Tribes of the Coos, Lower Umpqua and Siuslaw Indians through the enactment of Public Law 98-481which was signed into law on 17 October 1984.

Future Directions

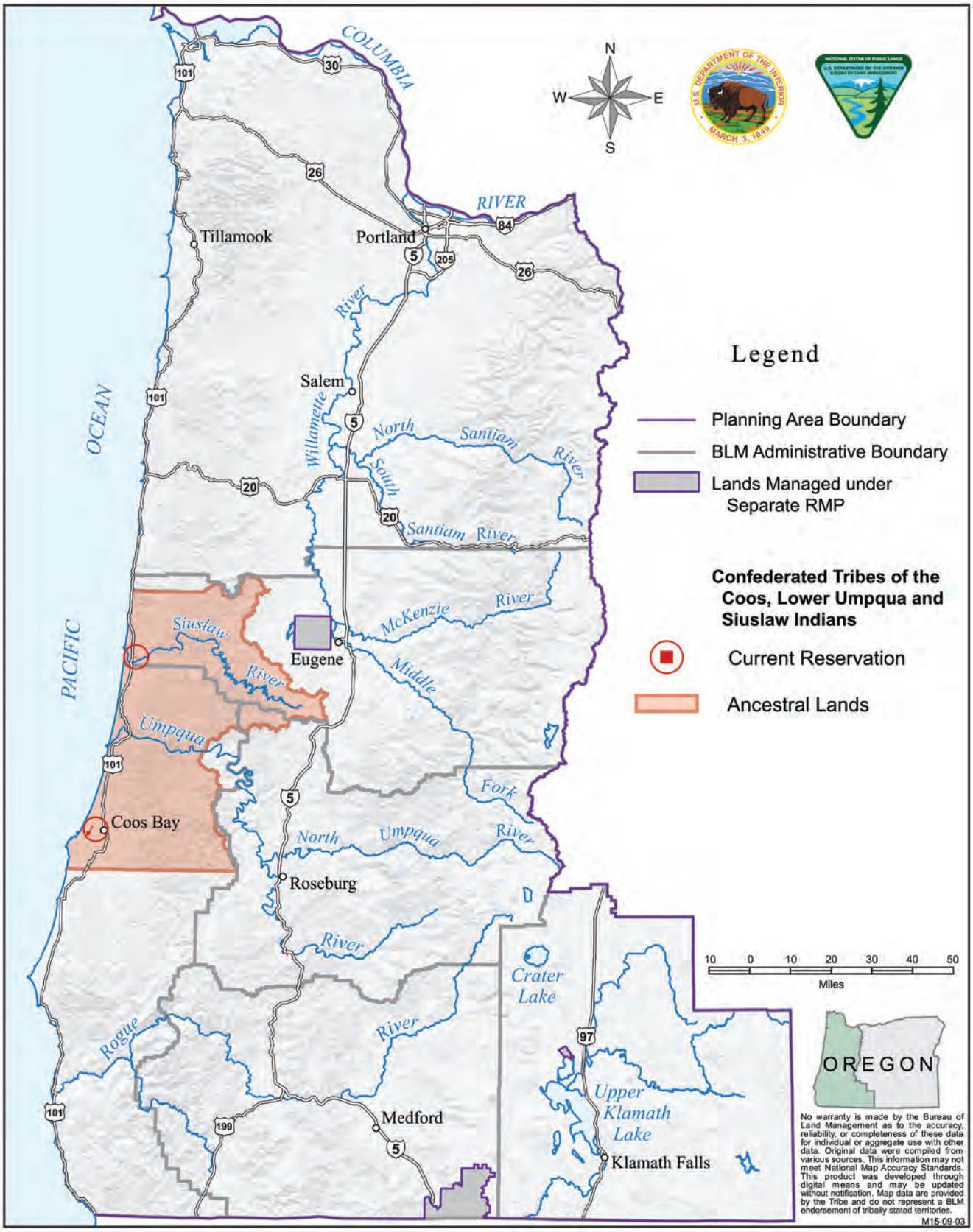
We of the Coos, Lower Umpqua, and Siuslaw have lived here since time immemorial. Our culture and stories are reminders to show our appreciation for all that we have. We have always taken only what we need, and we have always given back. For hundreds of generations we lived in balance with nature. We bring back the bones of the first caught Salmon to the ocean to show respect to the Salmon. It is our way of celebrating and communicating our appreciation to the Salmon, in recognition of their sacrifice. It is also a time to refrain from fishing and give reprieve to the first Salmon as they run upriver. We consider ourselves responsible for the survival and health of the fish, forest, waters and all the resources of our lands.

We understand that People are part of the Natural World. We understand that for us to live other parts of creation must give us their lives. We understand that our lives depend on the lives of others. We must take care of them, as they take care of us. We all must take care of each other. For ten thousand years, for five hundred generations, we have returned our Ancestors to the earth. Our Ancestors' bones are all around us – in the earth, in the trees, in the water, in the air. We feel the spirits of our Ancestors accompanying us every day as the Tribe continues on.

Over 150 years ago, we signed a treaty would have exchanged our land for some promises. That treaty was never ratified; we were removed from our lands and the promises were not kept. Where once millions of salmon returned to our streams, today only thousands return.

BLM-managed lands are culturally significant to the Tribes. Tribal cultural resources include archaeological sites and traditional cultural properties; living cultural resources such as cedar and salmon; and spiritually-significant sites including certain promontories and viewsheds. These cultural resources contribute to the health of tribal cultures and the persistence of tribal identities.

Today, we are Tribal members and we are neighbors. Today we sit around the same table. Today we face the same issues, and today we work together and create common solutions. We are proud to be members of the communities in our Ancestral Watersheds. We greatly respect the accomplishments of our partnerships, and we look forward to the continued healing that our partnerships can achieve.



Map R-1: Tribal Lands of the Confederated Tribes of the Coos, Lower Umpqua and Siuslaw Indians

The Confederated Tribes of the Grand Ronde Community of Oregon

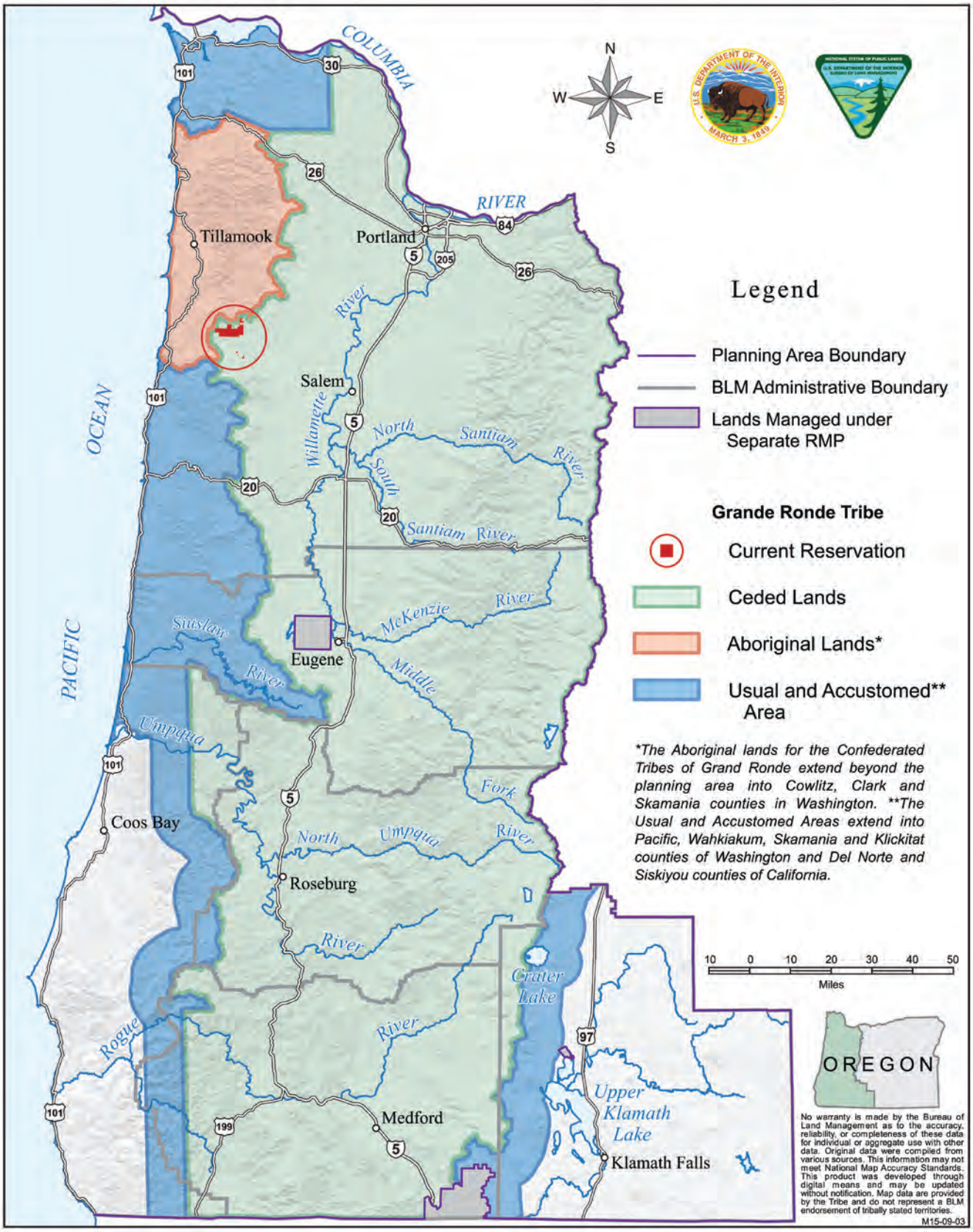
More than 30 Tribes and Bands were relocated to the Grand Ronde Reservation from western Oregon, southwestern Washington, and northern California and removed to the Reservation after signing seven treaties from 1853-1855. These include the Rogue River, Umpqua, Chasta, Kalapuya, Chinookan, Molalla and Tillamook Indians who had lived in their traditional homelands since time immemorial. Prior to removal they lived off the land – fish, game and plant foods were plentiful, and they traded with other Tribes and later, with non-Indians.

The Grand Ronde Reservation was begun by treaty arrangements in 1854 and 1855 and firmly established by Executive Order on June 30th, 1857. The original reservation contained more than 60,000 acres and was located on the eastern side of the coast range on the headwaters' of the South Yamhill River, about 60 miles southwest of Portland and about 25 miles from the ocean.

In 1887, the General Allotment Act became law. Under the law, 270 allotments totaling more than 33,000 acres were made to the Tribal members of the reservation. These allotments came with the understanding that they would pass from federal trust status into private ownership after 25 years. The purpose of the Act was to encourage Tribal people to become farmers and eliminate common ownership of land, traditional activities and practices. In 1901 U.S. Inspector James McLaughlin declared 25,791 acres of the reservation "surplus" and the U.S. sold it for $1.10 per acre to non-tribal businesses and citizens.

In 1936 under the Indian Reorganization Act (also known as the Howard-Wheeler Act), the Tribe was able to purchase 536.99 acres to provide homes and land for tribal people. The attempt at recovery of land was halted on August 13th, 1954, when the Congress passed Public Law 588, the Western Oregon Termination Act, which terminated the Tribe's federal recognition and abolished the treaties that had been negotiated in good faith. This act of legislation was aggressively pursued by then Secretary of Interior James Douglas McKay. McKay was Oregon's 25th Governor prior to accepting the position of Secretary of Interior. McKay oversaw the implementation of the Western Oregon Termination Act, which went into effect on August 13, 1956. For nearly 30 years, the members of the Tribe were landless with the exception of the Tribal cemetery and without the Tribe to provide a focal point of community. Irreparable damage was done to the Tribal community's health, education, languages and cultures. In the early 1970s efforts began to reverse the Termination Act and to reestablish the Tribe. Tribal leaders worked together with no financial backing, only a cemetery, and their desire for the Tribe to restore its federal recognition.

On November 22nd, 1983, Public Law 98-165, also known as the Grand Ronde Restoration Act, was signed into law. After a great deal of negotiations with the local community, local landowners, as well as state and federal agencies, the Tribe developed a Reservation Plan. Following this on September 9th, 1988, Public Law 100-425, also known as the Grand Ronde Reservation Act, was passed, restoring 9,811 acres of the original reservation. On October 4, 1994, Public law 103-435, added 240 acres to the Reservation to compensate the Tribe for a surveying error that was never corrected prior. Today the 10,052-acre reservation lies just north of the community of Grand Ronde. With Restoration of the Tribal government and the re-establishment of the Reservation, the Tribe has focused on rebuilding Tribal programs, developing Tribal services and servicing the greater community. The Tribe has provided a viable community that contributes to the local economy and provides for the achievement of the Tribal members.



Map R-2: Tribal Lands of the Confederated Tribes of Grand Ronde

The Confederated Tribes of Siletz Indians

The Confederated Tribes of Siletz Indians (CTSI) consists of the many Tribes and Bands who were removed to or came to reside on the Siletz/Coast Reservation beginning in 1856 or after. Almost exclusively, ancestral Tribal residents resided there by Aboriginal Right and/or Treaty Right (it being their designated permanent home under treaty stipulations/approved federal policy).

Prior to Treaties being signed, the Reservation being established, and the U.S policy that all Western Oregon Indians were to confederate and live within its borders, Siletz ancestral peoples maintained about 20 million acres of ancestral territories, approximately 19 million of those acres were the area of Oregon west of the summit of the Cascades. As treaties were signed, our people generally ceded large territories to the U.S., while maintaining certain rights. Those rights included: (1) the right to a permanent reservation (and adequate land, water, fish wildlife and other resources for the CTSI to sustain itself into the future); (2) payment for cession of aboriginal title to those vast territories; and (3) right to a temporary reservation or ability to stay within the ceded area until the President of the U.S. selected the permanent reservation.

November 9, 1855, President Pierce signed an Executive Order establishing our permanent reservation at about 1.1 million acres. It included approximately 1/3 of what is now the State of Oregon's coastline. Removal of our ancestors to the new reservation began soon after. An encampment was established just off the eastern border of the reservation as a staging area for bringing tribes to the reservation. Just after most of the tribes had moved from the encampment/staging area to the Siletz Reservation, President Buchanan saw fit to re-designate the temporary encampment as the Grand Ronde Reservation. All Tribes and individuals who came to reside within the Siletz Reservation became members of the Confederated Tribes of Siletz. Those who remained at the encampment became members of the Confederated Tribes of Grand Ronde. All Western Oregon Indians were considered to belong to one or the other of the confederations. There were individuals, and small family groups who had stayed off-reservation, or returned from one or other of the reservation to live in old homelands.

Many hardships were endured, including starvation, neglect, abuse, forced labor, and violent assaults and punishments, sometimes resulting in deaths. Tribes were still being brought onto our Reservation from temporary encampments at Fort Umpqua and other places into the early 1860s. At about this time, the Coos, Lower Umpqua people who had not previously resided within the reservation were brought to a new Sub-Agency of our reservation established at Yachats, referred to as the Alsea Sub-Agency or Yachats Sub-Agency.

Quickly the brutal implementation of federal policy turned our Reservation's atmosphere into one of a harsh prison camp, rather than the Tribal Homeland that had been promised. That perception of our population suffering to bend to the will and whims of the U.S. and shifting policy decisions led U.S. Administrative and Legislative officials to take actions which grabbed large portions of our permanent reservation through illegal means – which did not take into account our peoples' treaty rights, or their own legal responsibilities/lack of authority.

In 1865, about 200,000 acres of our permanent reservation, around Yaquina Bay were taken by order signed by President Johnson. That action left our remaining reservation lands in two detached parcels. In 1875, another 700,000 acres were ripped from our possession through an Act of Congress. Our people were forced to move, instead of being informed that they had to give informed consent in order for the Act to legally take effect.

From 1875-1892 our remaining reservation consisted of about 225,000 acres. In 1892 the General Allotment Act took effect both on reservation and for our off-reservation families. Five hundred fifty-one

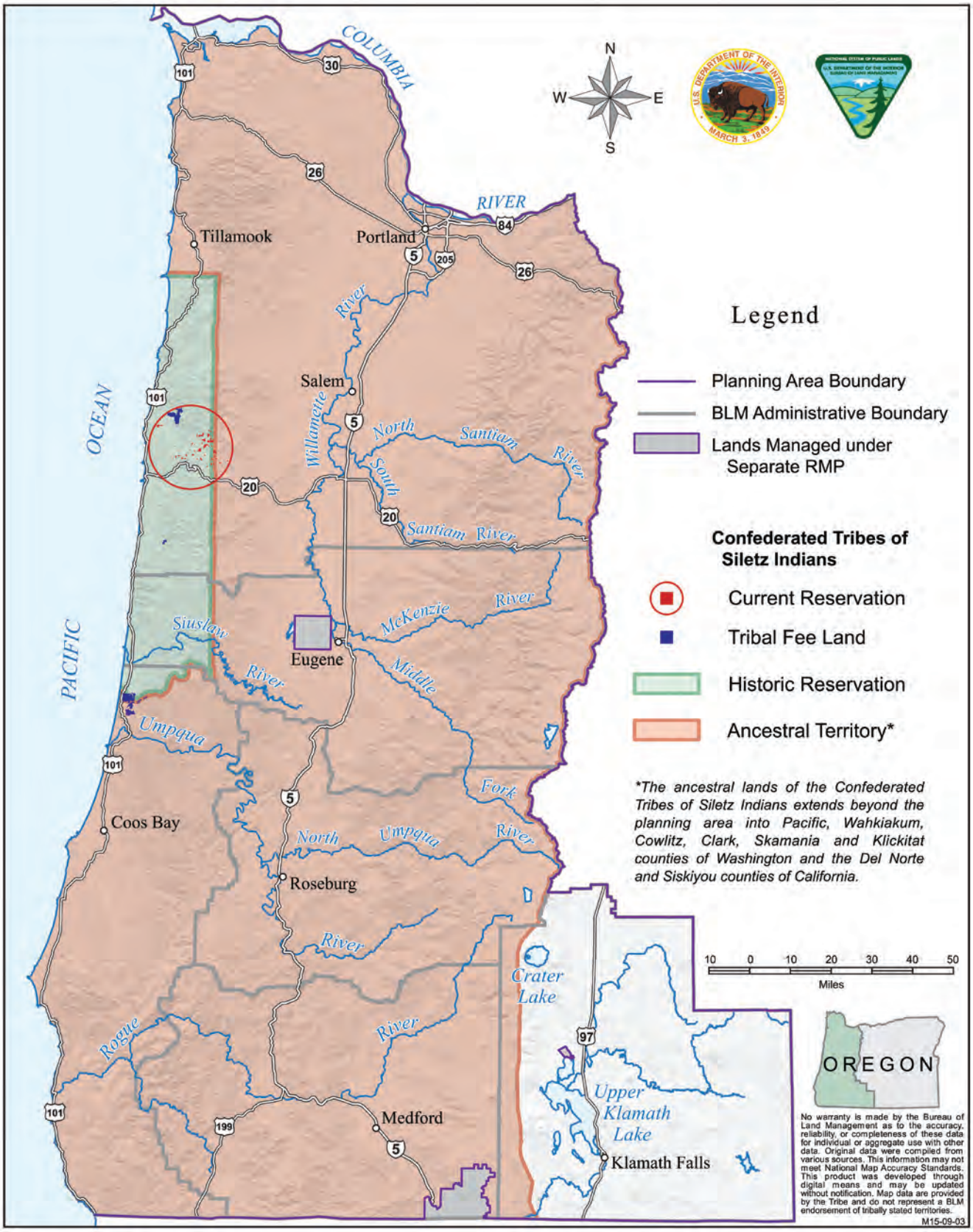
(551) Siletz Reservation Allotments of approximately 80 acres each were assigned to the tribal members then present, and before some families could even return to claim an allotment, the allotment rolls were closed and the remaining reservation lands declared "surplus." Our Tribe was forced to agree to cede those lands for 74 cents an acre, or they "could be taken just like the 1865 and 1875 reductions – without compensation". Promises that future tribal members could apply for and receive allotments from the open and unclaimed areas of the ceded areas remain unfulfilled.

Quickly, U.S. law and policy began to restrict our ability to hang onto even our allotments. By 1912, over half of the Siletz Allotments were non-Indian owned. All of these actions, from treaties, removal, reservation reductions, to loss of family allotments were experienced as a constant onslaught, and continued as U.S. Court of Claims and Indian Claims Commission cases were brought forward by our people. The U.S. Courts generally denied or minimized the U.S.'s responsibilities to our pay for lands ceded to the U.S., or maintain the reservation boundaries that had been set according to treaty stipulations. A combination of individuals who were of Coos, Lower Umpqua and Siuslaw descent brought suit for taking of aboriginal title without a title. Many enrolled Siletz members participated in the suit, but the effort was initiated by off-reservation families not enrolled, so the Court found in part that the group did not have standing to bring the suit – because the Confederated Tribes of Siletz, the legal successors in interest to those ancestral tribes, had not brought the action. Our Tillamook, Yaquina, Alsea, Tututni, Chetco and Coquille people brought suit through the Confederated Tribes of Siletz Indians, and seemed to be on the verge of a major victory, when the U.S. appealed that claims case to the U.S. Supreme Court. The Supreme Court decided that descendants of those tribes were only entitled to value at the time of taking, no interest accrued, because the U.S had failed to ratify their own treaty. A mere pittance was recovered for all of the generations of suffering since removal from those lands.

Simultaneous with land claims actions proceeding, was Siletz and Grand Ronde being targeted for the U.S. Policy of terminating tribal governments in the 1950s. The Western Oregon Termination Act was passed in 1954, and named the Confederated Tribes of Siletz Indians and Confederated Tribes of Grand Ronde, but no other Tribal governments were really recognized at that time. To ensure that no individuals living off-reservation, separate from Siletz or Grand Ronde, or that constituent groups who were members of those confederations could step forward later, and claim that they had survived the intended termination by not being named in the act – Congress named every western Oregon aboriginal group who had ever been named in a federal document, to be sure no chance of any tribal groups asserting status in Western Oregon would be possible. In 1956, the Western Oregon Termination Act took full effect.

Termination was meant to be the final blow to the CTSI and its members. The judgment funds from claims decisions were even held-up as insurance that no concerted resistance to the implementation of Termination would arise. About 1970, Siletz Indians began calling meetings and asking our people to come together and support an effort to get Congress to address our situation. Many of our people were living in poverty. Sub-standard housing was too common, healthcare and education access was low. In 1973, the Menominee Tribe of Wisconsin successfully petitioned Congress to reverse their Termination Act. The CTSI began working toward the same goal, but as the first landless tribe to regain federal recognition after being terminated. In November 1977, Congress passed, and President Jimmy Carter signed into law The Siletz Restoration Act. The Restoration Act called for an initial Reservation Plan to be submitted to Congress for consideration. The Siletz Tribe was advised to submit a modest request for return of lands, which could alter be expanded. The 1980, Siletz Reservation Act included about 3,660 acres of small scattered BLM administered parcels, primarily east of the town of Siletz. Today the CTSI owns about 15,000 acres, mostly timberlands added to our holdings after 1980, through purchase, donation, wildlife mitigation agreements, etc. Those lands are held in a variety of status' (Reservation, non-Reservation Trust, and fee) and managed for a combination of resource use/protection/enhancement values and revenue generation for member services.

Many places of intense historical, cultural and spiritual significance to our Confederated Tribes of Siletz Indians are now owned/managed by the BLM. Among these are ancestral villages such as Umpqua Eden, prayer places, treaty signing, and temporary Reservation sites such as Table Rocks in the Rogue Valley, battle sites such as Hungry Hill, numerous plant and other resource gathering places tended by our ancestors, both within and outside of our 1855 Siletz Reservation boundaries, including Yaquina Head Outstanding Natural Area. Because our people do not hold title or control of these places currently does not release us from our obligations to maintain our connections to them and recognize them for their importance to all generations in the past, present and future.



Map R-3: Tribal Lands of the Confederated Tribes of Siletz Indians

The Coquille Indian Tribe

The Coquille Indian Tribe is a people that have always shared a strong connection with the land. This relationship is evident in the tribe's name which comes from the Native name for a lamprey eel, or "Scoquel," of which the river it abounded in took its name as well, and was later shortened to, "Coquell." Thus, "Coquille", pronounced, Ko-kwel, derived from a Chinook jargon word, became the name of a place and a people.

Coquille ancestors lived at South Slough on lower Coos Bay, in all the watersheds of the Coquille River system from the ocean to its headwaters, and along the coast as far as Cape Blanco and Port Orford. They spoke three distinct local languages; Miluk, Hanis, and Athapaskan, intermixed with Chinook jargon, the trade language for Northwest Native Americans. Along the coast, estuary shorelines and sheltered coastal bays offered food of all sorts, and canoe travel was easy. In the interior, streams and rivers full of fish and valleys where deer and elk wintered, determined where villages were located. Seasonal places in the uplands and interior valleys away from the estuaries and coast were often hunting and food gathering areas used by many different Native groups. Typically, when Coquille and other groups gathered for berry and nut harvesting, root digging, or at hunting and fishing sites, it was also a time of celebration, and for renewing old relationships and making new ones. These places were returned to year after year. Today, annual events like the Mid-Winter Gathering, Restoration Day Celebration, and Solstice Dances all respond to those ancient Coquille practices.

The Coquille people's Ancestral Homelands encompassed more than one million acres, all of it ceded to the U.S. government in treaties signed by, "Coquille chiefs and head-men," first in 1851 and again in 1855. Those treaties were never ratified by the U.S. Senate, thus reservation lands and other considerations promised in the treaties never materialized, so the Coquille people and the generations that followed were denied permanent Tribal homelands.

On June 28, 1989, Congress passed public Law 101-42, which re-established the Coquilles as a federally recognized Indian Tribe. The Coquille Restoration Act restored the Tribe's eligibility to participate in federal Indian programs and to receive funding to provide health, education, housing assistance, and pursue economic development for its members. The Act also reaffirmed the Tribe as a sovereign government, and validated the Tribe's authority to manage and administer political and legal jurisdiction over its lands and resources, its businesses, and its Tribal community members. Today, the Tribe, made up of over a thousand members, provides services to tribal members throughout the world and especially concentrated within the five-county service area of Coos, Curry, Douglas, Lane, and Jackson counties in Oregon.

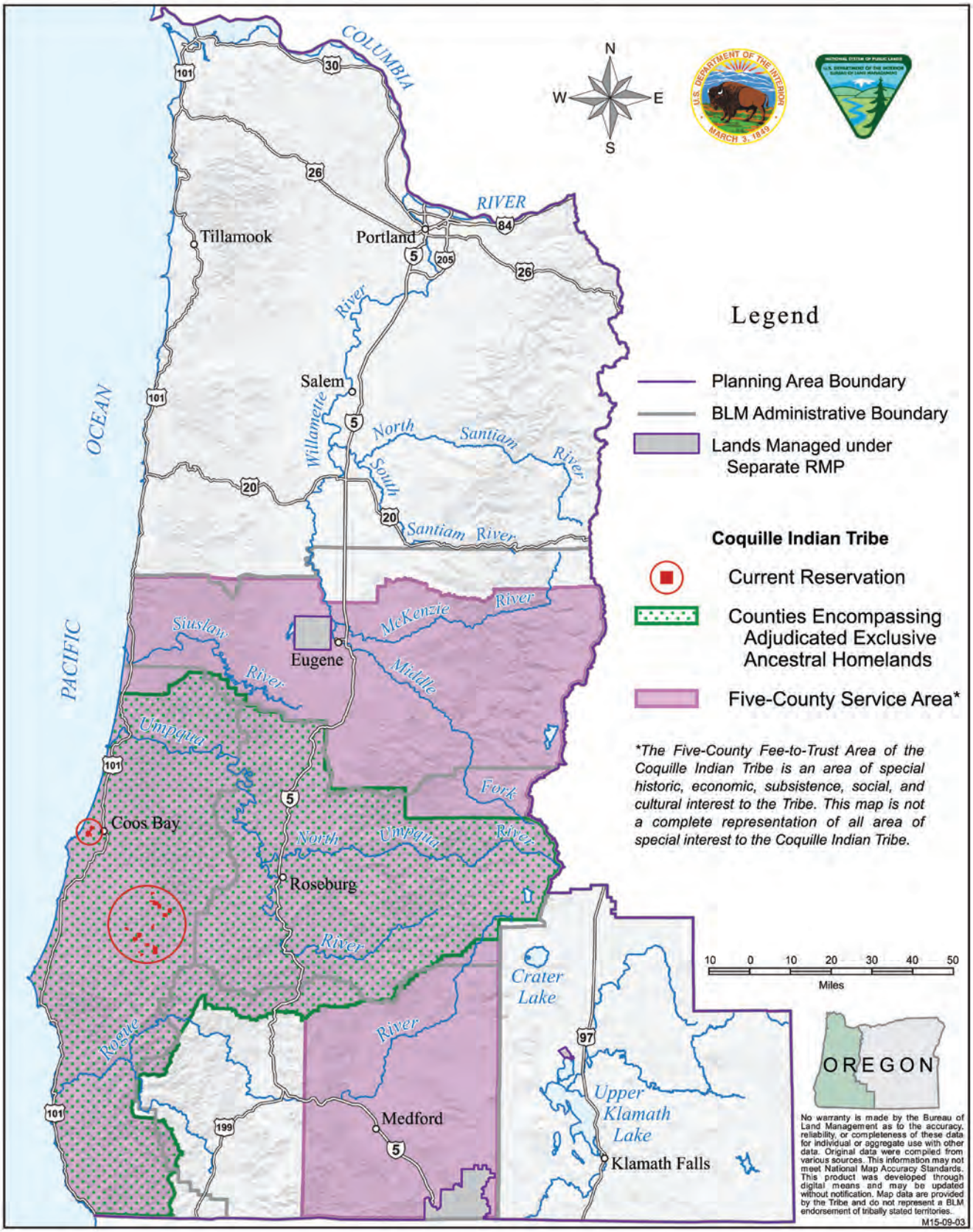
The Coquille Forest was created by enactment of P.L. 104-208, Division B, and Title V on September 30 1996. This Public Law, passed by the U.S. Congress and signed by President Clinton, restored 5,410 acres (5,397 according to GIS) of ancestral homelands to the Coquille Indian Tribe and designated the restored lands as the Coquille Forest.

The Coquille Forest Act allows the Coquille Tribe an opportunity to reaffirm Tribal stewardship over a small portion of its ancestral homelands, and to reestablish many of the Tribal cultural traditions that were once practiced on these landscapes.

The purpose for creation of the Coquille Forest was described by Senator Hatfield in his statement before the U.S. Senate concerning Amendment No. 5150 to the Oregon Resources Conservation Act of 1996 [S. 1662]: "It is intended to establish a Coquille Forest for the Coquille Tribe that will mesh into the broader forest management of Coos County. Within this context, the Coquille Forest is to provide a basis for

restoring the Tribe's culture as well as providing economic benefits [Congressional Record- Senate, pg. S9656, August 2, 1996].

The respect the Coquille people have always had for their Ancestral Homelands, much of which is now administered by the Bureau of Land Management, is carried on in legacy through the practices of the Coquille Indian Tribe today. Annual trips are still made to harvest traditional foods, gather grasses for weaving baskets and enjoy celebrations on the land their ancestors had stewardship over for thousands of years. The land is, and always will be, an integral part of their identity and heritage as a people.



Map R-4: Ancestral Homelands and Areas of Special Interest to the Coquille Indian Tribe

The Cow Creek Band of Umpqua Tribe of Indians

The Cow Creek Band of Umpqua Tribe of Indians, located in Douglas County, Oregon, signed a treaty with the United States of America on September 19, 1853, which was one of the first treaty's from the Pacific Northwest to be ratified by the Senate on April 12, 1854. By that agreement, the Cow Creeks became a landless tribe, ceding more than 800 square miles of the Umpqua watershed in Southwestern Oregon to the United States. Unfortunately, the Treaty was ignored by the Federal Government for nearly a century until the Termination Act in 1956 which terminated federal relations with the Cow Creeks, along with 60 other tribes and bands in western Oregon.

The Cow Creeks received no prior notification of the Termination Act, and because of that were able to obtain presidential action in 1980 to take a land claims case to the U.S. Court of Claims. On December 29, 1982, nearly 125 years after the Treaty was signed, P.L. 97-391 was passed by Congress and the Tribe regained federal recognition.

With federal recognition, the tribe was able to negotiate federal contracts with the Bureau of Indian Affairs and the Indian Health Service to administer such programs as Housing, Education, and others related to health for the enrolled membership of the Tribe within the tribal service area.

Current enrollment for the Tribe is over 1600 members. Nearly one half of all tribal members reside in the tribe's seven county service area consisting of Coos, Deschutes, Douglas, Jackson, Josephine, Klamath and Lane Counties. These counties were determined by the Bureau of Indian Affairs and Indian Health Service as required by the CFR to define "on or near the reservation" for the tribe.

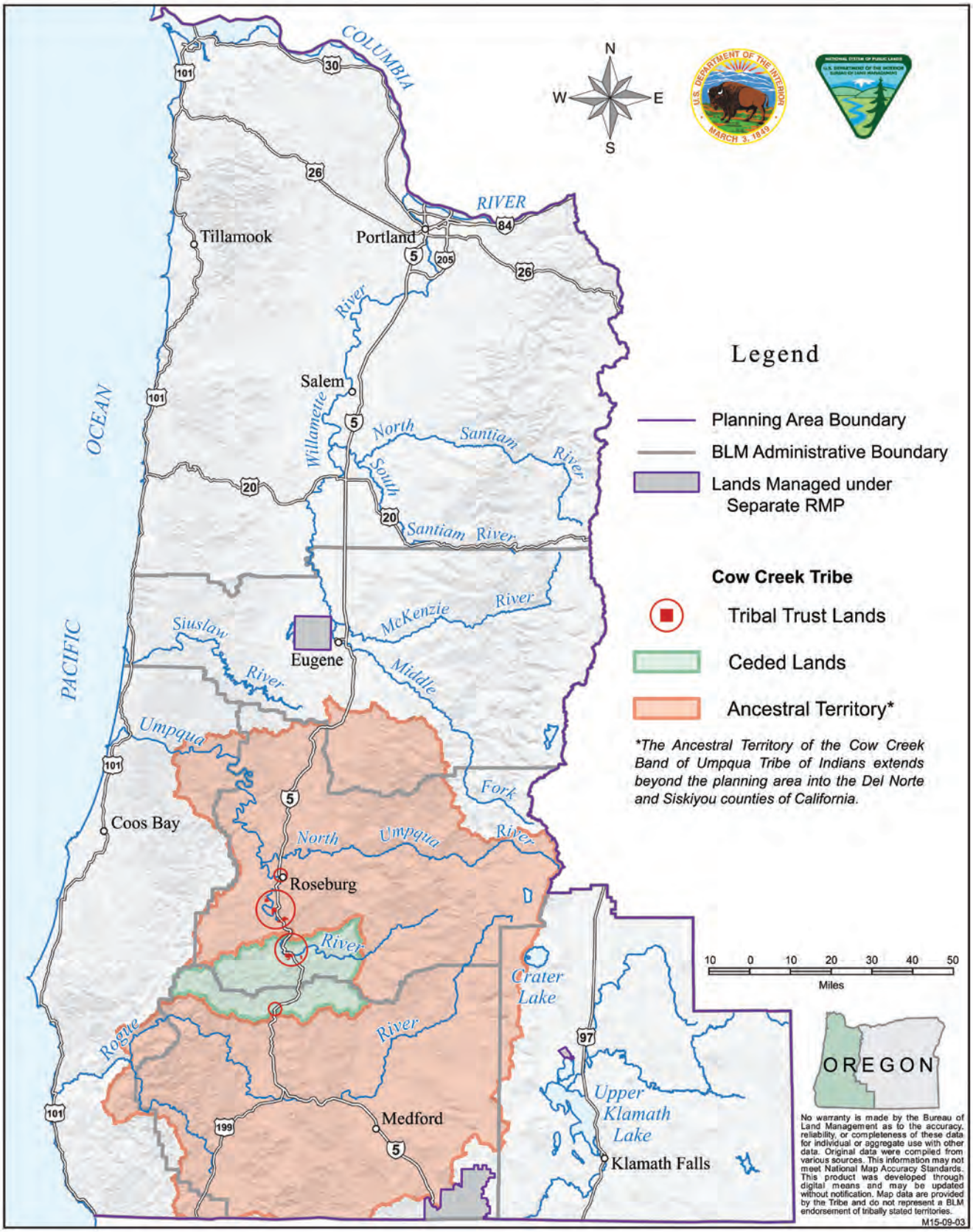
In 1985 the Tribe purchased 29 acres in Canyonville, Oregon which was eventually taken into "trust" by the federal government and became the Tribal Reservation. This property is only 6 miles from where the Treaty was signed in 1853.

The tribe has maintained strong cultural ties to the area. The traditional Cow Creek Pow-wow is held annually at South Umpqua Falls, an area that has tremendous importance to the tribe's culture and tradition.

Another area of great historical, cultural, and traditional use is an area known as the Huckleberry Patch on the Rogue-Umpqua Divide. This area was a traditional use area for the tribe and has great historic importance.

The Tribe has remained steadfast in the realization of tribal economic self-sufficiency. After years of planning and financial packaging, the Tribe opened the Cow Creek Bingo Center on April 30, 1992. Through careful management of tribal assets, the tribe was able to initiate a series of expansions that resulted in the Seven Feather Hotel and Casino Resort.

With proceeds from the resort, the tribe has developed an aggressive economic development program that includes land acquisition and business diversification and development.



Map R-5: Tribal Lands of the Cow Creek Band of Umpqua Tribe of Indians

The Klamath Tribes

naanok ?ans naat sat'waY
a naat ciiwapk diceew'a "We help each other; We will live good"

We are the Klamath Tribes, the Klamaths, the Modocs and the Yahooskin. We have lived here (**Map R-6**), in the Klamath Basin of Oregon, from time beyond memory. Our legends and oral history tell about when the world and the animals were created, when the animals and gmok'am'c – the Creator – sat together and discussed the creation of man. If stability defines success, our presence here has been, and always will be, essential to the economic well-being of our homeland and those who abide here.

Time Immemorial

In the old times we believed everything we needed to live was provided for us by our Creator in this rich land east of the Cascades. We still believe this. We saw success as a reward for virtuous striving and likewise as an assignment of spiritual favor, thus, "Work hard so that people will respect you", was the counsel of our elders. For thousands upon countless thousands of years we survived by our industriousness. When the months of long winter nights were upon us, we survived on our prudent reserves from the abundant seasons. Toward the end of March, when supplies dwindled, large fish runs surged up the Williamson, Sprague, and Lost River. At the place on the Sprague River where gmok'am'c first instituted the tradition, we still celebrate the Return of c'waam Ceremony.

The six tribes of the Klamaths were bound together by ties of loyalty and Family, they lived along the Klamath Marsh, on the banks of Agency Lake, near the mouth of the Lower Williamson River, on Pelican Bay, beside the Link River, and in the uplands of the Sprague River Valley. The Modoc's lands included the Lower Lost River, around Clear Lake, and the territory that extended south as far as the mountains beyond Goose Lake. The Yahooskin Bands occupied the area east of the Yamsay Mountain, south of Lakeview, and north of Fort Rock. Everything we needed was contained within these lands.

The Nineteenth Century

In 1826 Peter Skeen Ogden, a fur trapper from the Hudson's Bay Company, was the first white man to leave his footprints on our lands. One hundred and seventy five years later those footprints have multiplied into the thousands, each leaving their marks on the lands and the Klamath Tribes. The newcomers came first as explorers, then as missionaries, settlers and ranchers. After decades of hostilities with the invaders, the Klamath Tribes ceded more than 23 million acres of land in 1864 and we entered the reservation era. We did, however, retain rights to hunt, fish and gather in safety on the lands reserved for us "in perpetuity" — forever. Treaty 1864

From the first, Klamath Tribal members demonstrated an eagerness to turn new economic opportunities to our advantage. Under the reservation program, cattle ranching was promoted. In the pre-reservation days horses were considered an important form of wealth and the ownership of cattle was easily accepted. Tribal members took up ranching, and were successful at it. Today the cattle industry still remains an important economic asset for many of us. The quest for economic self-sufficiency was pursued energetically and with determination by Tribal members. Many, both men and women, took advantage of the vocational training offered at the Agency and soon held a wide variety of skilled jobs at the Agency, at the Fort Klamath military post, and in the town of Linkville. Due to the widespread trade networks established by the Tribes long before the settlers arrived, another economic enterprise that turned out to be extremely successful during the reservation period was freighting, in August of 1889, there were 20 Tribal teams working year-round to supply the private and commercial needs of the rapidly growing

county. A Klamath Tribal Agency – sponsored sawmill was completed in 1870 for the purpose of constructing the Agency.

The Twentieth Century

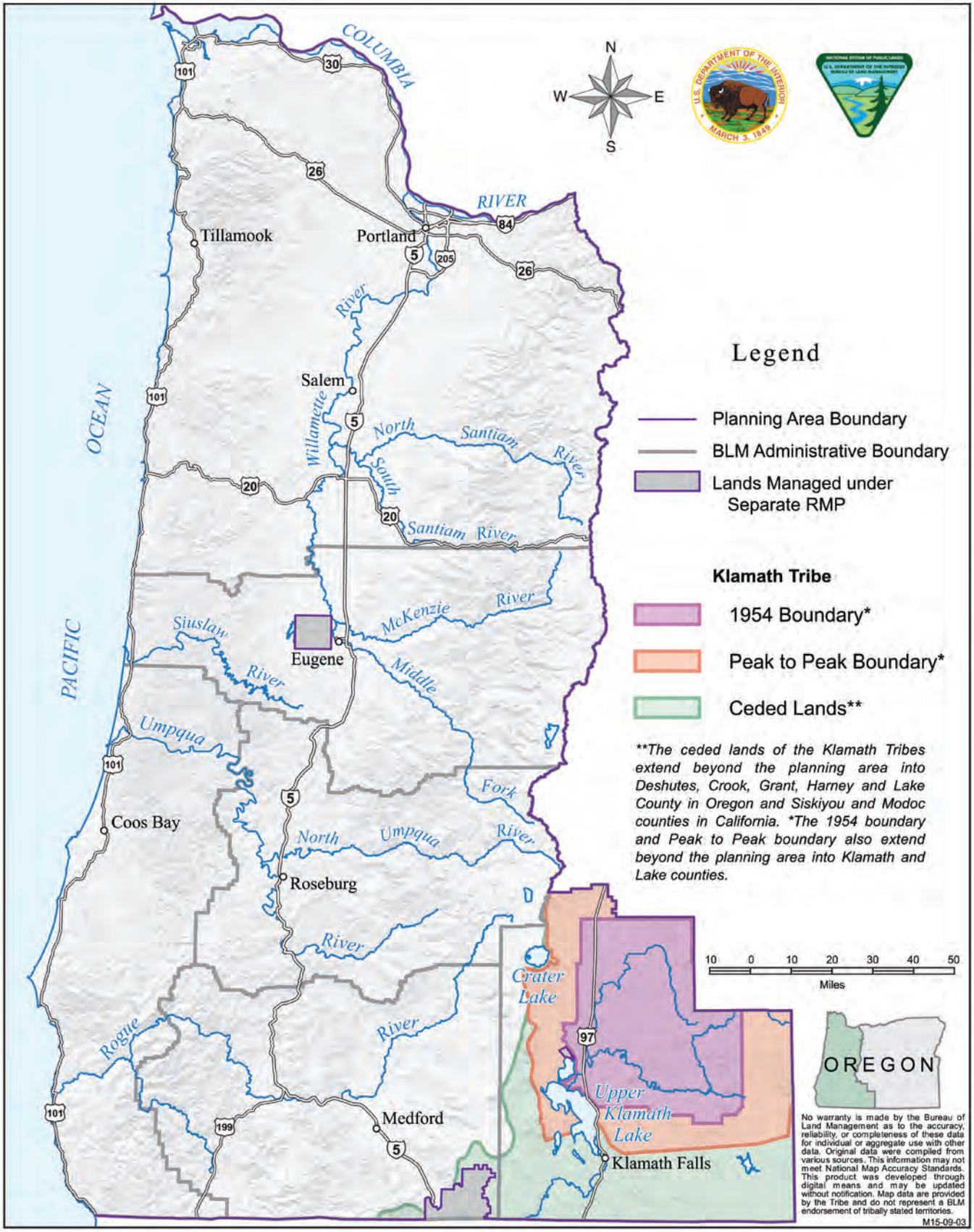
By 1873, Tribal members were selling lumber to Fort Klamath and many other private parties, and by 1896 the sale to parties outside of the reservation was estimated at a quarter of a million board feet. With the arrival of the railroad in 1911, reservation timber became extremely valuable. The economy of Klamath County was sustained by it for decades. By the 1950's the Klamath Tribes were one of the wealthiest Tribes in the United States. We owned and judiciously managed for long term yield, the largest remaining stand of Ponderosa pine in the west. We were entirely self-sufficient. We were the only tribes in the United States that paid for all the federal, state and private services used by our members.

In 1954, the Klamath Tribes were terminated from federal recognition as a tribe by an act of congress. During the process of termination the elected Tribal representatives consistently opposed termination. There was, in addition, a report from the Bureau of Indian Affairs (BIA) which concluded that the Klamath Tribes were NOT ready for termination and recommended against it. Despite this consistent official opposition from the Tribes and the BIA, congress adopted the Klamath Termination Act (P. L 587). Not only did we see the end of federal recognition and supplemental human services, but tragically our reservation land base of approximately 1.8 million acres was taken by condemnation and the Klamaths were terminated as a Tribe. This single act of Congress had devastating effects on the Klamath Tribes and several other tribes across the country.

The Tribes' Position on Termination

In 1974 the Federal Court ruled that we had retained our Treaty Rights to hunt, fish and gather, and to be consulted in land management decisions when those decisions affected our Treaty Rights.
In 1986, we were successful in regaining Restoration of Federal Recognition for our Tribes. Although our land base was not returned to us, we were directed to compose a plan to regain economic self-sufficiency. Our Economic Self-sufficiency Plan reflects the Klamath Tribes' continued commitment to playing a pivotal role in the local economy.

During the Economic Self-sufficiency Plan (ESSP) development process, the Planning Department and other committees reviewed hundreds of ideas and concept combinations that would help attain our much-desired goal of long term economic self-sufficiency. After a lengthy analysis process the recommendation was made and accepted by the Tribal Council and the General Council, that the Tribes construct a casino. With our usual energy and determination the Tribes efforts became reality.



Map R-6: Tribal Lands of the Klamath Tribes

Tribal Listening Sessions

Overview

As part of the outreach process for the RMP, the BLM reached out to all nine federally recognized Tribes located within or holding interests within the planning area, inviting them to participate in listening sessions. These invitations initiated coordination and communication with the Tribes in this RMP planning process. Several Tribes also have representatives in the Cooperating Agency Advisory Group (CAAG), which has been and will continue to collaborate with the BLM throughout the duration of the planning process. In addition to these efforts and formal government-to-government consultation, the BLM will continue to be available for meetings throughout the planning process with interested and affected Tribes.

BLM managers and RMP team members conducted listening sessions with five Tribes at local Tribal Headquarters (**Table R-1**). Cogan Owens Cogan facilitated four of the five meetings with assistance from DS Consulting; BLM staff facilitated one meeting. Their notes, combined with BLM staff notes, comprise the content of this summary.

Table R-1. Alphabetical listing of Tribal listening sessions*

Tribe	Date
The Confederated Tribes of Grand Ronde Community of Oregon†	May 22, 2013
The Confederated Tribes of Siletz Indians†	June 7, 2013
The Coquille Indian Tribe†	May 14, 2013
The Cow Creek Band of Umpqua Tribe of Indians†	December 18, 2013
The Klamath Tribes†	July 15, 2013

* The Confederated Tribes of Coos, Lower Umpqua, and Siuslaw Indians, Confederated Tribes of Warm Springs, Karuk Tribe, and Quartz Valley Indian Community elected not to have listening sessions.

† Denotes the Tribal representative serves as a member of the CAAG. In addition to these Tribes, the Confederated Tribes of Coos, Lower Umpqua, and Siuslaw Indians also serve on the CAAG.

These listening sessions initiated efforts to ensure that Tribes were involved early in the RMP process and that the BLM understands Tribal interests. The listening sessions—

- Provided Tribal Councils and staff with an update on the planning process and external initiatives;
- Sought input on Tribal issues and concerns and what analytical questions need to be addressed in developing Planning Criteria;
- Identified how Tribes can provide input during future phases of the planning process; and
- Sought input on the level and mechanisms for participation desired by each Tribe.

The BLM had not publically released the Purpose and Need at the time the first three listening sessions were held. These notes reflect only the listening sessions, and not subsequent discussions that the BLM held with the Tribes who expressed interest in follow up discussions on the Purpose and Need. These follow up sessions with the Tribes occurred through conversations with Tribal representatives through the CAAG.

At each listening session, materials presented included—

- Maps of BLM-administered lands in western Oregon (e.g., planning area and administrative land designations)
- Draft analytical questions developed with input from the CAAG's Tribal Work Group
- A fact sheet on the process and timeline

Listening sessions ranged from 1.5 to 3 hours in length and covered several common discussion items (**Table R-2**).

Table R-2. Listening session agenda and format

Meeting Agenda Items	Participants
Introductions and Background	District Manager and Tribal Council
Update on Planning Process and Schedule	State Office staff
Questions/Discussion	Tribal Council and staff
Listening Session • What are the areas of Tribal interest? • What are Tribal values and concerns to address in the RMP? • What are analytical questions that BLM should address?	Facilitator
Summary/Closing	District Manager

To help frame the discussion of Planning Criteria for Tribal interests, Heather Ulrich, RMP Tribal Liaison, provided a preliminary list of issues and concerns that generally addressed how BLM-administered land management actions would affect the following:

- Tribal plant collection, management, and use
- Tribal resource collection of obsidian and other non-biological resources
- Tribal fishing and hunting resources and practices
- Tribal access to areas of interest including areas of plant collection, fishing, hunting, sacred sites, or places of traditional religious and cultural importance
- Sacred sites and places of traditional religious and cultural importance
- Neighboring Tribally managed lands

Because of these listening sessions, the BLM expanded and refined this initial list to address the diverse number topics and resources of interest to Tribes more accurately. The Planning Criteria contains a section on Tribal Interests that outlines the refined list of analytical questions as gathered from Tribal outreach.

Tribal Listening Session Highlights

The following section summarizes the participants and highlights of each of the listening sessions.

Confederated Tribes of Grand Ronde

May 22, 2013
Tribal Headquarters, Grand Ronde, Oregon

Tribal council participants: Toby McClary, Secretary; Jon George, Council Member; June Sherer, Council Member; Kathleen Tom, Council Member; Chris Mercier, Council Member
Tribal staff participants: David Harrelson, Cultural Protection Manager; Eirik Thorsgard, Tribal Historic Preservation Officer; Michael Karnosh, Ceded Lands Program Manager; Michael Wilson, Natural Resources Director
BLM attendees: Kim Titus, Salem District Manager; Ginnie Grilley, Eugene District Manager; Heather Ulrich, RMP Tribal Liaison; Mark Brown, RMP Project Manager; Trish Hogervorst, Salem District Public Affairs Officer

Facilitator: Jim Owens, Cogan Owens Cogan

General comments and highlights of main Tribal interest topics

- The Grand Ronde has just signed (2013) a Natural Resources Management Plan that they feel may serve as a model for other Tribes. Their timber land is managed for sustained yield. In writing their Natural Resources Management Plan, the Tribe met with environmental groups to educate them on the plan. The Tribe is very proud of the fact that environmental groups had previously predicted the Grand Ronde timber would be gone in 20 years; at 30 years, there is still plenty of timber on Tribal lands due to good management.
- The Tribe asked about gated BLM roads. Could tribes get passes through gated areas to access cultural sites? Could BLM let the Tribe know the conditions of the roads? Tribal members could serve as eyes/ears for the BLM on BLM-administered lands during their Tribal gathering of cedar, huckleberries, etc. Tribal access and public access are not the same. The Tribe expressed a need for Tribal access to BLM-administered lands for religious reasons.
- Private companies are harvesting and punching in roads interrupting fish passage and providing no maintenance on the roads for many years. The Tribe is concerned about this happening on BLM-administered lands.
- There is a lot of available timber and our communities and counties are in need; consider increased timber production based upon sustainable management principles.
- Can the BLM add language at the plan level that establishes Tribes as partners for cultural resource work such as surveys?
- Develop a partnership for managing plants of interest, including "take" and the preparation for harvest and harvest methods.
- Could the Grand Ronde be included in all Tribal consultations since all lands on the BLM map are Ceded lands with treaty rights?
- The Tribe is contracting with National Park Service (NPS) and National Oceanic and Atmospheric Administration (NOAA) to conduct traditional cultural landscape studies on indigenous landscapes. Could the BLM hire Tribes to work on this on BLM-administered land?
- There are concerns regarding management of BLM-administered lands bordering the eastside of Grand Ronde lands.
- Could BLM meet regularly with Tribes on new rules coming down and create a memorandum of understanding on annual meeting to discuss mutual issues/projects? The Tribe would like to finish Tribal memorandum of understanding as cooperating agency on the planning process.
- Interested in discussion of Purpose and Need at a future date.
- The Tribe offered a tour of Grand Ronde lands to see work (i.e., fish passage projects) they are doing in natural resources. The Tribe has opened 60+ miles of streams for fish passage.

Planning considerations

- Restoration and long-term maintenance of fish passage. Old roads left unmaintained block fish passage.
- Indigenous landscapes and landscape level analysis.
- Quantifying non-commercial items is not the way to approach it. Cannot compare value of timber products versus non-commercial timber products (e.g., items for making baskets and other Tribal cultural needs).
- How BLM manages collection of special forest products to prevent degradation.
- Tribe would like to provide information to the BLM on restoration efforts (e.g., hazelnut sticks for basketry). The Tribe would like to see more lands managed for Tribal cultural resources.

Confederated Tribes of Siletz Indians

June 7, 2013
Tribal Headquarters, Siletz, Oregon

Tribal Council participants: Delores Pigsley, Chairman; Lillie Butler, Council Member; Loraine Butler, Council Member; Reggie Butler, Sr. , Council Member; Robert Kentta, Council Member
Tribal staff participants: Mike Kennedy, Natural Resources Manager
BLM attendees: Kim Titus, Salem District Manager; Ginnie Grilley, Eugene District Manager; Mark Brown, RMP Project Manager; Heather Ulrich RMP Tribal Liaison; Richard Hatfield, Mary's Peak Resource Area Field Manager
Facilitator: Jim Owens, Cogan Owens Cogan

General comments and highlights of main Tribal interest topics

- How does the RMP fit into the Wyden Plan?
- The Tribe expressed concern for air, water, and climate change.
- The Tribe expressed concern for timber receipts and Secure Rural Schools.
- The Tribe stated it would like a memorandum of understanding for collecting basketry materials.
- Tribe has past and ongoing interest in public domain lands in Lincoln County.
- Look into Tribes' "right of first refusal" for excess Federal lands within original reservation boundaries that are designated for disposal.
    - Can Tribes provide input to what lands the BLM can put in Land Tenure Zone 3 (suitable for disposal)?
- First level of interest in BLM-administered lands are those within the original reservation boundary. Some interests include:
    - Hazel management
    - Hunting access
    - Spruce root collection
- The Tribe expressed concern regarding destruction and looting of archaeological sites and artifacts as well as public use impacts in certain key areas of interest to the Tribe within the planning area.
- Concern regarding BLM ability to coordinate consultation with other/all Tribes concerned.
- Plant collection: Where resources are on BLM-administered land, can the Tribe help manage them, increase them, and collect them? Specific collection interests include:
    - Beargrass collection
    - Ferns and peeled chittum
    - Sugar pine and ancient oaks; digger pine in Applegate and Rogue valleys
    - Willamette Valley oak savannah, angelica (Lomatium species), scrub oak, and rocky outcrops
    - Acorns and pileated woodpeckers for feathers; want to ensure that the Tribe can obtain forage permits for these resources
- The Tribe identified a need for improved coordination on memoranda of understanding with other Tribes when Tribal territory is impacted.

Planning considerations

- Protection of historic trail systems.
- Preserve some type of visible boundary between the historic reservation lands and BLM-administered lands (e.g., leave large trees).
- Management of public domain lands in Lincoln County by the Tribes.
- Management for traditionally collected plants (e.g., beargrass, hazel nuts, angelica) on all BLM-administered lands; stand diversity that encourages spruce, other species important for collection;

adverse effects of overly dense timber stands on sugar pine, ancient oaks. Management should include heavy thinning or clearcuts to reopen areas for beargrass collection.

- Identification/interpretation of battle sites.
- Management for marbled murrelet.
- Protection of cemetery sites and other archaeological sites and artifacts impacted by inadvertent public use or intentional damage and looting.

Coquille Indian Tribe

May 14, 2013
Tribal Headquarters, North Bend, Oregon

Tribal participants: Brenda Meade, Chair; Toni Ann Brend, Vice-Chair; Ken Tanner, Chief; George Smith, Executive Director; Joan Metcalf, Secretary/Treasurer; Sharon Parrish, Representative; Kippy Robbins, Representative; Jason Robison, Natural Resources Director
BLM attendees: Mark Johnson, Coos Bay District Manager; Ralph Thomas, Coos Bay Associate District Manager; Heather Ulrich, RMP Tribal Liaison; Mark Brown, RMP Project Manager; Megan Harper, Coos Bay District Public Affairs Officer
Facilitator: Jim Owens, Cogan Owens Cogan

General comments and highlights of main Tribal interest topics

- The Coquille Indian Tribe regained Tribal status in 1989. A 1950's Court of Claims case provided exclusive ancestral territory on BLM-administered lands within the Coos Bay District. Other geographic areas outside of this exclusive ancestral territory are of shared interest with other Tribes. The Coquille Forest Act of 1996 put 5,400 acres of BLM-administered lands into trust for the Tribe to manage. They have a huge stake in BLM plan revisions because of statutory direction that requires the Coquille Forest to be managed per the standards and guidelines of Federal forest plans "on adjacent or nearby Federal lands."
- The Tribe expressed concern regarding the economic health of the communities that the Coquille and other Tribes work in, and how Tribes influence and contribute to the communities they live and work in (e.g., Coquille is the second largest employer in Coos County).
- Tribal approach is to maintain healthy communities that rely upon timber harvest but still only take what is needed and managing for the needs of the earth rather than the needs of humans. Living in balance; sustainability from a cultural perspective.
- In regards to the Tribal Cooperative Management Area (TCMA), consider Adaptive Management Area framework with site-specific management prescriptions and intensive monitoring.
- Tribe desires greater direct involvement in management of Coos Bay Wagon Road lands. Tribe has proposed a cooperative management agreement with Coos County; developing a concept paper to share with the Congressional delegation.
- Tribe wants to ensure an ongoing relationship with the BLM beyond this planning process.
- Interested in discussion of Purpose and Need at a future date.

Planning considerations

- Economic values that lead to a sustainable and economically healthy Tribal community.
- Approach for and addressing management of the Coos Bay Wagon Road and cooperative management.
- Consideration of TCMA in all alternatives based upon Direction from the Secretary of the Interior.
- Concerns regarding climate change and impacts on Tribal resources and natural resources.
- Adjacency issues in the context of the Tribe's exclusive ancestral territory.
- Management of natural/cultural resources within riparian areas.
- The Tribe wants to ensure that the planning effort considers provisions of existing agreements with the BLM (e.g., memoranda of understanding and memoranda of agreement). If proposed planning considerations are in opposition to, or not fully consistent with agreement provisions, further discussions with the Tribe should occur prior to moving forward with such considerations.

Cow Creek Band of Umpqua Tribe of Indians

December 18, 2013
Tribal Headquarters, Roseburg, Oregon

Tribal participants: Robert Van Norman, Treasurer; Lonnie Rainville, Operations Officer; Tim Vredenburg, Director of Forest Management; Amy Amoroso, Director of Natural Resources; Jessie Plueard, Archaeologist; Rhonda Malone, Cultural Development Coordinator; Kelly Coates, Fisheries Biologist; Heather Bartlett, Environmental Specialist; Scott Van Norman, Wildlife Technician
BLM attendees: Mark Brown, RMP Project Manager; Abbie Jossie, Roseburg District Manager; Heather Ulrich, RMP Tribal Liaison; Molly Casperson, Roseburg District Archaeologist
Facilitator: Cheyne Rossbach, Roseburg District Public Affairs Officer

General comments and highlights of main Tribal interest topics

- Purpose and Need Statement seems too broad and that it will be challenging to develop alternatives.
- The Tribe is very aware of the politics surrounding the BLM, specifically proposed legislation directed toward BLM-administered lands. Specifically, Congressman DeFazio's O&C Trust, Conservation, and Jobs Act and Senator Wyden's O&C Act of 2013 and Canyon Mountain Land Conveyance Act of 2013.
- There was interest in knowing how the RMP planning process was taking into consideration proposed legislation.
- Interest in clarification of the differences between the RMP Purpose and Need statement, current practices, and what is in the Northwest Forest Plan.
- There was interest in the definition of "old growth."
- The public perception of old growth as natural is not true. The character of historic forests was a direct result of Tribal management. Recognize historic human involvement in "old growth" development in the new definition of old growth – that past humans "created" what is old growth today. The idea that pristine or untouched are characteristic of old growth is incorrect.
- How will the BLM balance the needs of the county, who says they need a set amount of money, versus the other needs (e.g., northern spotted owl recovery)? Do the perceived needs of the counties direct the plan?
- The way the BLM draws lines around resources conflicts with how the Tribe would delineate resources and, at times, the BLM and Tribe are not even looking at the same kinds of resources. Tribal staffs at the table do not adhere to the silo approach of isolated old growth stands or owls. One example where Tribal values and BLM values are in conflict is that old growth is not fire resilient like it was 100 years ago because the Tribe is not managing them the way they did traditionally (i.e., annual fire cycles).
- It is problematic that the structural complexity of forests related to fires cannot be mapped. The forests are not as they should be because management is not as it was historically (Tribal management). Another example of the incongruous nature of Federal and Tribal land management strategies is diminishing meadows that are important foraging locales for game. Definitions and alternatives should be adaptive enough to protect Tribal resources.
- Early seral habitat is important for foraging and hunting, which has little to do with meeting timber targets. The Tribe needs to be able to hunt and regular fire cycles are important to create habitat.
- The Tribe expressed interest in the differences in the proposed riparian buffer zones. Two important issues to the Tribe are clean water and fish.
- There have been Tribal efforts working on lamprey conservation and the Tribe encouraged the BLM to raise the bar on conservation efforts as well. Conservation methods for lamprey are also good for salmon.

- Water issues include more than quality. There are more streams than in the past, with less water in tributaries. Changes like these create systems that are more compatible for invasive or exotic species, which directly harm lamprey. Management of upland systems directly affects lamprey. The BLM riparian zones may not align with Tribal values. An example of this from the BLM's pilot project includes finding beargrass in no-touch riparian zones. The presence of beargrass in these zones suggests it was open at one time, so a no-touch area conflicts with the way the Tribe would manage the beargrass.
- Think of Tribal concerns when you consult with the National Marines Fisheries Service (NMFS) or whoever. Your decisions affect how the Tribe can consult for the next year, which ultimately affects how the Tribe can manage its own lands. Think of the Federal government's trust responsibility to the Tribe.
- Recreation is important in the new RMP, but off-highway vehicle (OHV) recreation creates issues for the Tribe's cultural sites. As this plan develops, the public will put pressure on the BLM to open OHV areas that will directly affect cultural sites.
- This area is the ancestral territory of the Tribe. We have been here for thousands of years and intend to stay.
- Beyond archaeological sites, recognize that the Tribe has spiritual sites that have visual and auditory sensitivity. Address this with future Visual Resource Inventory efforts.

<u>Planning considerations</u>

- How would land management actions affect resident deer and elk populations?
- Interest in BLM's approach to water, fish, and lamprey conservation.
- Concerns for effects to archaeological and other cultural resources.
- Consider Tribal views of management and resources, which are typically different from BLM perspectives. Tribal perspectives are particularly important in respect to land management, fire, water, and riparian area management.

Klamath Tribes

July 15, 2013
Tribal Government Office, Chiloquin, Oregon

Tribal participants: Perry Chocktoot, Jr., Director of Culture and Heritage; Kathleen Mitchell, General Manager
BLM attendees: Mark Brown, RMP Project Manager; Heather Ulrich, RMP Tribal Liaison; Donald Holmstrom, Klamath Falls Field Manager; Brooke Brown, Klamath Falls Resource Area Archaeologist
Facilitator: Robin Gumpert, DS Consulting

General comments and highlights of main Tribal interest topics

- The Tribe's interest area begins at the top of the Cascade Range.
- The Tribe expressed concern about splitting the Lakeview District into separate RMPs, requiring the Tribe to consult with two offices on two different plans. All of the Lakeview District is part of the Klamath Tribes' aboriginal territory.
- Will the RMP result in more or less timber harvested?
- Grazing allotments affect cultural resources, mostly near fences and water sources and rock features. Desire 100 percent survey on all allotments so that the BLM can say for sure what the impacts are to sites.
- Concern over archaeological contracting firms surveying on BLM-administered lands when they have no experience in the area and may not have the background to identify and subsequently document sites.
- Desire for the BLM to listen to what the Tribes have to say at all levels of management and engage in meaningful consultation. The Tribe and the BLM need to be allies on projects, and this occurs with meaningful consultation.
- The Tribe identified concern that the Purpose and Need includes no Section 106 responsibilities.
- Meaningful consultation as part of the planning process needs to be captured in the Purpose and Need. Tribes are interested in what is going on elsewhere, even if not on their aboriginal lands.
- Trees have importance to the Tribe, particularly culturally modified tress (cambium peeled trees and bow stave trees). Section 106 needs to protect these important areas of cultural interest. Spiritual integrity is first and foremost of importance to the Tribe. Tribal Resolution 92-047 states that all sites are sacred.
- Clean water in the Klamath watershed is of great concern.
- The Tribe has 22 million acres of aboriginal lands, and they are concerned about grazing, timber harvest activities, and protecting their sacred sites. The Tribes would like to see preservation of their sacred sites.
- It is frustrating when Tribes feel like they are sharing information and not heard.
- BLM has come a long way on meaningful consultation, and needs to do this on all projects. Face time (face-to-face meetings) means a lot to the Tribe.
- All of the BLM-administered lands in Klamath County are of interest to the Tribe. There are numerous and diverse archaeological, cultural, and spiritual locations within the BLM-administered lands that are of great importance and interest to the Tribe.
- Primary impacts to Tribal interests are grazing, timber, OHV, and low water exposing sites.
- The BLM needs to recognize federal trust responsibilities and talk to the Tribe about closures to areas affecting sites. The Tribe expressed a need for a memorandum of understanding for government-to-government consultation.

Planning considerations

- Grazing allotments that affect cultural resources, mostly near fences and water sources, and rock features.
- Protection of culturally modified trees (cambium peeled trees and bow stave trees).
- Primary impacts to Tribal interests are grazing, timber, public motorized vehicle use, water levels in reservoirs.

Tribal Listening Session Summary

These five listening sessions provided BLM managers and RMP staff with a greater understanding of Tribal histories and their interests in the lands and resources that the BLM manages. As part of the RMP, these topics of interest are included as analytical questions in the Planning Criteria and the effects analyzed by alternative and the Proposed RMP in Chapter 3. The analysis will inform decision makers on how land management actions affect those resources of concern to the Tribes.

Some of the recurring themes identified during these listening sessions included:

- Hunting, fishing and plant gathering access
- Plant collection, management and use
- Multiple Tribes with interests (sometimes competing) on the same BLM-administered lands;
- Fish and lamprey
- Archaeological sites and impacts due to land management actions as well as public use and vandalism
- Cooperative opportunities
- Climate change
- Air and water quality
- Balancing healthy forests and the need for economic stability for the counties and Tribes
- Land acquisition into Tribal ownership or Tribal management
- Indigenous landscape studies
- Management of BLM-administered lands adjacent to Tribal land
- Land management activities that benefit multiple resources of cultural value
- Memoranda of understanding
- Impacts from recreation and public motorized vehicle use to cultural sites
- Effects of proposed legislation on the planning process

Detailed notes captured during these sessions will aid managers as they continue managing the lands that hold importance to the Tribes. The BLM collected valuable information from these listening sessions that will inform land managers beyond the scope of this RMP in carrying out the BLM mission.

Cultural Plants

The following are two lists that provide summaries of plants with cultural importance and use to Tribes. These plant lists are not exhaustive and include the more commonly known and used plants. **Table R-3** is compiled from source materials provided by the Klamath Tribes (Klamath Tribes 2007, Oregon Native Plant Society 1993, "Common Plant List" n.d., Casey *et al.* 2010, Anderson *et al.* 2012). This table focuses on plants found in habitats more commonly associated with the Eastside Management Area. **Table R-4** is compiled from source materials provided by the Coquille Tribe (Fluharty *et al.* 2010), as well as from conversations and consultation meetings with the other Tribes the BLM has been consulting (David Harrelson, Confederated Tribes of the Grand Ronde, personal communication, September 19, 2011; Confederated Tribes of Grand Ronde Tribal Council and staff, May 22, 2013; Robert Kentta, Confederated Tribes of Siletz Indians, personal communication, June 7, 2013; Confederated Tribes of Siletz Indians Tribal Council and staff, personal communication, June 22, 2105). This table is includes plants found in habitats more commonly associated with the moist forest lands in western Oregon. These plant lists supplement the discussion in the Tribal Interests section of Chapter 3 (Issue 2), as well as provide readers, managers, and others implementing this RMP a base understanding of the variety of plants Tribes consider having cultural importance.

Table R-3. Plants of cultural significance to the Klamath Tribes

Species	Common Name	Habitats	Known Uses
Achillea millefolium	Yarrow	Disturbed sites at all elevations, dry to moist meadows	Medicinal
Allium acuminatum	Wild Onion	Various, often dry hillsides, open areas, foothills	Edible, household, medicinal
Allium tolmiei	Wild Onion	Moist ground throughout area	Medicinal
Allium validum	Swamp Onion	Meadows, wetlands	Edible, medicinal
Alnus crispa	Mountain Alder	Moist forests, and along streams and bogs	Edible, household, medicinal, tools
Alnus incana	Alder	Streamsides, margins of wetlands and lakes	Medicinal, household
Amaranthus graecizans	Amaranth, Pigweed	Weedy, dry/wet areas	Edible, household
Amelanchier alnifolia	Serviceberry	Dry ground, in clearings, along streams and lakes	Edible, medicinal, tools
Angelica lucida, Apium graveolens	Wild Celery	Moist semi-shaded soils	Edible, medicinal
Apocynum cannibinum	Indian Hemp	Permanently wet areas, springs or river banks	Edible, household, medicinal
Apocynum adrosaemifolium	Dogbane	Roadsides, open forest, dry rocky areas	Cordage, thread
Arctostaphylos patula	Greenleaf Manzanita	Roadsides, open slopes, burned areas	Edible, medicinal
Arctostaphylos uva-ursi	Bearberry	Moist lodgepole basins and meadow edges in pumice soils	Edible
Artemesia cana	White Sagebrush	Floodplains, washes, streambanks, sandy soils	Medicinal
Artemesia tridentata	Big Sagebrush	Dry gravely or rocky soils, plains, high deserts, lower mountain slopes	Edible, ceremonial, household, medicinal
Basamorhiza sagittata	Arrowleaf Balsamroot	Shrublands, juniper/pine woodlands, rocky slopes, forest openings	Edible, medicinal
Berberis aquifolia	Oregon Grape	Juniper/pine woodlands, rocky slopes, mixed conifer forest	Edible, household, medicinal
Brodiaea coronaria, Dichelostem macongesta, Tritelia hyacinthina	Brodiaea	Pine woodlands, meadows, scablands, and other shrublands	Edible

Species	Common Name	Habitats	Known Uses
Bryoria spp.	Black Tree Lichen, Horsehair Lichen	Grows on coniferous trees, generally above the snow line	Edible
Ca1ocedrus decurrens	Incense Cedar	Variety of soils, usually on western slopes at mid to high elevations; deep well-drained slightly acidic sandy loam soils	Crafts, edible, household, medicinal
Calochortus macrocarpus	Mariposa Lily	Sagebrush community, slopes, flats	Edible, medicinal
Camassia quamash	Camas Root	Meadows, stream-sides, moist to wet in spring, moist forested valleys	Ceremonial, edible
Carex scopulorum	Sedge	Wet areas: streams, lakes, marsh areas	Ceremonial, edible, household
Ceanothus prostratus	Squaw Carpet	Dry forest floors	Household
Cercocarpus betuloides	Birch Leaf Mountain Mahogany	Juniper/pine woodlands, rocky slopes	Tools
Cercocarpus ledifolius	Curl Leaf Mountain Mahogany	Juniper/pine woodlands, rocky slopes, edges of scablands	Medicinal, household, tools
Chenopodium fremontii	Lamb's Quarters (Gooseroot)	Weedy, disturbed areas	Edible, household
Chimaphila umbellatum	Prince's Pine	Mixed conifer/sub-alpine forest	Edible, medicinal
Cimicifuga racemosa	Black Cohosh	Woodland garden, dappled shade, shady edge	Edible, medicinal
Claytonia perfoliata	Miner's Lettuce	Disturbed and waste ground, moist banks and slopes, partial shade, light soils and dry sandy soils	Edible, medicinal
Cornus stonolonifera	Red Osier Dogwood	Riparian zone	Edible, household
Discina perlata	Elephant Ear Fungus (Pig's Ear)	Saprobic snowbank fungus found under conifers in the spring	Edible
Equisetum arvense	Marestail (Horsetail)	Road ditches, riparian areas, pond/lake margins	Edible, medicinal
Erythronium grandiflorum	Avalanche Lily	Sagebrush slopes	Edible, medicinal
Elymus cinereus, E. canadensis	Giant Wild Rye	Dry sandy gravelly or rocky soil	Edible, household
Foenicultum vulgare	Fennel	Well drained soils	Ceremonial, edible, household, medicinal
Fragaria virginiana	Wild Strawberry	Disturbed sites all elevations, lodgepole, ponderosa, or mixed conifer forest, riparian areas	Edible, medicinal
Fritillaria pudica	Yellow Bell	Rocky, lithic soils	Edible
Heracleum lanatum	Cow Parsnip	Wet places	Edible, medicinal
Juniperus occidentalis	Western Juniper	Well-drained soils	Edible, household, medicinal
Lewisia rediviva	Bitteroot	Low sagebrush scablands, lithic, thin rocky soils	Edible, ceremonial
Lilium washingtonianum	Mountain Lily	Ponderosa pine/mixed conifer, especially canopy gaps, and burned clearcuts	Edible
Lomatium californicum	Wild Celery Root and Leaves	Juniper/pine woodlands, rocky slopes	Edible
Lomatium canbyi	Canby's biscuitroot	Open, rocky places at low elevations, often with sagebrush	Edible
Lomatium cous	Biscuitroot	Dry, often open rocky slopes and flats, often with sagebrush	Edible
Lomatium dissectum	Fernleaf biscuitroot	Open, rocky slopes and dry meadows, talus	Ceremonial, edible, medicinal

Species	Common Name	Habitats	Known Uses
Lomatium macrocarpum, L. martindalei	Wild Carrot	Scablands. Mid to high elevation openings, mixed conifer	Ceremonial, edible, medicinal
Lomatium nudicaule	Pestle parsnip	Dry open or lightly wooded areas at low to moderate elevations	Edible, household, medicinal
Lomatium triternatum	Wild Carrot, Nine-leaved Biscuitroot	Juniper/pine woodlands, scablands, widespread; open slopes and meadow in dry to fairly moist soil at low to moderate elevations	Ceremonial, edible, medicinal
Lomatium utriculatum	Common Lomatium	Prairies and other open rocky places west of the Cascades	Edible, medicinal
Lonicera involucrata	Twinberry	Moist soil, banks of streams, open coniferous forests	Edible, household, medicinal
Mentha arvensis	Wild Mint	Moist sites, often disturbed	Edible, medicinal
Mentzelia laevicaulis	Blazing Star	Dry, sandy open places	Edible
Nicotiana attenuata	Coyote Tobacco	Shrublands, juniper/pine woodlands, roadsides	Ceremonial
Nuphar lutea ssp. *polysepala*	Wocus Lily	Ponds, lakes, ditches, open water in marsh	Edible, medicinal
Oryzopsis hymenoides	Indian Rice Grass	Dry, sandy soil	Edible
Osmorhiza occidentalis	Western Sweet-Cicely	Semi-shade (light woodland) or no shade; requires moist soil	Edible, household, medicinal
Perideridia gairdneri	Ipos	Scab-rock flats	Edible
Philadelphus lewisii	Mock Orange	Gullies, water courses, rocky cliffs, talus slopes and rocky hillsides of sagebrush deserts	Edible, household, medicinal, tools
Phragmites communis	Arrow Cane	Riparian, lake edge	Edible, tools
Phragmites austrailis	Common Reed (Arrow Reed)	Wetlands, ditches (Highway 97)	Crafts, tools
Pinus contorta var. *latifolia*	Lodgepole Pine	Variety of soils, well drained	Household
Pinus ponderosa	Ponderosa Pine	Dry forests, lower slopes	Crafts, household
Pinus lambertiana	Sugar Pine	Forests at moderate altitudes	Crafts, edible
Populus tremuloides	Aspen	Riparian, meadow edges	Household, medicinal
Prunus emarginata	Bitter Cherry	moist slopes and along stream banks	Edible, medicinal
Prunus subcordata	Wild Plum	Juniper/pine woodlands, rocky slopes	Edible
Prunus virginiana	Chokecherry	Moist, open slopes, streambanks, moist areas below rocky outcrops	Ceremonial, edible, medicinal
Ribes aureum	Golden Currant	In mountains, lower elev. moist sites. In desert, along springs, gullies, near water sources	Edible
Ribes cereum	Wax Currant	Widespread, found in openings in most habitats	Edible, medicinal, tools
Ribes lacustre	Swamp Berries (Prickly Currant, Black gooseberry)	Riparian areas, springs	Edible, medicinal
Rosa gymnocarpa, R. woodsii	Wild Rose/Rose hips	Juniper/pine woodlands, rocky slopes, mixed conifer forest, riparian areas	Crafts, edible, medicinal, tools
Rosa nutkana	Wild Rose/Rose hips	Sunny roadside, woodsides, hedges	Crafts, edible, medicinal, tools
Rubus leucodermis, R. ursinus	Blackberry	Disturbed mixed conifer, riparian areas	Edible, medicinal
Rubus parviflorus	Thimbleberry	Riparian zone, forest openings	Edible, household, medicinal

Species	Common Name	Habitats	Known Uses
Sagittaria cunneata	Wild Potato	Wetlands, shallow water	Edible
Salix lemmonii, *S. geyeriana,* *S. exigua,* *S. lasiandra,* *Salix* ssp.	Willow, Pacific Willow	Wetlands, riparian areas, ditches, lake/pond margins	Edible, household, medicinal
Salix scouleri	Willow	Disturbed uplands, riparian areas, roadsides	Edible, household, medicinal
Sambucus nigra ssp. *caerulea*	Elderberry	Juniper/pine woodlands, rocky slopes, riparian areas; wet areas next to rocks and walls	Crafts, edible, household, medicinal
Sambucus pubens	American Red Elder	Moist to wet soils along streams, in woods and open areas	Ceremonial, edible, household, medicinal
Sassafras albidum	Sassafras	Moist, well-drained soil	Edible, household, medicinal
Scirpus acutus	Tule	Marshes, ditches	Crafts, edible, medicinal
Symplocarpus foetidus	Skunk Cabbage	Marshes, bogs, swampy woods and by streams	Cosmetic, edible, medicinal
Thelycrania stolonifera	Red Willow	Semi-shade (light woodland) or no shade; requires moist or wet soil	Edible, household, medicinal
Trifolium macrocephalum	Big Head Clover	Dry, rocky soils, among sagebrush, pine	Edible
Typha latifolia	Cattail	Marshes, ditches, lake margins	Edible, household, medicinal
Urtica dioica	Stinging Nettle	Ditches, canals, lake margins, burn piles	Edible, household, medicinal
Vaccinium membranaceum	Huckleberry	Moist mixed conifer and riparian areas, clearings	Edible, medicinal
Vaccinium uliginosum	Blueberry	Wet meadows, lake margins, lodgepole pine swamps	Edible, household
Valeriana sitchensis, *V. edulis*	Valerian	Moist forest; along small streams, springs and seeps, wet/dry meadows	Edible, medicinal
Verbascum densiflorum	Mullein	Waste places, railway embankments and similar dry sunny localities	Medicinal
Wyethia mollis	Mule's Ears	Shrublands, juniper/pine woodlands, rocky slopes, forest openings, dry/wet meadows	Edible, medicinal
Xerophyllum tenax	Bear grass	High open spaces, woodland, sunny edge, dappled shade	Crafts, edible, household, medicinal

Note: 'Common Plant List' provided by the Klamath Tribes, Cultural Department, November 4, 2015.

Table R-4. Common cultural plants of importance to tribes in western Oregon

Species	Common Name	Habitats	Known Uses
Acer circinatum	Vine Maple	Moist soils along riparian zones and stream banks, shade tolerant	Tools
Acer macrophyllum	Big-Leaf Maple (Oregon Maple)	Rich coarse gravelly soils along coastal stream and river banks	Clothing, crafts
Achillea millefolium	Yarrow (Milfoil)	Disturbed soils in well drained grasslands and open forest floors	Medicinal
Achlys triphylla	Vanilla Leaf	Moist deep, shaded forest floors, north slope openings and road cuts	Aromatics, edible flavoring,

Species	Common Name	Habitats	Known Uses
			medicinal
Adiantum aleuticum, A. pedatum	Maidenhair Fern (Five-finger Fern)	Wet seeps, sandy and gravelly stream banks, waterfall edges in shady forest riparian areas	Crafts (basketry), hygiene, medicinal
Alnus rubra	Red Alder (Coast, Western Alder)	Widespread, prefers moist shaded areas	Dye, medicinal
Amelanchier alnifolia	Service Berry (June Berry, Shadbush, Saskatoon)	Open to lightly shaded coniferous forest edges	Edible, medicinal, tools, ropes
Anaphalis margaritacea	Pearly Everlasting	Open disturbed areas, full sun	Medicinal, smoking
Angelica lucida	Angelica (Sea Watch, Wild Celery)	Moist semi-shaded soils, salt tolerant usually near the ocean	Edible, medicinal
Apocynum adrosaemifolium	Dogbane	Roadsides, open forest, dry rocky areas	Tools (cordage, thread)
Arbutus menziesii	Madrone	Well drained, poor soils with low moisture and nutrient content	Edible, medicinal, crafts (beads)
Arctostaphylos columbiana	Hairy Manzanita	Rocky open slopes at low elevation and sunny edges of forests	Medicinal
Arctostaphylos uva-ursi	Kinnikinnick (Bear-berry, Uva-ursi)	Ocean beaches to ridge tops, coarse sandy soils in partial to light shade	Medicinal, smoking
Asarum caudatum	Ginger (Wild Ginger)	Moist, shady forests and stream banks	Edible, medicinal, tools
Athyrium filix-femina	Lady Fern	Prefers shady stream banks, seeps and wet forest floors	Edible, medicinal
Baccharis pilularis	Coyote Brush (Chaparral Broom, Kidneywort)	Open dry sites, sea cliffs, bluffs and thickets along the coast	Edible, medicinal
Calandrina cilata	Red Maid (Wild Portulaca, Purslane)	Grasslands, disturbed sites, pastures	Edible, medicinal
Calochortus tolmiei	Mariposa Lily (Cat's Ear)	Open coniferous forests and rocky meadows	Edible
Camassia leichtlinii C. qualmash	Camas	Vernally wet meadows that dry by summer	Edible
Carex obnupta	Slough Sedge (Slough Grass, Tall Basket Grass)	Prefers freshwater shallows, muddy meadows, marshes, stream banks	Crafts (basketry)
Chamaecyparis lawsoniana	Port-Orford-Cedar (Lawson's Cypress)	Coastal mixed evergreen forests	Clothing, shelter, tools
Claytonia perfoliata	Minor's Lettuce	Shaded, moist areas at low to medium elevations	Edible
Cornus nuttallii	Pacific Dogwood	Well-drained soils in partial shade	Dye, tools
Cornus stolonifera C. sericea	Red Osier Dogwood (Red Willow)	Semi-shaded and open wet areas along forested stream and river banks	Edible, medicinal, crafts (basketry)
Corylus cornuta	Hazel (Hazelnut, Beaked Filbert)	Open forests, shrublands, moist areas	Clothing, crafts (basketry) , edible, tools (traps)
Daucus carota D. pusilius	Wild Carrot (Queen Anne's Lace)	Sunny open grasslands and roadsides	Edible, medicinal
Delphinium nuttallianum	Larkspur (Two-lobed Delphinium, Up-land Larkspur)	Open, dry grasslands	Insecticide
Dentaria tenella	Spring Beauty	Open, lightly shaded, moist forested	Edible

Species	Common Name	Habitats	Known Uses
		foothills	
Dicentra formosa	Bleeding Heart	Moist, shady forests, lowlands to mid-montane	Medicinal
Epilobium angustifolium	Fireweed (Elk Bush)	Open, well drained soils in grasslands or shrubby edges with full sun often seen along road banks	Clothing, medicinal, tools
Epilobium glaberrimum	Willow-herb	Open disturbed areas, post burn areas	Medicinal
Equisetum hyemale *E. arvense*	Horsetail (Scouring Rush, Snake Grass)	Open wet to moist places	Edible, medicinal, tools
Fragaria chiloensis *F. vesca*	Strawberry (Beach, Woodland Strawberry	Meadows, stream banks, open woods, shrublands	Edible, medicinal
Fraxinus latifolia	Oregon Ash	Wet, lowland areas, semi-shade tolerant	Tools
Galium asparine *G. triflorum*	Bed Straw (Cleavers, Goosegrass)	Widespread, prefers moist shaded areas	Dye, medicinal, tools
Gaultheria shallon	Salal	Low to mid elevation moist forest edges, shrublands, prefers partial shade	Edible, medicinal
Goodyera oblongifolia	Rattlesnake Plantain	Coniferous forests with decomposing leaf litter, non-disturbed sites such as old-growth stands	Medicinal
Heracleum lanatum	Cow Parsnip (Wild Parsnip)	Moist, open to partially shaded areas of forest understory, roadsides and meadows	Edible
Holodiscus discolor	Oceanspray (Arrow-wood, Iron-wood)	Moist open forest	Medicinal, tools
Hypericum anagalloides	Bog-Wort (St. John's Bogwort)	Fresh water marshes, pond edges, wet areas	Medicinal
Iris tenax *I. douglasiana*	Iris (Douglas Iris, Oregon Iris)	Open areas, forest edges, roadsides, stream banks, grassy margins	Crafts (basketry), edible, medicinal, tools
Juncus effuses	Tussock (Common Rush/Wire Grass)	Moist open grasslands to wet marshes	Basketry, hats
Ledum groenlandicum *L. palustre* spp. *groenlandicum*	Labrador Tea (Bog Tea, Ledum)	Poorly drained acidic soils under semi-shade to open sites under high forest canopies	Edible, medicinal, smoking
Letharia vulpine *L. columbiana*	Wolf Moss (Wolf Lichen)	Sunny, dry coniferous forests on undisturbed twigs and branches, shade tolerant	Dye, medicinal
Lilium columbianum	Tiger Lily (Oregon, Columbia Lily)	Meadows, thickets, open forest and clearings	Edible
Lithocarpus densiflorus	Tan Oak (Tanbark Oak)	Shade tolerant, minor component of the Pacific NW mixed evergreen forests	Edible
Lomatium triternatum	Coastal Biscuit Root	Mid-mountain open slopes and meadows	Edible, medicinal
Lysichitum americanum	Skunk Cabbage	Acidic wet soils associate with open coniferous forests, marshes, stream banks	Edible, medicinal, tools
Madia sativa	Tarweed (Coast Tarweed)	Grasslands and disturbed areas	Edible
Mahonia (Berberis) nervosa *Mahonia (Berberis) aquifolium*	Oregon Grape	Moist conifer forests to oak savannas	Edible, medicinal, dyes
Maianthemum dilatatum	May Lily (False Lily of the Valley)	Any shady, moist habitats, stream banks	Edible, medicinal
Menziesia ferruginea	False Azalea	Moist slopes in shady, open shrub land	Edible, tools

Species	Common Name	Habitats	Known Uses
		and coniferous forest edges	
Myrica californica	Wax Myrtle (California Bayberry)	Prefers full sun, wet peaty soils, but hardy	Medicinal
Nuphar polysepalum	Yellow Pond Lily (Spatterdock, Cow Lily)	Sandy soils, submerged in 1–3 feet of still water, prefers full sun	Edible
Oxalis oregano	Redwood Sorrel	Moist forested sites low to mid elevation	Edible
Phyllospadix torreyi *P. scouleri*	Surf Grass (Sea Grass)	Tide pools, coastal surf zones below low tide level	Crafts (basketry)
Physocarpus capitatus	Ninebark (Pacific Ninebark)	Prefers shade, tolerates full sun in moist areas, low elevation forests, stream and river banks, marshes	Medicinal
Picea sitchensis	Sitka Spruce	Wet meadows, stream banks, open woods, shrublands	Crafts (basketry), tools
Pinus contorta	Shore Pine (Beach Pine, Lodgepole)	Low to mid-elevation areas, wet, bogs, prefers full sun	Ceremonial, medicinal, tools
Pinus lambertiana	Sugar Pine	Conifer hardwood forests	Edible, tools
Pinus sabiniana	Digger Pine (Bull or Gray Pine)	Dry foothill woodlands	Crafts (basketry), edible, medicinal
Polypodium glycyrrhiza	Licorice Fern	Tree trunks in shady forests, mossy logs, woody debris	Edible, medicinal
Polystichum munitum	Sword Fern	Understory forested slopes, shady to semi-open	Edible, medicinal, cooking
Populus balsamifera *P. trichocarpa*	Cottonwood (Black Cottonwood, Balsam Poplar)	Sunny, moist areas forming riparian corridors	Medicinal, resin
Prunella vulgaris	Heal-All (Native Heal All, Self-heal)	Moist grasslands, disturbed sites and open stream banks	Edible, medicinal
Prunus emarginata	Wild Cherry (Bitter Cherry)	Moist riparian areas, prefers sunny stream banks	Edible, medicinal, tools
Pseudotsuga menziesii	Douglas Fir	Widespread, moist, fog belt to drier forests	Ceremonial, medicinal, tools
Pteridum aquilinum	Bracken Fern (Brake Fern)	Prefers open areas with partial to full sun	Crafts (basketry), edible, tools
Pyrus fusca / Malus fusca	Crab Apple (Oregon or Pacific)	Moist, open shrub lands, open coniferous forests below 800 meters	Edible, tools
Quercus garryana	Oregon White Oak (Garry Oak)	Varied western Oregon, mixed conifer stands	Edible
Rhamnus purshiana / Frangula purshiana	Cascara (Chittam, Buckthorn)	Moist, coastal coniferous forests, often associated with red alder	Dye, medicinal, tools
Rhododendron macrophyllum	Rhododendron	Moist, coastal and low elevation forest understories, rich acidic soils	Tools
Ribes laxiflorum	Black Current (Trailing Black Currant)	Marshes and wet coastal forests to mountain slopes, shade tolerant	Edible, medicinal
Rosa gymnocarpa / Rosa nutkana	Wood Rose	Shady understory in mid to low elevation forests	Edible, medicinal, ceremonial
Rubus parviflorus	Thimbleberry (Wild Raspberry)	Moist open forests and shrublands	Edible, medicinal, soap
Rubus spectabilis	Salmonberry	Riparian areas, moist forest edges, shrubland, prefers partial sun	Edible, medicinal
Rubus ursinus	Pacific Blackberry	Open, disturbed sites in prairies to forests	Edible, medicinal
Sagittaria latifolia	Wapato	Low elevation marshes, ponds, ditches,	Edible, medicinal

Species	Common Name	Habitats	Known Uses
	(Arrowhead)	partly submerged in shallow water	
Salix exigua	Sandbar Willow (Narrow-leaf Willow)	Thickets along coastal stream banks, riparian areas, gravel bars	Crafts (basketry), tools
Salix hookeriana	Hooker's Willow (Coast Willow)	Moist open areas in coastal fog belt	Crafts (basketry), cordage, fish weirs, medicinal
Salix lasiandra	Pacific Willow	Damp soils, stream banks, floodplains, wet meadows	Crafts (basketry), medicinal, edible, tools
Salix scouleriana	Scouler's Willow (Black Willow, Mountain Willow)	Moist pockets of shrublands	Smoking, tools, tattoo pigment
Sambucus acemosa *S. caerulea*	Elderberry (Red and Blue)	Sunny openings in moist forests along watercourses	Ceremonial, edible, medicinal, tools
Satureja douglasii *Clinopodium douglasii*	Yerba Buena (Mountain Tea)	Well drained open, semi-shaded forest floors	Medicinal
Schoenoplectus pungens *Scirpus pungens*	Three-Square Sedge	Estuarine wetlands, river mouths	Crafts (basketry)
Scirpus acutus *Schoenoplectus acutus*	Tule (Bulrush)	Brackish or freshwater areas in shallow muddy meadows, marshes, stream banks	Edible, tools
Scirpus maritimus *S. microcarpus*	Bulrush (Seacoast Bulrush, Small-flowered Bulrush)	Marshes, pond margins, wet fields	Clothing, edible, medicinal
Sphagnum species	Moss	Moist shaded trees, downed logs and soils with high debris content	Tools
Stachys mexicana	Wood Betony (Woundwort)	Grassy wetlands, along banks of open water	Medicinal
Symphoricarpos albus	Snowberry	Moist open forests to swampy thickets, shade and sun tolerant	Medicinal, tools
Sisyrinchium bellum	Blue-eyed Grass	Sunny to partial shaded grasslands	Medicinal, tools
Taxus brevifolia	Yew	Moist shady forests associated with serpentine soils	Medicinal, tools
Thuja plicata	Red Cedar (Western Red cedar, Canoe Cedar)	Moist, mixed evergreen forests, shady habitats	Clothing, crafts, medicinal, shelter, tools
Trifolium wormskjoldii	Springbank Clover	Moist to wet open areas	Edible, medicinal
Trillium ovatum	Trillium (Birth Root, Indian Balm)	Moist, open forests and shrublands as understory herb, ravine bottoms, stream banks	Medicinal
Triteleia hyacinthine *T. bridgesii* *T. grandiflora*	Harvest Lily (Grass Nut, White and Blue Brodia)	Open, grasslands, wet meadows	Edible
Tsuga heterophylla	Western Hemlock	Shade tolerant, second generation forest tree, likes rotting wood under closed canopy	Edible, tools
Typha latifolia	Cattail (Flags)	Flooded edges of stream, pond, and marshes	Clothing, crafts, edible, tools
Ulva lactuca	Sea Lettuce (Sea Weed, Chinese Lettuce)	Calm, sheltered marine environments, tidal zones	Edible, medicinal
Umbellularia californica	Myrtle (Oregon Myrtlewood,	Open chaparral and grasslands	Edible, medicinal

Species	Common Name	Habitats	Known Uses
	Pepperwood)		
Urtica dioica	Nettle (Stinging Nettle, Tall Nettle)	Moist areas, shaded forests, stream banks	Edible, medicinal, tools
Vaccinium ovatum *V. parvifolium*	Huckleberry (Black and Red)	Open, moist, coniferous forests and bordering shrub lands	Edible, medicinal
Viola sempervirens *V. glabella*	Violet (Evergreen Violet, Wood Violet)	Moist, open woods and shrublands	Edible, medicinal
Woodwardia fimbriata	Woodwardia Fern (Giant Chain Fern)	Moist, shaded areas along creeks and riverbanks, coastal conifer hardwood forests	Crafts (basketry)
Xerophyllum tenax	Bear Grass	Open forest over-story with filtered light	Crafts (basketry)
Zigadenus freemontii *Z. micranthus*	Death-Camas (Star Lily)	Grassy, rocky outcrops or open wooded slopes	Poisonous, medicinal bulbs used carefully

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Appendix S – Other Wildlife

Bald Eagle

Table S-1. Bald eagle nesting habitat development in the decision area

Year	No Action (Acres)	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)	PRMP (Acres)	No Timber Harvest (Acres)
Current Condition							
2013	247,608	247,608	247,608	247,608	247,608	247,393	247,608
Alternatives/Proposed RMP							
2023	239,162	245,926	240,541	237,713	246,257	241,113	251,623
2033	241,217	250,307	248,623	234,618	254,734	247,912	260,791
2043	269,083	284,349	284,691	259,979	290,664	282,197	301,812
2053	283,700	300,363	302,859	273,581	312,466	298,799	320,636
2063	300,862	322,298	325,246	288,660	338,378	319,828	345,936

Table S-2. Bald eagle nesting habitat development in the planning area

Year	No Action (Acres)	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)	PRMP (Acres)	No Timber Harvest (Acres)
Current Condition							
2013	1,146,747	1,146,747	1,146,747	1,146,747	1,146,747	1,146,532	1,146,747
Alternatives/Proposed RMP							
2023	1,138,301	1,145,065	1,139,680	1,136,852	1,145,396	1,140,252	1,150,762
2033	1,140,356	1,149,446	1,147,762	1,133,757	1,153,873	1,147,051	1,159,930
2043	1,168,222	1,183,488	1,183,830	1,159,118	1,189,803	1,181,336	1,200,951
2053	1,182,839	1,199,502	1,201,998	1,172,720	1,211,605	1,197,938	1,219,775
2063	1,697,743	1,719,179	1,722,127	1,685,541	1,735,259	1,716,709	1,742,817

Golden Eagle

Table S-3. Golden eagle nesting habitat development in the decision area

Year	No Action (Acres)	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)	PRMP (Acres)	No Timber Harvest (Acres)
Current Condition							
2013	789,751	789,751	789,751	789,751	789,751	787,870	789,751
Alternatives/Proposed RMP							
2023	750,166	779,767	770,310	757,922	786,414	772,764	797,483
2033	729,066	782,249	782,891	737,013	802,040	779,784	812,293
2043	787,103	860,962	866,826	796,427	893,766	861,269	909,511
2053	821,344	911,220	930,695	843,357	964,908	920,758	967,010
2063	848,128	957,588	982,160	878,459	1,026,264	969,364	1,018,234

Table S-4. Golden eagle nesting habitat development in the planning area

Year	No Action (Acres)	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)	PRMP (Acres)	No Timber Harvest (Acres)
Current Condition							
2013	3,225,904	3,225,904	3,225,904	3,225,904	3,225,904	3,224,023	3,225,904
Alternatives/Proposed RMP							
2023	3,186,319	3,215,920	3,206,463	3,194,075	3,222,567	3,208,917	3,233,636
2033	3,165,219	3,218,402	3,219,044	3,173,166	3,238,193	3,215,937	3,248,446
2043	3,223,256	3,297,115	3,302,979	3,232,580	3,329,919	3,297,422	3,345,664
2053	3,257,497	3,347,373	3,366,848	3,279,510	3,401,061	3,356,911	3,403,163
2063	4,612,466	4,721,926	4,746,498	4,642,797	4,790,602	4,733,702	4,782,572

Structural Stage Development

Table S-5. Early Successional forest habitat development in the decision area

Year	No Action (Acres)	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)	PRMP (Acres)	No Timber Harvest (Acres)
Current Condition							
2013	46,249	46,249	46,249	46,249	46,249	53,459	46,249
Alternatives/Proposed RMP							
2023	92,216	91,012	81,747	138,088	69,273	86,427	43,016
2033	101,496	97,831	73,282	180,450	51,793	74,945	9,667
2043	100,324	86,622	105,364	145,343	44,531	78,167	12,233
2053	111,095	79,930	132,251	127,038	47,977	81,505	14,105
2063	110,566	80,089	118,311	131,001	46,001	65,418	14,418

Table S-6. Early Successional forest habitat development in the planning area

Year	No Action (Acres)	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)	PRMP (Acres)	No Timber Harvest (Acres)
Current Condition							
2013	1,112,694	1,112,694	1,112,694	1,112,694	1,112,694	1,119,904	1,112,694
Alternatives/Proposed RMP							
2023	1,158,661	1,157,457	1,148,192	1,204,533	1,135,718	1,152,872	1,109,463
2033	1,088,405	1,084,740	1,060,190	1,167,359	1,038,702	1,061,854	996,579
2043	1,087,233	1,073,531	1,092,273	1,132,252	1,031,440	1,065,076	999,145
2053	1,098,004	1,066,839	1,119,160	1,113,947	1,034,886	1,068,414	1,001,017
2063	1,097,475	1,066,998	1,105,220	1,117,910	1,032,910	1,052,327	1,001,331

Table S-7. Stand Establishment forest habitat development in the decision area

Year	No Action (Acres)	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)	PRMP (Acres)	No Timber Harvest (Acres)
Current Condition							
2013	388,767	388,767	388,767	388,767	388,767	387,247	388,767
Alternatives/Proposed RMP							
2023	393,078	393,271	392,762	392,609	392,885	391,203	393,698
2033	261,528	259,790	261,142	260,643	261,162	266,906	263,693
2043	193,516	189,545	142,827	236,987	169,905	185,587	144,688
2053	169,130	158,823	77,038	243,421	118,027	146,536	75,210
2063	139,442	107,771	24,419	170,143	64,048	101,930	22,334

Table S-8. Stand Establishment forest habitat development in the planning area

Year	No Action (Acres)	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)	PRMP (Acres)	No Timber Harvest (Acres)
Current Condition							
2013	2,473,304	2,473,304	2,473,304	2,473,304	2,473,304	2,471,784	2,473,304
Alternatives/Proposed RMP							
2023	2,477,615	2,477,808	2,477,299	2,477,146	2,477,422	2,475,740	2,478,235
2033	2,277,548	2,275,810	2,277,162	2,276,663	2,277,182	2,282,926	2,279,713
2043	2,130,000	2,126,029	2,079,311	2,173,471	2,106,389	2,122,071	2,081,173
2053	2,105,614	2,095,307	2,013,522	2,179,905	2,054,511	2,083,020	2,011,695
2063	2,075,926	2,044,255	1,960,903	2,106,627	2,000,532	2,038,414	1,958,819

Table S-9. Young forest habitat development in the decision area

Year	No Action (Acres)	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)	PRMP (Acres)	No Timber Harvest (Acres)
Current Condition							
2013	622,916	622,916	622,916	622,916	622,916	619,631	622,916
Alternatives/Proposed RMP							
2023	593,429	559,361	582,353	559,043	565,137	577,103	563,863
2033	621,154	553,647	588,635	563,582	560,568	590,318	550,334
2043	542,593	475,991	516,096	502,575	478,273	514,917	464,112
2053	410,984	347,098	395,704	369,961	347,204	387,248	331,876
2063	361,710	335,731	367,900	393,286	324,719	356,605	294,265

Table S-10. Young forest habitat development in the planning area

Year	No Action (Acres)	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)	PRMP (Acres)	No Timber Harvest (Acres)
Current Condition							
2013	9,807,038	9,807,038	9,807,038	9,807,038	9,807,038	9,803,753	9,807,038
Alternatives/Proposed RMP							
2023	9,777,551	9,743,483	9,766,475	9,743,165	9,749,259	9,761,225	9,747,986
2033	9,953,329	9,885,822	9,920,810	9,895,757	9,892,743	9,922,493	9,882,509
2043	9,954,304	9,887,702	9,927,807	9,914,286	9,889,984	9,926,628	9,875,822
2053	9,822,695	9,758,809	9,807,415	9,781,672	9,758,915	9,798,959	9,743,586
2063	8,295,651	8,269,672	8,301,841	8,327,227	8,258,660	8,290,546	8,228,205

Table S-11. Mature forest habitat development in the decision area

Year	No Action (Acres)	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)	PRMP (Acres)	No Timber Harvest (Acres)
Current Condition							
2013	515,324	515,324	515,324	515,324	515,324	517,893	515,324
Alternatives/Proposed RMP							
2023	530,495	535,495	528,263	510,523	555,899	533,354	570,286
2033	604,423	623,388	617,535	566,186	659,078	612,852	692,423
2043	748,405	753,999	746,035	671,321	807,110	736,129	864,305
2053	862,653	876,970	864,974	781,688	941,998	862,326	1,015,653
2063	907,043	889,737	916,491	792,794	968,826	910,498	1,045,993

Table S-12. Mature forest habitat development in the planning area

Year	No Action (Acres)	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)	PRMP (Acres)	No Timber Harvest (Acres)
Current Condition							
2013	2,431,709	2,431,709	2,431,709	2,431,709	2,431,709	2,434,278	2,431,709
Alternatives/Proposed RMP							
2023	2,446,880	2,451,880	2,444,648	2,426,908	2,472,284	2,449,739	2,486,671
2033	2,520,808	2,539,773	2,533,920	2,482,571	2,575,463	2,529,237	2,608,808
2043	2,664,790	2,670,384	2,662,420	2,587,706	2,723,495	2,652,514	2,780,690
2053	2,062,366	2,076,683	2,064,687	1,981,401	2,141,711	2,062,039	2,215,365
2063	3,584,526	3,567,220	3,593,974	3,470,277	3,646,309	3,587,981	3,723,475

Table S-13. Structurally-complex forest habitat development in the decision area

Year	No Action (Acres)	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)	PRMP (Acres)	No Timber Harvest (Acres)
Current Condition							
2013	588,435	588,435	588,435	588,435	588,435	583,459	588,435
Alternatives/Proposed RMP							
2023	552,481	582,560	576,573	561,435	578,505	573,612	591,365
2033	573,098	627,043	621,105	590,837	629,097	616,678	646,110
2043	576,860	655,541	651,378	605,473	661,880	646,899	676,889
2053	607,836	698,878	691,732	639,592	706,493	684,084	725,384
2063	642,938	748,371	734,577	674,474	758,105	727,248	785,217

Table S-14. Structurally-complex forest habitat development in the planning area

Year	No Action (Acres)	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)	PRMP (Acres)	No Timber Harvest (Acres)
Current Condition							
2013	1,578,370	1,578,370	1,578,370	1,578,370	1,578,370	1,573,394	1,578,370
Alternatives/Proposed RMP							
2023	1,542,416	1,572,495	1,566,508	1,551,370	1,568,440	1,563,547	1,581,271
2033	1,563,033	1,616,978	1,611,040	1,580,772	1,619,032	1,606,613	1,636,016
2043	1,566,795	1,645,476	1,641,313	1,595,408	1,651,815	1,636,834	1,666,795
2053	2,314,443	2,405,485	2,398,339	2,346,199	2,413,100	2,390,691	2,431,962
2063	2,349,545	2,454,978	2,441,184	2,381,081	2,464,712	2,433,855	2,491,796

Table S-15. Early Successional, Stand Establishment, and Young stands with Structural Legacies (1.1, 2.1, 3.1, 3.3) in the decision area

Year	No Action (Acres)	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)	PRMP (Acres)	No Timber Harvest (Acres)
Current Condition							
2013	223,475	223,475	223,475	223,475	223,475	225,291	223,475
Alternatives/Proposed RMP							
2023	284,566	225,728	268,316	223,556	253,306	266,574	228,516
2033	301,306	199,160	267,575	196,131	244,514	270,921	204,698
2043	320,868	174,503	277,134	176,150	242,589	288,002	175,062
2053	344,989	149,389	278,851	149,441	235,643	291,343	151,473
2063	367,349	123,248	265,647	124,348	226,262	284,114	128,372

Table S-16. Mature and Structurally-complex stands with Structural Legacies (4.2, 5.1, 5.2, 5.3) in the decision area

Year	No Action (Acres)	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)	PRMP (Acres)	No Timber Harvest (Acres)
Current Condition							
2013	862,411	862,411	862,411	862,411	862,411	860,528	862,411
Alternatives/Proposed RMP							
2023	822,156	850,413	840,454	824,563	859,206	842,310	871,438
2033	808,459	858,389	859,842	806,909	882,385	856,446	893,801
2043	884,185	952,884	962,440	879,988	993,084	954,604	1,011,663
2053	923,935	1,005,188	1,026,964	926,363	1,070,004	1,016,855	1,074,271
2063	961,980	1,058,410	1,087,349	962,201	1,141,298	1,072,105	1,136,633

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Snags and Down Woody Material

The BLM tabulated the amount of existing snags and down woody material using the BLM's forest inventory data from the Current Vegetation Survey (CVS) – measured permanent plot data. The BLM contracted with the forestry consulting firm of Mason, Bruce & Girard of Portland, Oregon, to jointly develop and build the Woodstock model described in Appendix C and that consulting firm also computed the existing amount of snag and down wood from the CVS plot data and strata that the BLM further summarized here in **Appendix S**.

- Qualifying snag = 5" DBH is smallest recorded in CVS data summary; no minimum height or decay class requirement.
- Qualifying down woody material = Decay Class 1–4, > 4" minimum diameter; exclude decay class 5.

Refer to **Appendix C** for further information on forest inventory data.

Existing Snag Density

Table S-17. Snag density (trees per acre) in the decision area by structural group

Structural Group	Diameter Class (Inches DBH)											Sub-Plots
	< 6	6–12	12–18	18–24	24–30	30–36	> 36	< 10	10–20	> 20	All	
Early Successional	4.1	6.5	2.2	1.4	0.7	0.6	0.3	9.4	3.7	2.6	15.7	127
Stand Establishment	1.5	3.4	1.2	0.7	0.5	0.2	0.3	4.4	2.0	1.4	7.8	1,313
Young	5.0	9.2	2.0	0.8	0.4	0.3	0.4	12.9	3.6	1.6	18.1	1,666
Mature	5.6	15.9	3.1	1.4	0.8	0.5	0.7	18.9	6.3	2.9	28.1	1,527
Structurally-complex	3.3	8.4	2.7	1.9	1.3	0.9	1.2	10.2	4.8	4.7	19.8	1,617
Weighted Average	**3.9**	**9.4**	**2.3**	**1.2**	**0.8**	**0.5**	**0.7**	**11.8**	**4.2**	**2.7**	**18.7**	**6,250**

Table S-18. Snag density (trees per acre) in the decision area by structural stage

Structural Stage	Diameter Class (Inches DBH)											Sub-Plots
	< 6	6–12	12–18	18–24	24–30	30–36	> 36	< 10	10–20	> 20	All	
Early Successional *with* Structural Legacies	-	0.8	1.2	0.9	0.3	0.9	0.1	0.8	1.2	2.1	4.1	31
Early Successional *without* Structural Legacies	5.4	8.3	2.5	1.6	0.8	0.6	0.4	12.2	4.5	2.7	19.4	96
Stand Establishment *with* Structural Legacies	4.3	6.1	1.0	0.6	0.3	0.3	0.1	9.9	1.9	1.1	12.8	211
Stand Establishment *without* Structural Legacies	0.9	2.9	1.2	0.7	0.5	0.2	0.3	3.4	2.0	1.4	6.8	1,102
Young – High Density, *with* Structural Legacies	3.1	6.6	2.2	1.2	0.5	0.5	0.6	8.3	4.0	2.2	14.6	417
Young – High Density, *without* Structural Legacies	5.7	10.1	1.9	0.7	0.4	0.3	0.3	14.5	3.5	1.3	19.3	1,144
Young – Low Density, *with* Structural Legacies	5.4	10.9	0.7	0.2	0.9	0.5	0.1	16.3	0.9	1.4	18.6	31
Young – Low Density, *without* Structural Legacies	4.4	9.5	2.3	1.2	0.7	0.2	0.3	11.8	5.0	1.9	18.6	74
Mature, Single-layered Canopy	6.2	19.9	3.6	1.7	1.0	0.5	0.8	22.9	7.6	3.2	33.7	677
Mature, Multi-layered Canopy	5.2	12.7	2.7	1.3	0.6	0.5	0.7	15.7	5.3	2.6	23.6	850
Structurally-complex, Developed Structurally-complex	3.3	9.5	2.9	1.9	1.0	0.8	1.0	11.4	5.0	4.0	20.4	649
Structurally-complex, Existing Old Forest	3.3	7.8	2.5	1.9	1.6	1.0	1.3	9.6	4.7	5.1	19.3	925
Structurally-complex, Existing Very Old Forest	3.9	5.0	1.7	2.6	1.6	1.2	3.3	7.3	4.2	7.8	19.4	43
Weighted Average	**3.9**	**9.4**	**2.3**	**1.2**	**0.8**	**0.5**	**0.7**	**11.8**	**4.2**	**2.7**	**18.7**	**6,250**

Table S-19. Snag density (trees per acre) in the northern districts (Coos Bay, Eugene, and Salem) by structural group

Structural Group	Diameter Class (Inches DBH)											Sub-Plots
	< 6	6–12	12–18	18–24	24–30	30–36	> 36	< 10	10–20	> 20	All	
Early Successional	-	-	0.9	0.3	-	1.2	-	-	0.9	1.6	2.5	17
Stand Establishment	0.9	2.3	1.9	1.0	0.8	0.3	0.4	2.8	2.9	2.0	7.7	500
Young	5.7	10.1	2.1	0.9	0.5	0.3	0.5	14.5	3.6	1.9	20.0	847
Mature	5.8	19.8	3.7	1.8	1.0	0.6	1.1	22.2	7.8	3.8	33.8	849
Structurally-complex	2.3	7.5	3.2	2.6	1.7	1.3	2.0	8.5	5.4	6.7	20.6	622
Weighted Average	**4.1**	**11.0**	**2.8**	**1.5**	**1.0**	**0.6**	**1.0**	**13.3**	**5.1**	**3.5**	**22.0**	**2,835**

Table S-20. Snag density (trees per acre) in the northern districts (Coos Bay, Eugene, and Salem) by structural stage

Structural Stage	Diameter Class (Inches DBH)											Sub-Plots
	< 6	6–12	12–18	18–24	24–30	30–36	> 36	< 10	10–20	> 20	All	
Early Successional *with* Structural Legacies	-	-	1.3	0.4	-	1.8	-	-	1.3	2.2	3.5	12
Early Successional *without* Structural Legacies	-	-	-	-	-	-	-	-	-	-	-	5
Stand Establishment *with* Structural Legacies	4.0	6.0	1.1	1.5	1.2	-	-	10.0	1.6	2.2	13.9	24
Stand Establishment *without* Structural Legacies	0.7	2.1	1.9	1.0	0.8	0.4	0.5	2.4	3.0	2.0	7.4	476
Young – High Density, *with* Structural Legacies	2.9	4.5	2.5	1.6	0.5	0.7	1.3	6.5	4.0	3.6	14.1	156
Young – High Density, *without* Structural Legacies	6.4	11.4	2.0	0.7	0.5	0.2	0.4	16.5	3.5	1.5	21.5	677
Young – Low Density, *with* Structural Legacies	-	24.1	5.3	-	5.3	-	-	24.1	5.3	5.3	34.7	2
Young – Low Density, *without* Structural Legacies	-	6.0	0.9	1.3	-	0.4	1.3	2.0	5.3	2.7	10.0	12
Mature, Single-layered Canopy	6.7	22.3	4.0	1.8	1.2	0.6	0.9	25.3	8.6	3.7	37.6	531
Mature, Multi-layered Canopy	4.3	15.6	3.1	1.7	0.7	0.7	1.4	17.1	6.5	3.8	27.5	318
Structurally-complex, Developed Structurally Complex	2.0	8.8	3.9	2.5	1.6	1.3	1.8	9.1	6.5	6.2	21.8	272
Structurally-complex, Existing Old Forest	2.5	6.7	2.6	2.7	1.8	1.2	2.1	8.2	4.6	6.9	19.7	317
Structurally-complex, Existing Very Old Forest	3.7	4.4	1.9	2.3	1.1	1.6	3.9	6.6	4.3	8.0	18.8	33
Weighted Average	**4.1**	**11.0**	**2.8**	**1.5**	**1.0**	**0.6**	**1.0**	**13.3**	**5.1**	**3.5**	**22.0**	**2,835**

Table S-21. Snag density (trees per acre) in the southern districts (Klamath Falls, Medford, and Roseburg) by structural group

Structural Group	Diameter Class (Inches DBH)											Sub-Plots
	< 6	6–12	12–18	18–24	24–30	30–36	> 36	< 10	10–20	> 20	All	
Early Successional	4.7	7.4	2.4	1.5	0.8	0.5	0.3	10.8	4.1	2.7	17.7	110
Stand Establishment	1.8	4.1	0.7	0.5	0.3	0.2	0.2	5.4	1.4	0.9	7.8	813
Young	4.2	8.4	1.9	0.7	0.4	0.3	0.2	11.3	3.6	1.3	16.1	819
Mature	5.4	11.0	2.4	1.0	0.5	0.3	0.3	14.8	4.4	1.7	20.9	678
Structurally-complex	3.9	8.9	2.3	1.4	1.1	0.7	0.7	11.3	4.4	3.5	19.2	995
Weighted Average	**3.8**	**8.0**	**1.9**	**1.0**	**0.6**	**0.4**	**0.4**	**10.6**	**3.5**	**2.0**	**16.1**	**3,415**

Table S-22. Snag density (trees per acre) in the southern districts (Klamath Falls, Medford, and Roseburg) by structural stage

Structural Group	Diameter Class (Inches DBH)											Sub-Plots
	< 6	6–12	12–18	18–24	24–30	30–36	> 36	< 10	10–20	> 20	All	
Early Successional *with* Structural Legacies	-	1.3	1.1	1.1	0.6	0.3	0.1	1.3	1.1	2.1	4.5	19
Early Successional *without* Structural Legacies	5.7	8.7	2.6	1.6	0.8	0.6	0.4	12.8	4.7	2.9	20.5	91
Stand Establishment *with* Structural Legacies	4.4	6.1	1.0	0.5	0.2	0.3	0.1	9.8	1.9	0.9	12.7	187
Stand Establishment *without* Structural Legacies	1.1	3.5	0.6	0.5	0.3	0.1	0.3	4.1	1.3	1.0	6.3	626
Young – High Density, *with* Structural Legacies	3.1	7.8	2.0	0.9	0.4	0.3	0.2	9.4	4.0	1.4	14.9	261
Young – High Density, *without* Structural Legacies	4.6	8.4	1.8	0.6	0.2	0.3	0.2	11.7	3.4	1.1	16.2	467
Young – Low Density, *with* Structural Legacies	5.8	10.0	0.4	0.2	0.5	0.5	0.1	15.8	0.5	1.2	17.5	29
Young – Low Density, *without* Structural Legacies	5.2	10.2	2.5	1.2	0.9	0.2	0.1	13.7	4.9	1.7	20.3	62
Mature, Single-layered Canopy	4.3	11.2	2.4	1.1	0.4	0.2	0.2	14.4	3.9	1.4	19.7	146
Mature, Multi-layered Canopy	5.7	10.9	2.4	1.0	0.6	0.3	0.3	14.9	4.6	1.8	21.3	532
Structurally-complex, Developed Structurally-complex	4.3	9.9	2.2	1.4	0.6	0.4	0.5	13.0	4.0	2.3	19.3	377
Structurally-complex, Existing Old Forest	3.7	8.4	2.5	1.4	1.4	0.9	0.8	10.3	4.7	4.1	19.2	608
Structurally-complex, Existing Very Old Forest	4.8	7.2	1.1	3.7	3.2	-	1.1	9.6	4.0	7.4	21.1	10
Weighted Average	**3.8**	**8.0**	**1.9**	**1.0**	**0.6**	**0.4**	**0.4**	**10.6**	**3.5**	**2.0**	**16.1**	**3,415**

Existing Down Woody Material Quantities

Table S-23. Down woody material cover in the decision area by structural group

Structural Group	Decay Class (Percent Cover)						Transects (Number)
	1	2	3	4	5	All	
Early Successional	0.2%	0.9%	1.5%	0.9%	0.3%	3.8%	254
Stand Establishment	0.2%	0.4%	1.4%	1.6%	0.4%	4.1%	2,626
Young	0.2%	0.4%	1.0%	1.4%	0.6%	3.6%	3,332
Mature	0.3%	0.7%	1.4%	1.8%	0.9%	5.0%	3,054
Structurally-complex	0.3%	0.7%	1.8%	1.5%	0.6%	4.9%	3,234
Weighted Average	**0.2%**	**0.6%**	**1.4%**	**1.5%**	**0.6%**	**4.4%**	**12,500**

Table S-24. Down woody material cover in the decision area by structural stage

Structural Stage	Decay Class (Percent Cover)						Transects (Number)
	1	2	3	4	5	All	
Early Successional *with* Structural Legacies	0.2%	1.5%	2.4%	1.3%	0.3%	5.6%	62
Early Successional *without* Structural Legacies	0.1%	0.7%	1.3%	0.8%	0.3%	3.1%	192
Stand Establishment *with* Structural Legacies	0.2%	0.3%	0.7%	1.1%	0.8%	3.1%	422
Stand Establishment *without* Structural Legacies	0.2%	0.4%	1.6%	1.7%	0.4%	4.3%	2,204
Young – High Density, *with* Structural Legacies	0.2%	0.3%	1.1%	1.2%	0.4%	3.2%	834
Young – High Density, *without* Structural Legacies	0.3%	0.4%	1.0%	1.5%	0.6%	3.8%	2,288
Young – Low Density, *with* Structural Legacies	0.1%	0.2%	0.3%	0.2%	0.1%	0.9%	62
Young – Low Density, *without* Structural Legacies	0.1%	0.9%	1.3%	0.9%	0.3%	3.3%	148
Mature, Single-layered Canopy	0.3%	0.9%	1.5%	1.9%	0.9%	5.5%	1,354
Mature, Multi-layered Canopy	0.2%	0.6%	1.3%	1.7%	0.8%	4.6%	1,700
Structurally-complex, Developed Structurally-complex	0.2%	0.5%	1.5%	1.5%	0.6%	4.3%	1,298
Structurally-complex, Existing Old Forest	0.3%	0.8%	1.9%	1.5%	0.6%	5.2%	1,850
Structurally-complex, Existing Very Old Forest	0.4%	1.2%	5.2%	2.3%	0.9%	10.0%	86
Weighted Average	**0.2%**	**0.6%**	**1.4%**	**1.5%**	**0.6%**	**4.4%**	**12,500**

Table S-25. Down woody material cover in the northern districts (Coos Bay, Eugene, and Salem) by structural group

Structural Group	Decay Class (Percent Cover)						Transects (Number)
	1	2	3	4	5	All	
Early Successional	0.1%	1.6%	2.1%	1.0%	0.4%	5.3%	34
Stand Establishment	0.3%	0.4%	1.5%	1.5%	0.5%	4.1%	1,000
Young	0.3%	0.5%	1.2%	1.7%	0.7%	4.4%	1,694
Mature	0.4%	0.8%	1.6%	1.7%	0.9%	5.4%	1,698
Structurally-complex	0.3%	1.0%	2.7%	1.9%	0.8%	6.8%	1,244
Weighted Average	**0.3%**	**0.7%**	**1.7%**	**1.7%**	**0.8%**	**5.2%**	**5,670**

Table S-26. Down woody material cover in the northern districts (Coos Bay, Eugene, and Salem) by structural stage

Structural Stage	Decay Class (Percent Cover)						Transects (Number)
	1	2	3	4	5	All	
Early Successional *with* Structural Legacies	0.2%	2.3%	3.0%	1.4%	0.6%	7.5%	24
Early Successional *without* Structural Legacies	-	-	-	-	-	-	10
Stand Establishment *with* Structural Legacies	-	0.2%	0.5%	1.3%	0.8%	2.8%	48
Stand Establishment *without* Structural Legacies	0.3%	0.4%	1.5%	1.5%	0.5%	4.2%	952
Young – High Density, *with* Structural Legacies	0.3%	0.4%	1.4%	1.7%	0.5%	4.3%	312
Young – High Density, *without* Structural Legacies	0.3%	0.5%	1.1%	1.7%	0.8%	4.4%	1,354
Young – Low Density, *with* Structural Legacies	0.8%	2.1%	-	1.4%	-	4.4%	4
Young – Low Density, *without* Structural Legacies	-	3.2%	2.3%	1.6%	1.0%	8.1%	24
Mature, Single-layered Canopy	0.4%	0.8%	1.6%	1.9%	1.0%	5.6%	1,062
Mature, Multi-layered Canopy	0.3%	0.7%	1.5%	1.5%	0.8%	5.0%	636
Structurally-complex, Developed Structurally-complex	0.2%	0.7%	1.9%	1.6%	0.7%	5.1%	544
Structurally-complex, Existing Old Forest	0.3%	1.3%	3.1%	2.1%	0.9%	7.7%	634
Structurally-complex, Existing Very Old Forest	0.4%	1.5%	6.5%	2.7%	1.0%	12.2%	66
Weighted Average	**0.3%**	**0.7%**	**1.7%**	**1.7%**	**0.8%**	**5.2%**	**5,670**

Table S-27. Down woody material cover in the southern districts (Klamath Falls, Medford, and Roseburg) by structural group

Structural Group	Decay Class (Percent Cover)						Transects (Number)
	1	2	3	4	5	All	
Early Successional	0.2%	0.8%	1.4%	0.9%	0.3%	3.5%	220
Stand Establishment	0.1%	0.5%	1.4%	1.6%	0.4%	4.0%	1,626
Young	0.1%	0.3%	0.8%	1.0%	0.4%	2.7%	1,638
Mature	0.1%	0.7%	1.1%	1.8%	0.8%	4.5%	1,356
Structurally-complex	0.2%	0.5%	1.3%	1.3%	0.5%	3.8%	1,990
Weighted Average	**0.2%**	**0.5%**	**1.2%**	**1.4%**	**0.5%**	**3.7%**	**6,830**

Table S-28. Down woody material cover in the southern districts (Klamath Falls, Medford, and Roseburg) by structural stage

Structural Stage	Decay Class (Percent Cover)						Transects (Number)
	1	2	3	4	5	All	
Early Successional *with* Structural Legacies	0.2%	0.9%	2.0%	1.2%	-	4.5%	38
Early Successional *without* Structural Legacies	0.1%	0.7%	1.3%	0.8%	0.3%	3.3%	182
Stand Establishment *with* Structural Legacies	0.2%	0.3%	0.8%	1.1%	0.8%	3.2%	374
Stand Establishment *without* Structural Legacies	0.1%	0.5%	1.6%	1.8%	0.3%	4.3%	1,252
Young – High Density, *with* Structural Legacies	0.1%	0.3%	0.9%	0.9%	0.4%	2.6%	522
Young – High Density, *without* Structural Legacies	0.2%	0.3%	0.8%	1.1%	0.5%	2.9%	934
Young – Low Density, *with* Structural Legacies	-	-	0.3%	0.1%	0.1%	0.7%	58
Young – Low Density, *without* Structural Legacies	0.1%	0.4%	1.1%	0.7%	0.1%	2.4%	124
Mature, Single-layered Canopy	0.2%	1.1%	1.2%	1.9%	0.5%	4.9%	292
Mature, Multi-layered Canopy	0.1%	0.5%	1.1%	1.8%	0.8%	4.4%	1,064
Structurally-complex, Developed Structurally-complex	0.2%	0.4%	1.2%	1.4%	0.5%	3.7%	754
Structurally-complex, Existing Old Forest	0.2%	0.6%	1.3%	1.3%	0.4%	3.9%	1,216
Structurally-complex, Existing Very Old Forest	0.1%	0.3%	1.0%	0.8%	0.5%	2.7%	20
Weighted Average	**0.2%**	**0.5%**	**1.2%**	**1.4%**	**0.5%**	**3.7%**	**6,830**

Assumptions for Snag and Down Woody Material Creation or Retention Targets

The BLM developed snag and down woody material creation targets by comparing the amount of existing snags and down wood against desired amounts and any deficits from the desired condition was used as a creation target for silvicultural treatments (in these types of projects snags and dead wood would be added to reach the desired condition). For fuels treatments and salvage projects the BLM established retention targets based on the desired condition (in these types of projects snags and dead wood would generally be subtracted but only down to the desired condition).

The concept and assumptions described here were used in the Proposed RMP, Alternative B, and Alternative D. The process for BLM used to develop snag and down woody material creation and retention targets is outlined in more detail below.

Step 1. Develop target levels as interpreted by BLM using the Decayed Wood Advisor (DecAID) (Mellen-McLean *et al*. 2012) as a reference.

- BLM assumed Small/Medium Trees from DecAID provided an appropriate context based on typical tree size in projects (refer to SmallMedium_Trees tab).
    - Assume the Small/Medium Trees syntheses from DecAID provide context because QMD of trees reported in recent BLM projects is between 10 and 19 inches 98 percent of the time. The BLM reviewed 2–3 forest management EAs published by each district during 2013–2014 (15 total).
- BLM assumed that the provinces used in DecAID were applicable to the districts as follows:
    - Assume Westside Lowland Conifer-Hardwood in the Oregon Coast Range province (WLCH_OCO_S) applied to the west side of Salem District, west side of Eugene District, all of Coos Bay District, and the northwest-portion of Roseburg District.

- Assume Westside Lowland Conifer-Hardwood in the Western Cascades province (WLCH_OCA_S) applied to the eastside of Salem District, eastside of Eugene District, and the northeast-portion of Roseburg District.
- Assume Southwest Oregon Mixed Conifer-Hardwood in the Klamath province (SWOMC_S) applied to the southern-half of Roseburg District and all of Medford District.
- Assume Eastside Mixed Conifer East Cascades/Blue Mountains (EMC_ECB_S) applied to Klamath Falls Field Office.

- In the Harvest Land Base, the BLM used the 30 percent tolerance levels from DecAID as a reference to establish the target levels of snags and down woody material (**Table S-29**).

In the Late-Successional Reserve and Riparian Reserve, the BLM used the 50 percent tolerance levels from DecAID as a reference to establish the target levels of snags and down woody material (**Table S-30**).

Table S-29. Snag and down woody material target levels within the Harvest Land Base

District/ Field Office	Province	Snags/Acre		Down Wood
		> 20" DBH	> 10" DBH	(Percent Cover)
Coos Bay	All	4.8	5.3	3.0
Eugene	OR Coast Range	4.8	5.3	3.0
	Western Cascades	4.8	5.3	4.5
Klamath Falls	All	2.7	6.7	2.0
Medford	All	2.0	4.0	1.4
Roseburg	OR Coast Range	4.8	5.3	3.0
	Western Cascades	4.8	5.3	4.5
	Klamath	2.0	4.0	1.4
Salem	OR Coast Range	4.8	5.3	3.0
	Western Cascades	4.8	5.3	4.5

Table S-30. Snag and down woody material target levels within the Late-Successional Reserve and Riparian Reserve

District/ Field Office	Province	Snags/Acre		Down Wood
		> 20" DBH	> 10" DBH	(Percent Cover)
Coos Bay	All	8.1	18.6	6.0
Eugene	OR Coast Range	8.1	18.6	6.0
	Western Cascades	8.1	18.6	10.0
Klamath Falls	All	4.2	12.5	3.0
Medford	All	3.2	7.3	2.0
Roseburg	OR Coast Range	8.1	18.6	6.0
	Western Cascades	8.1	18.6	10.0
	Klamath	3.2	7.3	2.0
Salem	OR Coast Range	8.1	18.6	6.0
	Western Cascades	8.1	18.6	10.0

Step 2. Calculate existing snag density and quantities of down woody material.
As described above, the BLM tabulated and summarized the existing amounts of snags and down woody material using the BLM forest inventory data from CVS plots. Existing amounts are summarized above in **Table S-17** through **Table S-28**.

Step 3. Calculate the deficit or surplus of snags and down woody material.

- The BLM calculated the deficit or surplus of snags and down woody material by subtracting the existing levels from the target levels of dead wood within the Harvest Land Base (**Table S-31**) and the reserves (**Table S-32**).

Table S-31. Snag and down woody material deficits (-) or surplus (+) within the Harvest Land Base

District/ Field Office	Province	Snags/Acre		Down Wood	
		> 20" DBH	> 10" DBH	(Percent Cover)	(Trees/Acre)
Coos Bay	All	-1.3	+3.4	+1.4	+6.5
Eugene	OR Coast Range	-1.3	+3.4	+1.4	+6.5
	Western Cascades	-1.3	+3.4	-0.1	-0.3
Klamath Falls	All	-0.7	-1.2	+1.2	+8.4
Medford	All	0.0	+1.5	+1.8	+8.3
Roseburg	OR Coast Range	-2.8	0.2	+0.2	+1.0
	Western Cascades	-2.8	0.2	-1.3	-5.7
	Klamath	0.0	+1.5	+1.8	+8.3
Salem	OR Coast Range	-1.3	+3.4	+1.4	+6.5
	Western Cascades	-1.3	+3.4	-0.1	-0.3

Table S-32. Snag and down woody material deficits (-) or surplus (+) within the Late-Successional Reserve and Riparian Reserve

District/ Field Office	Province	Snags/Acre		Down Wood	
		> 20" DBH	> 10" DBH	(Percent Cover)	(Trees/Acre)
Coos Bay	All	-4.6	-9.9	-1.6	-7.1
Eugene	OR Coast Range	-4.6	-9.9	-1.6	-7.1
	Western Cascades	-4.6	-9.9	-5.6	-25.1
Klamath Falls	All	-2.2	-7.0	+0.2	+1.6
Medford	All	-1.2	-1.8	+1.2	+7.0
Roseburg	OR Coast Range	-6.1	-13.1	-2.8	-12.5
	Western Cascades	-6.1	-13.1	-6.8	-30.6
	Klamath	-1.2	-1.8	+1.2	+7.0
Salem	OR Coast Range	-4.6	-9.9	-1.6	-7.1
	Western Cascades	-4.6	-9.9	-5.6	-25.1

Step 4. Convert down woody material deficit to number of trees.

- The deficit amount of down woody material expressed as percent cover was converted to linear feet per acre using a conversion from DecAID:

- Percent cover = (linear meters/hectare) / X-variable
- Where the X-variable varied:
  - Westside Lowland Conifer Hardwoods (both in Oregon Coast Range and Western Cascades [WLCH_S]) X-variable = 316.23
  - Southwestern Oregon Mixed Conifer (SWOMC_S) X-variable = 398.9
  - Eastside Mixed Conifer East Cascades (EMC_ECB_S) X-variable = 480.51
- Linear feet per acre were converted to trees per acre using the assumption that a tree is 93 feet tall. From BLM forest inventory data, 93 feet is the average tree height of Douglas-fir that is 15–16 inches DBH (C. Hooper, BLM, Vegetation Modeling Lead, personal communication, February 19, 2014).
- Converted deficit or surplus in down woody material converted to number of trees per acre is shown in **Table S-31** and **Table S-32**.

Step 5. Interpret snag and down woody material information into management direction.

- In interpreting the calculated amounts of snags and down woody material that was either deficit or surplus, the BLM had several assumptions, including:
  - Actively create additional dead wood (snags) at time of treatment to compensate for the calculated deficits (**Table S-31** and **Table S-32**).
  - Existing snags and DWM would be retained – even if there are surplus snags or down woody material.
  - Snags >20" DBH size class would contribute towards deficits of snags >10" DBH.
  - Snags >20" DBH or >10" DBH would contribute eventually to down woody material because ~30 percent fall within 10 years (*Snag Dynamics in Western Oregon and Washington* from Mellen-McLean *et al*. 2012).
  - Total trees/acre to be snagged would be the greatest number of: 20" DBH snag deficit, 10" DBH snag deficit, or the down woody material deficit.
  - Deficit of >20" DBH snags would be met from this greatest number; balance of trees to be snagged would be >10" DBH.

Fuel-reduction actions in the reserved land use allocations would not reduce snags or down woody material below target levels for the reserve (**Table S-30**). No active recruitment would occur in response to fuel-reduction – only retention down to target levels.

Bureau Sensitive Wildlife Species

Table S-33. Habitat development for Bureau Sensitive wildlife species documented or suspected to occur in the decision area

Taxon	Species		Hab. Group*	S&M Cat.†	Amount of Habitat (Acres) (Percent)								Structural Stage(s) for Habitat Analysis (Numeric Codes)	Species Range (Counties)	Source for Species Range
	Common Name	Scientific Name			in 2013	in 2063									
					Current	No Action	Alt. A	Alt. B	Alt. C	Alt. D	PRMP	No Timber Harvest			
BI	Tricolored blackbird	*Agelaius tricolor*	Wet	-	2,850	No change	No change	No change	No change	No change	No change	No change	Wetland layer	Jack, Klam, Mult	ORBIC 2013
BI	Grasshopper sparrow	*Ammodramus savannarum*	Early	-	25,487	55,477 (218%)	35,188 (138%)	53,134 (208%)	57,469 (225%)	23,533 (92%)	35,805 (140%)	11,938 (47%)	Early-successional (1.1, 1.2) or Agricultural, Grassland, Shrub land (GNN 2, 6, 7)	Jack, Lane, Linn, Polk	NatureServe 2014
BI	Tule goose	*Anser albifrons elgasi*	Wet	-	1,625	No change	No change	No change	No change	No change	No change	No change	Wetland layer	Klam	ORBIC 2013
BI	Dusky Canada goose	*Branta canadensis occidentalis*	Wet	-	7,749	No change	No change	No change	No change	No change	No change	No change	Wetland layer	Bent, Colu, Lane, Linn, Mari, Mult, Polk, Till, Wash, Yamh	ORBIC 2013
BI	Aleutian Canada goose	*Branta hutchinsii leucopareia*	Wet	-	7,299	No change	No change	No change	No change	No change	No change	No change	Wetland layer	Bent, Colu, Coos, Curr, Mari, Mult, Polk, Till, Wash, Yamh	ORBIC 2013
BI	Bufflehead	*Bucephala albeola*	Wet	-	15,858	No change	No change	No change	No change	No change	No change	No change	Wetland layer	All except Bent, Linc, Polk	ORBIC 2013
BI	Yellow rail	*Coturnicops noveboracensis*	Wet	-	1,625	No change	No change	No change	No change	No change	No change	No change	Wetland layer	Klam	ORBIC 2013
BI	Black swift	*Cypseloides niger*	X	-	*No Data*	*No Data*	*No Data*	*No Data*	*No Data*	*No Data*	*No Data*	*No Data*	Waterfalls	Doug, Jack, Lane	ORBIC 2013
BI	Snowy egret	*Egretta thula*	Wet	-	1,625	No Change	No Change	No Change	No Change	No Change	No Change	No Change	Wetland layer	Klam	ORBIC 2013

Taxon	Species		Hab. Group*	S&M Cat.†	Amount of Habitat (Acres) (Percent)								Structural Stage(s) for Habitat Analysis (Numeric Codes)	Species Range (Counties)	Source for Species Range
					in 2013	in 2063									
	Common Name	Scientific Name			Current	No Action	Alt. A	Alt. B	Alt. C	Alt. D	PRMP	No Timber Harvest			
BI	White-tailed kite	*Elanus leucurus*	Wet	-	7,703	No Change	No Change	No Change	No Change	No Change	No Change	No Change	Wetland layer	Bent, Clat, Coos, Curr, Doug, Jack, Jose, Lane, Polk, Till	ORBIC 2013
BI	American peregrine falcon	*Falco peregrinus anatum*	X	-	*No Data*	*No Data*	*No Data*	*No Data*	*No Data*	*No Data*	*No Data*	*No Data*	Cliffs	All	ORBIC 2013
BI	Tufted puffin	*Fratercula cirrhata*	NF	-	182	No Change	No Change	No Change	No Change	No Change	No Change	No Change	Marine, estuarine (GNN 11)	Clat, Coos, Curr, Lane, Linc, Till	ORBIC 2013
BI	Bald eagle	*Haliaeetus leucocephalus*	Late	-	247,608	300,862 (122%)	322,298 (130%)	325,246 (131%)	288,660 (117%)	338,378 (137%)	319,828 (129%)	345,936 (140%)	See Chapter 3	See Chapter 3	See Chapter 3
BI	Harlequin duck	*Histrionicus histrionicus*	Wet	-	13,075	No Change	No Change	No Change	No Change	No Change	No Change	No Change	Wetland layer	Clac, Clat, Coos, Curr, Doug, Klam, Lane, Linc, Linn, Mari, Mult, Till, Wash	ORBIC 2013
BI	Franklin's gull	*Larus pipixcan*	Wet	-	1,625	No Change	No Change	No Change	No Change	No Change	No Change	No Change	Wetland layer	Klam	Burrows and Gilligan 2003
BI	Lewis's woodpecker	*Melanerpes lewis*	Early	-	12,896	89,420 (693%)	12,249 (95%)	70,832 (549%)	8,716 (68%)	31,361 (243%)	43,067 (334%)	16,361 (127%)	Early-successional with Structural Legacies (1.1) or Shrub land (GNN 7)	Colu, Doug, Jack, Jose, Klam, Lane, Mult	GeoBOB 2013
BI	American white pelican	*Pelecanus erythrorhynchos*	Wet	-	1,625	No Change	No Change	No Change	No Change	No Change	No Change	No Change	Wetland layer	Klam	ORBIC 2013
BI	California brown pelican	*Pelecanus occidentalis californicus*	Wet	-	4,656	No Change	No Change	No Change	No Change	No Change	No Change	No Change	Wetland layer	Clat, Coos, Curr, Doug, Lane, Linc, Till	ORBIC 2013

Taxon	Species		Hab. Group*	S&M Cat.†	Amount of Habitat (Acres) (Percent)								Structural Stage(s) for Habitat Analysis (Numeric Codes)	Species Range (Counties)	Source for Species Range
	Common Name	Scientific Name			in 2013	in 2063									
					Current	No Action	Alt. A	Alt. B	Alt. C	Alt. D	PRMP	No Timber Harvest			
BI	White-headed woodpecker	*Picoides albolarvatus*	Early	-	10,313	72,725 (705%)	11,882 (115%)	40,209 (390%)	8,567 (83%)	24,085 (234%)	29,051 (282%)	15,923 (154%)	Early-successional with Structural Legacies (1.1) or Shrub land (GNN 7)	Doug, Jack, Jose, Klam	GeoBOB 2013; NatureServe 2014
BI	Horned grebe	*Podiceps auritus*	Wet	-	6,997	No Change	No Change	No Change	No Change	No Change	No Change	No Change	Wetland layer	Clat, Coos, Curr, Doug, Klam, Lane, Linc, Linn, Till	ORBIC 2013
BI	Red-necked grebe	*Podiceps grisegena*	Wet	-	9,018	No Change	No Change	No Change	No Change	No Change	No Change	No Change	Wetland layer	Clat, Coos, Curr, Doug, Jack, Jose, Lane, Linn, Mari, Mult, Polk, Wash, Yamh	ORBIC 2013
BI	Oregon vesper sparrow	*Pooecetes gramineus affinis*	Early	-	5,726	28,774 (503%)	26,868 (469%)	58,696 (1025%)	48,788 (852%)	18,086 (316%)	31,193 (545%)	1,798 (31%)	Early-successional (1.1, 1.2) or Agricultural, Grassland, Shrub land (GNN 2, 6, 7)	Bent, Clac, Lane, Linn, Mari, Polk	Nature Serve 2014
BI	Purple martin	*Progne subis*	NF	-	8,682	No Change	No Change	No Change	No Change	No Change	No Change	No Change	Agricultural, grassland, shrub land, woodland (GNN 2, 6, 7)	All	ORBIC 2013; ISSSP Fact Sheet
HA	Black salamander	*Aneides flavipunctatus*	Late	-	389,409	422,485 (108%)	488,842 (126%)	508,151 (130%)	484,370 (124%)	505,687 (130%)	494,087 (127%)	514,176 (132%)	Young High Density with Structural Legacies (3.1), Mature (4.1, 4.2), or Structurally-complex (5.1, 5.2, 5.3)	Jack, Jose	NatureServe 2014

Taxon	Species		Hab. Group*	S&M Cat.†	Amount of Habitat (Acres) (Percent)								Structural Stage(s) for Habitat Analysis (Numeric Codes)	Species Range (Counties)	Source for Species Range
	Common Name	Scientific Name			in 2013	in 2063									
					Current	No Action	Alt. A	Alt. B	Alt. C	Alt. D	PRMP	No Timber Harvest			
HA	Cope's giant salamander	*Dicamptodon copei*	RR	-	31,891	54,247 (170%)	55,037 (173%)	51,898 (163%)	48,739 (153%)	55,292 (173%)	55,098 (173%)	55,685 (175%)	within 1 SPTH of streams[3]	Clac, Clat, Colu, Mult, Till, Wash	ORBIC 2013
HA	Siskiyou mountains salamander	*Plethodon stormi*	Late	A, D‡	328,037	365,523 (111%)	432,740 (132%)	447,786 (137%)	425,029 (129%)	447,347 (136%)	434,541 (132%)	457,766 (140%)	Mature (4.1, 4.2), or Structurally-complex (5.1, 5.2, 5.3)	Jack, Jose	Olson *et al.* 1999
HA	Foothill yellow-legged frog	*Rana boylii*	RR	-	321,122	526,680 (164%)	544,580 (170%)	518,121 (161%)	477,250 (149%)	546,135 (170%)	537,999 (168%)	547,918 (171%)	within 1 SPTH of streams[3]	Coos, Curr, Doug, Jack, Jose, Klam, Lane, Linn, Mari	Olson & Davis 2009
HR	Western pond turtle	*Actinemys marmorata*	Wet	-	17,976	No Change	No Change	No Change	No Change	No Change	No Change	No Change	Wetland layer	Bent, Clac, Colu, Coos, Curr, Doug, Jack, Jose, Klam, Lane, Linn, Mari, Mult, Polk, Till, Wash, Yamh	ORBIC 2013
HR	Painted turtle	*Chrysemys picta*	Wet	-	11,414	No Change	No Change	No Change	No Change	No Change	No Change	No Change	Wetland layer	Bent, Clac, Colu, Lane, Linn, Mari, Mult, Polk, Wash, Yamh	ORBIC 2013
IBI	Western ridged mussel	*Gonidea angulata*	RR	-	203,020	352,336 (174%)	366,093 (180%)	345,512 (170%)	315,192 (155%)	367,742 (181%)	367,790 (181%)	369,320 (182%)	within 1 SPTH of streams[3]	Bent, Clac, Coos, Curr, Doug, Klam, Linn, Mult, Wash	ORBIC 2013
IBI	Montane peaclam	*Pisidium ultramontanum*	RR	-	1,687	2,541 (151%)	2,544 (151%)	2,494 (151%)	2,141 (127%)	2,546 (151%)	2,470 (146%)	2,546 (151%)	within 1 SPTH of streams[3]	Klam	ORBIC 2013
IG	Puget oregonian	*Cryptomastix devia*	Late	A	69,849	104,370 (149%)	90,137 (129%)	91,866 (132%)	75,737 (109%)	95,953 (137%)	89,577 (128%)	119,919 (172%)	Mature (4.1, 4.2), and Structurally-complex (5.1, 5.2, 5.3)	Clac, Colu, Mult, Wash, Yamh	GeoBOB 2013; Duncan *et al.* 2003

Taxon	Species		Hab. Group*	S&M Cat.†	Amount of Habitat (Acres) (Percent)								Structural Stage(s) for Habitat Analysis (Numeric Codes)	Species Range (Counties)	Source for Species Range
	Common Name	Scientific Name			in 2013	in 2063									
					Current	No Action	Alt. A	Alt. B	Alt. C	Alt. D	PRMP	No Timber Harvest			
IG	Olympia pebblesnail	*Fluminicola virens*	RR	-	170,252	297,448 (175%)	310,252 (182%)	290,660 (171%)	264,102 (155%)	311,556 (183%)	307,530 (181%)	313,030 (184%)	within 1 SPTH of streams[3]	Bent, Clac, Colu, Doug, Linn, Mari, Mult, Wash, Yamh	ISSSP Fact Sheet 2012; ORBIC 2013
IG	Great basin ramshorn	*Helisoma newberryi newberryi*	RR	-	1,687	2,541 (151%)	2,544 (151%)	2,494 (151%)	2,141 (127%)	2,546 (151%)	2,470 (146%)	2,546 (151%)	within 1 SPTH of streams[3]	Klam	ISSSP Fact Sheet 2010
IG	Oregon shoulderband	*Helminthoglypta hertleini*	NF	-	1,079	No Change	No Change	No Change	No Change	No Change	No Change	No Change	Rock (GNN 3)	Doug, Jack, Jose	ORBIC 2013
IG	Highcap lanx	*Lanx alta*	RR	-	1,687	2,541 (151%)	2,544 (151%)	2,494 (151%)	2,141 (127%)	2,546 (151%)	2,470 (146%)	2,546 (151%)	within 1 SPTH of streams[3]	Klam	ISSSP Fact Sheet 2009
IG	Scale lanx	*Lanx klamathensis*	RR	-	1,687	2,541 (151%)	2,544 (151%)	2,494 (151%)	2,141 (127%)	2,546 (151%)	2,470 (146%)	2,546 (151%)	within 1 SPTH of streams[3]	Klam	ORBIC 2013
IG	Rotund lanx	*Lanx subrotunda*	RR	-	105,894	187,135 (177%)	196,261 (185%)	185,370 (175%)	169,778 (160%)	197,307 (186%)	194,352 (184%)	198,321 (187%)	within 1 SPTH of streams[3]	Doug	ISSSP Fact Sheet 2010
IG	Newcomb's littorine snail	*Littorina subrotundata*	NF	-	82	No Change	No Change	No Change	No Change	No Change	No Change	No Change	Marine, estuarine (GNN 11)	Coos, Linc	ISSSP Fact Sheet
IG	Travelling sideband	*Monadenia fidelis celeuthia*	NF	-	628	No Change	No Change	No Change	No Change	No Change	No Change	No Change	Rock (GNN 3)	Jack	ORBIC 2013
IG	Columbia sideband	*Monadenia fidelis columbiana*	RR	-	4,136	5,824 (141%)	5,983 (145%)	5,326 (129%)	3,979 (96%)	5,983 (145%)	5,918 (143%)	5,983 (145%)	Mesic forest; within 1 SPTH of streams[3]	Mult, Wash	ISSSP Fact Sheet 2011
IG	Green sideband	*Monadenia fidelis flava*	Mid	-	32,579	39,971 (123%)	39,578 (121%)	41,972 (129%)	35,767 (110%)	36,032 (111%)	42,303 (130%)	45,292 (139%)	Young High Density with Structural Legacies (3.1), Mature (4.1, 4.2), and Structurally-complex (5.1, 5.2, 5.3)	Curry	GeoBOB 2013
IG	Modoc Rim sideband	*Monadenia fidelis* ssp. nov. (Modoc Rim)	NF	-	252	No Change	No Change	No Change	No Change	No Change	No Change	No Change	Rock, talus (GNN 3)	Klam	ORBIC 2013

Taxon	Species		Hab. Group*	S&M Cat.†	Amount of Habitat (Acres) (Percent)								Structural Stage(s) for Habitat Analysis (Numeric Codes)	Species Range (Counties)	Source for Species Range
	Common Name	Scientific Name			in 2013	in 2063									
					Current	No Action	Alt. A	Alt. B	Alt. C	Alt. D	PRMP	No Timber Harvest			
IG	Robust walker	*Pomatiopsis binneyi*	RR	-	59,062	80,437 (136%)	81,754 (138%)	80,420 (136%)	79,949 (135%)	81,858 (139%)	80,572 (136%)	82,135 (139%)	within 1 SPTH of streams[3]	Curr, Jose	ORBIC 2013
IG	Pacific walker	*Pomatiopsis californica*	RR	-	94,824	164,133 (173%)	168,075 (177%)	158,126 (167%)	139,688 (147%)	168,303 (177%)	165,644 (175%)	168,478 (178%)	within 1 SPTH of streams[3]	Coos, Lane	ORBIC 2013
IG	Crater Lake tightcoil	*Pristiloma crateris*	Late	A§	420,914	564,206 (134%)	612,093 (146%)	611,835 (145%)	533,140 (127%)	644,678 (153%)	598,183 (142%)	708,674 (168%)	Mature (4.1, 4.2), and Structurally-complex (5.1, 5.2, 5.3)	Polygon of counties clipped east of I-5	Duncan *et al*. 2003
IG	Crowned tightcoil	*Pristiloma pilsbryi*	Late	-	21,451	40,295 (188%)	41,433 (193%)	40,519 (189%)	41,541 (194%)	41,529 (194%)	40,405 (188%)	42,009 (196%)	Mature (4.1, 4.2), and Structurally-complex (5.1, 5.2, 5.3)	Till	GeoBOB 2013
IG	Shiny tightcoil	*Pristiloma wascoense*	X	-	*No Data*	*No Data*	*No Data*	*No Data*	*No Data*	*No Data*	*No Data*	*No Data*	Ponderosa pine forests	Coos, Doug, Jack, Mari	ISSSP Fact Sheet
IG	Siskiyou hesperian	*Vespericola sierranus*	Late	-	326,439	365,529 (112%)	432,746 (133%)	447,793 (137%)	425,035 (130%)	447,354 (137%)	434,541 (133%)	457,772 (140%)	Mature (4.1, 4.2), and Structurally-complex (5.1, 5.2, 5.3)	Jack, Jose	ORBIC 2013
IG	Lined ramshorn	*Vorticifex effusus diagonalis*	RR	-	1,687	2,541 (151%)	2,544 (151%)	2,494 (151%)	2,141 (127%)	2,546 (151%)	2,470 (146%)	2,546 (151%)	within 1 SPTH of streams[3]	Klam	ORBIC 2013
IICO	Siuslaw sand tiger beetle	*Cicindela hirticollis siuslawensis*	NF	-	1,178	No Change	No Change	No Change	No Change	No Change	No Change	No Change	Coastal sand dunes (GNN 5)	Coos, Lane, Linc, Till	ORBIC 2013
IIHY	Franklin's bumblebee	*Bombus franklini*	NF	-	5,117	No Change	No Change	No Change	No Change	No Change	No Change	No Change	Variety of flowering plants; prairie (GNN 6, 7)	Doug, Jack, Jose	ORBIC 2013
IIHY	Western bumblebee	*Bombus occidentalis*	NF	-	6,430	No Change	No Change	No Change	No Change	No Change	No Change	No Change	Variety of flowering plants; prairie (GNN 6, 7)	Clac, Coos, Doug, Jack, Jose, Klam, Lane, Linc, Polk	ORBIC 2013

Taxon	Species		Hab. Group*	S&M Cat.†	Amount of Habitat (Acres) (Percent)								Structural Stage(s) for Habitat Analysis (Numeric Codes)	Species Range (Counties)	Source for Species Range
	Common Name	Scientific Name			in 2013	in 2063									
					Current	No Action	Alt. A	Alt. B	Alt. C	Alt. D	PRMP	No Timber Harvest			
IILE	Johnson's hairstreak	*Callophrys johnsoni*	Late	-	1,104,899	1,549,987 (140%)	1,638,115 (148%)	1,651,075 (149%)	1,467,275 (133%)	1,726,938 (156%)	1,637,746 (148%)	1,831,210 (166%)	Mature (4.1, 4.2) or Structurally-complex (5.1, 5.2, 5.3)	All	NatureServe 2014
IILE	Gray-blue butterfly	*Plebejus podarce klamathensis*	NF	-	2,461	No Change	No Change	No Change	No Change	No Change	No Change	No Change	Wet montane meadows (GNN 6)	Doug, Jack, Klam	ISSSP Fact Sheet 2006
IILE	Coastal greenish blue butterfly	*Plebejus saepiolus littoralis*	NF	-	288	No Change	No Change	No Change	No Change	No Change	No Change	No Change	Coastal sand dunes (GNN 5)	Curr, Lane	ORBIC 2013
IILE	Mardon skipper	*Polites mardon*	NF	-	2,256	No Change	No Change	No Change	No Change	No Change	No Change	No Change	Meadows (GNN 6)	Curr, Jack	Cons. Assess. USFWS 2010
IILE	Coronis fritillary	*Speyeria coronis coronis*	NF	-	4,549	No Change	No Change	No Change	No Change	No Change	No Change	No Change	Variety of flowering plants; prairie (GNN 6, 7)	Jack, Jose	ORBIC 2013
IIOR	Siskiyou short-horned grasshopper	*Chloealtis aspasma*	Early	-	23,336	44,302 (190%)	19,290 (83%)	10,357 (44%)	21,021 (90%)	11,604 (50%)	13,582 (58%)	10,130 (43%)	Early-successional (1.1, 1.2)	Jack, Jose	NatureServe 2014
IITR	Scott's apatanian caddisfly	*Allomyia scotti*	RR	-	13,583	23,743 (175%)	24,627 (181%)	23,346 (172%)	22,011 (162%)	24,711 (182%)	24,623 (181%)	25,004 (184%)	within 1 SPTH of streams[3]	Clac	ORBIC 2013
IITR	A caddisfly	*Rhyacophila chandleri*	RR	-	164,657	287,787 (175%)	300,136 (182%)	282,179 (171%)	254,726 (155%)	301,221 (183%)	296,375 (180%)	302,353 (184%)	within 1 SPTH of streams[3]	Doug, Lane	ORBIC 2013
IITR	Haddock's rhyacophilan caddisfly	*Rhyacophila haddocki*	RR	-	24,774	39,200 (158%)	40,210 (162%)	37,959 (153%)	35,501 (143%)	40,393 (163%)	39,813 (161%)	40,490 (163%)	within 1 SPTH of streams[3]	Bent, Curr	ORBIC 2013
IITR	A caddisfly	*Rhyacophila leechi*	RR	-	96,838	155,487 (161%)	160,063 (165%)	151,993 (157%)	137,910 (142%)	160,119 (165%)	157,493 (163%)	160,420 (166%)	within 1 SPTH of streams[3]	Jack, Lane	ORBIC 2013

Taxon	Species		Hab. Group*	S&M Cat.†	Amount of Habitat (Acres) (Percent)								Structural Stage(s) for Habitat Analysis (Numeric Codes)	Species Range (Counties)	Source for Species Range
	Common Name	Scientific Name			in 2013	in 2063									
					Current	No Action	Alt. A	Alt. B	Alt. C	Alt. D	PRMP	No Timber Harvest			
MA	Pallid bat	*Antrozous pallidus*	Mid	-	1,026,908	1,348,033 (131%)	1,435,273 (140%)	1,471,780 (143%)	1,305,381 (127%)	1,522,475 (148%)	1,462,784 (142%)	1,571,763 (153%)	Young with Structural Legacies (3.1, 3.3), Mature (4.1, 4.2), and Structurally-complex (5.1, 5.2, 5.3)	Coos, Curr, Doug, Jack, Jose, Klam, Lane	NatureServe 2014
MA	Oregon red tree vole	*Arborimus longicaudus*	Late	C	174,495	289,971 (166%)	279,899 (160%)	279,489 (160%)	236,047 (135%)	294,208 (169%)	277,503 (159%)	313,820 (180%)	Mature (4.1, 4.2) or Structurally-complex (5.1, 5.2, 5.3)	Defined DPS Polygon	USFWS 2011
MA	Pygmy rabbit	*Brachylagus idahoensis* (Outside Columbia Basin)	NF	-	63,877	No Change	No Change	No Change	No Change	No Change	No Change	No Change	Sagebrush (GNN 8)	Klam	ORBIC 2013
MA	Townsend's big-eared bat	*Corynorhinus townsendii*	X	-	No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data	Caves, Mines	Bent, Clac, Clat, Coos, Curr, Doug, Jack, Jose, Klam, Lane, Mari, Mult, Till, Wash	ORRBIC 2013
MA	Spotted bat	*Euderma maculatum*	-	-	-	-	-	-	-	-	-	-	-	Not in Decision Area: E. Oregon	ORBBIC 2013
MA	Pacific marten	*Martes caurina*	Late	-	168,181	289,336 (172%)	283,384 (168%)	289,229 (172%)	262,261 (156%)	301,325 (179%)	291,717 (173%)	332,169 (198%)	Mature (4.1, 4.2), and Structurally-complex (5.1, 5.2, 5.3)	Within 25 miles of the Pacific Coast	Assumed based on 80 FR 18749

Taxon	Species		Hab. Group*	S&M Cat.†	Amount of Habitat (Acres) (Percent)								Structural Stage(s) for Habitat Analysis (Numeric Codes)	Species Range (Counties)	Source for Species Range
	Common Name	Scientific Name			in 2013	in 2063									
					Current	No Action	Alt. A	Alt. B	Alt. C	Alt. D	PRMP	No Timber Harvest			
MA	Fringed myotis	*Myotis thysanodes*	Mid	-	1,192,066	1,604,929 (135%)	1,672,747 (140%)	1,721,310 (144%)	1,522,102 (128%)	1,782,578 (150%)	1,710,422 (147%)	1,855,364 (156%)	Young with Structural Legacies (3.1, 3.3), Mature (4.1, 4.2), and Structurally-complex (5.1, 5.2, 5.3)	Bent, Clac, Clat, Colu, Coos, Curr, Doug, Jack, Jose, Klam, Lane, Linc, Linn, Till, Wash	GeoBOB 2013; NatureServe 2014; ORBIC 2013
MA	Columbian white-tailed deer	*Odocoileus virginianus leucurus* (Douglas Co.)	Early	-	767	295 (38%)	712 (93%)	747 (97%)	589 (77%)	426 (56%)	577 (75%)	0 (0%)	See Chapter 3	See Chapter 3	See Chapter 3
Bureau Sensitive Summary§	**n=71 species total**	**n=66 species modeled**	**-**	**-**	**-**	**35 incr. 30 same 1 decr. 4 undet.**	**33 incr. 30 same 3 decr. 4 undet.**	**34 incr. 30 same 2 decr. 4 undet.**	**31 incr. 30 same 5 decr. 4 undet.**	**33 incr. 30 same 3 decr. 4 undet.**	**34 incr. 30 same 2 decr. 4 undet.**	**32 incr. 30 same 4 decr. 4 undet.**	**-**	**1 species not in Decision Area**	**-**

* **Hab. Group** = general categorization of the habitat association assumed by the BLM in this analysis for each species:

- **Early** = early-successional forest associate,
- **Mid** = mid-seral forest associate,
- **Late** = mature, late-successional, or old-growth forest associate,
- **NF** = non-forest associate,
- **Oak** = oak woodland associate,
- **Wet** = wetland associate,
- **RR** = stream or riparian-area associate,
- **X** = no habitat association used in this analysis.

† **S&M Cat.** = Survey and Manage Category based on the December 2003 list (USDA, USDI 2011). Individual categories are summarized below following 2001 ROD Survey and Manage Standards and Guidelines (pp. 7–13).

‡ **within 1 SPTH of streams** = assumption that habitat for wildlife species associated with streams or near-streams would be modeled by the amount of mature (4.1, 4.2) and structurally-complex (5.1, 5.2, 5.3) forest within 1 site potential tree height of the stream. This assumes that, in general, favorable habitat conditions (cool water temperatures, shade, abundant down wood) are more prevalent in mature and older forests.

§ **Summary** = number of species that under the alternatives would have: an increase (incr.) in habitat available, no change (same) in habitat available, a decrease (decr.) in the amount of habitat available, or the habitat availability is undetermined (undet.) or habitat data is unavailable.

Note: Counties are abbreviated as follows: Bent = Benton, Clac = Clackamas, Clat = Clatsop, Colu = Columbia, Coos = Coos, Curr = Curry, Doug = Douglas, Jack = Jackson, Jose = Josephine, Klam = Klamath, Lane = Lane, Linc = Lincoln, Linn = Linn, Mari = Marion, Mult = Multnomah, Polk = Polk, Till = Tillamook, Wash = Washington, Yamh = Yamhill.

Bureau Strategic Wildlife Species

Table S-34. Habitat development for Bureau Strategic wildlife species documented or suspected to occur in the decision area

Taxon	Species		Hab. Group*	S&M Cat.†	Amount of Habitat (Acres) (Percent)								Structural Stage(s) for Habitat Analysis (Numeric Codes)	Species Range (Counties)	Source for Species Range
					in 2013	in 2063									
	Common Name	Scientific Name			Current	No Action	Alt. A	Alt. B	Alt. C	Alt. D	PRMP	No Timber Harvest			
BI	Rhinoceros auklet	*Cerorhinca monocerata*	NF	-	236	No Change	No Change	No Change	No Change	No Change	No Change	No Change	Marine, estuarine (GNN 11)	Clat, Coos, Curr, Doug, Lane, Linc, Till	ORBIC 2013
BI	Trumpeter swan	*Cygnus buccinator*	Wet	-	2,896	No Change	No Change	No Change	No Change	No Change	No Change	No Change	Wetland layer	Clat, Colu, Klam, Mult, Polk	ORBIC 2013
BI	Merlin	*Falco columbarius*	NF	-	1,342	No Change	No Change	No Change	No Change	No Change	No Change	No Change	Open areas; agricultural, grasslands, shrub lands (GNN 2, 6, 7)	Klam	ORBIC 2013
BI	Canadian sandhill crane	*Grus canadensis rowani*	Wet	-	150	No Change	No Change	No Change	No Change	No Change	No Change	No Change	Wetland layer	Mult	ORBIC 2013
BI	Least bittern	*Ixobrychus exilis*	Wet	-	1,625	No Change	No Change	No Change	No Change	No Change	No Change	No Change	Wetland layer	Klam	ORBIC 2013
ICL	Oregon giant earthworm	*Driloleirus macelfreshi*	X	-	*No Data*	*No Data*	*No Data*	*No Data*	*No Data*	*No Data*	*No Data*	*No Data*	Subterranean, loose soils	Bent, Linc, Linn, Mari, Polk, Yamh	ORBIC 2013
IG	Cascades axetail slug	*Carinacauda stormi*	Late	N	237,164	366,778 (155%)	353,113 (149%)	353,116 (149%)	299,286 (126%)	382,037 (161%)	352,816 (149%)	422,835 (178%)	Mature (4.1, 4.2), and Structurally-complex (5.1, 5.2, 5.3)	Clac, Lane, Linn, Marion	GeoBOB 2013; NatureServe 2014
IG	Columbia duskysnail	*Colligyrus* sp. nov. (Columbia)	RR	-	14,555	25,014 (172%)	26,010 (179%)	24,553 (169%)	23,019 (158%)	26,094 (179%)	25,978 (178%)	26,387 (181%)	within 1 SPTH of streams[3]	Clac, Mult	ORBIC 2013
IG	Casebeer pebblesnail	*Fluminicola* sp. nov. (Casebeer)	RR	-	1,687	2,541 (151%)	2,544 (151%)	2,494 (151%)	2,141 (127%)	2,546 (151%)	2,470 (146%)	2,546 (151%)	within 1 SPTH of streams[3]	Klam	ORBIC 2013
IG	Fall Creek pebblesnail	*Fluminicola* sp. nov. (Fall Creek)	RR	-	38,075	54,835 (144%)	56,188 (148%)	55,183 (145%)	52,961 (139%)	56,205 (148%)	55,471 (146%)	56,389 (148%)	within 1 SPTH of streams[3]	Jack	ORBIC 2013
IG	Keene Creek pebblesnail	*Fluminicola* sp. nov. (Keene Creek)	RR	-	39,761	57,376 (144%)	58,731 (148%)	57,677 (145%)	55,102 (139%)	58,751 (148%)	57,941 (146%)	58,935 (148%)	within 1 SPTH of streams[3]	Jack, Klam	ORBIC 2013

Taxon	Species		Hab. Group*	S&M Cat.†	Amount of Habitat (Acres) (Percent)								Structural Stage(s) for Habitat Analysis (Numeric Codes)	Species Range (Counties)	Source for Species Range
					in 2013	in 2063									
	Common Name	Scientific Name			Current	No Action	Alt. A	Alt. B	Alt. C	Alt. D	PRMP	No Timber Harvest			
IG	Klamath Rim pebblesnail	*Fluminicola* sp. nov. (Klamath Rim)	RR	A§	1,687	2,541 (151%)	2,544 (151%)	2,494 (151%)	2,141 (127%)	2,546 (151%)	2,470 (146%)	2,546 (151%)	within 1 SPTH of streams[3]	Klam	Frest & Johannes 1999; ORBIC 2013
IG	Klamath pebblesnail	*Fluminicola* sp. nov. (Klamath)	RR	-	1,687	2,541 (151%)	2,544 (151%)	2,494 (151%)	2,141 (127%)	2,546 (151%)	2,470 (146%)	2,546 (151%)	within 1 SPTH of streams[3]	Klam	ORBIC 2013
IG	Lost River pebblesnail	*Fluminicola* sp. nov. (Lost River)	RR	-	1,687	2,541 (151%)	2,544 (151%)	2,494 (151%)	2,141 (127%)	2,546 (151%)	2,470 (146%)	2,546 (151%)	within 1 SPTH of streams[3]	Klam	ORBIC 2013
IG	Odessa pebblesnail	*Fluminicola* sp. nov. (Odessa)	RR	-	1,687	2,541 (151%)	2,544 (151%)	2,494 (151%)	2,141 (127%)	2,546 (151%)	2,470 (146%)	2,546 (151%)	within 1 SPTH of streams[3]	Klam	ORBIC 2013
IG	Toothed pebblesnail	*Fluminicola* sp. nov. (Toothed)	RR	-	38,075	54,835 (144%)	56,188 (148%)	55,183 (145%)	52,961 (139%)	56,205 (148%)	55,471 (146%)	56,389 (148%)	within 1 SPTH of streams[3]	Jack	ORBIC 2013
IG	Salamander slug	*Gliabates oregonius*	RR	-	58,763	100,652 (171%)	103,875 (177%)	96,809 (165%)	84,948 (145%)	103,914 (177%)	102,023 (174%)	104,032 (177%)	within 1 SPTH of streams[3]	Lane	ISSSP Fact Sheet 2013
IG	Barren juga	*Juga hemphilli hemphilli*	RR	-	972	1,271 (131%)	1,383 (142%)	1,207 (124%)	1,008 (104%)	1,383 (142%)	1,355 (139%)	1,383 (142%)	within 1 SPTH of streams[3]	Mult	ORBIC 2013
IG	Chace sideband	*Monadenia chaceana*	Late	B‖	648,117	838,467 (129%)	953,640 (147%)	958,674 (148%)	872,477 (135%)	986,526 (152%)	946,902 (146%)	1,028,012 (159%)	Mature (4.1, 4.2), and Structurally-complex (5.1, 5.2, 5.3)	Doug, Jack, Jose, Klam	Duncan *et al*. 2003
IG	Marsh walker	*Pomatiopsis chacei*	RR	-	9,124	13,502 (148%)	14,044 (154%)	13,328 (146%)	12,843 (141%)	14,209 (156%)	14,057 (154%)	14,284 (157%)	within 1 SPTH of streams[3]	Curr	ORBIC 2013
IG	Broadwhorl tightcoil	*Pristiloma johnsoni*	Late	-	472,142	714,295 (151%)	746,446 (158%)	738,105 (156%)	641,727 (136%)	791,217 (168%)	741,862 (157%)	833,514 (177%)	Mature (4.1, 4.2), and Structurally-complex (5.1, 5.2, 5.3)	Curr, Doug, Lane	GeoBOB 2013
IG	Pristine springsnail	*Pristinicola hemphilli*	RR	-	88,985	123,040 (138%)	125,281 (141%)	123,483 (139%)	121,075 (136%)	125,237 (141%)	123,340 (139%)	125,622 (141%)	within 1 SPTH of streams[3]	Jack, Jose, Mult	ISSSP Fact Sheet

Taxon	Species		Hab. Group*	S&M Cat.†	Amount of Habitat (Acres) (Percent)								Structural Stage(s) for Habitat Analysis (Numeric Codes)	Species Range (Counties)	Source for Species Range
					in 2013	in 2063									
	Common Name	Scientific Name			Current	No Action	Alt. A	Alt. B	Alt. C	Alt. D	PRMP	No Timber Harvest			
IG	Klamath tail-dropper	*Prophysaon* sp. nov. (Klamath)	Mid	-	220,138	234,750 (106%)	293,885 (133%)	300,640 (136%)	268,344 (122%)	294,427 (133%)	288,412 (131%)	308,387 (140%)	Young High Density with Structural Legacies (3.1), Mature (4.1, 4.2), and Structurally-complex (5.1, 5.2, 5.3)	Jack, Klam	GeoBOB 2013
IG	Lost River springsnail	*Pyrgulopsis* sp. nov. (Lost River)	RR	-	1,687	2,541 (151%)	2,544 (151%)	2,494 (151%)	2,141 (127%)	2,546 (151%)	2,470 (146%)	2,546 (151%)	within 1 SPTH of streams[3]	Klam	ORBIC 2013
IG	Dalles hesperian	*Vespericola depressa*	X	-	-	-	-	-	-	-	-	-	-	Not in Decision Area: Gill, Sher, Wasc	ORBBIC 2013
IG	Bald hesperian	*Vespericola* sp. nov. (Bald)	Wet	-	650	No Change	No Change	No Change	No Change	No Change	No Change	No Change	Wetland layer	Lane	ORBIC 2013
IICO	Marsh ground beetle	*Acupalpus punctulatus*	Wet	-	1,516	No Change	No Change	No Change	No Change	No Change	No Change	No Change	Wetland layer	Bent, Wash	ORBIC 2013
IICO	Hairy necked tiger beetle	*Cicindela hirticollis couleensis*	NF	-	1,011	No Change	No Change	No Change	No Change	No Change	No Change	No Change	Coastal sand dunes (GNN 5)	Coos	ISSSP Fact Sheet
IICO	Roth's blind ground beetle	*Pterostichus rothi*	Late	-	40,332	64,866 (161%)	64,479 (160%)	63,695 (158%)	58,462 (145%)	67,553 (167%)	63,437 (157%)	69,731 (173%)	Mature (4.1, 4.2), and Structurally-complex (5.1, 5.2, 5.3)	Bent, Linc	ISSSP Fact Sheet
IIHE	Cooley's lace bug	*Acalypta cooleyi*	Late	-	163,406	177,635 (109%)	224,263 (137%)	231,321 (142%)	209,035 (128%)	229,227 (140%)	220,940 (135%)	56,389 (148%)	Mature (4.1, 4.2), and Structurally-complex (5.1, 5.2, 5.3)	Jack	ORBIC 2013
IIHE	Lillian's lace bug	*Acalypta lillianis*	Late	-	147,809	230,879 (156%)	226,505 (153%)	225,131 (152%)	186,360 (126%)	245,405 (166%)	225,724 (153%)	261,909 (177%)	Mature (4.1, 4.2), and Structurally-complex (5.1, 5.2, 5.3)	Lane	ORBIC 2013

Taxon	Species		Hab. Group*	S&M Cat.†	Amount of Habitat (Acres) (Percent)								Structural Stage(s) for Habitat Analysis (Numeric Codes)	Species Range (Counties)	Source for Species Range
					in 2013	in 2063									
	Common Name	Scientific Name			Current	No Action	Alt. A	Alt. B	Alt. C	Alt. D	PRMP	No Timber Harvest			
IIHE	American grass bug	*Acetropis americana*	NF	-	2,850	No Change	No Change	No Change	No Change	No Change	No Change	No Change	Wet grasslands (Wetlands layer)	Bent, Yamh	ORBIC 2013
IIHE	Umbrose seed bug	*Atrazonotus umbrosus*	X	-	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Bent, Mari, Polk	ORBIC 2013
IIHE	American unique-headed bug	*Boreostolus americanus*	X	-	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Jack, Lane, Linn	ORBIC 2013
IIHE	Salien plant bug	*Criocoris saliens*	X	-	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Bent, Till	ORBIC 2013
IIHE	Arizona stink bug	*Dendrocoris arizonensis*	Oak	-	21,677	No Change	No Change	No Change	No Change	No Change	No Change	No Change	Oak woodlands	Bent, Jack	ISSSP Fact Sheet
IIHE	Foliaceous lace bug	*Derephysia foliacea*	NF	-	90	No Change	No Change	No Change	No Change	No Change	No Change	No Change	Mountain meadows (GNN 6)	Bent, Lane	ORBIC 2013
IIHE	Heidemann's damsel bug	*Hoplistoscelis heidemanni*	X	-	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Bent, Curr	ORBIC 2013
IIHE	Martin's water-measurer	*Hydrometra martini*	RR	-	15,649	25,697 (164%)	26,166 (167%)	24,631 (157%)	22,658 (145%)	26,184 (167%)	25,756 (165%)	26,206 (167%)	within 1 SPTH of streams[3]	Bent	ORBIC 2013
IIHE	Oregon plant bug	*Lygus oregonae*	NF	-	1	No Change	No Change	No Change	No Change	No Change	No Change	No Change	Coastal sand dunes (GNN 5)	Linc, Till	ORBIC 2013
IIHE	Essig's plant bug	*Macrotylus essigi*	Oak	-	0	No Change	No Change	No Change	No Change	No Change	No Change	No Change	Oak woodlands	Lane	ORBIC 2013
IIHE	Obrien's seed bug	*Malezonotus obrieni*	Late	-	147,809	230,879 (156%)	226,505 (153%)	225,131 (152%)	186,360 (126%)	245,405 (166%)	225,724 (153%)	261,909 (177%)	Mature (4.1, 4.2), and Structurally-complex (5.1, 5.2, 5.3)	Lane	ISSSP Fact Sheet
IIHE	Mulsant's water treader	*Mesovelia mulsanti*	RR	-	49,474	90,554 (183%)	92,595 (187%)	86,939 (176%)	81,198 (164%)	92,926 (188%)	91,969 (186%)	93,178 (188%)	within 1 SPTH of streams[3]	Bent, Linn, Till, Yamh	ORBIC 2013
IIHE	Marsh damsel bug	*Nabicula propinqua*	X	-	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Coos, Till	ORBIC 2013
IIHE	True fir plant bug	*Pinalitus solivagus*	X	-	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Bent, Jose, Lane	ORBIC 2013
IIHE	Hairy shore bug	*Saldula villosa*	NF	-	68	No Change	No Change	No Change	No Change	No Change	No Change	No Change	Salt marsh (GNN 11)	Coos	ORBIC 2013

Taxon	Species		Hab. Group*	S&M Cat.†	Amount of Habitat (Acres) (Percent)								Structural Stage(s) for Habitat Analysis (Numeric Codes)	Species Range (Counties)	Source for Species Range
					in 2013	in 2063									
	Common Name	Scientific Name			Current	No Action	Alt. A	Alt. B	Alt. C	Alt. D	PRMP	No Timber Harvest			
IIHE	California shield-backed bug	*Vanduzeeina borealis californica*	NF	-	89	No Change	No Change	No Change	No Change	No Change	No Change	No Change	Grassland, meadows (GNN 6)	Lane	ORBIC 2013
IILE	Hoary elfin	*Callophrys polios maritima*	NF	-	122	No Change	No Change	No Change	No Change	No Change	No Change	No Change	Coastal sand dunes (GNN 5)	Curr, Linc	ORBIC 2013
IILE	Oregon branded skipper	*Hesperia colorado oregonia*	X	-	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Jack, Jose	ORBIC 2013
IILE	Dog star skipper	*Polites sonora siris*	NF	-	156	No Change	No Change	No Change	No Change	No Change	No Change	No Change	Grassland, meadow (GNN 6)	Bent, Clat, Lane, Linn, Mult, Yamh	ORBIC 2013
IIPL	A stonefly	*Capnia kersti*	RR	-	58,763	100,652 (171%)	103,875 (177%)	96,809 (165%)	84,948 (145%)	103,914 (177%)	102,023 (174%)	104,032 (177%)	within 1 SPTH of streams[3]	Lane	ORBIC 2013
IITR	Denning's agapetus caddisfly	*Agapetus denningi*	RR	-	38,075	54,835 (144%)	56,188 (148%)	55,183 (145%)	52,961 (139%)	56,205 (148%)	55,471 (146%)	56,389 (148%)	within 1 SPTH of streams[3]	Jack	ORBIC 2013
IITR	Green Springs Mountain farulan caddisfly	*Farula davisi*	RR	-	38,075	54,835 (144%)	56,188 (148%)	55,183 (145%)	52,961 (139%)	56,205 (148%)	55,471 (146%)	56,389 (148%)	within 1 SPTH of streams[3]	Jack	ORBIC 2013
IITR	Schuh's homoplectran caddisfly	*Homoplectra schuhi*	RR	-	39,761	57,376 (144%)	58,731 (148%)	57,677 (145%)	55,102 (139%)	58,751 (148%)	57,941 (146%)	58,935 (148%)	within 1 SPTH of streams[3]	Jack, Klam	ORBIC 2013
IITR	A caddisfly	*Lepania cascada*	RR	-	20,423	34,609 (169%)	35,417 (173%)	33,876 (166%)	31,842 (156%)	35,507 (174%)	35,015 (171%)	35,537 (174%)	within 1 SPTH of streams[3]	Bent, Linc	ORBIC 2013
IITR	A caddisfly	*Moselyana comosa*	RR	-	233,650	394,603 (169%)	409,661 (175%	387,834 (166%)	354,497 (152%)	410,867 (176%)	404,695 (173%)	412,497 (177%)	within 1 SPTH of streams[3]	Bent, Clac, Doug, Jack, Klam, Lane	ORBIC 2013
IITR	A caddisfly	*Namamyia plutonis*	RR	-	176,244	268,808 (153%)	275,473 (156%)	263,871 (150%)	246,207 (140%)	275,665 (156%)	271,320 (154%)	276,281 (157%)	within 1 SPTH of streams[3]	Bent, Curr, Jack, Jose, Lane, Mari	ORBIC 2013
IITR	Tombstone Prairie caddisfly	*Oligophlebodes mostbento*	RR	-	181,543	318,200 (175%)	332,404 (183%)	311,879 (172%)	281,770 (155%)	333,633 (184%)	328,366 (181%)	334,882 (184%)	within 1 SPTH of streams[3]	Doug, Lane, Linn	ORBIC 2013

Taxon	Species		Hab. Group*	S&M Cat.†	Amount of Habitat (Acres) (Percent)								Structural Stage(s) for Habitat Analysis (Numeric Codes)	Species Range (Counties)	Source for Species Range
					in 2013	in 2063									
	Common Name	Scientific Name			Current	No Action	Alt. A	Alt. B	Alt. C	Alt. D	PRMP	No Timber Harvest			
IITR	O'brien rhyacophilan caddisfly	*Rhyacophila colonus*	RR	-	49,938	66,934 (134%)	67,710 (136%)	67,093 (134%)	67,106 (134%)	67,649 (135%)	66,515 (133%)	67,851 (136%)	within 1 SPTH of streams[3]	Jose	ORBIC 2013
IITR	One-spot rhyacophilan caddisfly	*Rhyacophila unipunctata*	RR	-	58,763	100,652 (171%)	103,875 (177%)	96,809 (165%)	84,948 (145%)	103,914 (177%)	102,023 (174%)	104,032 (177%)	within 1 SPTH of streams[3]	Lane	ORBIC 2013
MA	Gold beach pocket gopher	*Thomomys mazama helleri*	X	-	No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data	Subterranean, loose soils	Curr	ORBIC 2013
Bureau Strategic Summary§	**n=61 species total**	**n=51 species modeled**	-	-	-	**34 incr. 17 same 0 decr. 9 undet.**	**34 incr. 17 same 0 decr. 9 undet.**	**34 incr. 17 same 0 decr. 9 undet.**	**34 incr. 17 same 0 decr. 9 undet.**	**34 incr. 17 same 0 decr. 9 undet.**	**34 incr. 17 same 0 decr. 9 undet.**	**34 incr. 17 same 0 decr. 9 undet.**	-	1 species not in Decision Area	-

* **Hab. Group** = general categorization of the habitat association assumed by the BLM in this analysis for each species:

- **Early** = early-successional forest associate,
- **Mid** = mid-seral forest associate,
- **Late** = mature, late-successional, or old-growth forest associate,
- **NF** = non-forest associate,
- **Oak** = oak woodland associate,
- **Wet** = wetland associate,
- **RR** = stream or riparian-area associate,
- **X** = no habitat association used in this analysis.

† **S&M Cat.** = Survey and Manage Category based on the December 2003 list (USDA, USDI 2011). Individual categories are summarized below following 2001 ROD Survey and Manage Standards and Guidelines (pp. 7–13).

‡ **within 1 SPTH of streams** = assumption that habitat for wildlife species associated with streams or near-streams would be modeled by the amount of mature (4.1, 4.2) and structurally-complex (5.1, 5.2, 5.3) forest within 1 site potential tree height of the stream. This assumes that, in general, favorable habitat conditions (cool water temperatures, shade, abundant down wood) are more prevalent in mature and older forests.

§ **Summary** = number of species that under the alternatives and the Proposed RMP would have: an increase (incr.) in habitat available, no change (same) in habitat available, a decrease (decr.) in the amount of habitat available, or the habitat availability is undetermined (undet.) or habitat data is unavailable.

‖ Based upon direction contained in the ROD, equivalent-effort pre-disturbance surveys are required for these mollusk species.

Note: Counties are abbreviated as follows: Bent = Benton, Clac = Clackamas, Clat = Clatsop, Colu = Columbia, Coos = Coos, Curr = Curry, Doug = Douglas, Gill = Gilliam, Jack = Jackson, Jose = Josephine, Klam = Klamath, Lane = Lane, Linc = Lincoln, Linn = Linn, Mari = Marion, Mult = Multnomah, Polk = Polk, Sher = Sherman, Till = Tillamook, Wasc = Wasco, Wash = Washington, Yamh = Yamhill.

Survey and Manage Wildlife Species

Table S-35. Survey and Manage wildlife species: habitat development

Taxonomic Group	Species		SSS Status*	S&M Cat.†	Amount of Habitat (Acres) (Percent)								Structural Stage(s) for Habitat Analysis (Numeric Codes)	Species Range (Counties)	Source for Species Range
					in 2013	in 2063									
	Common Name	Scientific Name			Current	No Action	Alt. A	Alt. B	Alt. C	Alt. D	PRMP	No Timber Harvest			
Amphibians	Shasta Salamander	*Hydromantes shastae*	-	A										Not in Decision Area: California	Olson *et al.* 1999
Amphibians	Larch Mountain Salamander	*Plethodon larselli*	-	A										Not in Decision Area: Washington	GeoBOB 2015; State Director's SSSP list (July 13, 2015)
Amphibians	Siskiyou Mountains Salamander	*Plethodon stormi*	BS	D‡	326,439	365,523 (112%)	432,740 (133%)	447,786 (137%)	425,029 (130%)	447,347 (137%)	434,541 (132%)	457,766 (140%)	Mature (4.1, 4.2), or Structurally-complex (5.1, 5.2, 5.3)	Jack, Jose	Olson *et al.* 1999
Amphibians	Van Dyke's Salamander	*Plethodon vandykei*	-	A										Not in Decision Area: Washington	GeoBOB 2013; Olson *et al.* 1999

Taxonomic Group	Species		SSS Status*	S&M Cat.†	Amount of Habitat (Acres) (Percent)								Structural Stage(s) for Habitat Analysis (Numeric Codes)	Species Range (Counties)	Source for Species Range
	Common Name	Scientific Name			in 2013	in 2063									
					Current	No Action	Alt. A	Alt. B	Alt. C	Alt. D	PRMP	No Timber Harvest			
Birds	Great Gray Owl	*Strix nebulosa*	-	A	45,157	116,913 (259%)	77,909 (172%)	91,599 (203%)	88,930 (197%)	42,922 (95%)	64,255 (142%)	17,354 (38%)	Young High Density with Structural Legacies (3.1), Mature (4.1, 4.2), or Structurally-complex (5.1, 5.2, 5.3) or GNN Non-Forest Grassland, Shrub land, Sagebrush (6, 7, 8) that is < 650 feet from meadows or openings (1.1, 1.2) ≥ 10 acres in size	Doug, Jack, Jose, Klam, Lane, Linn	GeoBOB 2013
Mammals	Red Tree Vole	*Arborimus longicaudus*	-	C	926,858	1,260,016 (136%)	1,358,216 (147%)	1,371,586 (148%)	1,231,228 (133%)	1,432,730 (155%)	1,360,243 (146%)	1,517,390 (164%)	Mature (4.1, 4.2) or Structurally-complex (5.1, 5.2, 5.3)	All - outside defined polygon for North Oregon Coast DPS	USFWS 2011
Mammals	North Oregon Coast DPS of the Red Tree Vole	*Arborimus longicaudus*	BS	C	174,495	289,971 (166%)	279,899 (160%)	279,489 (160%)	236,047 (135%)	294,208 (169%)	277,503 (159%)	313,820 (180%)	Mature (4.1, 4.2) or Structurally-complex (5.1, 5.2, 5.3)	Defined DPS Polygon; see Chapter 3	USFWS 2011
Mollusks: Terrestrial	Puget Oregonian	*Cryptomastix devia*	BS	A	69,848	104,370 (149%)	90,137 (129%)	91,866 (132%)	75,737 (109%)	95,953 (137%)	89,577 (128%)	119,919 (172%)	Mature (4.1, 4.2), and Structurally-complex (5.1, 5.2, 5.3)	Clac, Colu, Mult, Wash, Yamh	GeoBOB 2013; Duncan *et al*. 2003
Mollusks: Terrestrial	Columbian Gorge Oregonian	*Cryptomastix hendersoni*	-	A										Not in Decision Area	Duncan *et al*. 2003

Taxonomic Group	Species		SSS Status*	S&M Cat.†	Amount of Habitat (Acres) (Percent)								Structural Stage(s) for Habitat Analysis (Numeric Codes)	Species Range (Counties)	Source for Species Range
					in 2013	in 2063									
	Common Name	Scientific Name			Current	No Action	Alt. A	Alt. B	Alt. C	Alt. D	PRMP	No Timber Harvest			
Mollusks: Terrestrial	Evening Fieldslug	*Deroceras hesperium*	-	B‖	546,866	710,856 (130%)	768,810 (141%)	780,754 (143%)	712,028 (130%)	797,683 (146%)	762,415 (139%)	855,358 (156%)	Mature (4.1, 4.2), and Structurally-complex (5.1, 5.2, 5.3)	Bent, Clac, Clat, Colu, Jack, Jose, Klam, Linc, Linn, Mari, Mult, Polk, Till, Wash, Yamh	Duncan *et al*. 2003
Mollusks: Aquatic	Klamath Rim Pebblesnail	*Flumincola* n. sp. 3	BStr	A§	1,687	2,541 (151%)	2,544 (151%)	2,494 (148%)	2,141 (127%)	2,546 (151%)	2,470 (146%)	2,546 (151%)	within 1 SPTH of streams#	Klam	Frest and Johannes 1999
Mollusks: Aquatic	Fredenberg Pebblesnail	*Flumincola* n. sp. 11	-	A§	38,075	54,835 (144%)	56,188 (148%)	55,183 (145%)	52,961 (139%)	56,205 (148%)	55,471 (146%)	56,389 (148%)	within 1 SPTH of streams#	Jack	Frest and Johannes 1999
Mollusks: Aquatic	Potem Pebblesnail	*Flumincola* n. sp. 14	-	A										Not in Decision Area: California	Frest and Johannes 1999
Mollusks: Aquatic	Flat-top Pebblesnail	*Flumincola* n. sp. 15	-	A										Not in Decision Area: California	Frest and Johannes 1999
Mollusks: Aquatic	Shasta Pebblesnail	*Flumincola* n. sp. 16	-	A										Not in Decision Area: California	Frest and Johannes 1999
Mollusks: Aquatic	Disjunct Pebblesnail	*Flumincola* n. sp. 17	-	A										Not in Decision Area: California	Frest and Johannes 1999
Mollusks: Aquatic	Globular Pebblesnail	*Flumincola* n. sp. 18	-	A										Not in Decision Area: California	Frest and Johannes 1999
Mollusks: Aquatic	Umbilicate Pebblesnail	*Flumincola* n. sp. 19	-	A§										Not in Decision Area: California	Frest and Johannes 1999

Taxonomic Group	Species		SSS Status*	S&M Cat.†	Amount of Habitat (Acres) (Percent)								Structural Stage(s) for Habitat Analysis (Numeric Codes)	Species Range (Counties)	Source for Species Range
	Common Name	Scientific Name			in 2013	in 2063									
					Current	No Action	Alt. A	Alt. B	Alt. C	Alt. D	PRMP	No Timber Harvest			
Mollusks: Aquatic	Lost Creek Pebblesnail	*Flumincola* n. sp. 20	-	A§										Not in Decision Area: California	Frest and Johannes 1999
Mollusks: Aquatic	Nugget Pebblesnail	*Flumincola seminalis*	-	A§										Not in Decision Area: California	Frest and Johannes 1999
Mollusks: Terrestrial	Trinity Shoulderband	*Helminthoglypta talmadgei*	-	D‡										Not in Decision Area	Duncan *et al*. 2003
Mollusks: Terrestrial	Keeled Jumping-slug	*Hemphillia burringtoni*	-	E										Not in Decision Area: Washington	Duncan *et al*. 2003
Mollusks: Terrestrial	Warty Jumping-slug	*Hemphillia glandulosa*	-	E	108,955	185,830 (171%)	171,962 (158%)	170,873 (157%)	148,725 (137%)	180,893 (166%)	167,061 (153%)	196,818 (181%)	Mature (4.1, 4.2), and Structurally-complex (5.1, 5.2, 5.3)	Bent, Clat, Colu, Linc, Polk, Till, Wash, Yamh	GeoBOB 2013; Duncan *et al*. 2003
Mollusks: Terrestrial	Malone Jumping-slug	*Hemphillia malonei*	-	C	92,029	138,358 (150%)	129,886 (141%)	130,366 (142%)	114,988 (125%)	140,038 (152%)	129,910 (141%)	164,778 (179%)	Mature (4.1, 4.2), and Structurally-complex (5.1, 5.2, 5.3)	Clac, Linn, Mari, Mult	GeoBOB 2013; Duncan *et al*. 2003
Mollusks: Terrestrial	Panther Jumping-slug	*Hemphillia pantherina*	-	B‖										Not in Decision Area: Washington	Duncan *et al*. 2003
Mollusks: Aquatic	Basalt Juga	*Juga (O)* n. sp. 2	-	A										Not in Decision Area: Hood, Wasco	Frest and Johannes 1999
Mollusks: Aquatic	Cinnamon Juga	*Juga (O)* n. sp. 3	-	A										Not in Decision Area: California	Frest and Johannes 1999
Mollusks: Aquatic	Columbia Duskysnail	*Lyogyrus* n. sp. 1	-	A	14,555	25,014 (172%)	26,010 (179%)	24,553 (169%)	23,019 (158%)	26,094 (179%)	25,978 (178%)	26,387 (181%)	within 1 SPTH of streams#	Clac, Hood, Mult	Frest and Johannes 1999

Taxonomic Group	Species		SSS Status*	S&M Cat.†	Amount of Habitat (Acres) (Percent)								Structural Stage(s) for Habitat Analysis (Numeric Codes)	Species Range (Counties)	Source for Species Range
					in 2013	in 2063									
	Common Name	Scientific Name			Current	No Action	Alt. A	Alt. B	Alt. C	Alt. D	PRMP	No Timber Harvest			
Mollusks: Aquatic	Washington (Masked) Duskysnail	*Lyogyrus* n. sp. 2	-	A										Not in Decision Area: Washington	Frest and Johannes 1999
Mollusks: Aquatic	Canary Duskysnail	*Lyogyrus* n. sp. 3	-	A										Not in Decision Area: California	Frest and Johannes 1999
Mollusks: Terrestrial	Chace Sideband	*Monadenia chaceana*	BStr	B‖	645,732	838,467 (130%)	953,640 (148%)	958,674 (148%)	872,477 (135%)	986,526 (153%)	946,902 (146%)	1,028,012 (159%)	Mature (4.1, 4.2), and Structurally-complex (5.1, 5.2, 5.3)	Doug, Jack, Jose, Klam	Duncan *et al*. 2003
Mollusks: Terrestrial	Dalles Sideband	*Monadenia fidelis minor*	-	A										Not in Decision Area: Columbia Gorge	Duncan *et al*. 2003
Mollusks: Terrestrial	Shasta Sideband	*Monadenia troglodytes troglodytes*	-	A										Not in Decision Area: California	Duncan *et al*. 2003
Mollusks: Terrestrial	Wintu Sideband	*Monadenia troglodytes wintu*	-	A										Not in Decision Area: California	Duncan *et al*. 2003
Mollusks: Terrestrial	Chelan Mountainsnail	*Oreohelix* n. sp.	-	A										Not in Decision Area: Washington	Duncan *et al*. 2003
Mollusks: Terrestrial	Crater Lake Tightcoil	*Pristiloma arcticum crateris*	BS	A§	420,914	564,206 (134%)	612,093 (146%)	611,835 (145%)	533,140 (127%)	644,678 (153%)	598,183 (142%)	708,674 (168%)	Mature (4.1, 4.2), and Structurally-complex (5.1, 5.2, 5.3)	Polygon of counties clipped east of I-5	Duncan *et al*. 2003
Mollusks: Terrestrial	Blue-gray Taildropper	*Prophysaon coeruleum*	-	A										Not S&M in Oregon; S&M in California and Washington	S&M list (Dec. 2003)

Taxonomic Group	Species		SSS Status*	S&M Cat.†	Amount of Habitat (Acres) (Percent)								Structural Stage(s) for Habitat Analysis (Numeric Codes)	Species Range (Counties)	Source for Species Range
	Common Name	Scientific Name			in 2013	in 2063									
					Current	No Action	Alt. A	Alt. B	Alt. C	Alt. D	PRMP	No Timber Harvest			
Mollusks: Terrestrial	Shasta Chaparral	*Trilobopsis roperi*	-	A										Not in Decision Area: California	Duncan *et al*. 2003
Mollusks: Terrestrial	Tehama Chaparral	*Trilobopsis tehamana*	-	A										Not in Decision Area: California	Duncan *et al*. 2003
Mollusks: Terrestrial	Hoko Vertigo	*Vertigo* n. sp.	-	A										Not in Decision Area: Washington	Duncan *et al*. 2003
Mollusks: Terrestrial	Big Bar Hesperian	*Vespericula pressleyi*	-	A										Not in Decision Area: California	Duncan *et al*. 2003
Mollusks: Terrestrial	Shasta Hesperian	*Vespericula Shasta*	-	A										Not in Decision Area: California	Duncan *et al*. 2003
Mollusks: Terrestrial	Knobby Rams-horn	*Vorticifex* n. sp. 1	-	E										Not in Decision Area: California	Frest and Johannes 1999
S&M Summary **	**n=43 species total**	**n = 13 species modeled**	**-**	**-**	**-**	**13 incr. 0 same 0 decr. 30 undet.**	**13 incr. 0 same 0 decr. 30 undet.**	**13 incr. 0 same 0 decr. 30 undet.**	**13 incr. 0 same 0 decr. 30 undet.**	**12 incr. 0 same 1 decr. 30 undet.**	**13 incr. 0 same 0 decr. 30 undet.**	**12 incr. 0 same 1 decr. 30 undet.**	**n=43 species total**	**30 species not in Decision Area**	**-**

* **SSS Status** = Special Status Species status: BS = Bureau Sensitive, BStr = Bureau Strategic, FP = Federal Proposed (also Bureau Sensitive), FC = Federal Candidate (also Bureau Sensitive).

† **S&M Cat.** = Survey and Manage Category based on the December 2003 list (USDA, USDI 2011). Individual categories are summarized below following 2001 ROD Survey and Manage Standards and Guidelines (pp. 7–13):

A = Rare, pre-disturbance surveys practical. Manage all known sites and minimize inadvertent loss of undiscovered sites.

B = Rare, pre-disturbance surveys not practical. Manage all known sites and minimize inadvertent loss of undiscovered sites.

C = Uncommon, pre-disturbance surveys practical. Identify and manage high-priority sites to provide for reasonable assurance of species persistence. Until high-priority sites can be determined, manage all known sites.

D = Uncommon, pre-disturbance surveys not practical or not necessary. Identify and manage high-priority sites to provide for reasonable assurance of species persistence. Until high-priority sites can be determined, manage all known sites.

E = Rare, status undetermined. Manage all known sites while determining if the species meets the basic criteria for Survey and Manage and, if so, to which category (A, B, C, or D) it should be assigned.

F = Uncommon or concern for persistence unknown, status undetermined. Determine if the species meets the basic criteria for Survey and Manage and, if so, to which category (A, B, C, or D) it should be assigned.

‡ Although pre-disturbance Surveys are deemed practical for this species, continuing pre-disturbance surveys is not necessary in order to meet management objectives.

§ For these species, until Management Recommendations are written, the following language will be considered part of the Management Recommendation: "Known and newly discovered sites of these species will be protected from grazing by all practical steps to ensure that the local population of the species will not be impacted."

|| Based upon direction contained in the ROD, equivalent-effort pre-disturbance surveys are required for these mollusk species.

within 1 SPTH of streams = assumption that habitat for wildlife species associated with streams or near-streams would be modeled by the amount of mature (4.1, 4.2) and structurally-complex (5.1, 5.2, 5.3) forest within 1 site potential tree height of the stream. This assumes that, in general, favorable habitat conditions (cool water temperatures, shade, abundant down wood) are more prevalent in mature and older forests.

** **Summary** = number of species that under the alternatives and the Proposed RMP would have: an increase (incr.) in habitat available, no change (same) in habitat available, a decrease (decr.) in the amount of habitat available, or the habitat availability is undetermined (undet.) or habitat data is unavailable.

Note: Counties are abbreviated as follows: Bent = Benton, Clac = Clackamas, Clat = Clatsop, Colu = Columbia, Coos = Coos, Curr = Curry, Doug = Douglas, Gill = Gilliam, Hood = Hood River, Jack = Jackson, Jose = Josephine, Klam = Klamath, Lane = Lane, Linc = Lincoln, Linn = Linn, Mari = Marion, Mult = Multnomah, Polk = Polk, Sher = Sherman, Till = Tillamook, Wasc = Wasco, Wash = Washington, Yamh = Yamhill.

Table S-36. Survey and Manage wildlife species: land use allocations of known sites in the decision area

Taxon	Species		SSS Status*	S&M Cat.†	2007 Outcome‡	Number of Known Sites						
						(# Sites)	(# Sites in Reserved Land-Use Allocations)					
	Common Name	Scientific Name				Total Sites	No Action	Alt. A	Alt. B	Alt. C	Alt. D	PRMP
Amphibians	Larch Mountain Salamander	*Plethodon larselli*	-	A	Insufficient Habitat in Part	-	-	-	-	-	-	-
Amphibians	Siskiyou Mountains Salamander	*Plethodon stormi*	BS	D	Insufficient Habitat in Part	213	46	204	177	170	100	184
Birds	Great Gray Owl	*Strix nebulosa*	-	A	Insufficient Habitat in Part	1,228#	247	1,014	726	820	739	800
Mammals	Red Tree Vole (outside of the North Oregon Coast DPS)	*Arborimus longicaudus*	-	C	Sufficient Habitat	7,957	2,669	6,822	5,407	5,175	5,719	5,854
Mammals	North Oregon Coast DPS of the Red Tree Vole	*Arborimus longicaudus*	BS	C	Insufficient Habitat in Part	395	355	374	370	354	366	357
Mollusks: Terrestrial	Puget Oregonian	*Cryptomastix devia*	BS	A	Sufficient Habitat	2	2	2	2	2	2	2
Mollusks: Terrestrial	Evening Fieldslug	*Deroceras hesperium*	-	B‖	Sufficient Habitat	20	17	16	16	16	17	15
Mollusks: Aquatic	Klamath Rim Pebblesnail	*Flumincola* n. sp. 3	BStr	A§	Sufficient Habitat	3	3	3	3	3	3	3
Mollusks: Aquatic	Fredenberg Pebblesnail	*Flumincola* n. sp. 11	-	A§	Sufficient Habitat	5	5	5	5	5	4	5
Mollusks: Terrestrial	Warty Jumping-slug	*Hemphillia glandulosa*	-	E	Sufficient Habitat	363	320	319	296	285	237	314
Mollusks: Terrestrial	Malone Jumping-slug	*Hemphillia malonei*	-	C	Sufficient Habitat	300	97	226	142	113	127	120
Mollusks: Aquatic	Columbia Duskysnail	*Lyogyrus* n. sp. 1	-	A	Sufficient Habitat	3	3	3	2	2	3	3
Mollusks: Terrestrial	Chace Sideband	*Monadenia chaceana*	BStr	B‖	Insufficient Habitat in Part	114	26	95	87	86	62	91
Mollusks: Terrestrial	Crater Lake Tightcoil	*Pristiloma arcticum crateris*	BS	A§	Sufficient Habitat	1	1	1	1	1	1	1
Subtotal by S&M Category			n=7	A	-	1,242	261	1,028	739	833	752	814
			n=2	B	-	134	43	111	103	102	79	106
			n=3	C	-	8,652	3,121	7,422	5,919	5,642	6,212	6,331
			n=1	D	-	213	46	204	177	170	100	184
			n=1	E	-	363	320	319	296	285	237	314
Totals	**n=14**	**n=14**	**-**	**-**	**-**	**10,60419,767**	**3,791 (36%)**	**9,084 (86%)**	**7,234 (68%)**	**14,064 (66%)**	**14,76080 (70%)**	**7,749 (73%)**

* **SSS Status** = Special Status Species status: BS = Bureau Sensitive, BStr = Bureau Strategic, FP = Federal Proposed (also Bureau Sensitive), FC = Federal Candidate (also Bureau Sensitive).

† **S&M Cat.** = Survey and Manage Category based on the December 2003 list (USDA, USDI 2011). Individual categories are summarized below following 2001 ROD Survey and Manage Standards and Guidelines (pp. 7-13):

A = Rare, pre-disturbance surveys practical. Manage all known sites and minimize inadvertent loss of undiscovered sites.

B = Rare, pre-disturbance surveys not practical. Manage all known sites and minimize inadvertent loss of undiscovered sites.

C = Uncommon, pre-disturbance surveys practical. Identify and manage high-priority sites to provide for reasonable assurance of species persistence. Until high-priority sites can be determined, manage all known sites.

D = Uncommon, pre-disturbance surveys not practical or not necessary. Identify and manage high-priority sites to provide for reasonable assurance of species persistence. Until high-priority sites can be determined, manage all known sites.

E = Rare, status undetermined. Manage all known sites while determining if the species meets the basic criteria for Survey and Manage and, if so, to which category (A, B, C, or D) it should be assigned.

F = Uncommon or concern for persistence unknown, status undetermined. Determine if the species meets the basic criteria for Survey and Manage and, if so, to which category (A, B, C, or D) it should be assigned.

‡ **2007 Outcomes** = Outcomes for Survey and Manage species from the *2007 Final Supplement to the 2004 Supplemental Environmental Impact Statement to Remove or Modify the Survey and Manage Mitigation Measure Standards and Guidelines* (June 2007). The outcomes summarized here are from the 2007 Supplement Alternative 2 where Survey and Manage was removed (USDA FS and USDI BLM 2007, pp. 261–262, 278–279, 280–281, 285–286, 291–292):

Sufficient Habitat = Habitat (including known sites) is sufficient to support stable populations range-wide.

Insufficient Habitat in Part = Habitat (including known sites) is sufficient to support stable populations range-wide, but habitat or known sites are insufficient to support stable populations in a portion of the taxa's range.

§ For these species, until Management Recommendations are written, the following language will be considered part of the Management Recommendation: "Known and newly discovered sites of these species will be protected from grazing by all practical steps to ensure that the local population of the species will not be impacted."

‖ Based upon direction contained in the ROD, equivalent-effort pre-disturbance surveys are required for these mollusk species.

For the great gray owl, the reported "Number of Known Sites" is the number of fauna observations in GeoBOB, and the actual number of known great gray owl "sites" is substantially less than these values. However, the numbers of great gray owl observations do provide an indicator of relative differences among the alternatives and the Proposed RMP.

Landbird Focal Species

Table S-37. Habitat development for landbird focal species

Taxon	Species		Hab. Group[§]	Land-bird Focal Species (Y/N)	Amount of Habitat (Acres) (Percent)								Structural Stage(s) for Habitat Analysis (Numeric Codes)	Species Range (By County)	Source for Species Range
					in 2013	in 2063									
	Common Name	Scientific Name			Current	No Action	Alt. A	Alt. B	Alt. C	Alt. D	PRMP	No Timber Harvest			
Birds: Landbird Focal Species	Black-throated Gray Warbler	*Setophaga nigrescens*	Early	Y[*]	387,247	139,443 (36%)	107,772 (28%)	24,419 (6%)	170,143 (44%)	64,049 (17%)	101,930 (26%)	22,334 (6%)	Stand Establishment (2.1, 2.2)	All	NatureServe 2014
Birds: Landbird Focal Species	Blue (Sooty) Grouse	*Dendragapus fuliginosus sierra*	Early	Y[*]	490,308	284,485 (58%)	225,647 (46%)	188,073 (38%)	339,836 (69%)	152,395 (31%)	208,730 (43%)	74,967 (15%)	Early-successional (1.1, 1.2), Stand Establishment (2.1, 2.2), or Young Low Density (3.3, 3.4)	All	NatureServe 2014
Birds: Landbird Focal Species	Brown Creeper	*Certhia Americana*	Late	Y[*, ‡]	1,101,353	1,549,987 (141%)	1,638,115 (149%)	1,651,075 (150%)	1,467,275 (133%)	1,726,938 (157%)	1,637,746 (149%)	1,831,210 (166%)	Mature (4.1, 4.2), or Structurally-complex (5.1, 5.2, 5.3)	All	NatureServe 2014
Birds: Landbird Focal Species	Chipping Sparrow	*Spicella passerine*	Early	Y[‡]	53,459	110,566 (206%)	80,089 (150%)	118,312 (221%)	131,002 (245%)	46,001 (86%)	65,418 (122%)	14,418 (27%)	Early-successional (1.1, 1.2)	All	NatureServe 2014
Birds: Landbird Focal Species	Common Nighthawk	*Chordeiles minor*	Early	Y[†]	62,141	119,248 (192%)	88,771 (143%)	126,994 (204%)	139,684 (225%)	54,683 (88%)	74,100 (119%)	23,100 (37%)	Early-successional (1.1, 1.2) or GNN Non-Forest Agricultural, Grassland, Shrub land (2, 6, 7)	All	NatureServe 2014
Birds: Landbird Focal Species	Fox Sparrow	*Passerlla iliaca*	Early	Y[*]	53,459	110,566 (206%)	80,089 (150%)	118,312 (221%)	131,002 (245%)	46,001 (86%)	65,418 (122%)	14,418 (27%)	Early-successional (1.1, 1.2)	All	NatureServe 2014

Taxon	Species		Hab. Group[§]	Land-bird Focal Species (Y/N)	Amount of Habitat (Acres) (Percent)								Structural Stage(s) for Habitat Analysis (Numeric Codes)	Species Range (By County)	Source for Species Range
					in 2013	in 2063									
	Common Name	Scientific Name			Current	No Action	Alt. A	Alt. B	Alt. C	Alt. D	PRMP	No Timber Harvest			
Birds: Landbird Focal Species	Grasshopper Sparrow	*Ammodramus savannarum*	Early	Y[†]	26,225	55,477 (211%)	35,188 (134%)	53,134 (203%)	57,469 (219%)	23,533 (90%)	35,805 (137%)	11,938 (46%)	Early-successional (1.1, 1.2) or GNN Non-Forest Agricultural, Grassland, Shrub land (2, 6, 7)	Jack, Lane, Linn, Polk	NatureServe 2014
Birds: Landbird Focal Species	Hammond's Flycatcher	*Empidonax hammondii*	Mid	Y[*]	1,087,922	1,234,282 (113%)	1,187,686 (109%)	1,239,055 (114%)	1,147,394 (105%)	1,251,205 (115%)	1,225,721 (113%)	1,302,043 (119%)	Young High Density (3.1, 3.2) or Mature (4.1, 4.2)	All	NatureServe 2014
Birds: Landbird Focal Species	Hermit Thrush	*Catharus guttatus*	Mid	Y[*]	1,087,922	1,234,282 (113%)	1,187,686 (109%)	1,239,055 (114%)	1,147,394 (105%)	1,251,205 (115%)	1,225,721 (113%)	1,302,043 (119%)	Young High Density (3.1, 3.2) or Mature (4.1, 4.2)	All	NatureServe 2014
Birds: Landbird Focal Species	Hermit Thrush	*Catharus guttatus*	Late	Y[‡]	860,528	961,980 (112%)	1,058,410 (123%)	1,087,349 (126%)	962,201 (112%)	1,141,298 (133%)	1,072,105 (125%)	1,136,633 (132%)	Mature Multi-layered Canopy (4.2) or Structurally-complex (5.1, 5.2, 5.3)	All	NatureServe 2014
Birds: Landbird Focal Species	Hermit Warbler	*Setophaga occidentalis*	Mid	Y[*]	1,087,922	1,234,282 (113%)	1,187,686 (109%)	1,239,055 (114%)	1,147,394 (105%)	1,251,205 (115%)	1,225,721 (113%)	1,302,043 (119%)	Young High Density (3.1, 3.2) or Mature (4.1, 4.2)	All	Avian Knowledge Northwest 2014
Birds: Landbird Focal Species	Lark Sparrow	*Chondestes grammacus*	Early	Y[†]	43,492	82,557 (190%)	46,993 (108%)	61,264 (141%)	67,724 (156%)	32,339 (74%)	42,325 (97%)	17,938 (41%)	Early-successional (1.1, 1.2) or GNN Non-Forest Agricultural, Grassland, Shrub land (2, 6, 7)	Bent, Jack, Jose, Klam, Lane, Linn, Mult, Till	Avian Knowledge Northwest 2014

Taxon	Species		Hab. Group[§]	Land-bird Focal Species (Y/N)	Amount of Habitat (Acres) (Percent)								Structural Stage(s) for Habitat Analysis (Numeric Codes)	Species Range (By County)	Source for Species Range
					in 2013	in 2063									
	Common Name	Scientific Name			Current	No Action	Alt. A	Alt. B	Alt. C	Alt. D	PRMP	No Timber Harvest			
Birds: Landbird Focal Species	Lazuli Bunting	*Passerina amoena*	Early	Y[*]	62,141	119,248 (192%)	88,771 (143%)	126,994 (204%)	139,684 (225%)	54,683 (88%)	74,100 (119%)	23,100 (37%)	Early-successional (1.1, 1.2) or GNN Non-Forest Agricultural, Grassland, Shrub land (2, 6, 7)	All – except Clat	Avian Knowledge Northwest 2014
Birds: Landbird Focal Species	Lewis' Woodpecker	*Melanerpes lewis*	Early	Y[†, ‡]	16,743	89,420 (534%)	12,249 (73%)	70,832 (423%)	8,716 (52%)	31,361 (187%)	43,067 (257%)	16,361 (98%)	Early-successional with Structural Legacies (1.1) or GNN Non-Forest Shrub land (7)	Colu, Doug, Jack, Jose, Klam, Lane, Mult	GeoBOB 2013,N
Birds: Landbird Focal Species	Nashville Warbler	*Oreothlypis ruficapilla*	Early	Y[*, ‡]	484,873	284,381 (59%)	117,859 (24%)	187,919 (39%)	339,513 (70%)	152,196 (18%)	208,276 (43%)	74,890 (15%)	Early-successional (1.1, 1.2), Stand Establishment (2.1, 2.2), or Young Low Density (3.3, 3.4) within the Klamath Province	All – except Linc	Avian Knowledge Northwest 2014
Birds: Landbird Focal Species	Northern Flicker	*Colaptes auratus*	Early	Y[*]	85,200	228,649 (268%)	14,382 (17%)	121,639 (143%)	13,940 (16%)	89,418 (105%)	139,580 (164%)	15,589 (18%)	Early-successional with Structural Legacies (1.1) or Stand Establishment with Structural Legacies (2.1)	All	NatureServe 2014
Birds: Landbird Focal Species	Olive-sided Flycatcher	*Contopus cooperi*	Early	Y[*, ‡]	405,075	249,722 (62%)	117,859 (29%)	141,484 (35%)	179,698 (44%)	108,880 (27%)	165,488 (41%)	36,629 (9%)	Early-successional with Structural Legacies (1.1) or Stand Establishment (2.1, 2.2)	All	NatureServe 2014

Taxon	Species		Hab. Group[§]	Land-bird Focal Species (Y/N)	Amount of Habitat (Acres) (Percent)								Structural Stage(s) for Habitat Analysis (Numeric Codes)	Species Range (By County)	Source for Species Range
					in 2013	in 2063									
	Common Name	Scientific Name			Current	No Action	Alt. A	Alt. B	Alt. C	Alt. D	PRMP	No Timber Harvest			
Birds: Landbird Focal Species	Orange Crowned Warbler	*Oreothlypis celata*	Early	Y[*]	53,459	110,566 (206%)	80,089 (150%)	118,312 (221%)	131,002 (245%)	46,001 (86%)	65,418 (122%)	14,418 (27%)	Early-successional (1.1, 1.2)	All	NatureServe 2014
Birds: Landbird Focal Species	Oregon Vesper Sparrow	*Pooecetus gramineus affinis*	Early	Y[†]	5,726	28,774 (503%)	26,868 (469%)	58,696 (1025%)	48,788 (852%)	18,086 (316%)	31,193 (545%)	1,798 (31%)	Early-successional (1.1, 1.2) or GNN Non-Forest Agricultural, Grassland, Shrub land (2, 6, 7)	Bent, Clac, Lane, Linn, Mari, Polk	NatureServe 2014
Birds: Landbird Focal Species	Pacific-slope Flycatcher	*Empidonax difficilis*	Late	Y[*]	1,101,353	1,549,987 (141%)	1,638,115 (149%)	1,651,075 (150%)	1,467,275 (133%)	1,726,938 (157%)	1,637,746 (149%)	1,831,210 (166%)	Mature (4.1, 4.2), or Structurally-complex (5.1, 5.2, 5.3)	All	Avian Knowledge Northwest 2014
Birds: Landbird Focal Species	Pileated Woodpecker	*Dryocarpus pileatus*	Late	Y[*]	860,528	961,980 (112%)	1,058,410 (123%)	1,087,349 (126%)	962,201 (112%)	1,141,298 (133%)	1,072,105 (125%)	1,136,633 (132%)	Mature Multi-layered Canopy (4.2) or Structurally-complex (5.1, 5.2, 5.3)	All	Avian Knowledge Northwest 2014
Birds: Landbird Focal Species	Purple Finch	*Haemorphus purpureus*	Mid	Y[*]	1,430,557	1,289,215 (90%)	1,356,356 (95%)	1,409,909 (99%)	1,316,798 (92%)	1,423,674 (100%)	1,387,328 (97%)	1,392,683 (97%)	Young High Density (3.1, 3.2), Mature Multi-layered Canopy (4.2), or Structurally-complex (5.1, 5.2, 5.3)	All	NatureServe 2014
Birds: Landbird Focal Species	Pygmy Nuthatch	*Sitta pygmaea*	Late	Y[‡]	10,331	9,439 (91%)	20,835 (202%)	20,054 (194%)	15,014 (145%)	16,935 (164%)	19,291 (187%)	17,195 (166%)	Mature Multi-layered Canopy (4.2) or Structurally-complex (5.1, 5.2, 5.3)	Klam	Avian Knowledge Northwest 2014

Taxon	Species		Hab. Group[§]	Land-bird Focal Species (Y/N)	Amount of Habitat (Acres) (Percent)								Structural Stage(s) for Habitat Analysis (Numeric Codes)	Species Range (By County)	Source for Species Range
					in 2013	in 2063									
	Common Name	Scientific Name			Current	No Action	Alt. A	Alt. B	Alt. C	Alt. D	PRMP	No Timber Harvest			
Birds: Landbird Focal Species	Rufous Hummingbird	*Selasphorous rufus*	Early	Y[*]	490,308	284,485 (58%)	225,647 (46%)	188,073 (38%)	339,836 (69%)	152,395 (31%)	208,730 (43%)	74,967 (15%)	Early-successional (1.1, 1.2), Stand Establishment (2.1, 2.2), or Young Low Density (3.3, 3.4)	All	NatureServe 2014
Birds: Landbird Focal Species	Streaked Horned Lark	*Eremophila alpestris strigata*	Early	Y[†]	2,671	20,421 (765%)	17,796 (666%)	36,245 (1357%)	29,977 (1122%)	13,939 (522%)	19,846 (743%)	1,092 (41%)	Early-successional (1.1, 1.2) or GNN Non-Forest Agricultural, Grassland, Shrub land (2, 6, 7).	Bent, Clac, Linn, Mari, Polk, Yamh	NatureServe 2014
Birds: Landbird Focal Species	Townsend's Warbler	*Setophaga townsedi*	Mid	Y[*]	1,087,922	1,234,282 (113%)	1,187,686 (109%)	1,239,055 (114%)	1,147,394 (105%)	1,251,205 (115%)	1,225,721 (113%)	1,302,043 (119%)	Young High Density (3.1, 3.2) or Mature (4.1, 4.2)	All	Avian Knowledge Northwest 2014
Birds: Landbird Focal Species	Varied Thrush	*Ixoreus naevius*	Late	Y[*]	860,528	961,980 (112%)	1,058,410 (123%)	1,087,349 (126%)	962,201 (112%)	1,141,298 (133%)	1,072,105 (125%)	1,136,633 (132%)	Mature Multi-layered Canopy (4.2) or Structurally-complex (5.1, 5.2, 5.3)	All	NatureServe 2014
Birds: Landbird Focal Species	Vaux's Swift	*Chaetura vauxi*	Mid	Y[*]	988,947	1,090,906 (110%)	1,156,869 (117%)	1,219,648 (123%)	1,062,341 (107%)	1,267,362 (128%)	1,205,529 (122%)	1,239,197 (125%)	Young High Density with Structural Legacy (3.1), Mature Multi-layered Canopy (4.2), or Structurally-complex (5.1, 5.2, 5.3)	All	NatureServe 2014

Taxon	Species		Hab. Group[§]	Land-bird Focal Species (Y/N)	Amount of Habitat (Acres) (Percent)								Structural Stage(s) for Habitat Analysis (Numeric Codes)	Species Range (By County)	Source for Species Range
					in 2013	in 2063									
	Common Name	Scientific Name			Current	No Action	Alt. A	Alt. B	Alt. C	Alt. D	PRMP	No Timber Harvest			
Birds: Landbird Focal Species	Western Meadowlark	*Sturnella neglecta*	Early	Y[†]	62,141	119,248 (192%)	88,771 (143%)	126,994 (204%)	139,684 (225%)	54,683 (88%)	74,100 (119%)	23,100 (37%)	Early-successional (1.1, 1.2) or GNN Non-Forest Agricultural, Grassland, Shrub land (2, 6, 7)	All	NatureServe 2014
Birds: Landbird Focal Species	Western Tanager	*Piranga ludoviciana*	Early	Y[*]	436,849	173,919 (40%)	145,558 (33%)	69,761 (16%)	208,834 (48%)	106,394 (24%)	143,312 (33%)	60,549 (14%)	Stand Establishment (2.1, 2.2) or Young Low Density (3.3, 3.4)	All	NatureServe 2014
Birds: Landbird Focal Species	White-Headed Woodpecker	*Picoides albolarvatus*	Early	Y[‡]	18,751	72,725 (388%)	11,882 (63%)	40,209 (214%)	8,567 (46%)	24,085 (128%)	33,642 (179%)	15,923 (85%)	Early-successional with Structural Legacies (1.1) or GNN Non-Forest Shrub land (7)	Doug, Jack, Jose, Klam	GeoBOB 2013; NatureServe 2014
Birds: Landbird Focal Species	Williamson's Sapsucker	*Sphyrapicus thyroideus*	Early	Y[‡]	87,168	215,195 (247%)	23,098 (26%)	101,787 (117%)	22,457 (26%)	84,237 (97%)	120,243 (138%)	24,061 (28%)	Early-successional with Structural Legacies (1.1), Stand Establishment with Structural Legacies (2.1), or Young Low Density with Structural Legacies (3.3)	Bent, Clac, Doug, Jack, Jose, Klam, Lane, Linn	Avian Knowledge Northwest 2014; GeoBOB 2013
Birds: Landbird Focal Species	Wilson's Warbler	*Cardellina pusilla*	Mid	Y[*]	1,137,525	1,268,758 (112%)	1,225,473 (108%)	1,284,396 (113%)	1,186,085 (104%)	1,293,550 (114%)	1,267,103 (111%)	1,340,257 (118%)	Young (3.1, 3.2, 3.3, 3.4) or Mature (4.1, 4.2)	All	NatureServe 2014

Taxon	Species		Hab. Group§	Land-bird Focal Species (Y/N)	Amount of Habitat (Acres) (Percent)								Structural Stage(s) for Habitat Analysis (Numeric Codes)	Species Range (By County)	Source for Species Range
					in 2013	in 2063									
	Common Name	Scientific Name			Current	No Action	Alt. A	Alt. B	Alt. C	Alt. D	PRMP	No Timber Harvest			
Birds: Landbird Focal Species	Winter Wren	*Troglodytes hiemalus*	Mid	Y*	1,230,613	1,670,659 (136%)	1,432,214 (116%)	1,776,612 (144%)	1,559,493 (127%)	1,845,313 (150%)	1,764,358 (143%)	1,925,362 (156%)	Young with Structural Legacies (3.1, 3.3), Mature (4.1, 4.2), or Structurally-complex (5.1, 5.2, 5.3)	All – except Linc	Avian Knowledge Northwest 2014
Landbird Summary‖	**n=34 species total**	**n=34 species modeled**	-	-	-	**26 incr. 0 same 8 decr. 0 undet.**	**23 incr. 0 same 11 decr. 0 undet.**	**27 incr. 0 same 7 decr. 0 undet.**	**23 incr. 0 same 11 decr. 0 undet.**	**18 incr. 0 same 16 decr. 0 undet.**	**26 incr. 0 same 8 decr. 0 undet.**	**13 incr. 0 same 21 decr. 0 undet.**	-	-	-

* Altman and Alexander (2012)
† Altman (2000a)
‡ Altman (2000b)
§ **Hab. Group** = general categorization of the habitat association assumed by the BLM in this analysis for each species:

- **Early** = early-successional forest associate,
- **Mid** = mid-seral forest associate,
- **Late** = mature, late-successional, or old-growth forest associate,
- **NF** = non-forest associate,
- **Oak** = oak woodland associate,
- **Wet** = wetland associate,
- **RR** = stream or riparian-area associate,
- **X** = no habitat association used in this analysis.

‖ **Summary** = number of species that under the alternatives would have: an increase (incr.) in habitat available, no change (same) in habitat available, a decrease (decr.) in the amount of habitat available, or the habitat availability is undetermined (undet.) or habitat data is unavailable.
Note: Counties are abbreviated as follows: Bent = Benton, Clac = Clackamas, Clat = Clatsop, Colu = Columbia, Coos = Coos, Curr = Curry, Doug = Douglas, Gill = Gilliam, Jack = Jackson, Jose = Josephine, Klam = Klamath, Lane = Lane, Linc = Lincoln, Linn = Linn, Mari = Marion, Mult = Multnomah, Polk = Polk, Sher = Sherman, Till = Tillamook, Wasc = Wasco, Wash = Washington, Yamh = Yamhill.

Columbian White-tailed Deer

High-quality forage habitat would vary among the alternatives over time. High-quality forage habitat in oak woodlands would not vary among the alternatives. The BLM calculated high-quality forage habitat from Woodstock vegetation model (i.e., early successional structural stages) output. The BLM calculated the amount of oak woodland from a separate data layer used by the RMP interdisciplinary team to map forest site moisture conditions that included potential vegetation data (lsc_moistdry_pvt_aoi_a_v3_rst). These two models overlap spatially, and, while the acreage is informative of relative conditions of deer forage habitat, they are not additive.

Table S-38. High-quality forage habitat development for the Columbian white-tailed deer within the range of the Lower Columbia River population in the decision area

Year	No Action (Acres)	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)	PRMP (Acres)	No Timber Harvest (Acres)	Oak Woodland (Acres)
Current Condition								
2013	459	459	459	459	459	459	459	-
Alternatives/Proposed RMP								
2023	459	2,973	2,392	3,956	1,905	2,832	459	-
2033	389	3,885	2,575	5,015	1,494	2,772	-	-
2043	1,823	2,227	3,519	2,606	584	1,569	-	-
2053	2,103	3,477	4,340	3,963	1,347	1,584	-	-
2063	987	3,220	3,779	5,316	1,688	1,488	-	-

Table S-39. High-quality forage habitat development for the Columbian white-tailed deer within the range of the Lower Columbia River population in the planning area

Year	No Action (Acres)	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)	PRMP (Acres)	No Timber Harvest (Acres)	Oak Woodland (Acres)
Current Condition								
2013	55,952	55,952	55,952	55,952	55,952	55,952	55,952	-
Alternatives/Proposed RMP								
2023	55,952	58,466	57,885	59,450	57,399	58,326	55,952	-
2033	55,794	59,290	57,981	60,420	56,900	58,177	55,405	-
2043	57,229	57,632	58,924	58,011	55,990	56,975	55,405	-
2053	57,509	58,882	59,745	59,368	56,752	56,989	55,405	-
2063	56,393	58,626	59,184	60,721	57,094	56,894	55,405	-

Table S-40. High-quality forage habitat development in conifer forest for the Columbian white-tailed deer within the range of the Douglas County population in the decision area

Year	No Action (Acres)	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)	PRMP (Acres)	No Timber Harvest (Acres)	Oak Woodland (Acres)
Current Condition								
2013	767	767	767	767	767	767	767	1,545
Alternatives/Proposed RMP								
2023	1,038	1,317	1,030	1,184	1,171	1,019	729	1,545
2033	1,587	1,676	1,200	1,944	1,370	1,443	684	1,545
2043	1,384	1,342	1,310	1,445	1,054	1,253	432	1,545
2053	983	1,080	1,412	1,160	1,119	1,231	432	1,545
2063	295	712	747	589	426	577	-	1,545

Table S-41. High-quality forage habitat development in conifer forest for the Columbian white-tailed deer within the range of the Douglas County population in the planning area

Year	No Action (Acres)	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)	PRMP (Acres)	No Timber Harvest (Acres)	Oak Woodland (Acres)
Current Condition								
2013	19,439	19,439	19,439	19,439	19,439	19,439	19,439	52,458
Alternatives/Proposed RMP								
2023	19,709	19,988	19,701	19,855	19,842	19,691	19,401	52,458
2033	20,258	20,347	19,871	20,615	20,041	20,114	19,356	52,458
2043	20,055	20,013	19,981	20,116	19,726	19,924	19,104	52,458
2053	19,660	19,751	20,083	19,832	19,790	19,902	19,104	52,458
2063	18,966	19,383	19,418	19,260	19,098	19,248	18,671	52,458

Deer and Elk

Table S-42. High-quality forage habitat development for deer and elk in the decision area

Year	No Action (Acres)	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)	PRMP (Acres)	No Timber Harvest (Acres)
Current Condition							
2013	46,249	46,249	46,249	46,249	46,249	53,459	46,249
Alternatives/Proposed RMP							
2023	92,216	91,012	81,747	138,088	69,273	86,427	43,016
2033	101,496	97,831	73,281	180,450	51,793	74,945	9,667
2043	100,324	86,622	105,364	145,343	44,531	78,167	12,233
2053	111,095	79,930	132,251	127,038	47,977	81,505	14,105
2063	110,566	80,089	118,311	131,001	46,001	65,418	14,418

Table S-43. High-quality forage habitat development for deer and elk in the planning area

Year	No Action (Acres)	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)	PRMP (Acres)	No Timber Harvest (Acres)
Current Condition							
2013	1,112,694	1,112,694	1,112,694	1,112,694	1,112,694	1,119,906	1,112,694
Alternatives/Proposed RMP							
2023	1,158,661	1,157,457	1,148,192	1,204,533	1,135,718	1,152,874	1,109,463
2033	1,088,405	1,084,740	1,060,190	1,167,359	1,038,702	1,061,857	996,579
2043	1,087,233	1,073,531	1,092,273	1,132,252	1,031,440	1,065,079	999,145
2053	1,098,004	1,066,839	1,119,160	1,113,947	1,034,886	1,068,417	1,001,017
2063	1,097,475	1,066,998	1,105,220	1,117,910	1,032,910	1,052,330	1,001,331

Fisher

Fisher Habitat

Table S-44. Total fisher habitat (denning, resting, foraging combined) in the decision area

Year	No Action (Acres)	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)	PRMP (Acres)	No Timber Harvest (Acres)
Current Condition							
2013	574,219	574,219	574,219	574,219	574,219	571,355	574,219
Alternatives/Proposed RMP							
2023	540,312	562,929	566,950	556,936	566,614	563,194	571,406
2033	508,448	557,325	564,704	544,409	564,162	557,166	570,339
2043	506,615	579,756	593,507	567,035	591,213	582,294	593,899
2053	514,442	609,830	633,093	600,094	626,542	617,289	623,829
2063	527,502	632,336	662,866	620,639	653,341	645,588	644,357

Table S-45. Fisher denning habitat in the decision area

Year	No Action (Acres)	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)	PRMP (Acres)	No Timber Harvest (Acres)
Current Condition							
2013	324,478	324,478	324,478	324,478	324,478	319,503	324,478
Alternatives/Proposed RMP							
2023	298,161	320,609	317,328	308,951	315,449	311,941	326,958
2033	288,378	333,386	331,912	320,253	332,599	323,791	345,024
2043	277,816	343,220	343,245	329,545	344,426	335,129	353,797
2053	286,468	364,269	360,761	346,072	366,379	350,910	376,841
2063	292,012	387,886	376,867	365,611	389,533	366,541	398,633

Table S-46. Fisher resting habitat in the decision area

Year	No Action (Acres)	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)	PRMP (Acres)	No Timber Harvest (Acres)
Current Condition							
2013	153,657	153,657	153,657	153,657	153,657	156,753	153,657
Alternatives/Proposed RMP							
2023	148,819	148,504	149,972	149,670	154,827	153,634	151,470
2033	125,316	132,781	135,607	130,593	137,631	137,063	132,291
2043	150,131	157,106	163,113	153,280	161,670	161,721	164,213
2053	153,310	168,252	188,158	172,182	178,813	184,880	172,239
2063	143,410	162,066	193,001	167,697	172,961	188,043	160,996

Table S-47. Fisher foraging habitat in the decision area

Year	No Action (Acres)	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)	PRMP (Acres)	No Timber Harvest (Acres)
Current Condition							
2013	96,084	96,084	96,084	96,084	96,084	95,100	96,084
Alternatives/Proposed RMP							
2023	93,332	93,816	99,650	98,315	96,338	97,619	92,977
2033	94,755	91,157	97,184	93,563	93,932	96,312	93,024
2043	78,668	79,430	87,149	84,210	85,117	85,444	75,889
2053	74,664	77,310	84,173	81,840	81,350	81,499	74,748
2063	92,080	82,384	92,998	87,331	90,847	91,004	84,728

Table S-48. Total fisher habitat (denning, resting, foraging combined) in the planning area

Year	No Action (Acres)	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)	PRMP (Acres)	No Timber Harvest (Acres)
Current Condition							
2013	4,484,755	4,484,755	4,484,755	4,484,755	4,484,755	4,481,891	4,484,755
Alternatives/Proposed RMP							
2023	4,450,848	4,473,465	4,477,486	4,467,472	4,477,150	4,473,729	4,481,942
2033	4,519,548	4,568,425	4,575,804	4,555,509	4,575,262	4,568,266	4,581,440
2043	4,554,018	4,627,160	4,640,911	4,614,438	4,638,616	4,629,697	4,641,302
2053	4,561,846	4,657,234	4,680,496	4,647,498	4,673,945	4,664,693	4,671,232
2063	4,574,905	4,679,739	4,710,269	4,668,042	4,700,745	4,692,992	4,691,760

Table S-49. Fisher denning habitat in the planning area

Year	No Action (Acres)	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)	PRMP (Acres)	No Timber Harvest (Acres)
Current Condition							
2013	639,570	639,570	639,570	639,570	639,570	634,595	639,570
Alternatives/Proposed RMP							
2023	613,253	635,701	632,420	624,044	630,541	627,033	642,051
2033	603,470	648,479	647,005	635,345	647,691	638,884	660,117
2043	592,908	658,313	658,338	644,638	659,518	650,222	668,889
2053	892,611	970,411	966,903	952,215	972,521	957,052	982,983
2063	898,154	994,028	983,009	971,753	995,675	972,684	1,004,775

Table S-50. Fisher resting habitat in the planning area

Year	No Action (Acres)	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)	PRMP (Acres)	No Timber Harvest (Acres)
Current Condition							
2013	825,681	825,681	825,681	825,681	825,681	828,777	825,681
Alternatives/Proposed RMP							
2023	820,843	820,527	821,996	821,693	826,851	825,658	823,494
2033	797,339	804,805	807,630	802,617	809,654	809,086	804,315
2043	822,155	829,129	835,136	825,303	833,693	833,744	836,236
2053	534,284	549,226	569,132	553,156	559,787	565,853	553,213
2063	1,241,308	1,259,963	1,290,899	1,265,595	1,270,859	1,285,940	1,258,894

Table S-51. Fisher foraging habitat in the planning area

Year	No Action (Acres)	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)	PRMP (Acres)	No Timber Harvest (Acres)
Current Condition							
2013	3,019,504	3,019,504	3,019,504	3,019,504	3,019,504	3,018,519	3,019,504
Alternatives/Proposed RMP							
2023	3,016,752	3,017,236	3,023,070	3,021,735	3,019,758	3,021,038	3,016,397
2033	3,118,739	3,115,142	3,121,169	3,117,548	3,117,916	3,120,296	3,117,008
2043	3,138,956	3,139,718	3,147,436	3,144,497	3,145,405	3,145,732	3,136,177
2053	3,134,951	3,137,597	3,144,461	3,142,127	3,141,637	3,141,787	3,135,035
2063	2,435,443	2,425,748	2,436,361	2,430,694	2,434,211	2,434,368	2,428,091

Table S-52. Land use allocations of fisher habitat under the No Action alternative on BLM-administered lands

Year	Within the HLB*		Within Reserves*		Total (Acres)
	(Acres)	(Percent)	(Acres)	(Percent)	
Denning					
2013	139,018	43%	185,460	57%	324,478
2023	113,292	38%	184,869	62%	298,161
2033	95,654	33%	192,723	67%	288,378
2043	81,691	29%	196,124	71%	277,816
2053	79,107	28%	207,362	72%	286,468
2063	74,084	25%	217,928	75%	292,012
Resting					
2013	84,954	55%	68,704	45%	153,657
2023	81,595	55%	67,224	45%	148,819
2033	65,345	52%	59,971	48%	125,316
2043	78,367	52%	71,764	48%	150,131
2053	79,604	52%	73,706	48%	153,310
2063	74,340	52%	69,070	48%	143,410
Foraging					
2013	53,240	55%	42,844	45%	96,084
2023	51,421	55%	41,911	45%	93,332
2033	53,029	56%	41,725	44%	94,755
2043	41,977	53%	36,691	47%	78,668
2053	39,801	53%	34,863	47%	74,664
2063	53,217	58%	38,863	42%	92,080
Total Habitat					
2013	277,212	48%	297,007	52%	574,219
2023	246,308	46%	294,004	54%	540,312
2033	214,028	42%	294,419	58%	508,448
2043	202,036	40%	304,579	60%	506,615
2053	198,511	39%	315,931	61%	514,442
2063	201,640	38%	325,862	62%	527,502
Habitat Capable					
-	542,082	51%	515,584	49%	1,057,666

* No Action HLB = AMA, CON, GFMA, NGFMA, SGFMA; Reserves = all other allocations

Table S-53. Land use allocations of fisher habitat under Alternative A on BLM-administered lands

Year	Within the HLB		Within Reserves		Total (Acres)
	(Acres)	(Percent)	(Acres)	(Percent)	
Denning					
2013	10,147	3%	314,331	97%	324,478
2023	4,645	1%	315,964	99%	320,609
2033	3,066	1%	330,320	99%	333,386
2043	3,235	1%	339,986	99%	343,220
2053	3,644	1%	360,625	99%	364,269
2063	4,871	1%	383,015	99%	387,886
Resting					
2013	11,329	7%	142,329	93%	153,657
2023	10,986	7%	137,518	93%	148,504
2033	8,664	7%	124,117	93%	132,781
2043	11,209	7%	145,896	93%	157,106
2053	12,008	7%	156,244	93%	168,252
2063	16,069	10%	145,997	90%	162,066
Foraging					
2013	10,218	11%	85,866	89%	96,084
2023	8,642	9%	85,175	91%	93,816
2033	6,628	7%	84,529	93%	91,157
2043	8,729	11%	70,702	89%	79,430
2053	9,098	12%	68,212	88%	77,310
2063	10,652	13%	71,733	87%	82,384
Total Habitat					
2013	31,694	6%	542,525	94%	574,219
2023	24,273	4%	538,656	96%	562,929
2033	18,358	3%	538,967	97%	557,325
2043	23,173	4%	556,584	96%	579,756
2053	24,750	4%	585,081	96%	609,830
2063	31,592	5%	600,744	95%	632,336
Habitat Capable					
-	138,903	13%	918,794	87%	1,057,666

Table S-54. Land use allocations of fisher habitat under Alternative B on BLM-administered lands

Year	Within the HLB		Within Reserves		Total (Acres)
	(Acres)	(Percent)	(Acres)	(Percent)	
Denning					
2013	54,608	17%	269,870	83%	324,478
2023	46,199	15%	271,128	85%	317,328
2033	47,713	14%	284,200	86%	331,912
2043	51,957	15%	291,288	85%	343,245
2053	54,404	15%	306,357	85%	360,761
2063	53,701	14%	323,166	86%	376,897
Resting					
2013	43,414	28%	110,244	72%	153,657
2023	41,878	28%	108,094	72%	149,972
2033	41,063	30%	94,544	70%	135,607
2043	47,903	29%	115,210	71%	163,113
2053	61,529	33%	126,629	67%	188,158
2063	75,290	39%	117,712	61%	193,001
Foraging					
2013	19,392	20%	76,692	80%	96,084
2023	23,006	23%	76,644	77%	99,650
2033	20,905	22%	76,280	78%	97,184
2043	22,905	26%	64,244	74%	87,149
2053	21,233	25%	62,941	75%	84,173
2063	28,338	30%	64,660	70%	92,998
Total Habitat					
2013	117,413	20%	456,806	80%	574,219
2023	111,083	20%	455,867	80%	566,950
2033	109,681	19%	455,023	81%	564,704
2043	122,765	21%	470,742	79%	593,507
2053	137,166	22%	495,927	78%	633,093
2063	157,328	24%	505,538	76%	662,866
Habitat Capable					
-	304,506	29%	753,160	87%	1,057,666

Table S-55. Land use allocations of fisher habitat under Alternative C on BLM-administered lands

Year	Within the HLB		Within Reserves		Total (Acres)
	(Acres)	(Percent)	(Acres)	(Percent)	
Denning					
2013	41,854	13%	282,624	87%	324,478
2023	25,995	8%	282,956	92%	308,951
2033	25,725	8%	294,528	92%	320,253
2043	26,943	8%	302,602	92%	329,545
2053	29,206	8%	316,867	92%	346,072
2063	30,293	8%	335,318	92%	365,611
Resting					
2013	50,474	33%	103,184	67%	153,657
2023	47,743	32%	101,927	68%	149,670
2033	39,687	30%	90,906	70%	130,593
2043	46,976	31%	106,304	69%	153,280
2053	54,656	32%	117,525	68%	172,182
2063	60,633	36%	107,064	64%	167,697
Foraging					
2013	21,680	23%	74,404	77%	96,084
2023	23,525	24%	74,790	76%	98,315
2033	19,296	21%	74,267	79%	93,563
2043	21,315	25%	62,895	75%	84,210
2053	19,999	24%	61,841	76%	81,840
2063	24,594	28%	62,736	72%	87,331
Total Habitat					
2013	114,007	20%	460,212	80%	574,219
2023	97,262	17%	459,674	83%	556,936
2033	84,708	16%	459,701	84%	544,409
2043	95,235	17%	471,801	83%	567,035
2053	103,861	17%	496,233	83%	600,094
2063	115,521	19%	505,118	81%	620,639
Habitat Capable					
-	320,423	30%	737,243	70%	1,057,666

Table S-56. Land use allocations of fisher habitat under Alternative D on BLM-administered lands

Year	Within the HLB		Within Reserves		Total (Acres)
	(Acres)	(Percent)	(Acres)	(Percent)	
Denning					
2013	31,448	10%	293,030	90%	324,478
2023	21,466	7%	293,983	93%	315,449
2033	26,927	8%	306,672	92%	332,599
2043	31,941	9%	312,484	91%	344,426
2053	38,445	10%	327,934	90%	366,379
2063	43,699	11%	345,834	89%	389,533
Resting					
2013	51,477	34%	102,181	66%	153,657
2023	53,436	35%	101,392	65%	154,827
2033	46,136	34%	91,494	66%	137,631
2043	53,594	33%	108,076	67%	161,670
2053	64,143	36%	114,670	64%	178,813
2063	68,450	40%	104,511	60%	172,961
Foraging					
2013	19,904	21%	76,180	79%	96,084
2023	19,904	21%	76,435	79%	96,338
2033	16,527	18%	77,405	82%	93,932
2043	21,343	25%	63,775	75%	85,117
2053	19,624	24%	61,726	76%	81,350
2063	29,838	33%	61,010	67%	90,847
Total Habitat					
2013	102,828	18%	471,391	82%	574,219
2023	94,805	17%	471,809	83%	566,614
2033	88,591	16%	475,571	84%	564,162
2043	106,878	18%	484,335	82%	591,213
2053	122,212	20%	504,330	80%	626,542
2063	141,986	22%	511,355	78%	653,341
Habitat Capable					
-	322,728	31%	734,938	69%	1,057,666

Table S-57. Land use allocations of fisher habitat under the Proposed RMP on BLM-administered lands

Year	Within the HLB		Within Reserves		Total (Acres)
	(Acres)	(Percent)	(Acres)	(Percent)	
Denning					
2013	47,615	15%	271,887	85%	319,503
2023	38,999	13%	272,942	87%	311,941
2033	37,829	12%	285,962	88%	323,791
2043	40,260	12%	294,869	88%	335,129
2053	40,067	11%	310,843	89%	350,910
2063	39,339	11%	327,202	89%	366,541
Resting					
2013	36,078	23%	120,675	77%	156,753
2023	36,427	24%	117,207	76%	153,634
2033	32,839	24%	104,224	76%	137,063
2043	38,277	24%	123,444	76%	161,721
2053	47,470	26%	137,409	74%	184,880
2063	57,484	31%	130,559	69%	188,043
Foraging					
2013	15,520	16%	79,580	84%	95,100
2023	17,763	18%	79,855	82%	97,619
2033	17,796	18%	78,517	82%	96,312
2043	18,465	22%	66,979	78%	85,444
2053	16,371	20%	65,129	80%	81,499
2063	22,835	25%	68,169	75%	91,004
Total Habitat					
2013	99,214	17%	427,142	83%	571,355
2023	93,189	17%	470,004	83%	563,194
2033	88,463	16%	468,703	84%	557,166
2043	97,002	17%	485,292	83%	582,294
2053	103,908	17%	513,381	83%	617,289
2063	119,658	19%	525,931	81%	645,588
Habitat Capable					
-	269,633	25%	788,034	75%	1,057,666

Fisher Habitat Harvested Under Each Alternative and the Proposed RMP

Table S-58. Fisher habitat harvested by the end of each decade under the No Action alternative over 50 years (2013–2063)

Year	Denning (Acres)	Resting (Acres)	Foraging (Acres)	Total Habitat Harvested (Acres)
2023	30,356	5,950	1,745	38,051
2033	25,933	7,161	1,548	34,642
2043	21,393	9,824	1,549	32,766
2053	13,182	11,252	1,846	26,280
2063	14,740	5,706	974	21,421

Table S-59. Fisher habitat harvested by the end of each decade under Alternative A over 50 years (2013–2063)

Year	Denning (Acres)	Resting (Acres)	Foraging (Acres)	Total Habitat Harvested (Acres)
2023	12,685	6,155	2,249	21,089
2033	5,218	8,536	3,153	16,907
2043	1,365	4,333	1,612	7,309
2053	388	7,130	1,179	8,697
2063	7,310	4,857	1,882	14,049

Table S-60. Fisher habitat harvested by the end of each decade under Alternative B over 50 years (2013–2063)

Year	Denning (Acres)	Resting (Acres)	Foraging (Acres)	Total Habitat Harvested (Acres)
2023	40,129	11,092	4,723	55,944
2033	24,429	14,339	4,203	42,971
2043	14,084	17,234	3,088	34,406
2053	9,347	11,564	2,182	23,093
2063	21,440	11,895	2,233	35,569

Table S-61. Fisher habitat harvested by the end of each decade under Alternative C over 50 years (2013–2063)

Year	Denning (Acres)	Resting (Acres)	Foraging (Acres)	Total Habitat Harvested (Acres)
2023	30,317	10,252	6,844	47,412
2033	14,892	22,423	4,360	41,674
2043	8,374	16,919	3,879	29,172
2053	5,885	10,186	1,575	17,646
2063	10,575	11,840	2,998	25,413

Table S-62. Fisher habitat harvested by the end of each decade under Alternative D over 50 years (2013–2063)

Year	Denning (Acres)	Resting (Acres)	Foraging (Acres)	Total Habitat Harvested (Acres)
2023	21,335	11,831	6,536	39,702
2033	5,620	15,303	5,017	25,940
2043	3,127	12,143	2,992	18,262
2053	790	8,788	1,587	11,165
2063	10,319	5,565	2,501	18,385

Table S-63. Fisher habitat harvested by the end of each decade under the Proposed RMP over 50 years (2013–2063)

Year	Denning (Acres)	Resting (Acres)	Foraging (Acres)	Total Habitat Harvested (Acres)
2023	38,032	10,575	3,594	52,202
2033	21,189	16,593	3,965	41,747
2043	9,197	16,147	4,017	29,360
2053	7,614	11,346	2,085	21,044
2063	18,168	10,682	2,260	31,111

Fisher Population

Table S-64. Fisher population in the planning area under the No Action alternative

Year	Total Fisher Habitat (Acres)	Female Fisher*	Male Fisher*	Total Fisher Population
2013	4,484,755	956	336	1,292
2023	4,450,848	949	334	1,283
2033	4,519,548	963	339	1,302
2043	4,554,018	971	342	1,312
2053	4,561,846	972	342	1,315
2063	4,574,905	975	343	1,318

* Estimated number of fisher assumes full occupancy of habitat based on availability of habitat and mean home range size (mean female home range is 4,692 acres, mean male home range is 13,329 acres).

Table S-65. Fisher population in the planning area under Alternative A

Year	Total Fisher Habitat (Acres)	Female Fisher*	Male Fisher*	Total Fisher Population
2013	4,484,755	956	336	1,292
2023	4,473,465	953	336	1,289
2033	4,568,425	974	343	1,316
2043	4,627,160	986	347	1,333
2053	4,657,234	993	349	1,342
2063	4,679,739	997	351	1,348

* Estimated number of fisher assumes full occupancy of habitat based on availability of habitat and mean home range size (mean female home range is 4,692 acres, mean male home range is 13,329 acres).

Table S-66. Fisher population in the planning area under Alternative B

Year	Total Fisher Habitat (Acres)	Female Fisher*	Male Fisher*	Total Fisher Population
2013	4,484,755	956	336	1,292
2023	4,477,486	954	336	1,290
2033	4,575,804	975	343	1,319
2043	4,640,911	989	348	1,337
2053	4,680,496	998	351	1,349
2063	4,710,269	1,004	353	1,357

* Estimated number of fisher assumes full occupancy of habitat based on availability of habitat and mean home range size (mean female home range is 4,692 acres, mean male home range is 13,329 acres).

Table S-67. Fisher population in the planning area under Alternative C

Year	Total Fisher Habitat (Acres)	Female Fisher*	Male Fisher*	Total Fisher Population
2013	4,484,755	956	336	1,292
2023	4,467,472	952	335	1,287
2033	4,555,509	971	342	1,313
2043	4,614,438	983	346	1,330
2053	4,647,498	991	349	1,339
2063	4,668,042	995	350	1,345

* Estimated number of fisher assumes full occupancy of habitat based on availability of habitat and mean home range size (mean female home range is 4,692 acres, mean male home range is 13,329 acres).

Table S-68. Fisher population in the planning area under Alternative D

Year	Total Fisher Habitat (Acres)	Female Fisher*	Male Fisher*	Total Fisher Population
2013	4,484,755	956	336	1,292
2023	4,477,150	954	336	1,290
2033	4,575,262	975	343	1,318
2043	4,638,616	989	348	1,337
2053	4,673,945	996	351	1,347
2063	4,700,745	1,002	353	1,355

* Estimated number of fisher assumes full occupancy of habitat based on availability of habitat and mean home range size (mean female home range is 4,692 acres, mean male home range is 13,329 acres).

Table S-69. Fisher population in the planning area under the Proposed RMP

Year	Total Fisher Habitat (Acres)	Female Fisher*	Male Fisher*	Total Fisher Population
2013	4,481,891	955	336	1,291
2023	4,473,729	953	336	1,289
2033	4,568,266	974	343	1,316
2043	4,629,697	987	347	1,334
2053	4,664,693	994	350	1,344
2063	4,692,992	1,000	352	1,352

* Estimated number of fisher assumes full occupancy of habitat based on availability of habitat and mean home range size (mean female home range is 4,692 acres, mean male home range is 13,329 acres).

Table S-70. Fisher population forecast in the planning area under the No Timber Harvest reference analysis

Year	Total Fisher Habitat (Acres)	Female Fisher*	Male Fisher*	Total Fisher Population
2013	4,485,024	956	336	1,292
2023	4,481,942	955	336	1,291
2033	4,581,440	976	344	1,320
2043	4,641,302	989	348	1,337
2053	4,671,232	996	350	1,346
2063	4,691,760	1,000	352	1,352

* Estimated number of fisher assumes full occupancy of habitat based on availability of habitat and mean home range size (mean female home range is 4,692 acres, mean male home range is 13,329 acres).

Gray Wolf

Table S-71. Wolf population, control, and depredation in Oregon

Wolf Statistics	2009*	2010†	2011‡	2012§	2013‖	2014#	Cumulative Total
Minimum Wolf Population *(# individuals)*	16	21	29	46	64	77	*Not applicable*
Wolf Packs *(# packs)*	2	2	4	6	8	9	*Not applicable*
Wolves Removed *(# individuals removed)*	2	-	2	-	-	-	4
Wolves Removed *(percent of population)*	13%	-	7%	-	-	-	*Not applicable*
Confirmed Wolf Depredations *(# livestock)*	30	8	17	12	12	32	111

* USFWS *et al.* 2010
† USFWS *et al.* 2011
‡ ODFW 2011
§ ODFW 2013
‖ ODFW 2014b
ODFW 2015c

Table S-72. Wolf population, control, and depredation in the northern Rocky Mountain population

Wolf Statistics	2009*	2010†	2011‡	2012§	2013‖	2014#	Cumulative Total
Minimum Wolf Population *(# individuals)*	2,292	2,045	2,354	2,569	2,613	2,401	*Not applicable*
Wolf Packs *(# packs)*	242	244	287	321	320	313	*Not applicable*
Wolves Removed *(# individuals removed)*	272	260	166	231	202	162	1,293
Wolves Removed *(percent of population)*	12%	13%	7%	9%	8%	7%	*Not applicable*
Confirmed Wolf Depredations *(# livestock)*	966	465	371	674	632	318	3,426

* USFWS *et al.* 2010
† USFWS *et al.* 2011
‡ USFWS *et al.* 2012
§ USFWS *et al.* 2013
‖ USFWS *et al.* 2014
USFWS *et al.* 2015

Marbled Murrelet

Marbled Murrelet Nesting Habitat

Table S-73. Marbled murrelet nesting habitat development in the decision area

Year	No Action (Acres)	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)	PRMP (Acres)	No Timber Harvest (Acres)
Current Condition							
2013	493,968	493,968	493,968	493,968	493,968	493,434	493,968
Alternatives/Proposed RMP							
2023	502,168	507,622	501,865	477,023	518,431	505,612	528,310
2033	565,762	579,509	569,953	515,784	602,023	569,860	621,274
2043	648,814	660,588	647,416	580,062	691,494	648,415	716,909
2053	733,369	739,298	725,624	648,471	779,791	734,794	811,704
2063	773,852	756,794	771,558	654,988	813,721	778,175	840,024

Table S-74. Marbled murrelet high-quality nesting habitat development in the decision area

Year	No Action (Acres)	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)	PRMP (Acres)	No Timber Harvest (Acres)
Current Condition							
2013	233,219	233,219	233,219	233,219	233,219	232,493	233,219
Alternatives/Proposed RMP							
2023	226,102	231,247	230,737	222,942	232,005	230,505	233,448
2033	252,025	259,411	258,532	244,219	260,620	258,796	263,781
2043	260,610	271,627	271,282	251,518	274,686	271,496	277,291
2053	275,825	286,819	287,764	265,232	290,827	287,891	294,382
2063	294,666	305,620	308,023	276,789	310,055	308,863	319,070

Table S-75. Marbled murrelet nesting habitat development in the planning area

Year	No Action (Acres)	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)	PRMP (Acres)	No Timber Harvest (Acres)
Current Condition							
2013	5,301,635	5,301,635	5,301,635	5,301,635	5,301,635	5,301,101	5,301,635
Alternatives/Proposed RMP							
2023	5,309,835	5,315,289	5,309,532	5,284,690	5,326,098	5,313,279	5,335,977
2033	5,414,289	5,428,036	5,418,481	5,364,311	5,450,550	5,418,388	5,469,801
2043	5,515,882	5,527,656	5,514,484	5,447,131	5,558,562	5,515,483	5,583,977
2053	5,600,437	5,606,367	5,592,692	5,515,539	5,646,859	5,601,862	5,678,772
2063	5,640,921	5,623,862	5,638,627	5,522,056	5,680,789	5,645,244	5,707,093

Table S-76. Marbled murrelet high-quality nesting habitat development in the planning area

Year	No Action (Acres)	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)	PRMP (Acres)	No Timber Harvest (Acres)
Current Condition							
2013	573,150	573,150	573,150	573,150	573,150	572,424	573,150
Alternatives/Proposed RMP							
2023	566,033	571,178	570,669	562,874	571,936	570,437	573,380
2033	591,956	599,342	598,464	584,150	600,551	598,727	603,712
2043	600,542	611,559	611,214	591,449	614,617	611,428	617,222
2053	781,686	792,680	793,625	771,094	796,688	793,752	800,243
2063	800,527	811,481	813,884	782,651	815,916	814,725	824,931

Table S-77. Land use allocations of marbled murrelet nesting habitat under the No Action alternative on BLM-administered lands

Year	Within the HLB*		Within Reserves*		Total Nesting Habitat (Acres)
	(Acres)	(Percent)	(Acres)	(Percent)	
2013	82,869	17%	411,099	83%	493,968
2023	79,359	16%	422,809	84%	502,168
2033	85,194	15%	480,568	85%	565,762
2043	97,618	15%	551,196	85%	648,814
2053	107,013	15%	626,356	85%	733,369
2063	113,358	15%	660,494	85%	773,852

* No Action HLB = AMA, CON, GFMA, NGFMA, SGFMA; Reserves = all other allocations

Table S-78. Land use allocations of high-quality marbled murrelet nesting habitat under the No Action alternative on BLM-administered lands

Year	Within the HLB*		Within Reserves*		Total Nesting Habitat (Acres)
	(Acres)	(Percent)	(Acres)	(Percent)	
2013	20,902	9%	212,317	91%	233,219
2023	13,950	6%	212,317	94%	226,267
2033	13,737	5%	238,287	95%	252,025
2043	11,136	4%	249,474	96%	260,610
2053	11,969	4%	263,856	96%	275,825
2063	14,938	5%	279,728	95%	294,666

* No Action HLB = AMA, CON, GFMA, NGFMA, SGFMA; Reserves = all other allocations

Table S-79. Land use allocations of marbled murrelet nesting habitat under Alternative A on BLM-administered lands

Year	Within the HLB		Within Reserves		Total Nesting Habitat (Acres)
	(Acres)	(Percent)	(Acres)	(Percent)	
2013	42,139	9%	451,829	91%	493,968
2023	29,694	6%	477,927	94%	507,622
2033	26,583	5%	552,926	95%	579,509
2043	28,416	4%	632,172	96%	660,588
2053	30,534	4%	708,764	96%	739,298
2063	22,551	3%	734,242	97%	756,794

Table S-80. Land use allocations of high-quality marbled murrelet nesting habitat under Alternative A on BLM-administered lands

Year	Within the HLB		Within Reserves		Total Nesting Habitat (Acres)
	(Acres)	(Percent)	(Acres)	(Percent)	
2013	2,839	1%	230,380	99%	233,219
2023	1,094	0%	230,153	100%	231,247
2033	300	0%	259,111	100%	259,411
2043	317	0%	271,311	100%	271,627
2053	439	0%	286,380	100%	286,819
2063	432	0%	305,188	100%	305,620

Table S-81. Land use allocations of marbled murrelet nesting habitat under Alternative B on BLM-administered lands

Year	Within the HLB		Within Reserves		Total Nesting Habitat (Acres)
	(Acres)	(Percent)	(Acres)	(Percent)	
2013	46,899	9%	447,069	91%	493,968
2023	36,407	7%	465,458	93%	501,865
2033	41,863	7%	528,090	93%	569,953
2043	50,223	8%	597,193	92%	647,416
2053	59,562	8%	666,062	92%	725,624
2063	71,140	9%	700,418	91%	771,558

Table S-82. Land use allocations of high-quality marbled murrelet nesting habitat under Alternative B on BLM-administered lands

Year	Within the HLB		Within Reserves		Total Nesting Habitat (Acres)
	(Acres)	(Percent)	(Acres)	(Percent)	
2013	4,070	2%	229,149	98%	233,219
2023	1,571	1%	229,166	99%	230,737
2033	1,123	0%	257,410	100%	258,532
2043	1,571	1%	269,711	99%	271,282
2053	2,238	1%	285,526	99%	287,764
2063	2,832	1%	305,191	99%	308,023

Table S-83. Land use allocations of marbled murrelet nesting habitat under Alternative C on BLM-administered lands

Year	Within the HLB		Within Reserves		Total Nesting Habitat (Acres)
	(Acres)	(Percent)	(Acres)	(Percent)	
2013	115,544	23%	378,424	77%	493,968
2023	83,937	18%	393,086	82%	477,023
2033	77,982	15%	437,802	85%	515,784
2043	86,494	15%	493,568	85%	580,062
2053	103,859	16%	544,612	84%	648,471
2063	89,191	14%	565,797	86%	654,988

Table S-84. Land use allocations of high-quality marbled murrelet nesting habitat under Alternative C on BLM-administered lands

Year	Within the HLB		Within Reserves		Total Nesting Habitat (Acres)
	(Acres)	(Percent)	(Acres)	(Percent)	
2013	18,479	8%	214,740	92%	233,219
2023	8,149	4%	214,793	96%	222,942
2033	8,026	3%	236,193	97%	244,219
2043	6,135	2%	245,382	98%	251,518
2053	6,673	3%	258,559	97%	265,232
2063	6,707	2%	270,082	98%	276,789

Table S-85. Land use allocations of marbled murrelet nesting habitat under Alternative D on BLM-administered lands

Year	Within the HLB		Within Reserves		Total Nesting Habitat (Acres)
	(Acres)	(Percent)	(Acres)	(Percent)	
2013	72,062	15%	421,906	85%	493,968
2023	76,716	15%	441,715	85%	518,431
2033	102,559	17%	499,463	83%	602,023
2043	131,995	19%	559,499	81%	691,494
2053	162,477	21%	617,314	79%	779,791
2063	178,386	22%	635,334	78%	813,721

Table S-86. Land use allocations of high-quality marbled murrelet nesting habitat under Alternative D on BLM-administered lands

Year	Within the HLB		Within Reserves		Total Nesting Habitat (Acres)
	(Acres)	(Percent)	(Acres)	(Percent)	
2013	6,887	3%	226,332	97%	233,219
2023	5,841	3%	226,163	97%	232,005
2033	7,668	3%	252,952	97%	260,620
2043	10,552	4%	264,134	96%	274,686
2053	13,448	5%	277,379	95%	290,827
2063	14,975	5%	295,081	95%	310,055

Table S-87. Land use allocations of marbled murrelet nesting habitat under the Proposed RMP on BLM-administered lands

Year	Within the HLB		Within Reserves		Total Nesting Habitat (Acres)
	(Acres)	(Percent)	(Acres)	(Percent)	
2013	34,362	7%	459,072	93%	493,434
2023	23,591	5%	482,021	95%	505,612
2033	23,489	4%	546,372	96%	569,860
2043	23,931	4%	624,483	96%	648,415
2053	30,596	4%	704,198	96%	734,794
2063	43,257	6%	734,918	94%	778,175

Table S-88. Land use allocations of high-quality marbled murrelet nesting habitat under the Proposed RMP on BLM-administered lands

Year	Within the HLB		Within Reserves		Total Nesting Habitat (Acres)
	(Acres)	(Percent)	(Acres)	(Percent)	
2013	3,425	1%	229,067	99%	232,493
2023	1,600	1%	228,905	99%	230,505
2033	1,189	0%	257,607	100%	258,796
2043	1,035	0%	270,462	100%	271,496
2053	1,427	0%	286,464	100%	287,891
2063	1,690	1%	307,174	99%	308,863

Kappa Analysis for Marbled Murrelet Habitat

The BLM calculated the kappa statistic to compare quantitatively the level of agreement between two different models of marbled murrelet habitat in the decision area. Competing models can produce results that agree (or disagree) simply by chance, and the kappa statistic is a measure of the agreement between two models that takes into account the possibility of chance agreement. While interpretations of the kappa statistic vary, the BLM used the interpretation summarized by Viera and Garret (2005, p. 362) (**Table S-89**). The BLM calculated the kappa statistic following Fowler *et al*. (1998) and Veira and Garret (2005).

Table S-89. Interpretation of the kappa statistic

Kappa	Agreement
< 0	Less Than Chance Agreement (Potential Systematic Disagreement)
0.01–0.20	Slight Agreement
0.21–0.40	Fair Agreement
0.41–0.60	Moderate Agreement
0.61–0.80	Substantial Agreement
0.81–0.99	Almost Perfect Agreement
1.00	Perfect Agreement

Source: Viera and Garret 2005

The two models compared include the one used by BLM in this Proposed RMP/Final EIS (refer to Chapter 3, Marbled Murrelet – Summary of Analytical Methods) and the one described in Chapter 2 of *Northwest Forest Plan – the First Twenty Years (1994-2013): Status and Trend of Marbled Murrelet Populations and Nesting Habitat* (Falxa and Raphael 2015).

The BLM modeled marbled murrelet nesting habitat in the Proposed RMP/Final EIS using the structural stage output from Woodstock vegetation modeling for 2013 and assumed:

- High-quality Nesting Habitat = structural stages 5.1, 5.2, or 5.3;
- Nesting Habitat = structural stages 3.1, 3.3, 4.1, 4.2, 5.1, 5.2, or 5.3; and
- Non-habitat = structural stages 1.1, 1.2, 3.2, or 3.4.

The model from Falxa and Raphael (2015), used habitat classes generated from a MaxEnt analysis that utilized GNN from 2012 for the vegetation covariate as well as several other data sources (Falxa and Raphael 2015, pp. 68–76) and used four classes of habitat suitability (p. 84):

- Class 1 = Lowest Suitability
- Class 2 = Marginal Suitability
- Class 3 = Moderate Suitability
- Class 4 = Highest Suitability

Raphael *et al*. (2015) often combined Class 3 and Class 4 habitat, which they reported as 'higher suitability' habitat.

The two models are coincident on 847,826 acres of BLM-administered lands (3,812,258 pixels that are 30 × 30 meters in size). **Table S-90** presents the cross-tabulation of structural stages and habitat classes from the two models.

Table S-90. Cross-tabulation of structural stages used in the Proposed RMP/Final EIS compared with habitat classes from Falxa and Raphael (2015)

Structural Stage (from Proposed RMP/Final EIS Analysis)		**Habitat Suitability Class (from Raphael *et al*. 2015)**				**Totals**
Name	**Code**	**1**	**2**	**3**	**4**	
Early Successional *with* Structural Legacies	1.1	14,633	4,952	452	7	**20,044**
Early Successional *without* Structural Legacies	1.2	21,036	3,420	248	7	**24,711**
Stand Establishment *with* Structural Legacies	2.1	24,355	14,007	684	133	**39,179**
Stand Establishment *without* Structural Legacies	2.2	406,373	125,748	13,106	1,182	**546,409**
Young – High Density, *with* Structural Legacies	3.1	93,008	72,946	27,690	5,876	**199,520**
Young – High Density, *without* Structural Legacies	3.2	692,148	283,847	36,187	3,119	**1,015,301**
Young – Low Density, *with* Structural Legacies	3.3	2,732	5,009	4,783	441	**12,965**
Young – Low Density, *without* Structural Legacies	3.4	18,735	14,434	4,276	400	**37,845**
Mature, Single-layered Canopy	4.1	213,186	212,971	65,814	11,690	**503,661**
Mature, Multi-layered Canopy	4.2	140,777	179,385	67,034	18,935	**406,131**
Structurally-complex, Developed Structurally-complex	5.1	74,871	170,670	93,228	26,936	**365,705**
Structurally-complex, Existing Old Forest	5.2	124,569	315,393	119,725	18,040	**577,727**
Structurally-complex, Existing Very Old Forest	5.3	4,965	29,940	25,102	3,053	**63,060**
Totals	**-**	**1,831,388**	**1,432,722**	**458,329**	**89,819**	**3,812,258**

Note: Values are counts of individual pixels (30 × 30 meters).

Using the information from **Table S-90**, the BLM calculated the kappa statistic for three different categorical combinations of model output:

- High-quality nesting habitat and non-high-quality nesting habitat (Kappa Run #1)
- High-quality nesting habitat, low-quality nesting habitat, and non-nesting habitat (Kappa Run #2)
- Nesting habitat and non-nesting habitat (Kappa Run #3)

The results of the three different runs calculating kappa are summarized below.

<u>Kappa Run #1</u>

For comparison of the two models in regards to high-quality nesting habitat versus all other habitat qualities (i.e., high-quality vs. non-high quality), the BLM assumed:

- Raphael *et al*. (2015) Habitat Classes:
  - High-quality Nesting Habitat = Class 3 or Class 4; and
  - Non-high-quality Nesting Habitat = Class 1 or Class 2.
- BLM Structural Stages:
  - High-quality Nesting Habitat = structural stages 5.1, 5.2, or 5.3; and
  - Non-high-quality Nesting Habitat = structural stages 1.1, 1.2, 3.1, 3.2, 3.3, 3.4, 4.1, or 4.2.

The results suggest that there is '*fair agreement*' (kappa = 0.22) between the two murrelet habitat models in discerning high-quality nesting habitat from non-high quality nesting habitat (**Table S-91**). The overall accuracy is 74 percent between the two models (i.e., the two models produced the same analytical result in 74 percent of the pixels).

Table S-91. Cross-tabulation of marbled murrelet habitat class (from Rachael *et al*. 2015) high-quality vs. non-high quality nesting habitat

Structural Stage (from Proposed RMP/Final EIS Analysis)	Habitat Class		Totals (Pixels)
	Non-high-quality (Pixels)	High-quality Nesting Habitat (Pixels)	
Non-high-quality	2,543,702	262,064	**2,805,766**
High-quality Nesting Habitat	720,408	286,084	**1,006,492**
Totals	**3,264,110**	**548,148**	**3,812,258**

Note: Values are counts of individual pixels (30 × 30 meters).

Kappa Run #2

For comparison of the two models in regards to high-quality nesting habitat, low-quality nesting habitat, and non-habitat, the BLM assumed:

- Raphael *et al*. (2015) Habitat Classes:
  - High-quality Nesting Habitat = Class 3 or Class 4;
  - Low-quality Nesting Habitat = Class 2; and
  - Non-nesting Habitat = Class 1.
- BLM Structural Stages:
  - High-quality Nesting Habitat = structural stages 5.1, 5.2, or 5.3; and
  - Low-quality Nesting Habitat = structural stages 3.1, 3.3, 4.1, or 4.2; and
  - Non-nesting Habitat = structural stages 1.1, 1.2, 3.2, or 3.4.

The results suggest that there is '*fair agreement*' (kappa = 0.23) between the two murrelet habitat models in discerning high-quality nesting habitat, low-quality nesting habitat, and non-nesting habitat from one another (**Table S-92**). The overall accuracy is 51 percent between the two models (i.e., the two models produced the same analytical result in 51 percent of the pixels).

Table S-92. Cross-tabulation of marbled murrelet habitat class (from Raphael *et al*. 2015) high-quality nesting habitat, low-quality nesting habitat, and non-habitat

Structural Stage (from Proposed RMP/Final EIS Analysis)	Habitat Class			Totals (Pixels)
	Non-habitat (Pixels)	Low-quality Nesting Habitat (Pixels)	High-quality Nesting Habitat (Pixels)	
Non-habitat	1,177,280	446,408	59,801	**1,683,489**
Low-quality Nesting Habitat	449,703	470,311	202,263	**1,122,277**
High-quality Nesting Habitat	204,405	516,003	286,084	**1,006,492**
Totals	**1,831,388**	**1,432,722**	**548,148**	**3,812,258**

Note: Values are counts of individual pixels (30 × 30 meters).

Kappa Run #3

For comparison of the two models in regards to nesting habitat versus all non-habitat, the BLM assumed:

- Raphael *et al*. (2015) Habitat Classes:
  - Nesting Habitat = Class 2, Class 3, or Class 4; and
  - Non-habitat = Class 1.
- BLM Structural Stages:

- Nesting Habitat = structural stages 3.1, 3.3, 4.1, 4.2, 5.1, 5.2, or 5.3; and
- Non-habitat = structural stages 1.1, 1.2, 3.2, or 3.4.

The results suggest that there is '*fair agreement*' (kappa = 0.39) between the two murrelet habitat models in discerning nesting habitat from non-habitat (**Table S-93**). The overall accuracy is 70 percent between the two models (i.e., the two models produced the same analytical result in 70 percent of the pixels).

Table S-93. Cross-tabulation of marbled murrelet habitat class (from Raphael *et al*. 2015) nesting habitat vs. non-habitat

Structural Stage (from Proposed RMP/Final EIS Analysis)	Habitat Class		Totals (Pixels)
	Non-habitat (Pixels)	Nesting Habitat (Pixels)	
Non-habitat	1,177,280	506,209	**1,683,489**
Nesting Habitat	654,108	1,474,661	**2,128,769**
Totals	**1,831,388**	**1,980,870**	**3,812,258**

Note: Values are counts of individual pixels (30 × 30 meters).

Overall, the marbled murrelet habitat model in the Proposed RMP/Final EIS appears to have '*fair agreement*' with the habitat model described in Falxa and Raphael (2015). The models seem to agree in discerning nesting habitat from non-habitat and high-quality habitat from other stand conditions (either non-habitat or low-quality nesting habitat). There is relatively less agreement between the two models in discerning high-quality from low-quality habitat as evidenced by low kappa statistics and overall accuracy. However, the BLM detected no systematic disagreement between the two models.

References

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Viera, A. J. and J. M. Garret. 2005. Understanding interobserver agreement: the kappa statistic. Family Medicine. **37**(5): 360–363. http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.483.429&rep=rep1&type=pdf.

Marbled Murrelet Designated Critical Habitat

Table S-94. Marbled murrelet nesting habitat development in designated critical habitat in the decision area

Year	No Action (Acres)	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)	PRMP (Acres)	No Timber Harvest (Acres)
Current Condition							
2013	273,174	273,174	273,174	273,174	273,174	273,178	273,174
Alternatives/Proposed RMP							
2023	279,663	287,274	277,165	269,436	286,747	280,433	287,761
2033	316,887	331,494	309,895	288,580	328,915	312,096	332,689
2043	362,224	379,380	354,011	328,535	376,676	354,576	381,421
2053	413,282	428,841	398,366	371,044	427,385	403,174	433,432
2063	434,896	442,991	419,668	380,736	440,396	422,335	446,137

Table S-95. Marbled murrelet high-quality nesting habitat development in designated critical habitat in the decision area

Year	No Action (Acres)	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)	PRMP (Acres)	No Timber Harvest (Acres)
Current Condition							
2013	154,331	154,331	154,331	154,331	154,331	154,331	154,331
Alternatives/Proposed RMP							
2023	154,266	154,515	153,559	149,579	154,097	153,963	154,522
2033	173,468	173,730	172,153	164,803	172,237	172,803	174,105
2043	180,766	181,190	179,316	169,448	180,709	180,202	181,438
2053	190,381	190,596	188,469	177,754	189,304	189,464	191,014
2063	197,017	197,646	194,091	180,763	193,961	196,107	198,051

Table S-96. Marbled murrelet high-quality nesting habitat development in designated critical habitat in the planning area

Year	No Action (Acres)	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)	PRMP (Acres)	No Timber Harvest (Acres)
Current Condition							
2013	344,345	344,345	344,345	344,345	344,345	344,345	344,345
Alternatives/Proposed RMP							
2023	344,280	344,529	343,573	339,593	344,111	343,977	344,536
2033	363,482	363,744	362,167	354,817	362,251	362,817	364,119
2043	370,780	371,204	369,330	359,462	370,723	370,216	371,452
2053	516,380	516,595	514,468	503,753	515,303	515,463	517,013
2063	523,016	523,645	520,090	506,762	519,960	522,106	524,050

Table S-97. Land use allocations of designated marbled murrelet critical habitat

Alternative/ Proposed RMP	Within the HLB		Within Reserves		Total Nesting Habitat (Acres)
	(Acres)	(Percent)	(Acres)	(Percent)	
No Action*	813	0%	479,585	100%	480,398
Alt. A	221	0%	480,177	100%	480,398
Alt. B	43,337	9%	437,061	91%	480,398
Alt. C	106,495	22%	373,903	78%	480,398
Alt. D	96,660	20%	383,738	80%	480,398
PRMP	39,718	8%	440,680	92%	480,398

* No Action HLB = AMA, CON, GFMA, NGFMA, SGFMA; Reserves = all other allocations

Table S-98. Land use allocations of designated marbled murrelet critical habitat within Zone 1

Alternative/ Proposed RMP	Within the HLB		Within Reserves		Total Nesting Habitat (Acres)
	(Acres)	(Percent)	(Acres)	(Percent)	
No Action*	729	0%	408,554	100%	409,283
Alt. A	211	0%	409,072	100%	409,283
Alt. B	30,903	8%	378,379	92%	409,283
Alt. C	79,435	19%	329,847	81%	409,283
Alt. D	82,172	20%	327,110	80%	409,283
PRMP	29,020	7%	380,262	93%	409,283

* No Action HLB = AMA, CON, GFMA, NGFMA, SGFMA; Reserves = all other allocations

Table S-99. Land use allocations of designated marbled murrelet critical habitat within Zone 2

Alternative/ Proposed RMP	Within the HLB		Within Reserves		Total Nesting Habitat (Acres)
	(Acres)	(Percent)	(Acres)	(Percent)	
No Action*	84	0%	71,002	100%	71,087
Alt. A	11	0%	71,076	100%	70,087
Alt. B	12,434	17%	58,653	83%	71,087
Alt. C	27,060	38%	44,027	62%	71,087
Alt. D	14,487	20%	56,600	80%	71,087
PRMP	10,698	15%	60,389	85%	71,087

* No Action HLB = AMA, CON, GFMA, NGFMA, SGFMA; Reserves = all other allocations

Marbled Murrelet Known Sites and Forecast Sites

Table S-100. Known marbled murrelet sites and past survey effort in the planning area

Ownership		Known Occupied Marbled Murrelet Sites		Marbled Murrelet Survey Effort			
Agency	**District or Forest**	**(Number)**	**(Acres)**	**Survey Period (Years)**	**Stations (Number)**	**Survey Polygons (Number)**	**Survey Area (Acres)**
Bureau of Land Management		351	51,995	1991-2014	6,121	1,496	83,234
BLM	Coos Bay	249	29,777	1993-2014	2,245	591	32,402
	Eugene	39	6,504	2002-2014	1,286	233	7,039
	Medford	-	-	1993-2014	597	123	10,430
	Roseburg	27	8,851	1993-2014	1,592	419	23,459
	Salem	36	6,863	1991-2014	401	130	9,904
U.S. Forest Service		417	21,144†	1986-2009	*Not available*		
USFS	Siuslaw	284*	*Not available*	1986-1997	*Not available*		
	Rogue-Siskiyou	133	21,144	1991-2009			
Oregon Department of Forestry		237	21,235	1989-2014	9,650	2,107	300,455
	Totals	**1,005**	**94,374**	**1986-2014**	**-**	**-**	**-**

* Surveyors observed occupied behaviors at 381 survey stations on the U.S. Forest Service's Siuslaw National Forest. For this analysis, BLM assumed that the stations within 400 meters of each other represented the same occupied site since the maximum effective distance of a survey station is 200 meters radius (Mack *et al*. 2003, p. 9). Thus, the 381 survey stations with occupied behaviors represent approximately 284 occupied sites.

† Only includes acreage from the Rogue-Siskiyou National Forest; acreage from the Siuslaw National Forest is not available.

Table S-101. Decadal forecast (2013–2063) of marbled murrelet occupied sites discovered or lost under the No Action alternative

Decade*	Nesting Habitat in the Decision Area (Acres)			Occupied Sites Forecast in the Decision Area (Number)		
	Totals	In the Harvest Scenario†		Totals	In the Harvest Scenario†	
		With Surveys	Without Surveys		Discovered and Protected	Lost
Current	493,968	-	-	2,459	-	-
1st	502,168	37,734	-	2,524	144	-
2nd	565,762	37,407	-	2,842	165	-
3rd	648,814	30,237	-	3,254	129	-
4th	733,369	35,391	-	3,714	165	-
5th	773,852	37,721	-	3,900	191	-
Totals	**-**	**178,491**	**-**	**-**	**795**	**-**

* Habitat acreage based on the start of the decade (i.e., 2023, 2033, 2043, 2053, 2063)

† Nesting habitat would be surveyed under the No Action alternative

Table S-102. Decadal forecast (2013–2063) of marbled murrelet occupied sites discovered or lost under Alternative A

Decade*	Nesting Habitat in the Decision Area (Acres)			Occupied Sites Forecast in the Decision Area (Number)		
	Totals	In the Harvest Scenario†		Totals	In the Harvest Scenario†	
		With Surveys	Without Surveys		Discovered and Protected	Lost
Current	493,968	-	-	2,459	-	-
1st	507,622	-	22,886	2,529	-	106
2nd	579,509	-	18,105	2,881	-	101
3rd	660,588	-	20,351	3,278	-	96
4th	739,298	-	20,857	3,709	-	89
5th	756,794	-	19,327	3,794	-	89
Totals	**-**	**-**	**101,526**	**-**	**-**	**481**

* Habitat acreage based on the start of the decade (i.e., 2023, 2033, 2043, 2053, 2063)
† No nesting habitat would be surveyed under Alternative A

Table S-103. Decadal forecast (2013–2063) of marbled murrelet occupied sites discovered or lost under Alternative B

Decade*	Nesting Habitat in the Decision Area (Acres)			Occupied Sites Forecast in the Decision Area (Number)		
	Totals	In the Harvest Scenario†		Totals	In the Harvest Scenario†	
		With Surveys	Without Surveys		Discovered and Protected	Lost
Current	493,968	-	-	2,459	-	-
1st	501,865	24,073	12,370	2,509	132	23
2nd	569,953	23,948	5,469	2,844	110	10
3rd	647,416	21,738	6,520	3,225	101	12
4th	725,624	20,382	4,755	3,660	95	9
5th	771,558	23,834	7,636	3,903	122	14
Totals	**-**	**113,975**	**36,751**	**-**	**559**	**67**

* Habitat acreage based on the start of the decade (i.e., 2023, 2033, 2043, 2053, 2063)
† Nesting habitat in Zone 1 (0–35 miles) would be surveyed under Alternative B

Table S-104. Decadal forecast (2013–2063) of marbled murrelet occupied sites discovered or lost under Alternative C

Decade*	Nesting Habitat in the Decision Area (Acres)			Occupied Sites Forecast in the Decision Area (Number)		
	Totals	In the Harvest Scenario†		Totals	In the Harvest Scenario†	
		With Surveys	Without Surveys		Discovered and Protected	Lost
Current	493,968	-	-	2,459	-	-
1st	477,023	10,028	47,584	2,422	35	189
2nd	515,784	11,057	36,788	2,635	34	174
3rd	580,062	3,089	41,190	2,973	11	178
4th	648,471	606	47,807	3,373	4	212
5th	654,988	1,615	51,125	3,415	5	238
Totals	**-**	**26,395**	**224,494**	**-**	**89**	**992**

* Habitat acreage based on the start of the decade (i.e., 2023, 2033, 2043, 2053, 2063)
† Nesting habitat ≥ 120 years of age would be surveyed under Alternative C

Table S-105. Decadal forecast (2013–2063) of marbled murrelet occupied sites discovered or lost under Alternative D

Decade*	Nesting Habitat in the Decision Area (Acres)			Occupied Sites Forecast in the Decision Area (Number)		
	Totals	In the Harvest Scenario†		Totals	In the Harvest Scenario†	
		With Surveys	Without Surveys		Discovered and Protected	Lost
Current	493,968	-	-	2,459	-	-
1st	518,431	38,735	-	2,577	141	-
2nd	602,023	21,684	-	3,002	74	-
3rd	691,494	23,508	-	3,440	89	-
4th	779,791	20,850	-	3,910	92	-
5th	813,721	45,150	-	4,085	166	-
Totals	**-**	**149,928**	**-**	**-**	**562**	**-**

* Habitat acreage based on the start of the decade (i.e., 2023, 2033, 2043, 2053, 2063)
† All nesting habitat would be surveyed under Alternative D

Table S-106. Decadal forecast (2013–2063) of marbled murrelet occupied sites discovered or lost under the Proposed RMP

Decade*	Nesting Habitat in the Decision Area (Acres)			Occupied Sites Forecast in the Decision Area (Number)		
	Totals	In the Harvest Scenario†		Totals	In the Harvest Scenario†	
		With Surveys	Without Surveys		Discovered and Protected	Lost
Current	493,434	-	-	2,459	-	-
1st	505,612	21,331	7,162	2,524	97	13
2nd	569,860	18,024	3,143	2,838	76	6
3rd	648,415	11,571	3,758	3,246	42	7
4th	734,794	13,702	2,586	3,710	69	5
5th	778,175	18,333	4,723	3,932	91	9
Totals	**-**	**82,960**	**21,371**	**-**	**377**	**39**

* Habitat acreage based on the start of the decade (i.e., 2023, 2033, 2043, 2053, 2063)
† Nesting habitat in Zone 1 (0-35 miles) would be surveyed under the Proposed RMP

Table S-107. Decadal forecast (2013–2063) of marbled murrelet occupied sites expected under the No Harvest reference analysis

Decade*	Nesting Habitat in the Decision Area (Acres)	Occupied Sites Forecast in the Decision Area (Number)
Current	494,412	2,461
1st	528,310	2,624
2nd	621,274	3,080
3rd	716,909	3,544
4th	811,704	4,043
5th	840,024	4,193

* Habitat acreage based on the start of the decade (i.e., 2023, 2033, 2043, 2053, 2063)

North Oregon Coast Distinct Population Segment (DPS) of the Red Tree Vole

Table S-108. North Oregon Coast DPS of the red tree vole habitat development in the decision area

Year	No Action (Acres)	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)	PRMP (Acres)	No Timber Harvest (Acres)
Current Condition							
2013	174,495	174,495	174,495	174,495	174,495	174,495	174,495
Alternatives/Proposed RMP							
2023	178,193	180,881	176,827	167,096	183,914	177,605	189,994
2033	214,128	218,570	212,751	189,394	225,827	207,486	235,607
2043	246,181	245,961	241,608	211,800	256,326	235,129	268,416
2053	281,094	278,632	274,507	236,514	293,181	272,217	309,872
2063	289,971	279,899	279,489	236,047	294,208	277,503	313,820

Table S-109. North Oregon Coast DPS of the red tree vole habitat development in the planning area

Year	No Action (Acres)	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)	PRMP (Acres)	No Timber Harvest (Acres)
Current Condition							
2013	741,263	741,263	741,263	741,263	741,263	741,263	741,263
Alternatives/Proposed RMP							
2023	744,961	747,649	743,595	733,864	750,682	744,373	756,762
2033	780,896	785,337	779,518	756,161	792,595	774,254	802,375
2043	812,948	812,729	808,376	778,568	823,094	801,897	835,184
2053	847,862	845,400	841,275	803,282	859,949	838,985	876,640
2063	978,930	968,859	968,448	925,006	983,168	966,462	1,002,779

Table S-110. North Oregon Coast DPS of the red tree vole habitat in the Harvest Land Base

Year	No Action (Acres)	Alt. A (Acres)	Alt. B (Acres)	Alt. C (Acres)	Alt. D (Acres)	PRMP (Acres)
Current Condition						
2013	33,810	21,715	37,846	61,284	58,847	28,529
Habitat Capable	69,758	47,155	83,381	133,847	133,396	61,905
Alternatives/Proposed RMP						
2023	36,316	17,779	35,739	49,993	62,055	23,853
2033	46,492	18,466	44,670	52,673	79,939	25,806
2043	52,777	17,616	48,865	55,996	93,221	25,344
2053	55,195	15,703	51,687	58,015	109,727	27,732
2063	55,478	12,862	49,519	51,496	108,764	26,339

Non-forest Habitat

For the analyses of non-forest habitat types on both BLM-administered lands and on all other ownerships, the BLM used the ecological systems data (ESLF Codes and ESLF Names) available in the 2012 Gradient Nearest Neighbor (GNN) (LEMMA 2014). There are 64 different ecological systems in the planning area.

For simplicity, the BLM grouped and re-classified these 64 categories into 12 similar non-forest habitat groups. Refer to **Table S-111** (Re-classification of non-forest habitats from GNN) for a complete list of the 64 ecological systems in the planning area and the BLM re-classification used in this analysis.

The BLM assumed that the non-forest habitats would remain in their current condition throughout the analysis period (2013–2063).

Table S-111. Re-classification of non-forest habitats from GNN

Gradient Nearest Neighbor		BLM-reclassification	
ESLF Code	**Ecological System Life Form (ESLF) Name**	**Code**	**Name**
21	Developed, Open Space	1	Urban/ Developed
22	Developed, Low Intensity		
23	Developed, Medium Intensity		
24	Developed, High Intensity		
61	Orchards Vineyards and Other High Structure Agriculture	2	Agriculture
81	Pasture/Hay		
82	Cultivated Cropland		
3118	North Pacific Alpine and Subalpine Bedrock and Scree	3	Rock
3128	Inter-Mountain Basins Volcanic Rock and Cinder Land		
3129	Rocky Mountain Cliff, Canyon and Massive Bedrock		
3140	North Pacific Volcanic Rock and Cinder Land		
3155	North Pacific Montane Massive Bedrock, Cliff and Talus		
3158	North Pacific Coastal Cliff and Bluff		
3167	Mediterranean California Serpentine Barrens		
3169	Central California Coast Ranges Cliff and Canyon		
3170	Klamath-Siskiyou Cliff and Outcrop		
7162	North Pacific Herbaceous Bald and Bluff		
9297	Inter-Mountain Basins Alkaline Closed Depression		
5258	Inter-Mountain Basins Mixed Salt Desert Scrub	4	Desert
5456	Inter-Mountain Basins Semi-Desert Shrub Steppe		
3165	Mediterranean California Northern Coastal Dune	5	Dunes
3177	North Pacific Maritime Coastal Sand Dune and Strand		
5205	North Pacific Dry and Mesic Alpine Dwarf-Shrubland, Fell-field and Meadow	6	Grassland/ Prairie
5409	Willamette Valley Upland Prairie and Savanna		
5452	Columbia Plateau Steppe and Grassland		
7102	California Mesic Serpentine Grassland		
7103	California Northern Coastal Grassland		
7108	Mediterranean California Alpine Dry Tundra		
7109	Mediterranean California Subalpine Meadow		
7110	North Pacific Montane Grassland		
7112	Northern Rocky Mountain Lower Montane, Foothill and Valley Grassland		
7157	North Pacific Alpine and Subalpine Dry Grassland		
8404	Introduced Upland Vegetation – Annual Grassland		
8502	Recently burned grassland		
9221	Willamette Valley Wet Prairie		
9265	Temperate Pacific Montane Wet Meadow		
3179	Inter-Mountain Basins Playa	7	Shrubland
5202	Columbia Plateau Scabland Shrubland		

Gradient Nearest Neighbor		BLM-reclassification	
ESLF Code	**Ecological System Life Form (ESLF) Name**	**Code**	**Name**
5260	North Pacific Avalanche Chute Shrubland		
5261	North Pacific Montane Shrubland		
5305	California Xeric Serpentine Chaparral		
5311	Northern and Central California Dry-Mesic Chaparral		
5457	Northern California Coastal Scrub		
7161	North Pacific Hypermaritime Shrub and Herbaceous Headland		
9103	Inter-Mountain Basins Greasewood Flat		
5256	Great Basin Xeric Mixed Sagebrush Shrubland		
5257	Inter-Mountain Basins Big Sagebrush Shrubland		
5453	Columbia Plateau Low Sagebrush Steppe	8	Sagebrush
5454	Inter-Mountain Basins Big Sagebrush Steppe		
5455	Inter-Mountain Basins Montane Sagebrush Steppe		
9321	Columbia Plateau Silver Sagebrush Seasonally Flooded Shrub-Steppe		
2201	Open Water (Fresh)		
3122	Temperate Pacific Freshwater Mudflat		
9166	North Pacific Bog and Fen		
9173	North Pacific Shrub Swamp		
9219	Temperate Pacific Freshwater Aquatic Bed	9	Freshwater/ Riparian
9220	North Pacific Intertidal Freshwater Wetland		
9222	North American Arid West Emergent Marsh		
9248	Mediterranean California Subalpine-Montane Fen		
9260	Temperate Pacific Freshwater Emergent Marsh		
9251	Northern California Claypan Vernal Pool	10	Vernal Pool
2202	Open Water (Brackish/Salt)	11	Marine
9281	Temperate Pacific Tidal Salt and Brackish Marsh		
3130	North American Alpine Ice Field	12	Ice

Table S-112. Non-forest habitat within the decision and planning areas

Structural Stage	Decision Area		Planning Area	
	(Acres)	(Percent)	(Acres)	(Percent)
Urban/Developed	11,434	12%	1,061,331	24%
Agricultural	1,951	2%	2,193,206	51%
Rock	1,710	2%	76,278	2%
Desert	9	0%	32	0%
Dunes	1,300	1%	37,611	1%
Grassland	3,795	4%	290,284	7%
Shrubland	2,936	3%	59,616	1%
Sagebrush	63,884	70%	246,644	6%
Freshwater Riparian	4,164	5%	348,773	8%
Vernal Pools	307	0%	7,668	0%
Marine/Tidal	236	0%	16,464	0%
Ice	27	0%	3,335	0%
Totals	**91,752**	**100%**	**4,341,241**	**100%**

Non-BLM Forest Habitat

The BLM modeled forest habitat on non-BLM-administered lands within the planning area using the 2012 GNN structural condition (STRUCCOND) (LEMMA 2014).

So that the GNN-derived habitat on non-BLM-administered lands could be readily compared with the Woodstock-derived forest habitat on BLM-administered lands, the BLM cross-walked the GNN STRUCCOND to the Woodstock structural stage categories (**Table S-113**).

Table S-113. Cross-walk of GNN STRUCCOND to Woodstock structural stages

GNN STRUCCOND		Woodstock Structural Stage	
Code	**Description***	**Code**	**Structural Stage**
0	Non-forest	-	Non-forest
1	Sparse (CANCOV < 10%)	1.1	Early Successional: with Structural Legacies
		1.2	Early Successional: without Structural Legacies
2	Open (CANCOV 10–40%)	2.1	Stand Establishment: with Structural Legacies
		2.2	Stand Establishment: without Structural Legacies
3 and 4	Sapling/pole - moderate/closed (CANCOV>40, QMD_DOM < 25cm) Small/medium tree - moderate/closed (CANCOV ≥ 40, QMD_DOM 25–50)	3.1	Young: High Density with Structural Legacies
		3.2	Young: High Density without Structural Legacies
		3.3	Young: Low Density with Structural Legacies
		3.4	Young: Low Density without Structural Legacies
5	Large tree - moderate/closed (CANCOV ≥ 40, QMD_DOM 50–75)	4.1	Mature: Single-layered Canopy
		4.2	Mature: Multi-layered Canopy
6	Large/giant tree - moderate/closed (CANCOV ≥ 40, QMD_DOM ≥ 75)	5.1	Structurally-complex: Developed Structurally-complex
		5.2	Structurally-complex: Existing Old Forest
		5.3	Structurally-complex: Existing Very Old Forest

* STRUCCOND Descriptions from LEMMA 2014

The BLM modeled the structural conditions on non-BLM-administered lands as continuing to provide the same distribution of habitat through time as the current condition, except in U.S. Forest Service reserves (i.e., Late-Successional Reserve and Congressionally Reserved lands).

The BLM modeled structural conditions continuing to develop on U.S. Forest Service reserve lands through time based on comparison to the mean ages of the Woodstock structural stages on the BLM-administered forestlands (**Table S-114**).

Table S-114. Assumptions for development of structural stages on non-BLM-administered lands

Code	Structural Stage	Mean Age* (Years)	BLM Assumption for Forest Habitat Development on Non-BLM-administered lands
1.1	Early Successional: with Structural Legacies	10.3	Pixel stays in Early Successional group for 1 decade
1.2	Early Successional: without Structural Legacies		
2.1	Stand Establishment: with Structural Legacies	24.7	Pixel stays in Stand Establishment group for 1 decade
2.2	Stand Establishment: without Structural Legacies		
3.1	Young: High Density with Structural Legacies	66.5	Pixel stays in Young group for 4 decades
3.2	Young: High Density without Structural Legacies		
3.3	Young: Low Density with Structural Legacies		
3.4	Young: Low Density without Structural Legacies		
4.1	Mature: Single-layered Canopy	95.6	Pixel stays in Mature group for 3 decades
4.2	Mature: Multi-layered Canopy		
5.1	Structurally-complex: Developed Structurally-complex	160.4	Once a pixel enters Structurally-complex group, it remains there
5.2	Structurally-complex: Existing Old Forest		
5.3	Structurally-complex: Existing Very Old Forest		

* Mean age calculated using age on BLM-administered lands.

The BLM assumed in this modeling that habitat on U.S. Forest Service reserve lands would not develop on lands that experience wildfire in the modeling (see the vegetation modeling section in Chapter 3).

For the purpose of this analysis, the BLM assumed that the future distribution of habitat conditions on non-BLM-administered lands and burned, U.S. Forest Service reserve lands would continue to reflect the current distribution of habitat conditions.

On private lands, the assumption that the future distribution of habitat conditions would remain the same as current conditions is likely to be a reasonable approximation. On State and U.S. Forest Service non-reserve lands, this assumption is likely to be an underestimate of the future development of habitat. The BLM acknowledges that the spatial arrangement of structural conditions would change in the future, but lacks information to make more specific projections of how structural conditions would change over time on non-BLM-administered lands. This assumption is consistent with the assumption used in the analysis of forest structure and spatial pattern in the 2008 FEIS, which describes the limitations on analyzing future changes on non-BLM-administered lands and is incorporated here by reference (USDI BLM 2008, pp. 532–536).

Appendix T – Northern Spotted Owl

Forecasting Habitat Change, and Northern Spotted Owl Population Responses, in Washington, Oregon and California

The U.S. Fish and Wildlife Service used HexSim (Schumaker 2011)—a spatially explicit, individual-based, population model—to help inform its decisions on northern spotted owl recovery and the delineation of northern spotted owl critical habitat. The U.S. Fish and Wildlife Service described the development and parameterization of its HexSim model in USDI FWS 2011 (pp. Appendix C) and USDI FWS 2012.

Early in its planning process, the BLM sought the advice of federal experts familiar with the applications of HexSim and other population models to inform management decisions. Based on its review, the BLM chose to use the northern spotted owl HexSim model developed by the U.S. Fish and Wildlife Service to inform its decisions on northern spotted owl recovery and the delineation of northern spotted owl critical habitat (USDI FWS 2011, pp. Appendix C, and USDI FWS 2012). The BLM did this because:

- Federal experts familiar with similar models had found HexSim to be as reliable as those models while requiring less calibration and time to operate.
- The U.S. Fish and Wildlife Service had developed its HexSim model through a peer-reviewed process and with the advice and assistance of northern spotted owl experts from throughout the northern spotted owl's range.
- The range-wide scale of the U.S. Fish and Wildlife Service HexSim model suited the BLM's analytical needs.
- The BLM was one of the cooperators that had advised the U.S. Fish and Wildlife Service during the development of its HexSim model and, thus, already was familiar with its operation and applications.
- The BLM determined that it could use the U.S. Fish and Wildlife Service's model, fully parameterized, to meet its specific planning needs with considerable savings in cost and time.
- The U.S. Fish and Wildlife Service already was familiar with the development and applications of its model. Since the U.S. Fish and Wildlife Service would advise the BLM during the development of the RMP, and the U.S. Fish and Wildlife Service eventually would render a biological opinion on the Proposed RMP, the BLM determined that the U.S. Fish and Wildlife Service's HexSim model would best suit its requirements for evaluating the potential effects of the alternatives and the Proposed RMP on northern spotted owl populations.

The BLM did not modify any of the population parameters in the U.S. Fish and Wildlife Service's HexSim model. The only difference between the U.S. Fish and Wildlife Service's use of its HexSim model and the BLM's use was that the BLM recalibrated the time step that corresponded to the year 2013.

The U.S. Fish and Wildlife Service calibrated its HexSim model to run with northern spotted owl relative habitat suitability surfaces (i.e., digitized geospatial datasets used for computer analyses), which it derived using 1996 and 2006 Gradient Nearest Neighbor (GNN) data developed by the U.S. Forest Service (Ohmann and Gregory 2002). Relative habitat suitability values range from 0 to 100, with higher numbers signifying better habitat value. The values themselves are derived from a variety of biotic and abiotic variables, such as the amount of forest canopy cover, mean tree diameter, and degree and direction of terrain slope. To create its relative habitat suitability surfaces, the U.S. Fish and Wildlife Service used MaxEnt (Phillips *et al*. 2006) to compare variables present on broad landscapes with those associated with known northern spotted owls nest sites.

Concurrent with the U.S. Fish and Wildlife Service process, the U.S. Forest Service created a separate set of northern spotted owl relative habitat suitability surfaces to evaluate implementation of the Northwest Forest Plan (Davis *et al*. 2011). The U.S. Forest Service based its surfaces on a unique set of MaxEnt models that it also derived using 1996 and 2006 GNN data (Davis *et al*. 2011, pp. 27–28).[46] Differences between the two processes included:

- The two agencies used different variable scales to create their MaxEnt models. The U.S. Forest Service variables were specific to 30 × 30-m pixels (Davis *et al*. 2011, p. 28), whereas the U.S. Fish and Wildlife Service variables were at the scale of 200 ha (USDI FWS 2012, p. 84).
- The two agencies trained their MaxEnt models to geographically different modeling regions (Davis *et al*. 2011, p. 35 and USDI FWS 2011, p. C-13).
- Whereas the U.S. Forest Service trained its MaxEnt models primarily on discrete variable values, which could change independently (Davis *et al*. 2011, p. 99), the U.S. Fish and Wildlife Service trained its MaxEnt models on a combination of discrete and compositional variables. Compositional variables are combinations of discrete variables, all of which must be present (USDI FWS 2012, p. C-38).
- The U.S. Forest Service used LandTrendr to examine changes in forest stand conditions from 1996 to 2006 from timber harvest, insects and disease, and wildfire (Davis *et al*. 2011, pp. 28, 29, 121–125).

Before the BLM northern spotted owl modeling process began, the BLM decided to use Woodstock for its planning process to forecast changes in forest stand growth and timber yield variables on the decision area (i.e., the BLM-administered lands in the planning area) (see the Vegetation Modeling Section in Chapter 3). Therefore, for the northern spotted owl modeling, the BLM created relative habitat suitability surfaces for the decision area that changed each decade for five decades (see Chapter 3, Northern Spotted Owl), using Woodstock variable outputs. In addition, to generate credible range-wide simulations of northern spotted owl demographic responses to the alternatives and the Proposed RMP using HexSim, the BLM:

- Created relative habitat suitability surfaces for all 'other lands' (i.e., lands other than BLM-administered lands in the planning area) within the northern spotted owl's range so that simulated northern spotted owls could move across planning area boundaries and respond to habitat conditions on all land ownerships inside and outside the planning area, and;
- Forecasted changes to those surfaces from forest ingrowth, timber harvest, and wildfire at the same decadal increments as its Woodstock model, something not done by either the U.S. Forest Service or U.S. Fish and Wildlife Service.

Thus, to simulate habitat conditions on the decision area, the BLM could not use the U.S. Forest Service or U.S. Fish and Wildlife Service relative habitat suitability surfaces, because the BLM needed to vary the relative habitat suitability surfaces according to each of the alternatives and the Proposed RMP and over time, using variables derived from Woodstock.

[46] Both the U.S. Fish and Wildlife Service and U.S. Forest Service trained their MaxEnt models using 1996 GNN data because the intent was to develop models that predicted the relative habitat suitability for northern spotted owls when competitive interactions with barred owl still were relatively uncommon. For this purpose, 1996 GNN data are better than 2006 and 2012 GNN data because, when associated with northern spotted owl nesting-roosting location data, they better represent the association between habitat conditions and northern spotted owl occupancy before later displacements of northern spotted owls by barred owls. Once the models were trained, both agencies projected their models to 2006 GNN data, the most recent data available. Hence, throughout the remainder of Section S-A, when the BLM refers to U.S. Fish and Wildlife Service 2006 GNN MaxEnt models or U.S. Forest Service 2006 GNN MaxEnt models it always means models developed with 1996 GNN data and applied to 2006 data.

To simulate habitat conditions on other lands within the northern spotted owl's range, the BLM originally hoped to build upon the relative habitat suitability surfaces developed by the U.S. Forest Service because:

- The similarity of scale between the BLM Woodstock variables and the U.S. Forest Service GNN variables potentially made it easier for the BLM to merge its relative habitat suitability surfaces for BLM-administered lands with those generated by the U.S. Forest Service for other lands;
- Since Woodstock generates individual variable values, instead of compositional variable values, the BLM could more-directly compare its MaxEnt models to those created by the U.S. Forest Service, and;
- Woodstock could generate the same variable values used by the U.S. Forest Service to create its relative habitat suitability surfaces, which potentially made the BLM and U.S. Forest Service surfaces more compatible.

In addition, the BLM initially hoped that unpublished U.S. Forest Service LandTrendr results could help it forecast habitat changes on other lands.

Therefore, the BLM programmed Woodstock to generate the same variables used by the U.S. Forest Service GNN MaxEnt models (see Davis *et al*. 2011, p. 99) and, using those variables, planned to apply the U.S. Forest Service's MaxEnt models to the decision area. The BLM initially hoped that there would be sufficient compatibility between the relative habitat suitability surfaces generated from the Woodstock and GNN datasets so that the BLM could use the Woodstock variable outputs for the decision area and the GNN variable outputs for all other lands. If the two sets of variable outputs were insufficiently compatible, the BLM could add a stand age variable to the Woodstock outputs to correlate the two relative habitat suitability surfaces.

Unfortunately, as described below under Model 1, the BLM found that the U.S. Forest Service MaxEnt models would not work in this way. Subsequently, the BLM went through an iterative process (described under models 1–13) to identify and account for design differences between the U.S. Forest Service and U.S. Fish and Wildlife Service GNN MaxEnt models so that the BLM could use the HexSim model developed by the U.S. Fish and Wildlife Service —with little or no recalibration—with relative habitat suitability surfaces that utilized both Woodstock data for the decision area and GNN data for other lands.

A. Developing MaxEnt Models for the Decision Area

Objectives and Selection Criteria

Since the BLM initially sought to use the U.S. Forest Service's GNN MaxEnt models, it first evaluated whether doing so was reasonable for its planning purposes. The BLM used three model assessment criteria to evaluate the utility of the U.S. Forest Service, and subsequently other, MaxEnt models:

1) Whether the current-year relative habitat suitability surface generated by the MaxEnt models had a strong correlation[47] with that generated by the U.S. Fish and Wildlife Service's MaxEnt models. The U.S. Fish and Wildlife Service calibrated its northern spotted owl HexSim model to its own relative habitat suitability surface. If the new relative habitat suitability surfaces were strongly correlated to the U.S. Fish and Wildlife Service's surface, the BLM could use the U.S. Fish and Wildlife Service's HexSim model with the new surfaces with relatively little recalibration of the HexSim model. However, if they were not strongly correlated, a long and detailed recalibration of the HexSim model would be needed. The BLM preferred to avoid a lengthy recalibration.

[47] Strong correlation: The BLM, knowing the substantive differences between the origins of the Woodstock and GNN datasets, did not choose an *a priori* minimum correlation coefficient. Instead, the BLM sought for the highest correlation coefficient it could achieve with the available datasets, and then determined if the coefficient were sufficiently strong to allow the BLM to proceed with its analyses.

2) Whether the relative habitat suitability models applied to BLM-administered lands performed similarly[48] to those applied to non-BLM-administered lands. The spatial scale for evaluating the effects of alternatives and the Proposed RMP on the northern spotted owl population was to occur over the entire geographic range of the northern spotted owl, within modeling regions, and at smaller scales. Hence, the BLM needed the models to perform similarly on the decision area and all other lands within the northern spotted owl's range.
3) Relative habitat suitability surfaces developed for the decision area had to be derived from the forest growth and timber yield variables generated by Woodstock, the most accurate data for those lands.

To determine if criterion 2 were met, the BLM evaluated how its models worked under the No Timber Harvest reference analysis by evaluating the portions of the decision area that occurred in various relative habitat suitability value bins and strength-of-selection bins (see Model 8, below, the first model so evaluated, for more information). This was a heuristic evaluation of the 'reasonableness' of the model(s) applied to decadal changes according to the No Timber Harvest reference analysis. The BLM forecasted changes at decadal intervals for 50 years. If the model(s) worked well, there would be a steady decrease in the portion of BLM-administered lands in low relative habitat suitability value bins and increases in the proportion of that land in higher relative habitat suitability value bins. This evaluation was heuristic because the BLM knew the general trajectory that would be seen if the model(s) worked reasonably well, even though it did not know the specific extent of that change.

Here, the BLM describes its process to develop relative habitat suitability surfaces that met its three assessment criteria. **Figure T-1** outlines the process.

[48] In this context, models 'performed similarly' in terms of their relative progressions, over time, through relative habitat suitability bins and strength-of-selection bins. See Model 8, below, the first model so evaluated, for descriptions of these analyses.

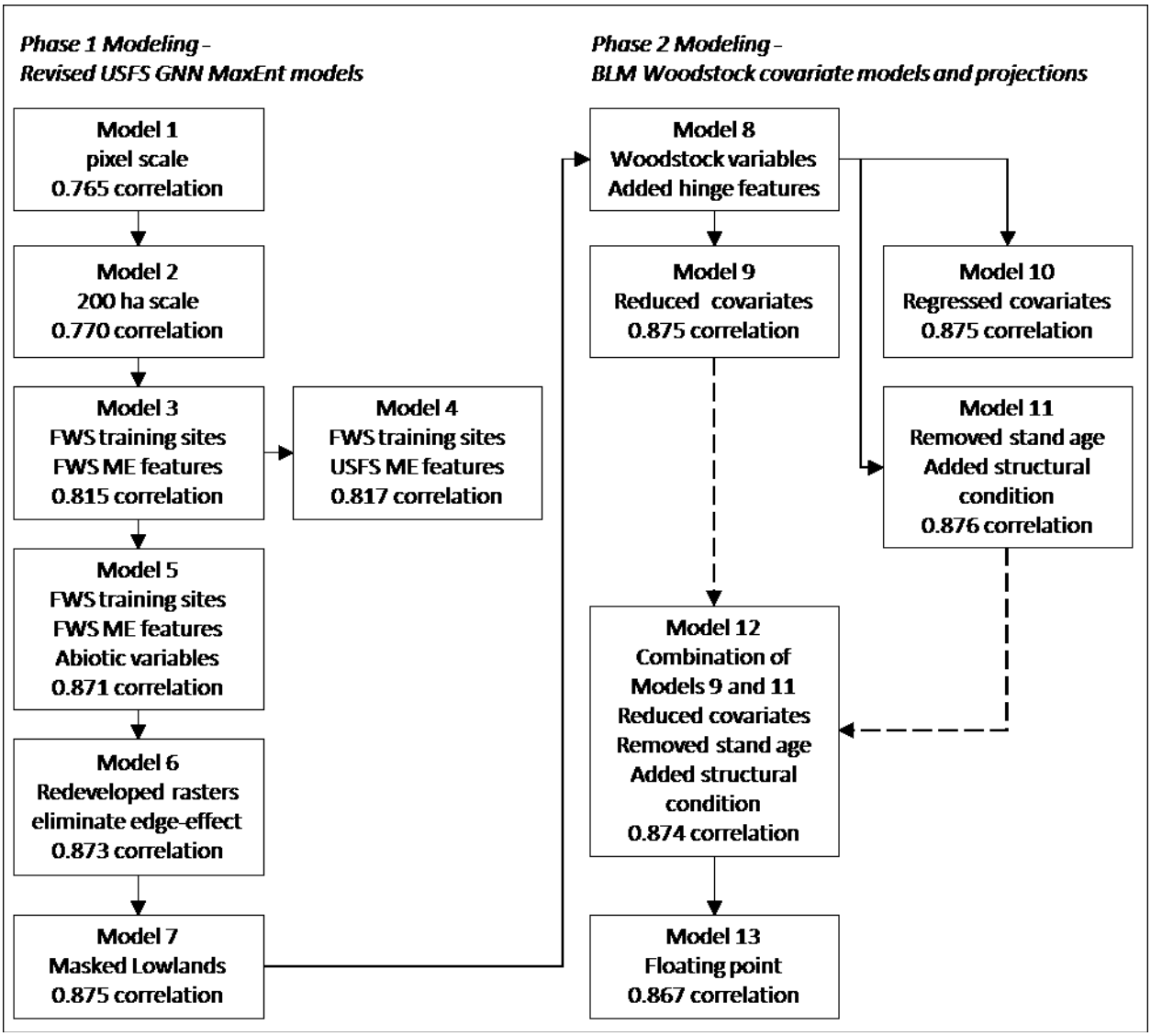


Figure T-1. Flowchart of the BLM MaxEnt modeling sequence
Note: ME refers to MaxEnt

Model 1

The BLM first conducted range-wide comparisons of the U.S. Forest Service (Davis *et al*. 2011) and U.S. Fish and Wildlife Service (USDI FWS 2011, pp. Appendix C) relative habitat suitability surfaces. The BLM overlaid the geographic range of the northern spotted owl with a grid of 86.6-ha hexagons—the grid used by the U.S. Fish and Wildlife Service's HexSim model (USDI FWS 2012, p. 24)—and compared the relative habitat suitability values of both sets of models in each hexagon. As shown in **Figure T-2** the two sets of models produced dissimilar results; the U.S. Fish and Wildlife Service 2006 GNN MaxEnt models estimated more of the landscape to be in the lowest (relative habitat suitability values 0–10) and highest (values greater than 40) bins, whereas the USDA FS 2006 GNN MaxEnt models estimated more of the landscape to be in the middle (values 11–40) bins. These results were not unexpected because, as described above, the U.S. Forest Service and U.S. Fish and Wildlife Service calculated relative habitat suitability values at different scales.

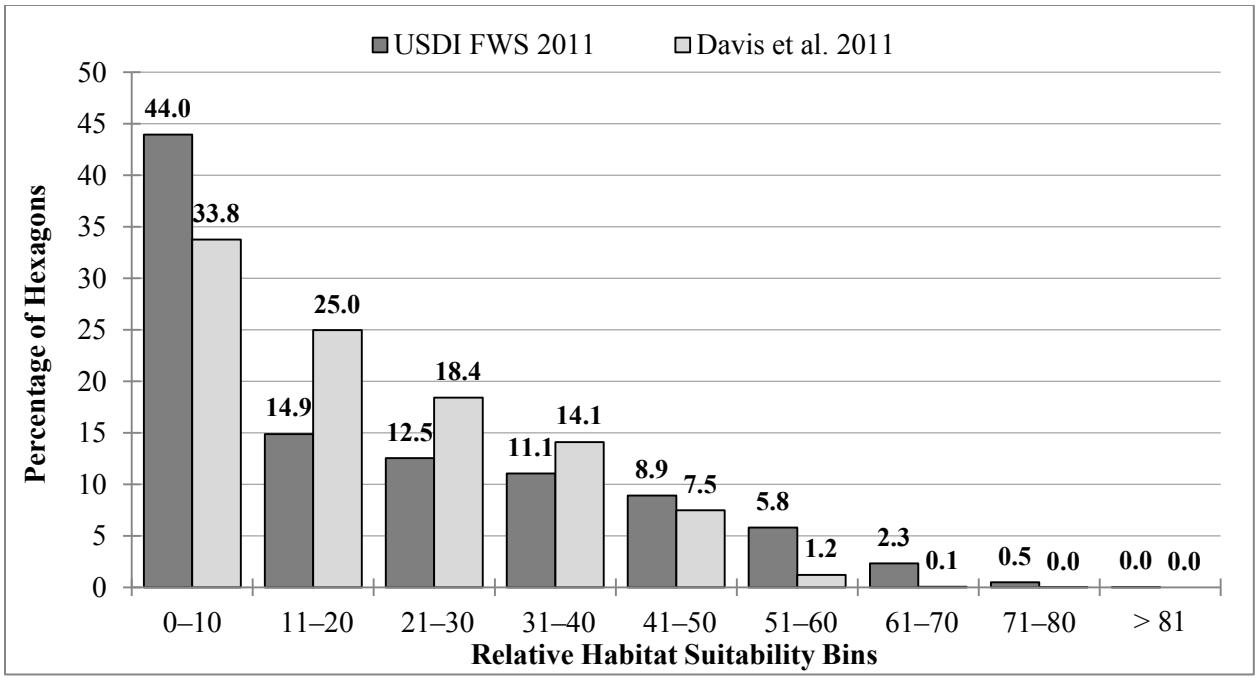


Figure T-2. Distribution of hexagons relative habitat suitability scores among various bins from 2006 GNN MaxEnt models developed by the U.S. Fish and Wildlife Service and the U.S. Forest Service
Source: USDI FWS 2011, pp. Appendix C; Davis *et al*. 2011

The correlation (Pearson r) between hexagon relative habitat suitability values for the two sets of models was 0.765. The BLM sought a stronger relationship as well as greater similarity in the distribution of relative habitat suitability scores. The BLM determined that the U.S. Forest Service 2006 GNN MaxEnt models failed assessment criterion 1.

Model 2

The Model 1 results suggested the influence of an artifact-of-scale; i.e., the correlation would have been stronger if the two sets of MaxEnt models had been calculated at the same scale. Therefore, the BLM ran the comparison again at the 200-ha scale used by the U.S. Fish and Wildlife Service because the GNN data in part were derived from satellite imagery, the spatial accuracy of which increases with scale. Stated another way, although the GNN variable data reasonably describe forest conditions on a landscape, they are less accurate at the 30 × 30 m pixel scale used by the U.S. Forest Service (see Ohmann and Gregory 2002 and http://www.fs.fed.us/wwetac/projects/ohmann.html). The BLM chose the 200-ha scale, because the BLM intended to use its relative habitat suitability surfaces with the U.S. Fish and Wildlife Service's HexSim model, in which simulated northern spotted owls 'select' habitat from a relative habitat suitability surface, and the scale at which northern spotted owls are known to strongly select habitat is the 200-ha (i.e., ~ 500-acre) core use area (see Chapter 3, Northern Spotted Owl).

MaxEnt examines a variety of variables associated with known northern spotted owl nest locations and identifies those variables and combinations of variables, and the relative importance of each variable/combination, that best discriminate between occupied and available locations. The U.S. Forest Service (Davis *et al*. 2011) divided the northern spotted owl range into six modeling regions and used MaxEnt to identify and weigh the best variables/combinations in each region, creating a unique MaxEnt model for each region. To alter the scale of the U.S. Forest Service relative habitat suitability surface, the BLM ran MaxEnt on the same modeling regions defined by the U.S. Forest Service, using the U.S. Forest Service 1996 GNN MaxEnt model for each region, but at the 200-ha scale. In other words, the BLM

created a new set of MaxEnt models (Model 2) by running MaxEnt, with the region-specific models developed by the U.S. Forest Service, to calculate new relative habitat suitability values for each 30 × 30-m pixel based on the mean of the values of each variable within the 200-ha circle around each pixel.

The correlation between the U.S. Fish and Wildlife Service 2006 GNN MaxEnt model and the Model 2 estimated relative habitat suitability for hexagons was 0.770. To meet assessment criterion 1, the BLM sought a stronger relationship.

Model 3

Keeping in mind that the U.S. Forest Service (Davis *et al*. 2011) and the U.S. Fish and Wildlife Service (USDI FWS 2011) developed their MaxEnt models for different purposes, the BLM addressed another difference between the two model sets. The U.S. Forest Service MaxEnt models used northern spotted owl nest and pair roost sites from the demographic study areas supplemented by a random subset of northern spotted owl pair sites from the 10-year monitoring report training data set (Davis and Lint 2005) that were outside of the study area boundaries and spaced no nearer to each other than the mean nearest neighbor distance for that modeling region (Ray Davis, U.S. Forest Service, personal communication via e-mail to Eric Greenquist, October 21, 2014). In contrast, the U.S. Fish and Wildlife Service MaxEnt models considered a subset of all known sites (USDI FWS 2011, p. C-21). Because northern spotted owl *known* nest sites tend to occur at greater densities in better habitat, and in areas that received more survey, when MaxEnt considers all sites, it calculates formulas that can be biased by the similarity of the variables around proximal sites. To help control for this, the U.S. Forest Service and U.S. Fish and Wildlife Service used different approaches to limit the number of known sites MaxEnt could consider (i.e., aware of biased datasets, the agencies took different steps to reduce the bias). For Model 3, and all subsequent models, the BLM used the same northern spotted owl locations used by the U.S. Fish and Wildlife Service.

The BLM also used the same MaxEnt feature sets used by the U.S. Fish and Wildlife Service. Features, in MaxEnt, refer to the functional forms or shapes of relationships evaluated in MaxEnt. The BLM did this to determine if it could use variables used by the U.S. Forest Service (albeit, at the different scale) and that the BLM could estimate with Woodstock, while, at the same time, minimizing other differences between the U.S. Forest Service and the U.S. Fish and Wildlife Service models so that the differences in the respective relative habitat suitability surfaces would not be a function of the differences in either training location or MaxEnt specifications (e.g., the features used).

The correlation between the U.S. Fish and Wildlife Service 2006 GNN MaxEnt models and the Model 3 estimated relative habitat suitability for hexagons was 0.815, an improvement from previous models. Although the BLM determined that this correlation coefficient was sufficiently strong to meet assessment criterion 1, it sought a stronger relationship.[49]

Model 4

Model 4 was identical to Model 3 except that the BLM returned to the MaxEnt features used by the U.S. Forest Service (Davis *et al*. 2011). The correlation between the U.S. Fish and Wildlife Service 2006 GNN MaxEnt models and the Model 4 estimated relative habitat suitability for hexagons was 0.817, nearly identical to that of Model 3, indicating that models 3 and 4 were nearly identical in their predictive capabilities.

[49] Although the BLM did not set an *a priori* correlation coefficient to evaluate model assessment criterion 1, statisticians commonly consider a Pearson r coefficient above 8.0 to be strong or very strong (e.g., Dancey and Reidy 2004).

Model 5

Model 5 was identical to Model 3 except that the BLM added the abiotic variables elevation, curvature, and relative slope position index (USDI FWS 2011, p. C-25 and Table C9). The correlation between the U.S. Fish and Wildlife Service 2006 GNN MaxEnt models and the Model 5 estimated relative habitat suitability for hexagons increased to 0.871. The BLM determined that this correlation coefficient met criterion 1, but it evaluated whether a stronger relationship was possible.

Model 6

Model 6 was identical to Model 5 except that the BLM redeveloped the variable rasters to match the methods used by the U.S. Fish and Wildlife Service (USDI FWS 2011, p. C-60). The BLM generated GNN variable rasters using buffered U.S. Forest Service modeling regions to eliminate edge effect. Because variable values reflect the mean of all values within a 200-ha circle, the MaxEnt model for a modeling region can be influenced by the lack of data beyond the regional boundary (i.e., up to 800 m beyond the boundary, the area potentially within the radius of a 200-ha circle). Buffering the modeling region caused MaxEnt to clip data at the regional boundary and calculate mean values from only variable values within the region.

The correlation between the U.S. Fish and Wildlife Service 2006 GNN MaxEnt models and the Model 6 estimated relative habitat suitability for hexagons was 0.873. The BLM evaluated whether a stronger relationship was possible.

Model 7

Model 7 was identical to Model 6 except that the BLM masked those portions of western Oregon, such as the Willamette Valley and Puget Lowlands that, due to limited habitat, support few, if any, northern spotted owls. This forced MaxEnt to consider more subtle associations between northern spotted owl sites and the habitat variables associated with those sites. In the BLM MaxEnt analyses, masked areas became unavailable to be included in the random subset of available locations to which MaxEnt compared locations occupied by northern spotted owls. Masking these areas resulted in MaxEnt formulas based on forests in which northern spotted owls occurred compared to other, available, forested areas rather than to the broader array of habitat types, some of which were unoccupied by northern spotted owls. This eliminated major areas of non-potential habitat from the models.

The correlation between the U.S. Fish and Wildlife Service 2006 GNN MaxEnt models and the Model 7 estimated relative habitat suitability for hexagons was 0.875.

Through the development of Model 7, the BLM had worked to refine the compatibility of the BLM regional MaxEnt models with those used by the U.S. Fish and Wildlife Service in its HexSim model. As stated earlier, the BLM saw the opportunity to use the unpublished U.S. Forest Service (Davis *et al*. 2011) LandTrendr data to help it forecast changes in relative habitat suitability values on other lands within the northern spotted owl range (lands other than BLM-administered lands in the planning area), and the BLM saw the opportunity to use the U.S. Fish and Wildlife Service's HexSim model to forecast northern spotted owl population responses. With a 0.875 correlation between the Model 7 relative habitat suitability surfaces and those developed by the U.S. Fish and Wildlife Service (both of which used 2006 GNN data), the BLM was confident of its reconciliation.

Model 8

Beginning with Model 8, the BLM replaced the 2006 GNN variable values for the decision area with those produced by Woodstock for 2013. Because the BLM, at this stage, was developing relative habitat suitability surfaces for its administered lands within the planning area, the BLM also begin limiting this, and subsequent models, to the three western Oregon modeling regions defined by the U.S. Forest Service: the Oregon Coast Range, Oregon and California Cascades, and Oregon and California Klamath modeling regions (Davis *et al*. 2011, p. 35). Finally, the BLM added the hinge feature to MaxEnt, adding this feature to the threshold, quadratic and linear features the BLM had added to Model 3. Adding the hinge feature allowed MaxEnt to consider more subtle associations between variables, an attempt to improve its predictive capability.

With these changes, the BLM began an iterative modeling process to—

1. Project the current MaxEnt model for each of the three western Oregon modeling regions to the Woodstock variables (i.e., beginning with Model 8, apply the Model 8 MaxEnt formulas to the 2013 Woodstock-generated variable values for the decision area) by using the MaxEnt .lamdas files from the model developed with the 1996 GNN data;[50]
2. Evaluate the projected MaxEnt outputs by (a) relative habitat suitability bins and (b) strength-of-selection habitat class distributions[51] through the decadal time-series (2013-2063);
3. Refine the model variables (i.e., generate new models, beginning with Model 9), and;
4. Repeat steps 1 through 3 with each set of new and refined MaxEnt models until all three of the assessment criteria were met.

As further explanation, MaxEnt is a multivariate model; i.e., its predictions are influenced by both the state of individual variables and how each variable co-varies with the other model variables. The U.S. Fish and Wildlife Service (USDI FWS 2011) and U.S. Forest Service (Davis *et al*. 2011) MaxEnt models were projected to 2006 GNN data. In contrast, for the decision area, the BLM would use the variable values derived from Woodstock. Thus, the BLM began evaluating how the 2006 GNN- and 2013 Woodstock-derived variables co-varied.

Figure T-3 shows scatterplots of the relationship between each pair of the biotic variables from 2006 GNN data (left) and 2013 Woodstock data (right) for the decision area. The BLM did not evaluate abiotic variables because the sources of those variables are the same for both models. For the initial comparisons, the BLM evaluated 2006 GNN data (the most recent dataset available at the time) and Woodstock's estimates for 2013 conditions on the decision area. It is important to note that the GNN and Woodstock datasets were derived through substantively different processes, so the BLM anticipated substantive, albeit undefined, differences between the two datasets.

[50] To clarify: The BLM developed all of its MaxEnt models using 1996 GNN data, then projected those models to 2006 GNN, 2012 GNN and 2013 Woodstock data.

[51] Based on its modeling needs (see Chapter 3, Northern Spotted Owl), the BLM divided northern spotted owl habitat into categories based on strength-of-selection. This was similar to the process used by the U.S. Fish and Wildlife Service (USDI FWS 2011, pp. C-31 – C-39) but, in the BLM's case, the BLM used four categories: (1) 'strongly selected against,' (2) 'selected against,' (3) 'selected for,' and (4) 'strongly selected for.' For additional information, see **Sections C** of this appendix.

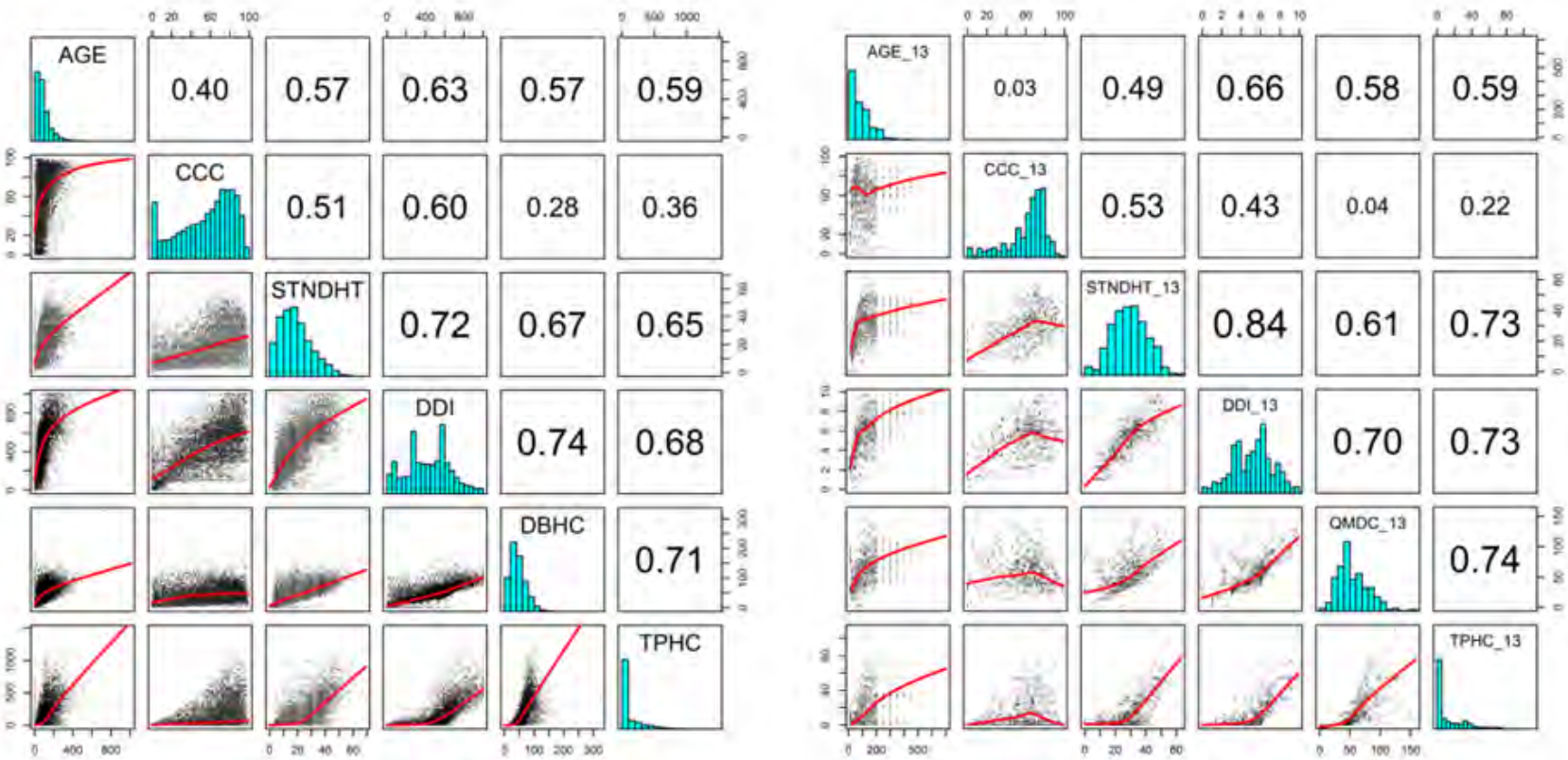


Figure T-3. Bivariate scatterplots for select 2006 GNN variables for the three western Oregon modeling regions (left) and 2013 Woodstock variables for the decision area (right)

Note: Both matrices display the XY scatter plots for each pair of variables, using a non-linear LOWESS smoother (locally-weighted scatterplot smoothing, a type of non-parametric regression) for the fitted line, in the lower left, the covariate histogram for each pair of variables across the diagonal, and the Pearson's correlation coefficient for each pair of variables in the upper right. Variable abbreviations are defined in the text, below, except DBHC, which refers to the mean trunk diameter of conifers, similar to quadratic mean trunk diameter of dominate and co-dominate conifers (QMDC_13).

The comparisons revealed very different relationships between stand age (AGE in **Figure T-3**) and canopy cover of all conifers (CCC), stand age and stand height (STNDHT), stand age and the number of large conifer trees per hectare (TPHC), canopy cover of all conifers and stand height, canopy cover of all conifers and stand diameter diversity index (DDI), canopy cover of all conifers and quadratic mean trunk diameter of conifers (QMDC), and canopy cover of all conifers and the number large conifer trees per hectare. Most disconcerting were the differences in the relationships of conifer canopy cover to stand height, diameter diversity index, mean conifer trunk diameter, and the number of large conifer trees per hectare. In all cases, Woodstock estimated that, as canopy cover increased beyond approximately 70 percent, each of these variables would decrease. In contrast, GNN represented these same relationships as increasing in all cases, though the rate of increase varied from slight (number of large conifer trees per hectare) to rapid (stand height and stand diameter diversity index).

In accordance with assessment criterion 2 the BLM also compared the models in terms of decadal progressions of relative habitat suitability. To this point, the correlations the BLM had calculated were between the U.S. Fish and Wildlife Service 2006 GNN MaxEnt models and the BLM 2006 GNN MaxEnt models at both modeling region and range-wide scales. For the BLM Woodstock models, the focus of the evaluation was the temporal trend in relative habitat suitability and habitat distributions. Given that the first projection of habitat change in the BLM's Woodstock model was the No Timber Harvest reference analysis, the BLM expected that the percentage of BLM-administered lands with low relative habitat suitability would decrease while the percentage in intermediate and higher relative habitat suitability would increase. The BLM based this expectation on its knowledge that northern spotted owls preferentially select areas with larger trees and more structural complexity and, as trees get older, they get larger, and such forests acquire more structural diversity. The BLM did not have a specific expectation on the exact quantity or percentage of BLM-administered lands in lower, intermediate, and high relative habitat suitability bins, only of the trends over time in each of those bins. The BLM's evaluations were meant to check on the trends.

However, as shown in **Figure T-4**, although the temporal trends in relative habitat suitability showed a reduction over time in the percentage of the landscape in the lowest relative habitat suitability categories and an increase in the highest relative habitat suitability category, the trend in the intermediate categories (40–50, 50–60, 60–70) were in the opposite direction than what was expected, particularity in the Oregon and California Cascades Modeling Region (**Figure T-4 B**).

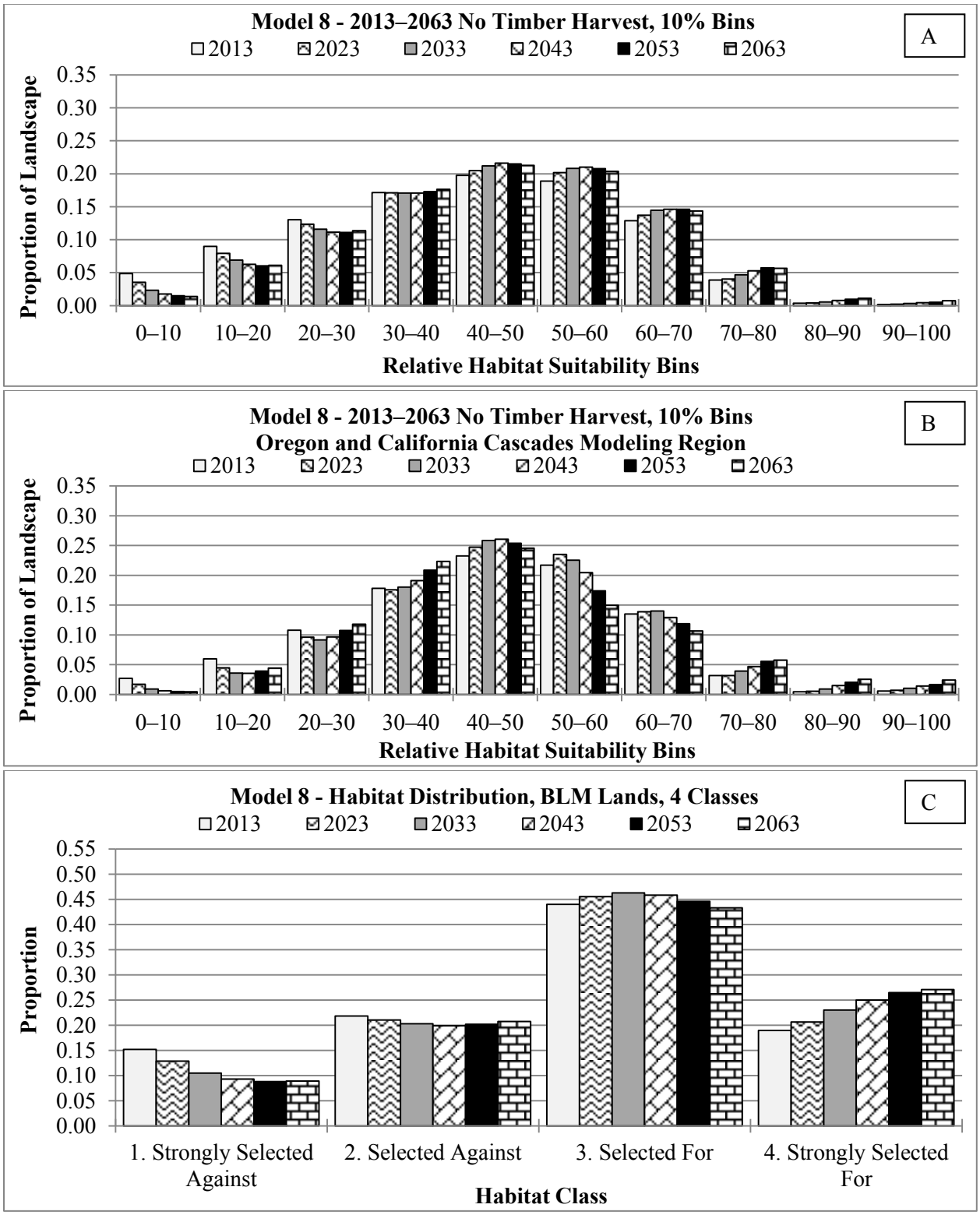


Figure T-4. No Timber Harvest: distribution of relative habitat suitability by decade for Model 8, on the decision area (A and C), and on BLM-administered lands in the Oregon and California Cascades Modeling Region (B)

Note: Histograms A and B show BLM-administered lands in each relative habitat suitability bin at the start of each of six decades. Histogram C shows BLM-administered lands in each strength-of-selection bin at the start of each of six decades.

In part, these trends in variable value with age and relative habitat suitability progression arose because the models generated from Woodstock variable data were not always indicative of how forests on BLM-administered lands develop. For example, an existing 140-year-old stand on BLM-administered lands does not exhibit the structural characteristics that an existing 40-year-old stand would be expected to exhibit in one-hundred years. The 40-year old stand might have received commercial thinning and other silvicultural practices that would result in different stand metrics when it eventually becomes 140 years old. Timber harvests before 1960 tended to be more extensive and intensive than later harvests, and subsequent regeneration commonly occurred through natural seeding. In contrast, timber harvests after 1960 more likely left legacy trees and riparian buffers, and the subsequent regeneration more commonly was the result of planting, fertilization, and thinning. Thus, younger stands on BLM-administered lands commonly exhibit some structural characteristics, such as canopy cover, that are greater than those of some older stands.

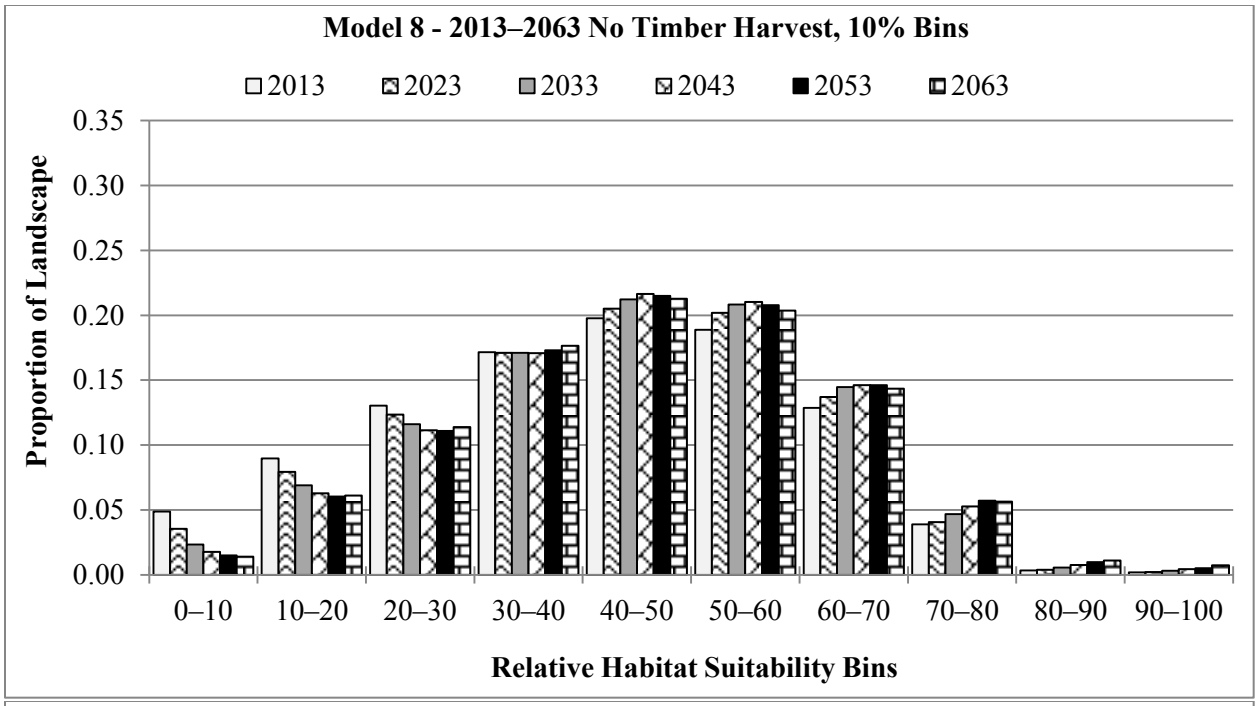
This analysis revealed that the BLM could not simply use Model 8 with the Woodstock-derived variable values. For example, as shown in **Figure T-3**, in the BLM 2013 Woodstock MaxEnt model, stand height was very influential. In the 2006 GNN data, stand height increased nearly linearly with stand age (**Figure T-3**, left matrix, STNDHT/AGE). In contrast, according to the 2013 Woodstock data, stand height increased rapidly with increasing age for young stands, but then the rate of increase decreased dramatically (**Figure T-3**, right matrix, STNDHT_13/AGE_13). The effect of these many differences was that, when the BLM used the Model 8 MaxEnt formulas (which were derived from 1996 GNN data) with the 2013 Woodstock variable values, relative habitat suitability decreased as stands got older, or, at least, their rate of increase was less than represented by the GNN data. Therefore, the BLM had to further modify the MaxEnt model to better reconcile how the 2013 Woodstock and 2006 GNN variables co-varied.

The BLM dealt with the appreciably different forms of relationships between the 2006 GNN and 2013 Woodstock variables by removing some of those variables, as described below. At this point, the BLM questioned whether it could meet model assessment criteria 2 and 3, especially given that age was an influential variable in the models. Additionally, similar to previous models, the BLM evaluated whether it could find stronger relationships between its newly developed models and the model developed by USDI FWS (2011).

Model 9

Model 9 was identical to Model 8 except that the BLM reduced the variable set of each modeling region based on its evaluation of differences in 2006 GNN and 2013 Woodstock variable distributions observed in the scatterplots and histograms generated by Model 8. The BLM removed those variables that strongly influenced a model's predictions and co-varied with other variables substantially differently within the 2006 GNN and 2013 Woodstock data. For the Oregon and California Klamath Region the BLM removed canopy cover of all conifers (CCC in **Figure T-3**) and the number of large conifer trees per hectare (TPHC); for the Oregon and California Cascades Region the BLM removed stand height (STNDHT) and the number of large conifer trees per hectare; and for the Oregon Coast Range Region the BLM removed stand height. Removing these variables allowed other variables to become more influential in the models. The reduced sets of variables produced what the BLM interpreted as a more reasonable distribution of changes in relative habitat suitability by decade, given the habitat change under the No Timber Harvest reference analysis.

Figure T-5 and **Figure T-6** compare the results of Models 9 and 8; Model 9 demonstrated a more-expected distribution of relative habitat suitability by decade.



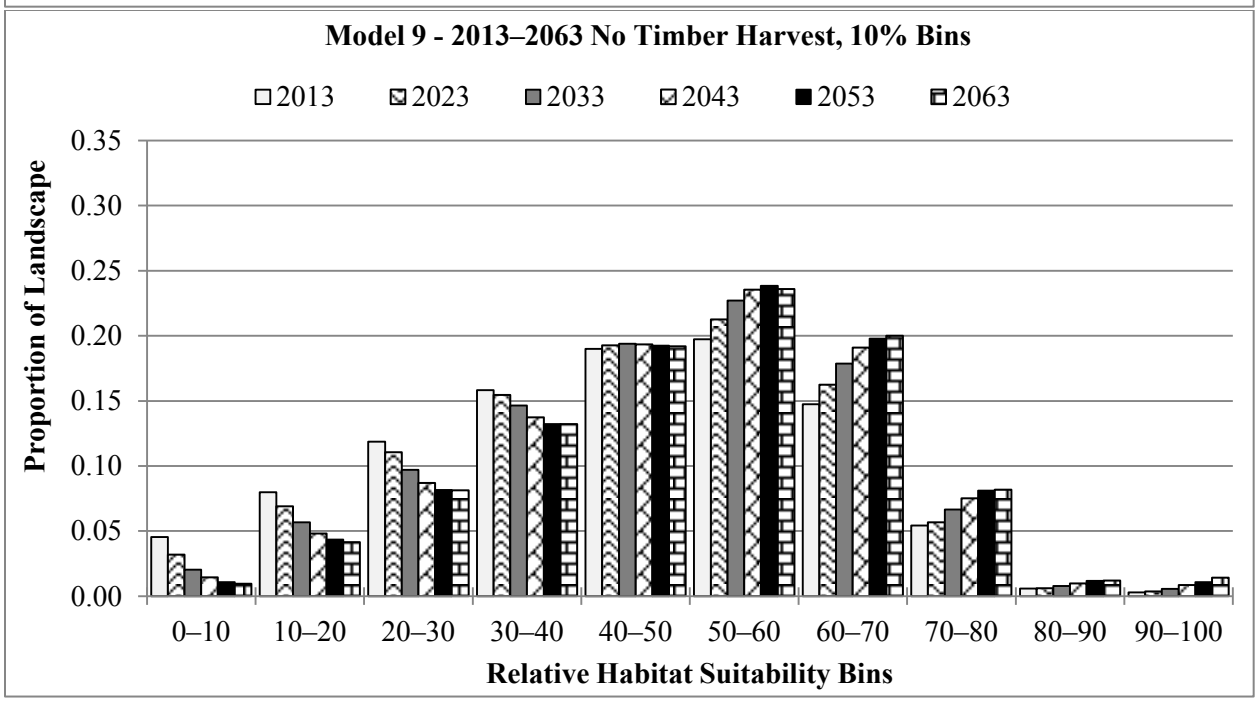


Figure T-5. No Timber Harvest: distributions of relative habitat suitability by decade for Model 8 (top) and Model 9 (bottom) on the decision area

Note: The histograms show the portion of BLM-administered lands in each relative habitat suitability bin at the beginning of each of six decades.

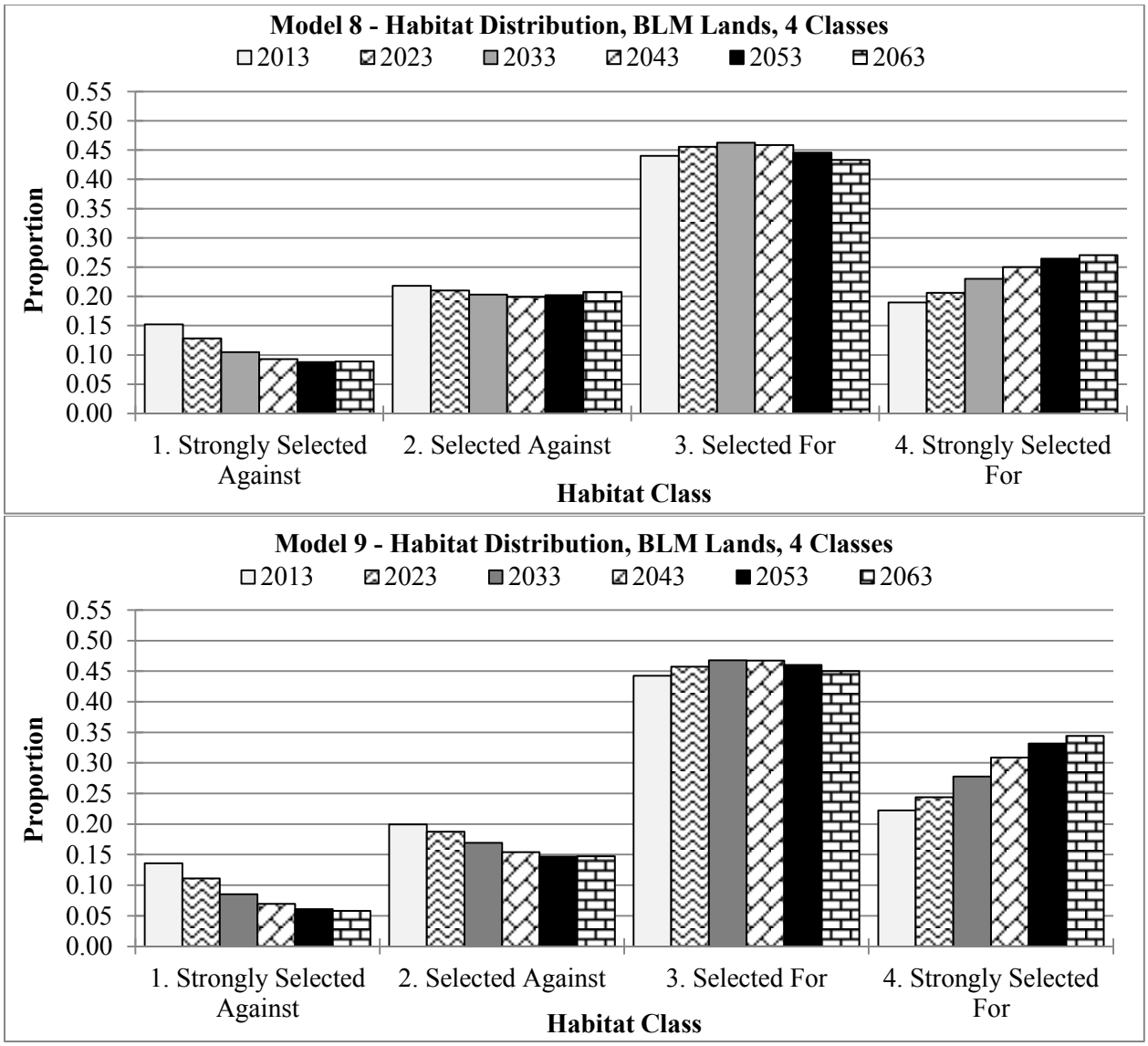


Figure T-6. No Timber Harvest: distribution of relative habitat suitability by decade for Model 8 (top) and Model 9 (bottom), on the decision area

Note: The histograms show the portion of BLM-administered lands in each strength-of-selection bin at the beginning of each of six decades.

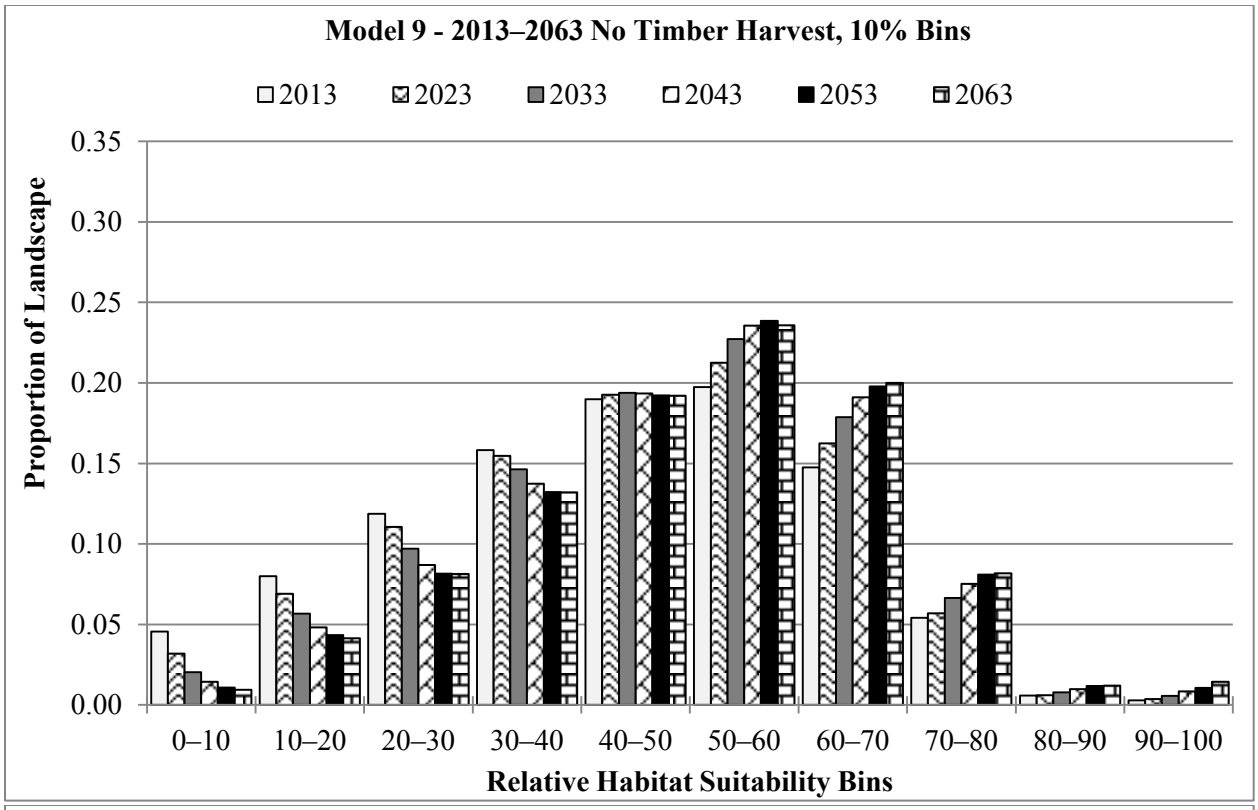
The correlation between the U.S. Fish and Wildlife Service 2006 GNN MaxEnt models and the Model 9 estimated relative habitat suitability for hexagons was 0.875, identical to that of Model 7. Nonetheless, the lack of the expected increase in the selected-for habitat class in **Figure T-6** indicated the need for further refinement. The BLM still questioned whether it could meet model assessment criteria 2 and 3, given that age was an influential variable in the models.

Model 10

Model 10 was identical to Model 8 except that, for those modeling regions and for those variables that showed declines with age, the BLM created regression equations to predict each of those variables as a function of age. The regression equations that best fit the data always were logarithmic (threshold)

relationships and had the effect of smoothing the associations. The BLM did this because these variables appeared in the original 2006 GNN MaxEnt models, but, for the 2013 Woodstock representation of BLM-administered lands, they sometimes showed counter-intuitive relationships—such as mean tree diameter and stand height declining as stands aged—only to sometimes increase at older ages. In part, these relationships probably were an artifact of limited data; relatively few BLM inventory plots exist in forest stands with very old trees. The BLM developed these regression equations within each of the three western Oregon modeling regions. The BLM also removed canopy cover of all conifers from the set of modeling covariates, because the distribution relative to age, even when regressed, was highly inconsistent with GNN canopy cover distributions.

As shown in **Figure T-7**, when compared to Model 9, Model 10 generated a more-expected and logical trend in relative habitat suitability change over time. The correlation between the U.S. Fish and Wildlife Service 2006 GNN MaxEnt models and the Model 10 estimated relative habitat suitability for hexagons again was 0.875. However, the BLM subsequently determined that Model 10 was not viable due to issues with the stand age variable.



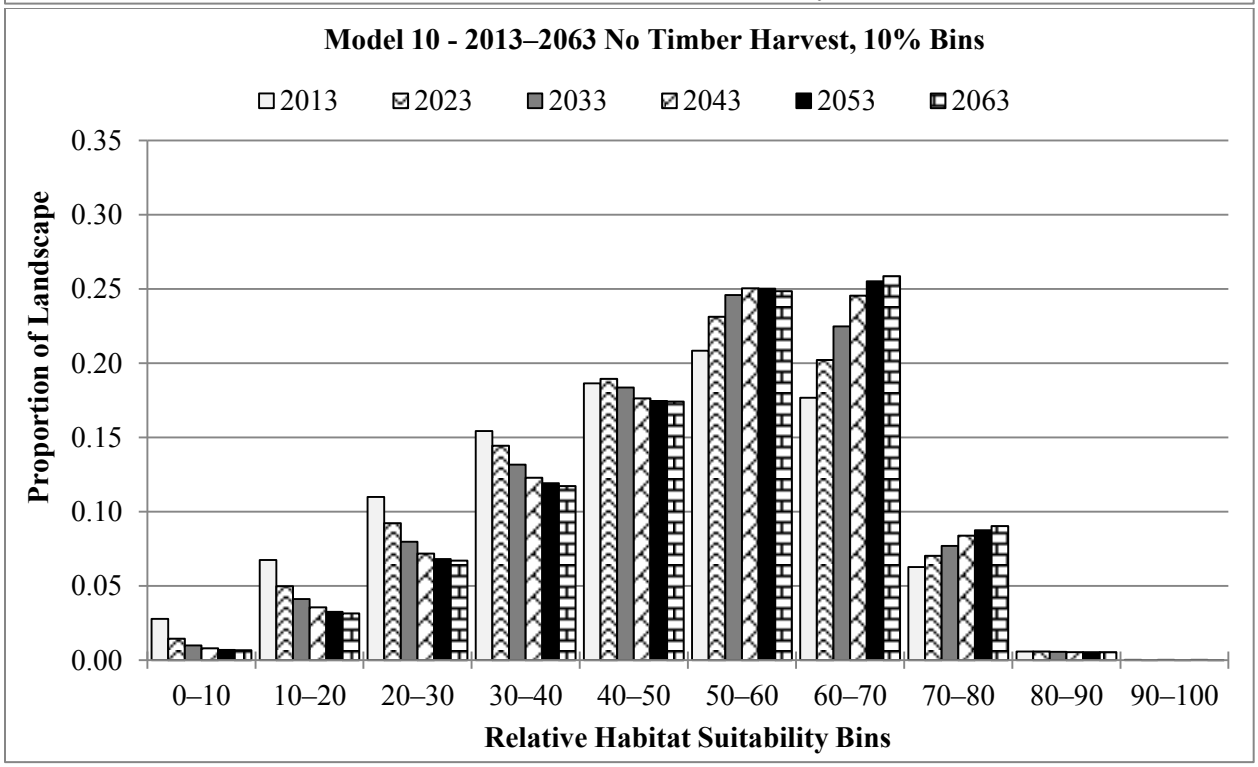


Figure T-7. No Timber Harvest: distributions of relative habitat suitability by decade for Model 9 (top) and Model 10 (bottom) on the decision area

Note: The histograms show the portion of BLM-administered lands in each relative habitat suitability bin at the beginning of each of six decades.

Woodstock, when it forecasts the treatment of a stand, does not threat stand age consistently. Instead, when Woodstock forecasts a treatment, it retains the original stand age or resets the stand age to 0, depending on the nature of the treatment (e.g., light thinning versus regeneration harvest). Thus, over time, forest stands of the same age value could have substantially different values for other variables. Since the BLM was creating relative habitat suitability surfaces for different decadal time steps, it could not rely on stand age as a variable. For this reason, Model 10 was not viable.

Model 11

Model 11 was identical to Model 8 (using non-regressed covariates) except that the BLM removed age as a variable for the reason described under Model 10. Instead, the BLM added the Woodstock "structural condition" variable because structural condition is a GNN-defined categorical variable that also can be derived from Woodstock data. The GNN structural condition classes included: sparse, open, sapling/pole, small/medium tree, large tree, and large/giant tree.

The correlation between the U.S. Fish and Wildlife Service 2006 GNN MaxEnt models and the Model 11 estimated relative habitat suitability for hexagons was 0.876, almost identical to that of Model 9. Nonetheless, as shown in **Figure T-8**, regarding model assessment criterion 2, the modified set of variables resulted in relative habitat suitability progressions that the BLM interpreted as less logical than expected.

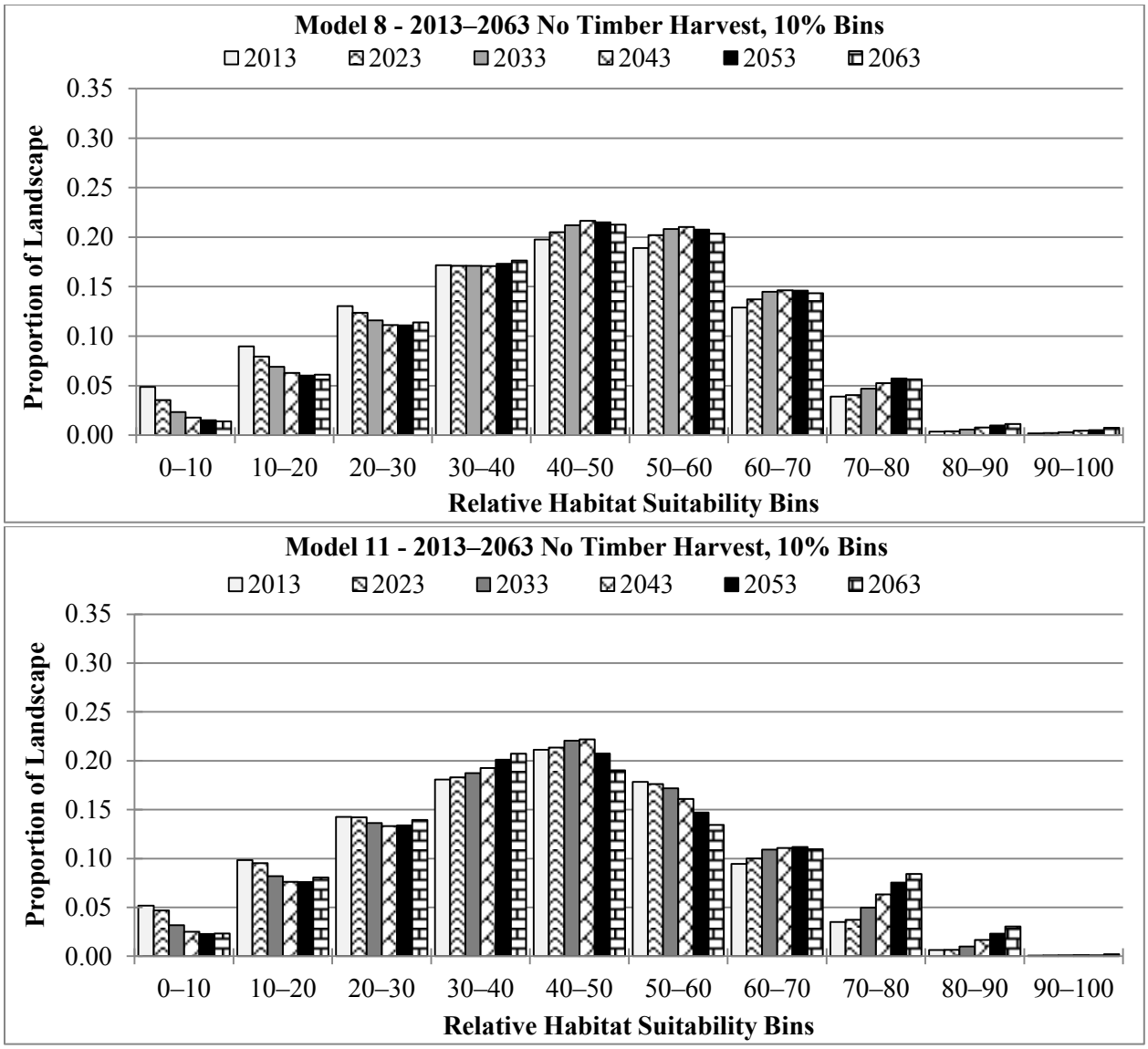


Figure T-8. No Timber Harvest: distributions of relative habitat suitability by decade for Model 8 (top) and Model 11 (bottom) on the decision area

Note: The histograms show the portion of BLM-administered lands in each relative habitat suitability bin at the beginning of each of six decades.

Model 12

Model 12 was a combination of the refinements implemented in models 9 and 11. The BLM used the same reduced set of variables used in Model 9, and removed age (because of the age-related issues described under Model 10) and added structural condition as it had in Model 11.

Figure T-9 and **Figure T-10** compare the decadal relative habitat suitability progressions under Models 9 and 12. Although Model 9 had generated the best previous distribution, it also included stand age as a variable, which Woodstock did not treat in a consistent manner. Model 12 was the best set of revised variables the BLM was able to develop. The Model 12 relative habitat suitability progressions were very similar to those for Model 9 in terms of showing the expected progression of relative habitat suitability by

decade, but also showed slightly lower relative habitat suitability values overall (as seen in the higher suitability bins).

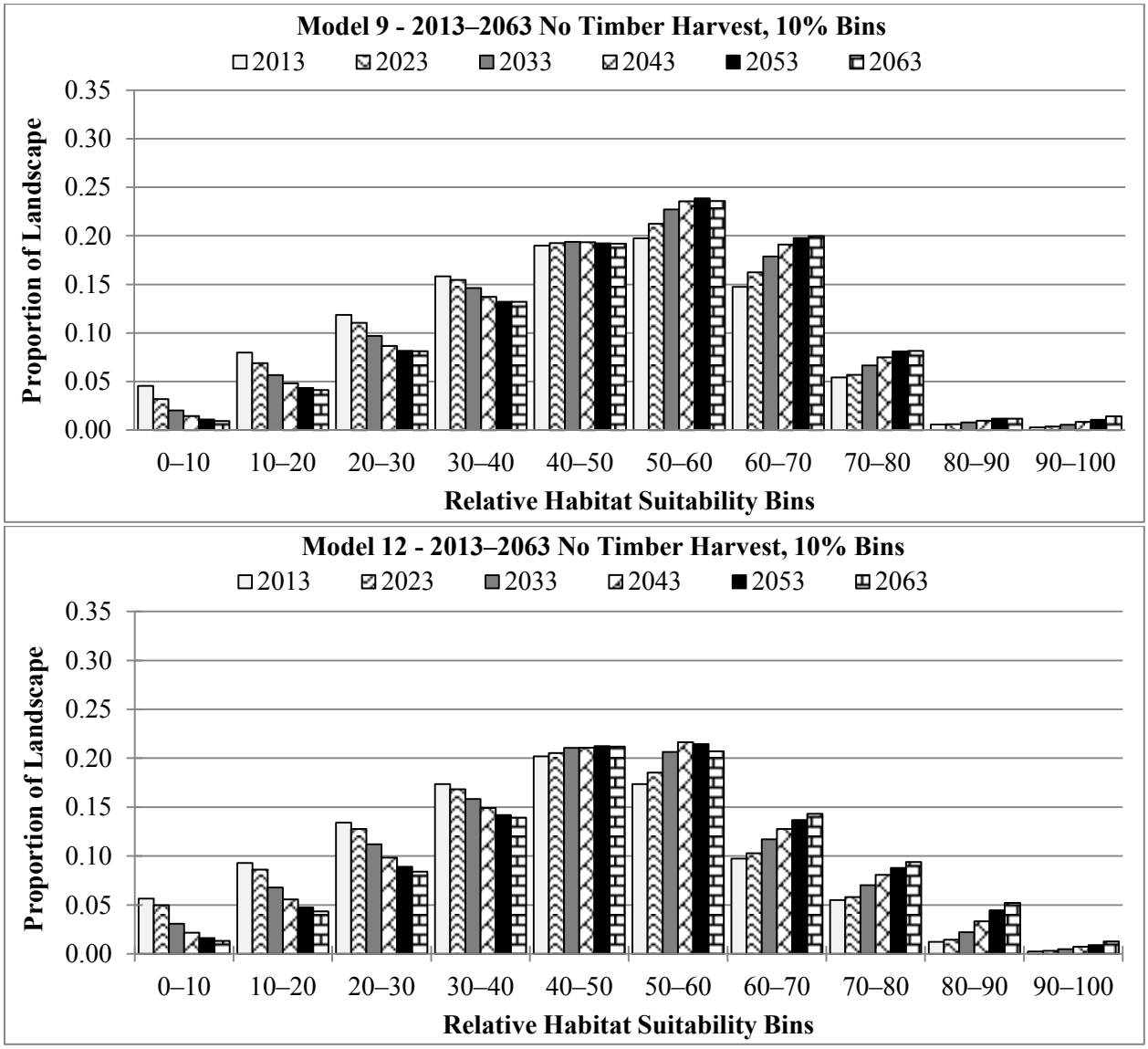


Figure T-9. No Timber Harvest: distributions of relative habitat suitability by decade for Model 9 (top) and Model 12 (bottom) on the decision area

Note: The histograms show the portion of BLM-administered lands in each relative habitat suitability bin at the beginning of each of six decades.

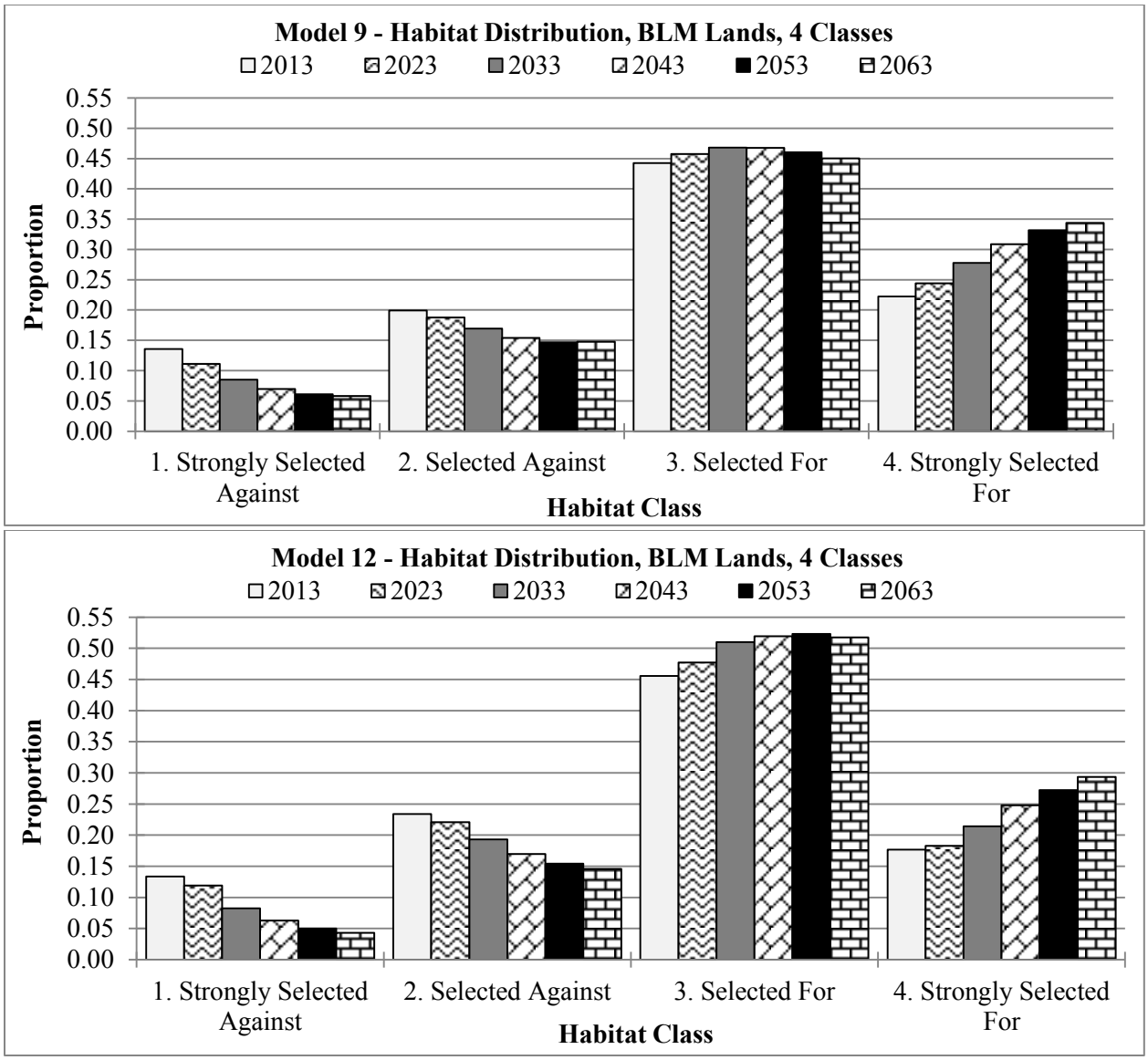


Figure T-10. No Timber Harvest: distribution of relative habitat suitability by decade for Model 9 (top) and Model 12 (bottom) on the decision area

Note: The histograms show the portion of BLM-administered lands in each strength-of-selection bin at the beginning of each of six decades.

The correlation between the U.S. Fish and Wildlife Service 2006 GNN MaxEnt models and the Model 12 estimated relative habitat suitability for hexagons was 0.874. Based on this correlation coefficient and the progressions shown in **Figure T-9** and **Figure T-10**, the BLM determined that Model 12 fulfilled its three model assessment criteria.

Model 13

Model 13 became the final BLM model. It was identical to Model 12, except that the BLM used floating point values, rather than integer values, to conform GNN covariate values to Woodstock output precision (i.e., to better reconcile the data going into the 2006 GNN and 2013 Woodstock models). Floating point values include decimals; integers are whole numbers.

The correlation between the U.S. Fish and Wildlife Service 2006 GNN MaxEnt models and the Model 13 estimated relative habitat suitability for hexagons was 0.867. For the three western Oregon modeling regions, this set of models included eleven variables for each of the modeling regions. **Table T-1** shows the variables and their relative contributions. As described below, the BLM determined that Model 13 fulfilled its three model assessment criteria. The BLM's earlier attempts to fine-tune models so as to increase the correlation between its newly-developed models and those of the USDI FWS (2011) were reasonable but, by this point, the BLM recognized that hexagon correlations of 0.860 to 0.870 were as strong as it likely would get, given inherent differences in the sources of the 2006 GNN and 2013 Woodstock variables.[52]

Table T-1. Model 13 variables and percent contributions by modeling region

Covariate	Covariate Description	KLAMT	ORCAS	ORCOA
ccc	Canopy cover of all conifers		0.45	1.0213
curv	Topographic curvature	5.0242	3.122	2.3622
dbhc	Basal-area weighted mean diameter of all live conifers	1.0851	11.3159	0.2664
ddi	Diameter diversity index	5.5428	40.1345	12.9418
elev	Elevation	1.1043	4.1592	2.6962
evghwd	Evergreen hardwood composition type	2.4068	4.1657	7.8237
oak	Oak composition type	6.6165	0.8094	
pine	Pine composition type	2.0507	13.552	6.4613
rpi	Relative position index (% slope position in 200 ha window)	29.631	12.8439	9.5835
stndht	Stand height, computed as average of heights of all dominant and co-dominant trees	44.6563		
struccond	Structural condition (lumping of Johnson and O'Neil's (2001) SIZECL and COVCL	0.3544	4.4098	0.2031
subalp	Sub-alpine composition type	1.528	5.0377	1.6429
tphc	Density of all live conifers ≥ 75 cm DBH			54.9975

Note: Missing values indicate that the BLM did not use the variable for the modeling region. The modeling regions are the Oregon and California Klamath (KLAMT), the Oregon and California Cascades (ORCAS), and Oregon Coast Range (ORCOA), described by Davis *et al*. (2011).

Before accepting Model 13, the BLM compared the Model 13 distribution of hexagons among relative habitat suitability bins with that of the U.S. Fish and Wildlife Service (USDI FWS 2011) 2006 GNN MaxEnt model for: (1) the decision area within the three western Oregon modeling regions and (2) all lands within those regions. To do this, the BLM "updated" the U.S. Fish and Wildlife Service relative habitat suitability surfaces by projecting the U.S. Fish and Wildlife Service's MaxEnt models, which the U.S. Fish and Wildlife Service had trained on 1996 GNN data (see footnote on p. 1), to newly-available 2012 GNN data (http://lemma.forestry.oregonstate.edu/data/structure-maps). (For brevity, these new models hereafter are referred to as the U.S. Fish and Wildlife Service 2012 GNN MaxEnt models, even though the BLM created them.) The BLM did this to reduce the temporal differences between the 2006 GNN and the 2013 Woodstock datasets.

[52] GNN variables are derived from vegetation measurements from regional networks of field plots and Landsat imagery data to characterize forest vegetation across a region; see Ohmann and Gregory (2002). Woodstock variables are derived from BLM Forest Operations Inventory (forest stand exam) data and U.S. Forest Service/BLM Current Vegetation Survey (https://www.fbo.gov/index?s=opportunity&mode=form&id=bed33e38414e6986bc3dbada90bde22a&tab=core&_cview=1) data.

The BLM evaluated relative habitat suitability distributions among eight relative habitat suitability bins (the largest bin being greater than 70, because so little of the landscape existed above that value). Thus, for the three modeling regions and eight bins, there were 24 modeling region by bin comparisons for the two sets of models. As shown in **Figure T-11**, the largest absolute value of difference was 5 percentage points and the smallest difference was 0 percentage points. Of the 24 comparisons, the most frequent difference was an absolute value of 1 percentage point (nine times), followed by 5 percentage points and 4 percentage points (four times each), 2 percentage points and 0 percentage points (three times each), and 3 percentage points (one time). Thus, the two sets of models predicted similar amounts of the landscape (all lands within each modeling region or only BLM-administered lands within each modeling region) within each of the relative habitat suitability bins.

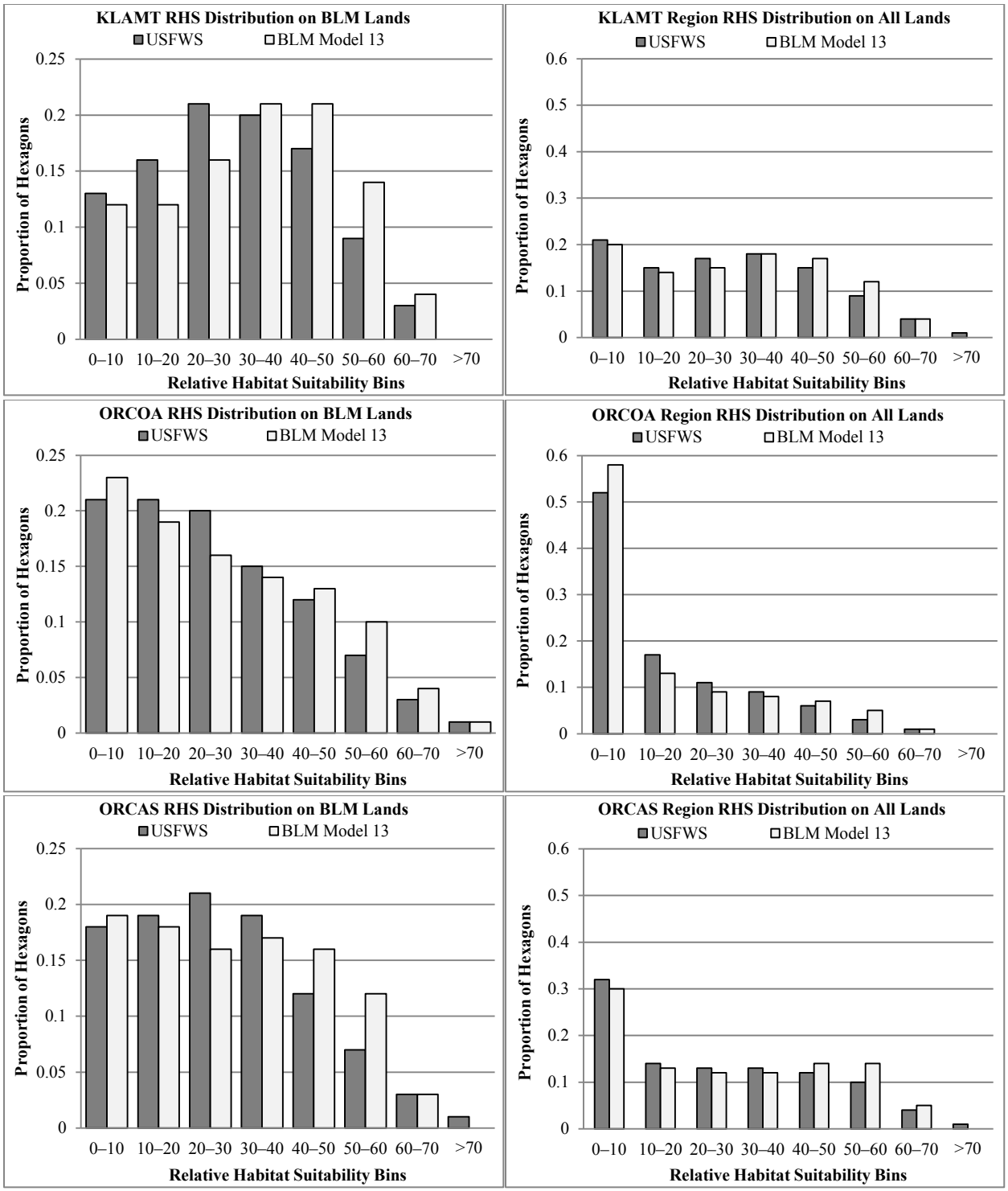


Figure T-11. Comparisons of the distribution of relative habitat suitability at the hexagon scale, on BLM-administered lands (left column), and all lands (right column), in the Oregon and California Klamath, Oregon Coast Range and the Oregon and California Cascades modeling regions (described by Davis *et al*. 2011)

Note: The U.S. Fish and Wildlife Service relative habitat suitability surfaces are based on the U.S. Fish and Wildlife Service 2012 GNN MaxEnt model. The BLM surfaces are based on the BLM 2013 Woodstock Model 13.

As shown in **Figure T-12**, the BLM also found, when mapped, a strong similarity in the spatial distribution of relative habitat suitability values between the two sets of models. Most differences were minor rather than one model predicting very high suitability for an area while the other model predicted very low suitability for that area.

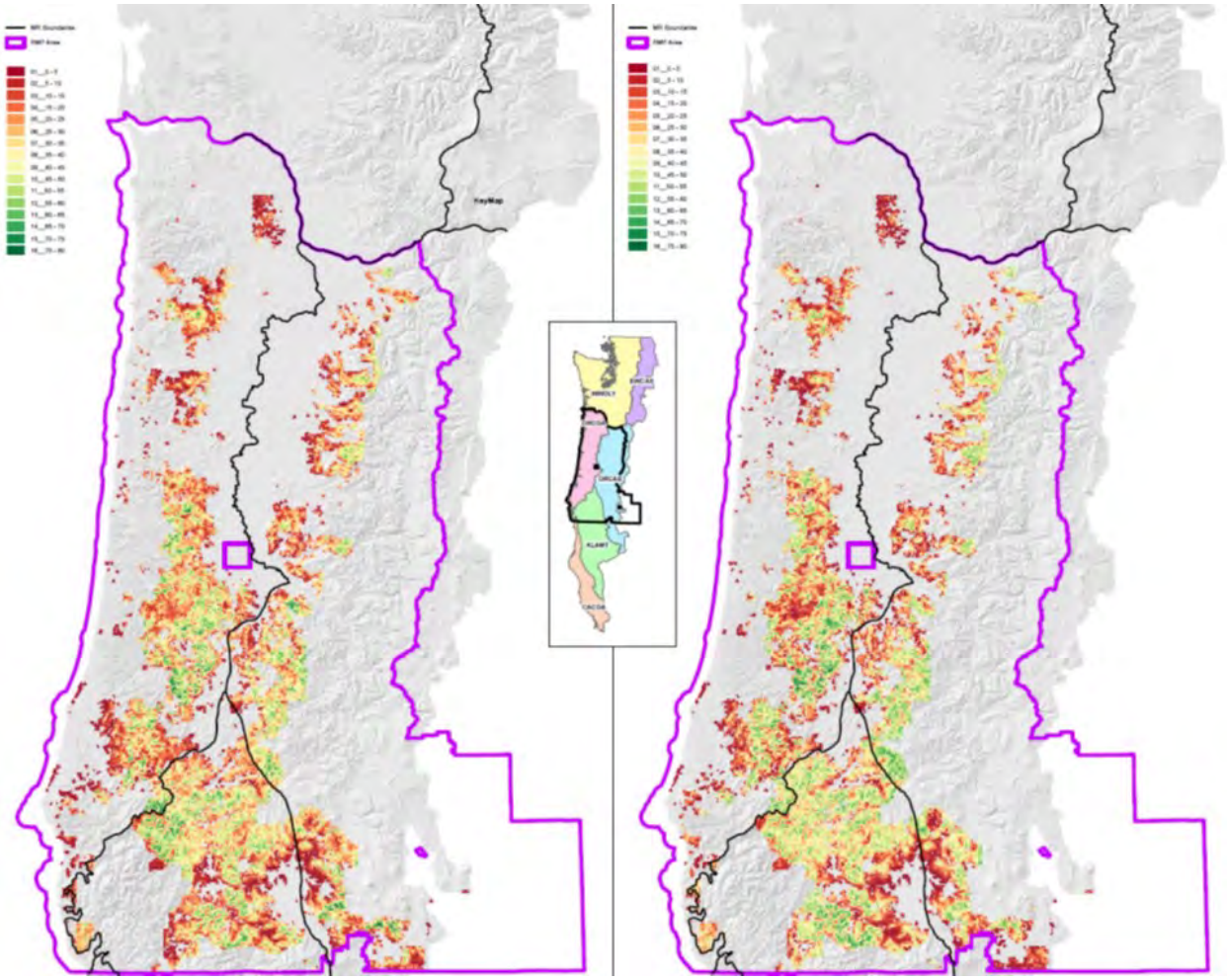


Figure T-12. Spatial distribution of relative habitat suitability for the U.S. Fish and Wildlife Service 2012 GNN MaxEnt model (left) and the BLM 2013 Woodstock Model 13 (right)
Note: Greener areas represent higher relative habitat suitability whereas redder colors represent lower relative habitat suitability.

Also, before accepting Model 13, the BLM examined the distribution of the northern spotted owl known sites used to train Model 13 (training sites) with those known sites withheld from model development (test sites) as described in the description of Model 3. There were 2,465 training sites in the northern spotted owl range (of which 490 occurred on the decision area) and 925 test sites in the northern spotted owl range (of which 164 occurred on BLM-administered lands).

Figure T-13 compares the range-wide distributions of training sites among relative habitat suitability bins for the U.S. Fish and Wildlife Service 1996 GNN MaxEnt models and the BLM 1996 GNN Model 13,[53] The distributions are similar. **Figure T-14** makes the same comparison of the test sites. The distributions

[53] As explained in the footnote on page 1, the U.S. Fish and Wildlife Service used 1996 GNN data to train its MaxEnt models. The BLM developed Model 13 using the same data for the comparison.

are not as similar as for the training sites, which are expected because the models were trained on the training sites. Nonetheless, the two distributions in **Figure T-14** follow similar trends.

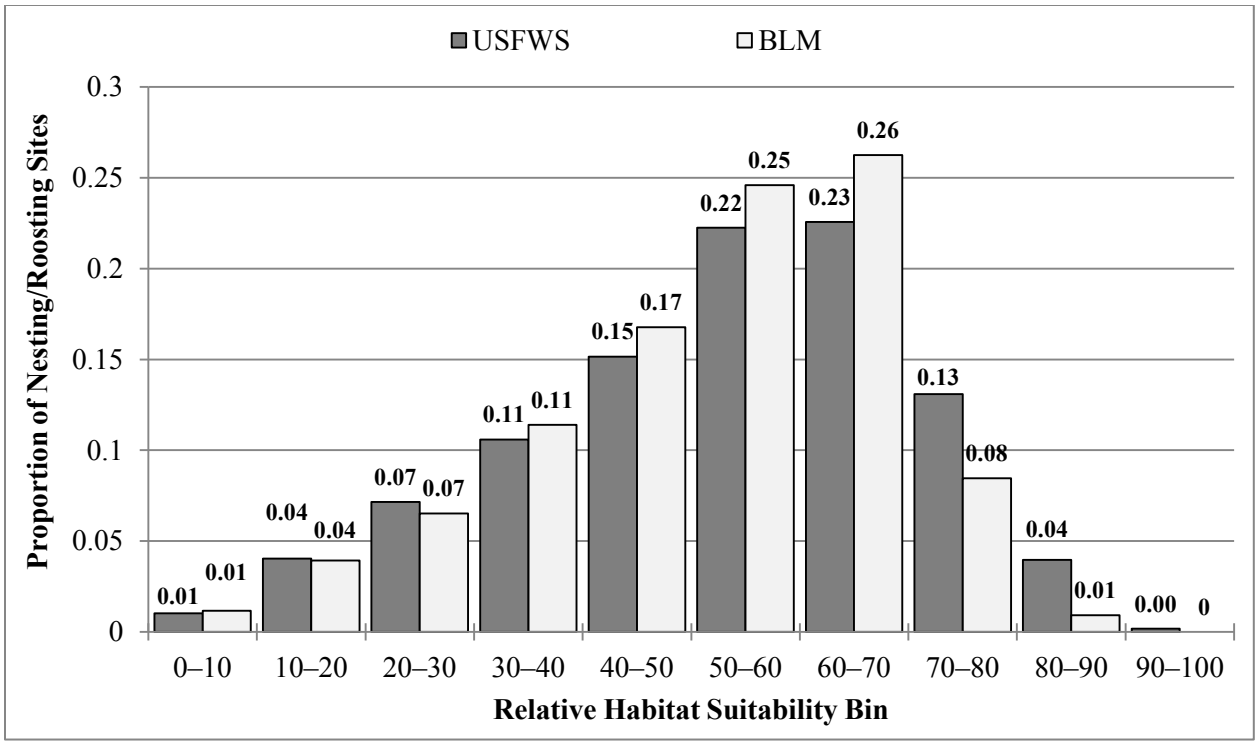


Figure T-13. Rangewide distribution of relative habitat suitability values among training northern spotted owl sites for the U.S. Fish and Wildlife Service 1996 GNN MaxEnt model and BLM's 1996 GNN Model 13

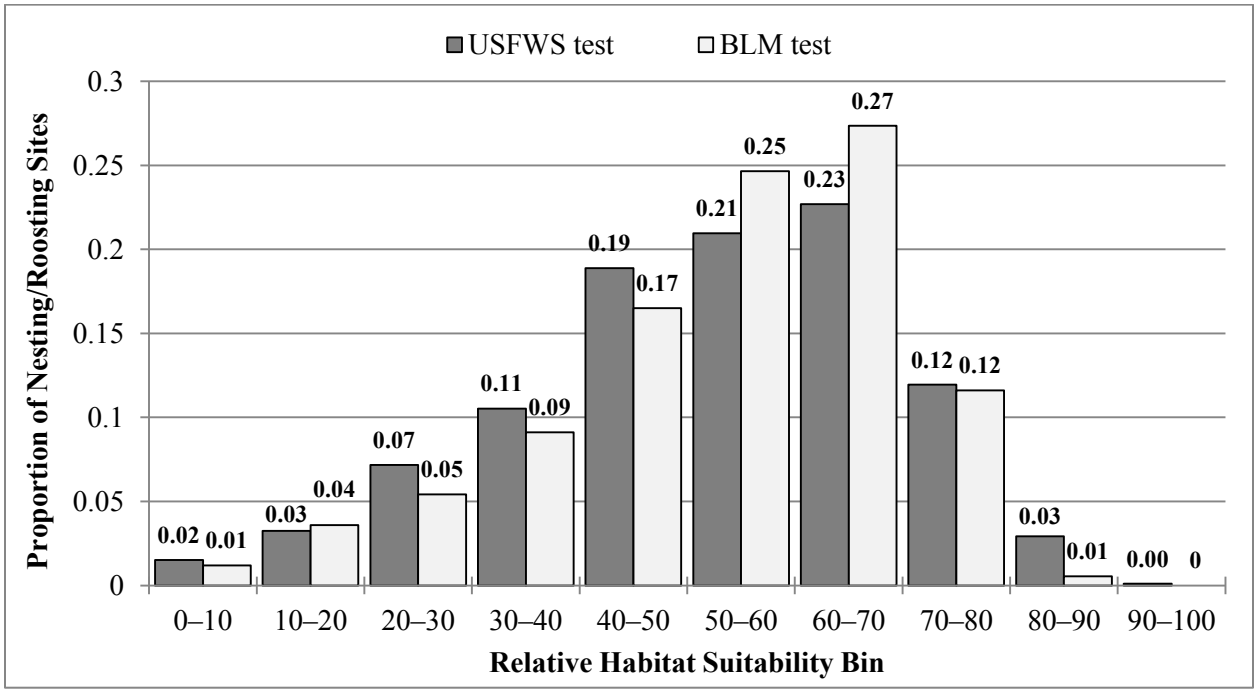


Figure T-14. Rangewide distribution of relative habitat suitability values among test northern spotted owl sites for the U.S. Fish and Wildlife Service 1996 GNN MaxEnt model and BLM's 1996 GNN Model 13

The BLM made similar comparisons for the decision area, this time using the U.S. Fish and Wildlife Service 2012 GNN MaxEnt models and the BLM 2013 Woodstock Model 13. **Figure T-15** shows the distributions for training sites on the decision area; **Figure T-16** shows the distributions for test sites on the same lands. As expected, the distributions are less similar than the range-wide distributions shown in **Figure T-13** and **Figure T-14** because of the smaller numbers of sites associated with the decision area and because of substantive differences in the origins of the 2012 GNN and 2013 Woodstock data. Because the Woodstock variables were derived from forest stand exam and Current Vegetation Survey plot data (i.e., on-the-ground examination and measurement), the BLM is confident of the accuracy of the Woodstock variables for the decision area. Nonetheless, **Figure T-13** to **Figure T-16** suggest that Model 13, as used by the BLM, inflates relative habitat suitability values. As explained below, this almost certainly is an artifact of truncating Model 13 to BLM-administered lands.

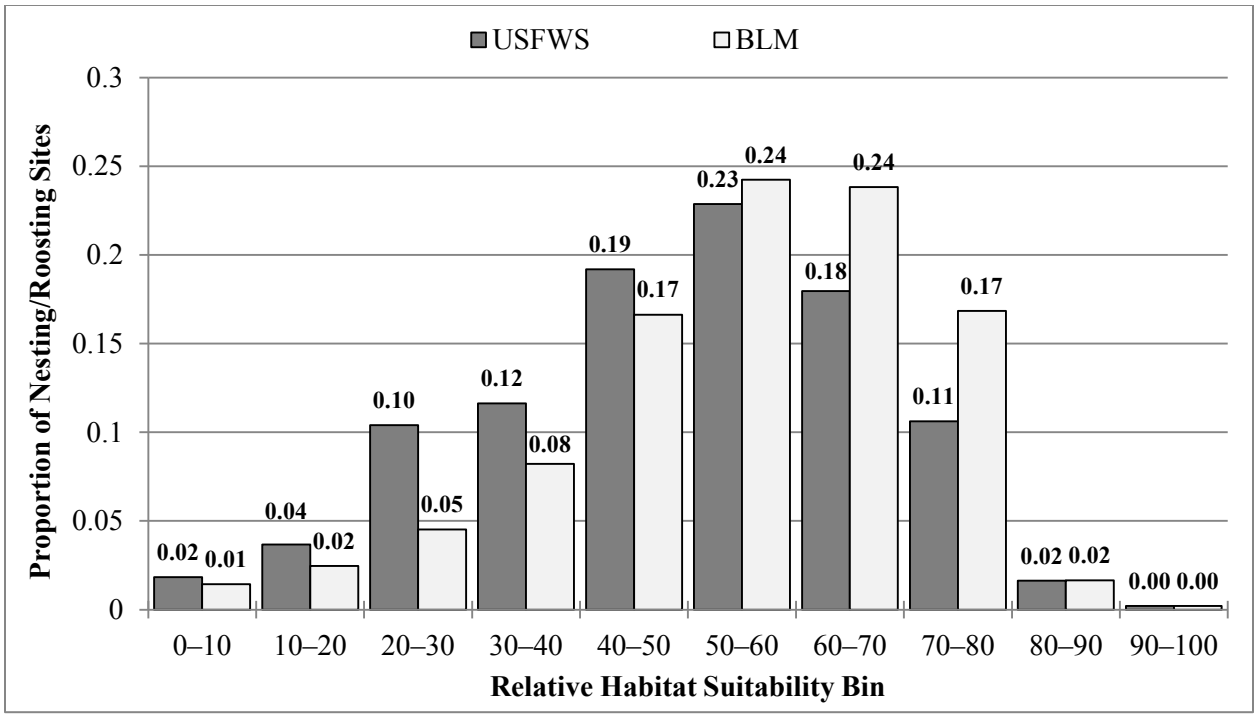


Figure T-15. Distribution of relative habitat suitability values among training northern spotted owl sites on the decision area for the U.S. Fish and Wildlife Service 2012 GNN MaxEnt model and BLM's 2013 Woodstock Model 13

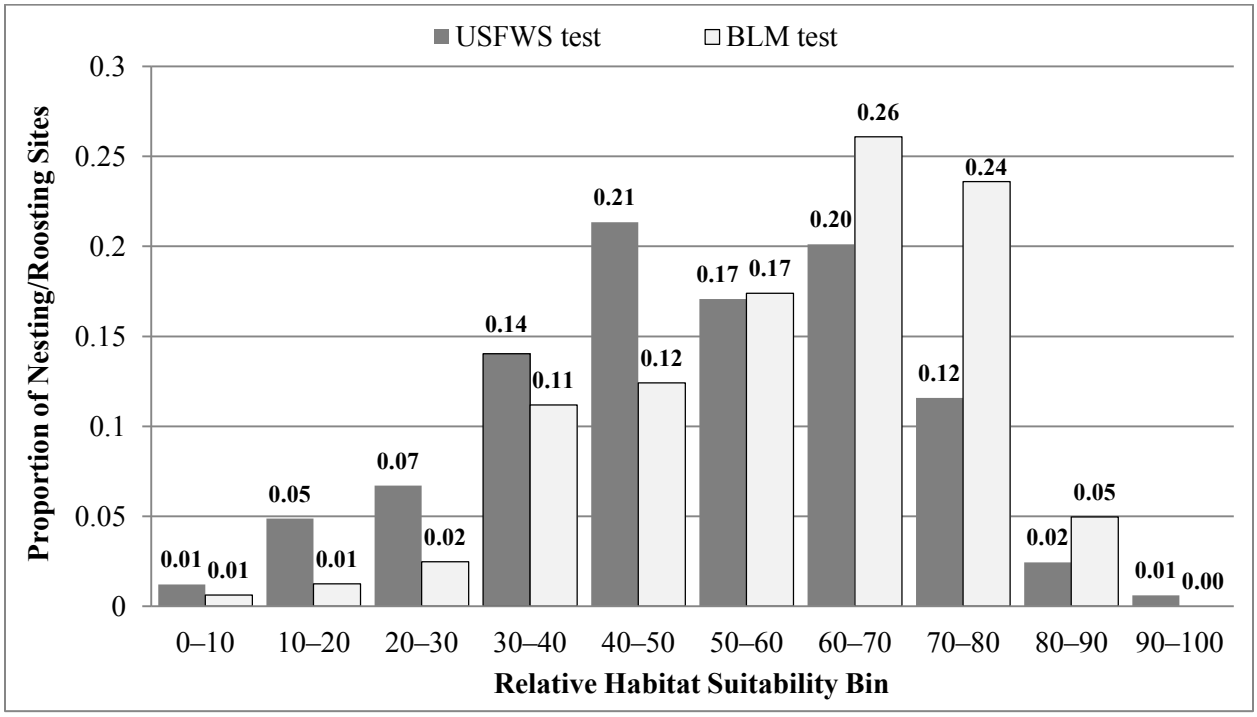


Figure T-16. Distribution of relative habitat suitability values among test northern spotted owl sites on the decision area for the U.S. Fish and Wildlife Service 2012 GNN MaxEnt model and BLM's 2013 Woodstock Model 13

As described above, MaxEnt calculates relative habitat suitability based on variable values within a 200-ha circle. GNN data, used in the U.S. Fish and Wildlife Service MaxEnt models, were available for all lands within the northern spotted owl range. However, the BLM developed Woodstock data only for the decision area. The BLM uses Woodstock data, because it is the most accurate data for BLM-administered lands. However, an artifact arises when the BLM applies Model 13 to BLM-administered lands that abut other lands (i.e., lands within 800 m of BLM-administered lands, which is the radius of a 200-ha circle). In this case, the BLM could use Model 13 to calculate relative habitat suitability values for 2013 based on 2013 Woodstock data for BLM-administered lands and 2012 GNN data for other lands. However, the BLM cannot do this for subsequent decades, because there are no reliable data on how individual GNN values vary and co-vary over time. As described below, the BLM simulated changes in relative habitat suitability values on other lands by developing a 2012 relative habitat suitability surface for each modeling region, and then changing relative habitat suitability values according to the calculated effects of ingrowth, wildfire, and timber harvest on those values at decadal increments. However, the BLM could not do the same for the underlying GNN variable values used to calculate relative habitat suitability. Stated another way, Woodstock generates new variable values for BLM-administered lands at decadal increments. However, after 2012, there are no comparable GNN values available for other lands abutting BLM-administered lands. Thus, after 2013, Model 13 must calculate relative habitat suitability values for BLM-administered lands using only Woodstock data. Since forest conditions on BLM-administered lands commonly support northern spotted owls better than those on adjacent lands, which frequently are industrial timber lands, the BLM method appears to inflate relative habitat suitability values on its own administered lands. This is not a weakness of Model 13. Instead, it is an artifact of data limitations for other lands within 800 m of the decision area. After publishing the Draft RMP/EIS, the BLM further refined its relative habitat suitability forecasts (see **Sections A** and **D** of this appendix).

B. Forecasting Change in Relative Habitat Suitability on Other Lands in Washington, Oregon and California for the Draft RMP/EIS

The BLM forecasted changes in relative habitat suitability from ingrowth, large (1,000+-acre) wildfires, and timber harvests for all lands within the U.S. portion of the northern spotted owl range. Modifications in forest structure and composition at decadal increments on the decision area were incorporated in the Woodstock models and reflected in the BLM's Model 13 relative habitat suitability surfaces. The BLM based its forecasted magnitudes of change on all other lands on differences between the U.S. Fish and Wildlife Service 1996 and U.S. Fish and Wildlife Service 2006 GNN-based relative habitat suitability surfaces. That is, BLM assumed that the decadal change in relative habitat suitability from 1996 to 2006 would be realized during subsequent decades.

To estimate rates-of-change from forest ingrowth in decadal increments, the BLM calculated the mean difference between 1996 and 2006 for each integer relative habitat suitability value (i.e., the analysis determined the mean value in 2006 for all pixels with the same value in 1996). The BLM generated rates-of-change statistics separately for each physiographic province and, within each province, further stratified by Congressionally Reserved lands (e.g., designated Wilderness Areas), Federal reserved lands (e.g., the Late-Successional Reserve under the Northwest Forest Plan), Federal non-reserved lands (e.g., Matrix lands under the Northwest Forest Plan), and non-Federal lands. The BLM excluded pixels from the analysis within Monitoring Trends in Burn Severity (http://www.mtbs.gov/) fire perimeters and unpublished U.S. Forest Service LandTrendr harvest patches (see Davis *et al*. 2011) to minimize the influence of other agents of change on the ingrowth rates.

Initially, the BLM included only pixels showing positive or no change between 1996 and 2006 in the calculations. The BLM did this because negative change does not reflect forest ingrowth. The BLM used

those derived rates-of-change to generate projected decadal relative habitat suitability surfaces for other lands, combined with the decadal Woodstock projections for BLM-administered lands. However, after examining the results, the BLM determined that the rate of ingrowth for forests in the drier portion of the northern spotted owl's range (i.e., most of California, and the eastern Cascades of Washington and Oregon) appeared to exceed observed rates. After additional consideration and testing, the BLM truncated all negative changes to 0 and all positive changes to 10 because negative changes in relative habitat suitability were not indicative of ingrowth and, knowing how habitat develops, rates higher than 10 were unrealistic. Although relatively few values exceeded 10, they were sufficiently high to affect mean rates-of-change. The final results were sets of range-wide ingrowth forecasts for strata within each physiographic province.[54]

The BLM used results from Davis *et al*. (2014) to forecast changes in relative habitat suitability values following wildfires. The BLM applied changes only for moderate and high severity fires by habitat class, because Davis *et al*. (2014) determined that low severity fires have a negligible effect on northern spotted owl habitat. These findings are supported by Manley's (2014) descriptions of the effects of fire on northern spotted owls. The BLM modeled the spatial locations, extents, and severity of future wildfires using the same predicted wildfire dataset included in the Woodstock models, which extends over the non-BLM portions of the northern spotted owl's range (**Appendix D** – Modeling Large Stochastic Wildfires and Fire Severity Within the Range of the Northern Spotted Owl).

Expanding on the methods described by Davis *et al*. (2011, pp. 28–30), the BLM used the unpublished U.S. Forest Service LandTrendr change detection data to develop range-wide forecasts of decadal rates of negative change in relative habitat suitability values following timber harvests. To create potential timber harvest patches on other lands, the BLM segmented the U.S. Forest Service 2006 GNN-based relative habitat suitability model using eCognition Developer 8 (Trimble Navigation Ltd., Westminster, CO). The BLM parameterized the software's segmentation routine to iteratively group neighboring pixels with similar relative habitat suitability values into discrete patches until the mean patch size ± 1 SD within each physiographic province and strata most closely approximated those observed in the LandTrendr dataset between 1996 and 2006 (**Table T-2** and **Table T-3**). Segmenting the U.S. Forest Service 2006 GNN-based surface resulted in more realistic representations of harvest treatment patch shapes and dimensions than those created using the smoother, 200-ha-scale U.S. Fish and Wildlife Service relative habitat suitability surfaces.

[54] The BLM subsequently tested methods to refine its forecasts; see Section D of this appendix. Because the U.S. Forest Service LandTrendr analysis was based on a 200-ha scale relative habitat suitability surface—i.e., relative habitat suitability values are based on the means of variable values within 800 meters of each pixel, the radius of a 200-ha circle—any negative change in burn and timber harvest areas would affect the relative habitat suitability values within 800 m, and not just within the treatment or burn area. The BLM tested masking areas within 800 meters of burn and treatment areas, and recalculating relative habitat suitability change, and found that this eliminated much of the negative change the BLM had detected outside burn and harvest areas. However, the degree of change did not cause the BLM to replace its analyses for the Draft RMP/EIS. As described in **Section D** of this appendix, the BLM subsequently tested additional methods to refine its relative habitat suitability surfaces during its preparation of the Proposed RMP/Final EIS.

Table T-2. Metrics, calculated from data developed by Davis *et al*. (2011), used to forecast decadal (1996–2006) losses of northern spotted owl dispersal and nesting-roosting habitat from timber harvest on lands other than BLM-administered lands in the planning area

Physiographic Province	Dispersal Habitat in 1996 (Acres)	Dispersal Habitat Harvested (Acres)	Dispersal Habitat Harvested (Percent)	Nesting-Roosting Habitat in 1996 (Acres)	Nesting-Roosting Habitat Harvested (Acres)	Nesting-Roosting Habitat Harvested (Percent)	Habitat Harvested that was Nesting-Roosting (Percent)	10-Year Mean Loss of Habitat to Harvest	Mean Harvest Patch Size (Acres)	Stand Harvest Patch Size (Acres)
Federal Non-Reserved Lands†										
Washington										
Eastern Cascades	128,810	1,208	1%	207,310	1,819	1%	60%	1.0%	20	10
Olympic Peninsula	39,038	128	-	37,275	47	-	27%	0.2%	19	9
Western Cascades	143,116	404	-	288,691	1,025	-	72%	0.3%	19	8
Western Lowlands	11	-	-	-	-	-	-	-	-	-
Oregon										
Coast Range	34,732	265	1%	34,722	135	-	34%	0.6%	21	11
Eastern Cascades	109,494	1,725	2%	145,704	1,756	1%	50%	1.4%	23	13
Klamath	111,577	628	1%	135,992	737	1%	54%	0.6%	18	7
Western Cascades	478,515	3,972	1%	844,548	6,669	1%	63%	0.9%	19	9
Willamette Valley	4	-	-	-	-	-	-	-	-	-
California										
Cascades	110,507	1,386	1%	63,151	1,858	3%	57%	2.1%	33	23
Coast Range	25,543	12	-	11,191	-	-	0%	-	12	-
Klamath	576,849	2,482	-	657,433	1,845	-	43%	0.4%	17	7
Federal Reserved Lands*										
Washington										
Eastern Cascades	139,270	606	-	268,674	1,618	1%	73%	0.8%	17	8
Olympic Peninsula	89,086	73	-	277,151	308	-	81%	0.1%	16	5
Western Cascades	182,939	234	-	486,969	443	-	65%	0.1%	18	7
Oregon										
Coast Range	118,696	598	1%	266,301	1,103	-	65%	0.5%	20	9
Eastern Cascades	73,898	397	1%	159,868	347	-	47%	0.4%	19	8
Klamath	218,679	103	-	210,418	232	-	69%	0.1%	20	10
Western Cascades	264,104	328	-	740,398	487	-	60%	0.1%	18	7
California										
Cascades	67,741	267	-	85,839	239	-	47%	0.3%	22	15
Coast Range	30,071	31	-	25,486	22	-	42%	0.1%	13	3
Klamath	335,682	536	-	579,128	526	-	50%	0.1%	16	5

Physiographic Province	Dispersal Habitat in 1996 (Acres)	Dispersal Habitat Harvested (Acres)	Dispersal Habitat Harvested (Percent)	Nesting-Roosting Habitat in 1996 (Acres)	Nesting-Roosting Habitat Harvested (Acres)	Nesting-Roosting Habitat Harvested (Percent)	Habitat Harvested that was Nesting-Roosting (Percent)	10-Year Mean Loss of Habitat to Harvest	Mean Harvest Patch Size (Acres)	Stand Harvest Patch Size (Acres)
Non-Federal Lands										
Washington										
Eastern Cascades	319,729	18,536	6%	362,291	24,540	7%	57%	6.3%	30	20
Olympic Peninsula	275,885	33,068	12%	192,741	23,153	12%	41%	12.0%	41	27
Western Cascades	212,118	23,573	11%	120,707	11,207	9%	32%	10.2%	39	27
Western Lowlands	524,668	73,413	14%	149,848	19,729	13%	21%	13.6%	40	27
Oregon										
Coast Range	659,641	104,393	16%	483,985	106,584	22%	51%	18.9%	44	30
Eastern Cascades	132,149	15,728	12%	114,531	11,061	10%	41%	10.8%	37	25
Klamath	300,416	26,920	9%	244,411	23,492	10%	47%	9.3%	33	22
Western Cascades	411,318	63,999	16%	260,687	45,250	17%	41%	16.5%	46	33
Willamette Valley	50,477	3,220	6%	37,962	3,553	9%	52%	7.9%	22	12
California										
Cascades	184,094	9,049	5%	109,434	6,310	6%	41%	5.3%	20	9
Coast Range	1,189,363	41,598	3%	967,484	36,891	4%	47%	3.7%	20	9
Klamath	382,099	10,094	3%	353,724	10,157	3%	50%	2.8%	19	8
Non-Federal Land Totals by State‡										
Washington	1,332,399	148,590	11%	825,587	78,629	10%	35%	10.3%	38	26
Oregon	1,554,001	214,260	14%	1,141,576	189,940	17%	47%	15.2%	42	30
California	1,755,556	60,741	3%	1,430,642	53,358	4%	47%	3.6%	20	9

* Congressionally Reserved and the decision area not included
† The decision area not included
‡ Mean harvest patch sizes on non-Federal lands by state are NOT averages of the above physiographic province averages

Table T-3. Changes, calculated from data developed by Davis *et al*. (2011), in relative habitat suitability values from timber harvests occurring in northern spotted owl habitat between 1996 and 2006 by physiographic province and Northwest Forest Plan land use allocation

Physiographic Province	Federal Reserved Lands*			Federal Non-Reserved Lands†			Non-Federal Lands		
	Selected Against	Selected For	Strongly Selected For	Selected Against	Selected For	Strongly Selected For	Selected Against	Selected For	Strongly Selected For
Washington									
Eastern Cascades	-2	-2	-	-2	-4	-2	-3	-6	-10
Olympic Peninsula	4	3	-	5	-8	4	-7	-12	-13
Western Cascades	4	2	4	3	-1	-1	-9	-15	-19
Western Lowlands	-	-	-	-	-	-	-7	-12	-16
Oregon									
Coast Range	2	-2	-	-3	1	1	-5	-10	-13
Eastern Cascades	1	1	-4	-	-1	-2	-3	-7	-16
Klamath	-1	1	-10	-	-1	-	-3	-5	-4
Western Cascades	-	-2	-5	1	-	-1	-7	-9	-6
Willamette Valley	-	-	-	-	-	-	-6	-7	-27
California									
Cascades	4	-6	-4	-5	-13	-13	-3	-7	-13
Coast Range	-2	-3	-	-2	-	-	1	1	-1
Klamath	0	1	-1	-1	-	1	-1	-1	-3

* Congressionally Reserved and the decision area not included
† The decision area not included

Starting with the 2012 relative habitat suitability surface (i.e., the surface the BLM created using 2012 GNN data with the U.S. Fish and Wildlife Service 1996 GNN MaxEnt models), the BLM forecasted changes on other lands from ingrowth, wildfire, and timber treatments before advancing in decadal increments for five decades (2013–2063). Modeling each decade in sequence was necessary because estimating change in future decadal intervals depended on adjusted values from the previous decade.

At the beginning of each decade, the BLM applied the rates-of-change in relative habitat suitability value from ingrowth and categorized the results into the four habitat suitability classes using the previously derived strength-of-selection class breaks: strongly-selected-against, selected-against, selected-for, and strongly-selected-for. Next, the BLM adjusted pixel values within the wildfire perimeters predicted to occur within the decade depending on the fire severity and corresponding relative habitat suitability class. The BLM categorized the resulting continuous surface into habitat classes a second time before adding the effects of timber harvests. Finally, the BLM calculated the median habitat class within each candidate harvest treatment patch (i.e., the results of the image segmentations described above), and randomly selected treatment patches in each province and strata until the area harvested approached, but did not exceed, the total decadal treatment area calculated from the LandTrendr data. The BLM then repeated the process for the next and subsequent decades.

The BLM applied the following four selection criteria when selecting timber harvest patches for the purpose of forecasting change in relative habitat suitability on lands other than BLM-administered lands:

- All modeled harvest patches had to exceed 10 acres in size because the BLM anticipated smaller timber harvests would be commercially inviable.
- The BLM did not allow the selection of patches that were more than 500 m from a road because of anticipated limitations to commercial access.

- Patches classified as 'strongly-selected-against' were not considered because such stands generally would be too young for commercial timber harvest.
- The BLM did not allow a patch to be selected for treatment twice during the 50-year forecast period. Once selected, the rates of change from harvest were applied to the relative habitat suitability values within each patch. After harvesting a patch, the BLM allowed ingrowth within modeled harvests to progress uninterrupted for the remainder of the planning horizon.

The BLM applied changes in relative habitat suitability to all lands before updating the pixel values on the decision area with the results from Model 13 for the same decade.

The BLM created only one set of decadal relative habitat suitability surfaces for non-BLM-administered lands across the northern spotted owl's range. The BLM used this single set of surfaces for all evaluations of the alternatives, the Proposed RMP, and the No Timber Harvest reference analysis (i.e., only the relative habitat surfaces for the decision area changed by alternative or the Proposed RMP). The BLM used this final set of relative habitat suitability surfaces, one for each decade between 2013 and 2063, for the HexSim population dynamics models.

C. Additional Notes on the BLM's Northern Spotted Owl Modeling and Analyses for the Draft RMP/EIS

Sections A and B appeared in Appendix S of the Draft RMP/EIS (USDI BLM 2015). However, the BLM did not intend those narratives to be sufficient to allow someone to duplicate BLM processes, only to help reviewers better understand the BLM's analytical processes so they could better interpret results. The BLM recorded the steps of its processes in its administrative record.

The BLM requested review of Appendix S of the Draft RMP/EIS by Drs. Bruce Marcot and Peter Singleton of the U.S. Forest Service—experts on northern spotted owl biology and modeling. The following section provides additional explanation of the BLM processes through responses to the comments of Drs. Bruce Marcot and Peter Singleton.

Relative Habitat Suitability Surfaces

Comment: As it explained in its development of models 1–13, the BLM worked to achieve a strong correlation between its relative habitat suitability surfaces and those prepared by the FWS on the apparent assumption that the FWS's surfaces were a near-perfect representation of northern spotted owl habitat. However, the BLM's process likely compounded the error inherent in FWS's surfaces with the error inherent in the BLM's process.

BLM response: The BLM did not assume that the U.S. Fish and Wildlife Service's relative habitat suitability surfaces represented a near-perfect representation of northern spotted owl habitat. Instead, the BLM reviewed the U.S. Fish and Wildlife Service's data and methods for surface development and determined that those surfaces (actually, the MaxEnt models developed by the U.S. Fish and Wildlife Service to create its surfaces, which the BLM then applied to 2012 GNN data to generate updated surfaces) most likely were the most credible range-wide northern spotted owl surfaces available. Second, as described above in this appendix, the BLM derived its MaxEnt models independently of the U.S. Fish and Wildlife Service's MaxEnt models, and then examined the degree of fit between the relative habitat suitability surfaces derived from the two sets of models to help ensure that HexSim would work with the merged surfaces. As described under Model 8, the BLM determined that it could not use stand age as a variable in its MaxEnt models because Woodstock calculates stand age differently over time based on simulated stand treatment. Since stand age typically is an important variable in the modeling of northern spotted owl habitat, the BLM compared the results of its MaxEnt models against those of the most-similar

and credible models available for the same land base. Although the relative habitat suitability surfaces developed by the U.S. Fish and Wildlife Service contain inherent uncertainty, the BLM used a rational process to refine and test its models. However, it did not tailor its models to generate surfaces similar to the U.S. Fish and Wildlife Service's surface.

That said, at the time the BLM prepared its northern spotted owl relative habitat suitability surfaces, only two comparable range-wide surfaces existed: one produced by the U.S. Fish and Wildlife Service (USDI FWS 2011, pp. Appendix C) and one by the U.S. Forest Service (Davis *et al.* 2011). Since preparation of the Draft RMP/EIS, the U.S. Forest Service updated its surfaces using 2012 GNN data (Davis *et al*. 2015). **Table T-4** compares the acres of northern spotted owl nesting-roosting habitat on federal lands as calculated by the U.S. Forest Service using 2012 GNN data (Davis *et al*. 2015, Table 6) and by the BLM using 2013 Woodstock data for the decision area and 2012 GNN data (U.S. Fish and Wildlife Service 1996 GNN MaxEnt models applied to 2012 GNN data) for other Federal lands. Even though these acres were calculated using different datasets, MaxEnt models and analytical scales, the estimates are similar.

Table T-4. A comparison of the estimated acres of northern spotted owl nesting-roosting habitat on Federal lands as calculated by the U.S. Forest Service and the BLM

Physiographic Province	U.S. Forest Service (Acres)	BLM (Acres)
Washington		
Olympic Peninsula	737,600	972,223
Western Lowlands	12,900	6,278
Western Cascades	1,169,500	1,238,477
Eastern Cascades	779,400	753,264
Washington Totals	**2,699,400**	**2,970,242**
Oregon		
Coast Range	506,200	867,550
Willamette Valley	7,500	8,194
Western Cascades	2,371,400	2,112,585
Klamath	932,100	828,637
Eastern Cascades	339,600	508,885
Oregon Totals	**4,156,800**	**4,325,851**
California		
Coast Range	123,800	103,130
Klamath	1,764,700	1,606,645
Cascades	209,300	142,265
California Totals	**2,097,800**	**1,852,040**

Comment: Developing relative habitat suitability surfaces that combine GNN and BLM Woodstock data compounds the uncertainty inherent in both datasets, making the surfaces, and the BLM analyses that use those surfaces, less reliable.

BLM response: The GNN/CVS data are the most reliable range-wide data available for other (non-BLM-administered) lands in the northern spotted owl's range. As described in this appendix, the BLM used the GNN-derived relative habitat suitability surfaces developed by the U.S. Fish and Wildlife Service (USDI FWS 2011, pp. C-16 – C-43) for all lands within the northern spotted owl range except BLM-

administered lands in the planning area. (Again, the BLM used the U.S. Fish and Wildlife Service 1996 GNN MaxEnt models but applied them to 2012 GNN data, so the BLM did not actually use the U.S. Fish and Wildlife Service's relative habitat suitability surfaces, only its MaxEnt models.)

The Woodstock (BLM data) variable values, which are derived from BLM field operations inventory and CVS plot data, are the most reliable data available for the decision area. Since the BLM used GNN- or Woodstock-derived relative habitat suitability surfaces appropriate to land base, and ensured, at multiple steps, that those surfaces were compatible, the uncertainty inherent in the GNN data does not compound the uncertainty inherent in the Woodstock data. Even though there is uncertainty inherent in the merged surfaces, because the surfaces are based on the best data available for each land base, the merged surfaces likely are more reliable than those derived from only GNN data.

Because biases or uncertainties in the underlying GNN/Woodstock layers and subsequent relative habitat suitability surfaces are used for comparing all alternatives and the Proposed RMP, and because BLM interprets the HexSim model results as relative among alternatives and the Proposed RMP, any over- or under-estimation of northern spotted owl habitat changes or population responses that may exist would exist for all alternatives and the Proposed RMP and would not influence the relative difference(s) among alternatives and the Proposed RMP. The BLM acknowledges that the uncertainty inherent in its relative habitat suitability surfaces compounds the uncertainty inherent in modeling that relies on those surfaces. However, that compounding effect is inherent in all modeling.

Comment: MaxEnt, which the BLM used to create relative habitat suitability surfaces for its administered lands, is prone to over-fitting the data, especially when too many variables are used.

BLM response: The BLM did not employ the full range of fitting features available in MaxEnt. The BLM MaxEnt models relied on 11 covariates specific to each of the western Oregon modeling regions (**Table T-1**). In addition, as described under Model 13, the BLM tested its MaxEnt models with data that had not been used to train the models to help ensure that the models did not over-fit the data.

Comment: How did the BLM use strength-of-selection thresholds to classify northern spotted owl habitat?

BLM response: Based on its modeling needs (see Chapter 3, Northern Spotted Owl), the BLM divided northern spotted owl habitat into categories based on strength-of-selection. This was similar to the process used by the U.S. Fish and Wildlife Service (USDI FWS 2011, pp. C-31 – C-39) but, in the BLM's case, the BLM used four categories: (1) strongly selected against, (2) selected against, (3) selected for, and (4) strongly selected for.

To summarize strength-of-selection: If the relative habitat suitability values greater than 45 represent 10 percent of a modeling region, and 50 percent of the northern spotted owl nests in that region are in areas with relative habitat suitability greater than 45, the strength-of-selection value would be 5.0 (50 percent of the nests divided by 10 percent of the area, which means that the area was used for nesting five times more than would be expected based on its availability). Similarly, if 50 percent of the landscape is in areas with relative habitat suitability less than 15, and 10 percent of the nests in that region are in areas with relative habitat suitability less than 15, the strength-of-selection would be -5.0 (10 percent of the nest sites divided by 50 percent of the area—and multiplied by -1—because the percent of nest sites is less than the percent of the area), which means the area was used five times less than would be expected based on its availability).

The BLM created strength-of-selection curves separately for each modeling region. These strength-of-selection-defined categories provided a relatively simple and consistent way to track changes in the amount of area containing habitats of differing value to northern spotted owls; with value being defined

by the owls' relative attraction or avoidance. The BLM then classified northern spotted owl habitat according to strength-of-selection curves following a process used by the U.S. Forest Service (Davis *et al*. 2011:36-40) but with its own relative habitat suitability surfaces. Examining the results for each modeling region, the BLM found that strength-of-selection curves between -2.75 and 2.75 were relatively flat in each modeling region, and then deviated sharply downward (below -2.75) or upward (above 2.75) beyond those values. Therefore, values below -2.75 were strongly selected against, values -2.75 – 0 were selected against, values 0 – 2.75 were selected for and values greater than 2.75 were strongly selected for.

Among the modeling regions, the 'strongly selected for' category accounted for 3.48 – 12.1 percent of the landscape and 15.4 – 72.0 percent of the known northern spotted owl sites; combining it with the 'selected for' category accounted for 18.7 – 35.4 percent of the landscape and 78.4 – 89.9 percent of the known northern spotted owl sites. Range-wide, 28.6 percent of the landscape was categorized as either 'selected for' or 'strongly selected for' and 83.8 percent of the known owl sites occurred on that landscape. Conversely, ~72 percent of the area was 'selected against' or 'strongly selected against' and contained ~17 percent of the known owl sites. Therefore, although the BLM could have chosen other values to define categories, the values it chose have real meaning for how northern spotted owls select habitat.

The BLM determined that the 'selected against' category in western Oregon described habitat that the BLM previously had classified as habitat used only for northern spotted owl dispersal. As described above (**Table T-4**), the BLM also determined that "selected for" and "strongly selected for" were reliable predictors of nesting-roosting habitat. Given that northern spotted owls show strongest selection for nesting and roosting habitat, less strong selection for foraging habitat, and still weaker selection for dispersal habitat, the BLM determined that the "strongly selected for," "selected for" and "selected against" categories, combined, were a reasonable description of habitats that supported dispersing northern spotted owls.

In **Table T-4**, the BLM compared the acres of nesting-roosting habitat on Federal lands derived by the U.S. Forest Service (Davis *et al.* 2015) and the BLM using their separate models and data sets. In **Table T-5**, the BLM compares the acres of northern spotted owl dispersal habitat on all lands in western Oregon (the BLM evaluated dispersal capability and flux only in western Oregon) as calculated by the U.S. Forest Service (Davis *et al*. 2015, Table 12) from 2012 GNN data, and by the BLM using 2013 Woodstock data for BLM-administered lands and 2012 GNN data for other lands. Even though the two agencies used different datasets and MaxEnt models, the results are similar. And, again, the BLM is confident that its 2013 data for BLM-administered lands in western Oregon are more reliable than the 2012 GNN data for those same lands.

Table T-5. A comparison of the estimated acres of northern spotted owl dispersal habitat on all lands in western Oregon as calculated by the U.S. Forest Service and by the BLM

Oregon Physiographic Province	Acres from Davis *et al*. 2015, Table 12	Acres calculated by the BLM
Coast Range	2,589,300	1,961,636
Western Cascades	4,082,000	3,728,991
Klamath	1,918,100	1,960,445
Eastern Cascades	1,307,700	1,035,568
Totals	**9,897,100**	**8,686,640**

<u>Comment</u>: The BLM should plot response curves for the range of potential values for each MaxEnt model covariate, with other covariates fixed at the mean for each habitat suitability class, to evaluate the

efficacy of the MaxEnt models for capturing plausible changes in habitat suitability in response to changes in forest structure from forest growth or management activities.

BLM response: The U.S. Fish and Wildlife Service also was asked to provide response curves but purposefully did not. Although relative habitat suitability values are intended to predict the relative suitability of an area (based on conditions within 800 meters of the focal pixel), the individual variable values are not meant to reflect all factors that influence northern spotted owls. Thus, the U.S. Fish and Wildlife Service sought a model with good predictive abilities and that was robust and well calibrated. In this, it succeeded. Since the BLM's models are highly correlated with the U.S. Fish and Wildlife Service's models, as verified by the BLM, they should have similar attributes. The BLM is confident that its models have good predictive ability and are robust because they predicted both the original data and independent data well.

HexSim

Comment: The BLM did not perform a sensitivity analysis to determine which covariate values most influence its HexSim results.

BLM response: The BLM relied on the sensitivity analyses performed by the U.S. Fish and Wildlife Service during the development of its model (USDI FWS 2012, pp. 13–17).The BLM did not modify any of the population parameters in the U.S. Fish and Wildlife Service's HexSim model. The only difference between the U.S. Fish and Wildlife Service's use of its HexSim model and the BLM's use was that the BLM updated northern spotted owl survival and reproduction rates, and barred owl encounter rates, according to the results of the 2016 northern spotted owl meta-analysis (provided by Dr. Katie Dugger, Oregon State University, the principal author of the meta-analysis; Dugger *et al*. 2016) and recommendations by the U.S. Fish and Wildlife Service, and recalibrated the simulation start time to the year 2013.

Comment: The BLM approach for simulating competitive interactions between barred owls and northern spotted owls misrepresents the ecological mechanism that contributes to spotted owls being displaced from sites, which many experts believe is interference competition. If interference competition and competitive displacement are the mechanisms, which contribute to spotted owl site abandonment, then total habitat carrying capacity becomes extremely important because much of that habitat is occupied by barred owls. If that is the case, then relatively small changes in habitat amount could produce disproportionate changes in northern spotted owl numbers. That relationship is currently masked within the BLM HexSim model because encounters with barred owls are represented as a random predation effect that has the potential to suppress the northern spotted owl population well below habitat carrying capacity.

BLM response: Northern spotted owl survival, as used in the U.S. Fish and Wildlife Service's HexSim model, and subsequently by the BLM, was derived from Forsman *et al*. 2011 (USDI FWS 2011, pp. C-59, C-68 and C-69, and 2012, pp. 10, 13) and, for preparation of the Proposed RMP/Final EIS, from the 2016 meta-analysis (Dugger *et al*. 2016). Although survival, as it is used in the model, might not reflect the ecological processes, such as interference competition, that cause northern spotted owls to react to barred owls in specific ways, it is based on scientific research.

As explained in the Northern Spotted Owl section of Chapter 3, BLM simulations indicate that, within the range of the alternatives and the Proposed RMP examined by the BLM, limited carrying capacity is not a basis for BLM decision-making because there are no substantive differences in the northern spotted owl responses among alternatives and the Proposed RMP. In addition, all alternatives and the Proposed RMP show essentially identical northern spotted owl responses as would occur under the BLM's No Timber Harvest reference analysis.

Neither the U.S. Fish and Wildlife Service nor the BLM have suggested that barred owl effects are random predation effects and not competition effects. The northern spotted owl HexSim model used by both the U.S. Fish and Wildlife Service and BLM simply assumes that, if a barred owl is present in a northern spotted owl's territory, survivorship of the spotted owl would decrease according to observed rates and probabilities. Neither agency assumed that this decrease was due to predation, starvation, competition or any other specific mechanism. The encounters with barred owls in the HexSim model are represented only as reductions in survival; scientists have not identified a specific mechanism. Among potential causes, displacement from nest sites (competition for nest sites), direct predation of spotted owls by barred owls (predation), and competition for food are ideas that have varying levels of support in the scientific community, and it is likely that more than one mechanism occurs.

When barred owl encounters are treated like predation effects, there may be little or no response to changes in habitat availability. The U.S. Fish and Wildlife Service found this to be the case when barred owl encounter rates exceeded 0.5. However, with barred owl encounter rates at 0.25 or 0.0, the U.S. Fish and Wildlife Service found a relatively strong effect of habitat on northern spotted owl populations. Those results are logical regardless of whether the actual mechanism is predation, competition or some combination.

Comment: On page 774 of the Draft RMP/EIS, the BLM notes that there is relatively broad consensus among northern spotted owl experts that competition with barred owls is a primary contributor to northern spotted owl population declines, and the BLM cites Dugger et al. (2011) and Wiens et al. (2014) regarding the importance of habitat conservation in the face of competition with barred owls. Unfortunately, the HexSim modeling in the BLM analysis does not capture that competitive displacement mechanism. This is a particularly difficult problem because representing spatial displacement of northern spotted owls by barred owls requires spatially explicit predictions of barred owl occupancy, and such information is probably not available for most of the range. One approach for addressing this problem would be to run HexSim scenarios both with and without additive mortality from barred owl interactions and interpret the outputs from model runs without barred owl impacts as estimates of total owl habitat carrying capacity, then compare carrying capacity across management alternatives with the understanding that the carrying capacity is in reality likely to be split between spotted owls and barred owls due to the displacement pressures of barred owls on spotted owl populations. Even using the modified barred owl encounter rates is likely to reduce the sensitivity of the HexSim model to changes in habitat amount and distribution.

<u>BLM response</u>: The suggestion that northern spotted owl population responses to the alternatives and the Proposed RMP are "likely to be split" between the effects of habitat and barred owl encounters is too suppositional for BLM decision-making processes. Furthermore, the National Environmental Policy Act requires the BLM to examine reasonably foreseeable northern spotted owl responses to its alternatives and the Proposed RMP. The BLM saw no value in determining if spotted owls would respond better under one alternative than another in the absence of barred owls when such absence was not reasonably foreseeable, even if the U.S. Fish and Wildlife Service were to implement a control program. That said, the BLM discussed the reasonableness of reduced barred owl encounter rates with the U.S. Fish and Wildlife Service. The BLM recognizes that both habitat and barred owls have impacts on northern spotted owl populations.

D. How the BLM Refined its Relative Habitat Suitability Surfaces between the Draft RMP/EIS and the Proposed RMP/Final EIS

As explained in Appendix S of the Draft RMP/EIS (USDI BLM 2015), the BLM developed, through separate processes, northern spotted owl relative habitat suitability surfaces for (1) the decision area (using BLM Woodstock covariates) and (2) all lands in the United States' portion of the northern spotted owl range (using GNN covariates). The BLM then deleted those portions of the range-wide surfaces that pertained to the decision area and replaced them with the surfaces it developed specifically for those lands. Here, the BLM describes how it further refined its relative habitat suitability surfaces since publication of the Draft RMP/EIS.

All Lands in the United States' Portion of the Northern Spotted Owl's Range

For the Draft RMP/EIS, the BLM forecasted decadal changes in relative habitat suitability over time from three causes: large (at least 1,000-acre) wildfires, timber harvest and forest ingrowth (USDI BLM 2015, pp. 1480–1485).

- To forecast large wildfires, the BLM developed the method described in Appendix D of the Draft RMP/EIS.
- To forecast timber harvest, the BLM used unpublished LandTrendr data developed by the U.S. Forest Service for 1996–2006 (Davis *et al*. 2011, pp. 28–30) and projected changes calculated from 1996–2006, specific to modeling region and land classification, into the future at decadal increments.
- To forecast forest ingrowth, the BLM initially masked out (1) 1996–2006 wildfire burn patches, (2) 1996–2006 calculated timber harvest units (based on the 1996–2006 LandTrendr data) and (3) lands within 800 meters of those areas (because the BLM relative habitat suitability values of each pixel are based on the means of covariate values within 800 meters of the pixel; see USDI BLM 2015, pp. 1480–1481). In theory, masking out these lands would eliminate all lands that experienced, or were influenced by, habitat losses during 1996–2006, leaving only those lands that had experienced positive or neutral changes (i.e., forest ingrowth) during that period.

The BLM verified the reliability of its wildfire methodology through expert review and continued to use it for the Proposed RMP/Final EIS. The BLM also determined that its use of LandTrendr was the most reliable method for forecasting timber harvest. However, to forecast forest ingrowth, the BLM found that, even after it had masked out the lands described above, the remaining lands still exhibited substantial habitat loss during 1996–2006 (i.e., the LandTrendr analysis did not account for much of the observed habitat loss that occurred during that period). Because the BLM needed to forecast changes in relative habitat suitability values from forest ingrowth, and habitat losses during 1996–2006 clearly did not result from ingrowth, the BLM compensated by changing all negative changes in relative habitat suitability values on unmasked lands during 1996–2006 to 0. In addition, because the BLM felt that positive changes in relative habitat suitability values during 1996–2006 greater than 10 were unrealistic, based on how northern spotted owl habitat is known to develop, the BLM truncated change values greater than 10 to 10. However, even though the BLM determined analytically that the resulting forecasts in forest ingrowth realistically followed observed forest structural progressions, it felt that its estimates of forest ingrowth in some areas, primarily in northern California, were optimistic and could be improved.

Following publication of the Draft RMP/EIS, the BLM experimented with dropping the 1996–2006 LandTrendr analysis. Instead, the BLM used GNN data to estimate changes (both positive and negative) from all causes other than large wildfires. Since the 2012 GNN data now were available, the BLM estimated such changes during 1996–2012 by:

- Masking out the decision area, because the BLM was estimating temporal changes in relative habitat suitability on other lands in this process;
- Masking out 1996–2012 wildfire burn patches of at least 1,000 acres, because the BLM would forecast habitat changes from large wildfires using its wildfire model;
- Masking out all lands within 800 meters of the BLM-administered lands and the 1996–2012 large wildfire patches.
- Calculating the observed mean change in each relative habitat suitability value during 1996–2012 for the remaining lands (i.e., for all 30 × 30-m pixels with the same relative habitat suitability value in 1996, calculating the mean change in that value between 1996 and 2012); and
- Dividing the mean rate-of-change for each relative habitat suitability value by 1.6 to prorate the 16-year (1996–2012) change to a decadal change (e.g., a mean change in relative habitat suitability value during 1996–2012 of +16 was prorated to +10; a mean change of -16 was prorated to -10).

The BLM calculated such mean changes by land division (i.e., for each physiographic province and, within each province, for Congressionally Reserved lands, all other Federal reserved lands, Federal non-reserved lands, and non-Federal lands). Since there are 12 physiographic provinces within the northern spotted owl's range, the BLM calculated 48 sets of mean changes in relative habitat suitability values.

Because the GNN data were derived from Landsat imagery, the BLM still was concerned that calculated mean changes (both positive and negative) for some relative habitat suitability values could be unrealistic given how forest structure develops. Although satellite imagery is reliable at the landscape scale, it is less reliable at the scale of a 200-ha circle (which has a radius of 800 m), the scale at which the BLM calculated relative habitat suitability values. Thus, the BLM anticipated that the values of some individual pixels could change to such a degree that they would bias the mean change for certain pixel values (e.g., a positive change that exceeds the rate at which forest stands are known to develop). This especially would be likely for relative habitat suitability values that were uncommon on the landscape in 1996.

To address this, the BLM compared, for each land division, decadal rates of change for all data and for subsets of data within 1.0, 1.5 and 2.0 standard deviations from the mean change for each relative habitat suitability value. The BLM found no appreciable differences between any of the resulting data sets, i.e., no evidence that one dataset projected habitat change more accurately than the other datasets. Therefore, the BLM chose to use the full dataset for each land division.

Table T-6 shows, for each physiographic province, forecasts of northern spotted owl habitat change during 2013–2063 on non-Federal lands using different methods. Habitat is classified by strength-of-selection, with 'selected for' and 'strongly selected for' corresponding to northern spotted owl nesting-roosting habitat, and these two classes plus 'selected against' corresponding to northern spotted owl dispersal habitat. Column 1 shows the forecasts that the BLM developed for the Draft RMP/EIS. Column 2 shows the forecasts according to the full 1996–2012 GNN datasets described in the previous paragraph.

Table T-6. A comparison of decadal rates of change in relative habitat suitability value on non-Federal lands from large wildfires, timber harvest and forest ingrowth, by strength-of-selection category and physiographic province, using four methods described in the text

Physiographic Province	Strength-of-Selection Class	1	2	3	4
Oregon Coast Range	Strongly Selected Against	-12.29%	25.04%	-10.55%	-10.74%
	Selected Against	63.46%	-76.17%	58.22%	59.20%
	Selected For	3.56%	-99.43%	-4.43%	-5.09%
	Strongly Selected For	-31.30%	-97.46%	-33.36%	-30.35%
Oregon Eastern Cascades	Strongly Selected Against	-60.02%	-78.70%	-45.31%	-56.83%
	Selected Against	45.81%	170.10%	37.22%	24.64%
	Selected For	126.66%	47.75%	97.81%	144.29%
	Strongly Selected For	49.63%	-59.68%	25.50%	60.72%
Oregon Klamath	Strongly Selected Against	-21.69%	1.34%	-10.39%	-13.53%
	Selected Against	31.99%	9.71%	23.47%	8.46%
	Selected For	31.53%	4.39%	8.39%	43.55%
	Strongly Selected For	82.08%	-85.47%	23.03%	24.36%
Oregon Western Cascades	Strongly Selected Against	-22.98%	34.72%	-6.75%	-6.62%
	Selected Against	69.89%	-89.10%	29.41%	28.99%
	Selected For	42.91%	-96.96%	-3.31%	-4.11%
	Strongly Selected For	47.27%	-98.79%	-6.29%	-3.05%
California Cascades	Strongly Selected Against	-29.12%	-35.58%	-14.78%	-21.78%
	Selected Against	51.60%	147.96%	19.78%	28.56%
	Selected For	62.70%	-44.34%	44.03%	54.01%
	Strongly Selected For	59.34%	-100.00%	27.89%	100.62%
California Coast Range	Strongly Selected Against	-50.55%	-81.80%	-26.80%	-48.05%
	Selected Against	-5.61%	-25.23%	-1.35%	-7.84%
	Selected For	10.15%	36.55%	7.08%	31.98%
	Strongly Selected For	114.60%	176.84%	51.87%	57.35%
California Klamath	Strongly Selected Against	-41.91%	-41.00%	-28.23%	-41.42%
	Selected Against	-15.98%	-0.56%	-14.50%	0.96%
	Selected For	36.88%	61.08%	39.05%	17.84%
	Strongly Selected For	97.68%	-12.72%	39.76%	96.46%
Washington Eastern Cascades	Strongly Selected Against	-21.66%	0.26%	-20.77%	-21.08%
	Selected Against	26.13%	66.58%	41.42%	24.98%
	Selected For	41.69%	-69.28%	25.84%	44.19%
	Strongly Selected For	45.30%	-97.29%	12.86%	36.73%
Washington Western Lowlands	Strongly Selected Against	-6.75%	10.56%	-5.92%	-5.86%
	Selected Against	74.88%	-100.00%	65.36%	63.91%
	Selected For	9.98%	-100.00%	9.98%	13.19%
	Strongly Selected For	26.60%	-100.00%	29.64%	47.83%
Washington Olympic Peninsula	Strongly Selected Against	-16.48%	24.65%	-14.82%	-15.08%
	Selected Against	63.15%	-43.84%	56.59%	49.07%
	Selected For	-3.57%	-99.79%	5.44%	25.85%
	Strongly Selected For	29.10%	-100.00%	-8.14%	-10.01%
Washington Western Cascades	Strongly Selected Against	-5.24%	9.31%	-4.81%	-4.73%
	Selected Against	51.10%	-37.64%	47.10%	45.98%
	Selected For	0.29%	-88.08%	0.26%	0.45%
	Strongly Selected For	-2.62%	-99.78%	-3.34%	-2.16%

Regarding the method reflected in **Table T-6**, Column 2, in the Oregon Coast Range and Oregon Western Cascades provinces, the two largest provinces in the decision area, unfiltered rates of change during 1996–2012 resulted in forecasted losses of 97–99 percent of selected-for and strongly-selected-for habitat during the next 50 years. (Not shown in **Table T-6**, the forecast for the Oregon Coast Range Province also showed a 43 percent loss in these classes during 2013–2023.) However, although these forecasts reflect observed rates of non-Federal timber harvests that began in the early to mid-1990s and extended to the 2008 recession (Gale *et al*. 2012, pp. 3–11), they cannot continue at this rate in the future and, thus, are not reliable for making 50-year forecasts. Stated another way: to lose 97–99 percent of such habitat on non-Federal lands during the next 50 years, it would have to be harvested from steep slopes, fragile soils, riparian areas, private house lots, State parks and other areas not reasonably subject to timber harvest, or burned on unprecedented numbers of acres by unprecedented levels of high-intensity wildfire (Gale *et al*. 2012). Thus, the BLM determined that habitat changes that occurred on non-Federal lands during 1996–2012, although real, were not indicative of future change, because they cannot continue at that rate and, therefore, could not be used in their raw form to forecast future change.

Given these results, the BLM returned to the method it used for the Draft RMP/EIS, with the following revisions:

- To forecast forest ingrowth, the BLM tested limiting positive changes in relative habitat suitability values to 1.0, 1.5 and 2.0 standard deviations from the mean instead of simply +10.
- To forecast timber harvest, the BLM replaced the 2006 LandTrendr analysis with the newly-available 2012 LandTrendr analysis.

The results of these changes are shown in columns 3 and 4 of **Table T-6**; Column 3 is based on limiting forest ingrowth rates to 1 standard deviation from the mean; Column 4 is based on limiting ingrowth rates to 2 standard deviations from the mean. Because columns 1–4 include the effects of forest ingrowth, timber harvest and wildfire on non-Federal lands, the forecasted change values are directly comparable.

Comparing the values in columns 1, 3 and 4 of **Table T-6**, the BLM determined that the values in columns 3 and 4 likely were more reliable forecasts of habitat change on non-Federal lands given past harvest rates and the fact that both sets of values reflected sustainable rates of timber harvest. In addition, the values in Column 3 were more conservative than the values in Column 4. After conferring with experts who were familiar with the original data and how forests develop in western Oregon (Craig Ducey, BLM, Jeffrey Dunk, Humboldt State University, Betsy Glenn, U.S. Fish and Wildlife Service, and David LaPlante, Natural Resource Geospatial, pers. com. to Eric Greenquist, various dates during 2015) , the BLM determined that the more-conservative Column 3 values, in terms of northern spotted owl habitat change on non-Federal lands, were the most realistic forecasts it could make from the available data.

In summary, the BLM determined analytically that the 1996–2012 GNN data, the most accurate data for non-BLM-administered lands in the range of the northern spotted owl, could not be used in their raw form to forecast habitat changes on those lands during 2013–2063, because observed rates of habitat loss on non-Federal lands during 1996–2012 were not indicative of future change. As described above, this finding by the BLM accords well with the findings of Gale *et al*. (2012). Therefore, the BLM explored methods to filter the GNN data to generate forecasts that better accord with projections of timber harvest on non-Federal lands at rates that could continue into the future. In refining its methods, the BLM chose the more conservative of its reliable forecasts: the forecast that showed the largest habitat losses on non-Federal lands that could still continue into the future. To be clear, the BLM does not intend its forecasts of range-wide habitat changes to be precise and accurate predictions of future habitat conditions. Instead, they are intended only as reasonable and credible approximations of future habitat conditions in each province and land classification that can be used to compare northern spotted owl habitat and population responses to the different alternatives and the Proposed RMP.

The Decision Area

For the Draft RMP/EIS, the BLM used only the covariate values derived by Woodstock to calculate relative habitat suitability values for BLM-administered lands. This was problematic because, normally, the relative habitat suitability value of each 30 × 30-m pixel is calculated from the means of the covariate values within 800 meters of the pixel. However, for the years 2023, 2033, 2043, 2053 and 2063 no GNN covariate values existed for lands that were within 800 meters of BLM-administered lands. Although the BLM can forecast decadal changes in relative habitat suitability values for other lands, as described above, it cannot forecast decadal changes in the GNN covariate values that are used to calculate relative habitat suitability values. Since Woodstock derives future covariate values only for BLM-administered lands, there existed no future covariate values for other lands within 800 meters of BLM-administered lands that the BLM could use to calculate relative habitat suitability values on BLM-administered lands for the years 2023, 2033, 2043, 2053, and 2063.

For the Draft RMP/EIS, the BLM used only Woodstock-derived covariate values to calculate relative habitat suitability on BLM-administered lands, effectively ignoring the influence of other lands within 800 meters of BLM-administered lands. The only option the BLM had to ignoring the influences of other lands within 800 meters of BLM-administered lands was to assume that habitat conditions on those other lands would remain static over time (i.e., calculate decadal relative habitat suitability values for BLM-administered lands using the decadal Woodstock covariate values for BLM-administered lands and the 2012 GNN covariate values for other lands within 800 meters of BLM-administered lands). The BLM chose to ignore the influence of other lands, because it determined that the effects of ignoring the other lands were negligible where BLM-administered lands abutted reserves on other Federal lands. However, where BLM-administered lands abutted non-Federal lands, especially private industrial timberlands, and to a lesser extent, Federal non-reserved lands, the BLM determined that its process tended to overestimate the relative habitat suitability of the BLM-administered lands.

With its more-conservative forecasts of habitat changes on other lands within the range of the northern spotted owl, as described above, the BLM determined that the latter of the two options described above—use the decadal Woodstock covariate values for BLM-administered lands and the 2012 GNN covariate values for other lands within 800 meters of BLM-administered lands—was likely more realistic than using only the decadal Woodstock covariates to calculate relative habitat suitability values for BLM-administered lands. The BLM tested modeling relative habitat suitability values on BLM-administered lands in two ways:

1. Non-weighted covariate values

- The BLM identified BLM-administered lands within 800 meters of Congressionally Reserved lands and other Federal reserves (e.g., the Late-Successional Reserve on U.S. Forest Service lands). On those BLM-administered lands, the BLM calculated relative habitat suitability values using only the Woodstock covariates within 800 meters of each pixel to account for the likelihood that habitat development on BLM-administered lands would best represent habitat development on the adjacent reserved lands.
- On all other BLM-administered lands, the BLM calculated relative habitat suitability values using the decadal Woodstock covariates for the BLM-administered lands within 800 meters of each pixel and the 2012 GNN covariate values within 800 meters of each pixel.

2. Weighted covariate values

- The BLM masked Congressionally Reserved lands and other Federal reserves within 800 meters of BLM-administered lands and excluded the GNN covariate values for those lands from its analysis.

- Within the 800 meters circle around each pixel, the BLM calculated the area of (1) BLM-administered lands plus Congressionally Reserved lands and other Federal reserves, and (2) Federal non-reserved lands and non-Federal lands.
- The BLM then weighted the decadal Woodstock covariate values and 2012 GNN covariate values within 800 meters of each pixel according to the area of each of the two land classifications; i.e., the BLM weighted the decadal Woodstock covariate values according to the portion of the 800 meters circle represented by BLM-administered lands, Congressionally Reserved lands and other Federal reserves, and the 2012 GNN covariate values according to the portion represented by Federal non-reserved lands and non-Federal lands.

The BLM found no substantive difference between the two methods in its habitat forecasts for BLM-administered lands over time. Therefore, the BLM chose not to weigh the covariate values, because that was the analytically simpler and quicker of the two methods.

E. Developing and Calibrating the BLM HexSim Model

As described above, the BLM determined that the HexSim model developed by the U.S. Fish and Wildlife Service to inform its decisions on northern spotted owl recovery and critical habitat (USDI FWS 2011, pp. Appendix C, and USDI FWS 2012), with specific changes, could help the BLM meet its planning needs. Therefore, the BLM took the U.S. Fish and Wildlife Service's northern spotted owl HexSim model, fully parameterized, and modified it as necessary. The BLM made the following changes:

- The BLM developed different range-wide relative habitat suitability surfaces that reflected spatially-explicit estimates of how forest stands would respond over time to forest ingrowth, timber harvest and wildfire on all lands, and also to forest restoration treatments (such as thinning consistent with Late-Successional Reserve or Riparian Reserve management direction) on the decision area.
- Although the BLM altered relative habitat suitability values by decade on all lands, as described above, the BLM did not otherwise augment or suppress those values. In effect, unlike some U.S. Fish and Wildlife Service simulations that limited northern spotted owl nesting to potential critical habitat units, the BLM always allowed simulated northern spotted owls to move, forage, and establish nest territories on all lands according to local relative habitat suitability values.
- Because the BLM required both stochastic and non-stochastic simulations of northern spotted owl response for the reasons described in Chapter 3 (Northern Spotted Owl, Issue 4), the BLM completed 500 replicate simulations of each alternative. In contrast, after its Phase 1 modeling, the U.S. Fish and Wildlife Service used only stochastic simulations, with 100 replicates per alternative (USDI FWS 2012, p. 29).
- Although the BLM calibrated the BLM model using the same method used by the U.S. Fish and Wildlife Service (USDI FWS 2011, pp. C-71 – C-74), the BLM calibration, described below, yielded unique numbers and locations of female northern spotted owls to begin each of the replicate simulations.
- The BLM used observed barred owl encounter rates (for the Draft RMP: Forsman *et al*. 2011, pp. Appendix B, and USDI FWS 2011, p. C-66 and Table C-25; for the Proposed RMP/Final EIS: the 2016 meta-analysis data provided by Dr. Dugger and as recommended by the U.S. Fish and Wildlife Service) for reasons described in Chapter 3 (Northern Spotted Owl Issue 4).
- Also for reasons described in Chapter 3 (Northern Spotted Owl Issue 4), the BLM simulated 50 years (2013–2063) with relative habitat suitability values changing every 10 years according to the BLM forecasts, and then held habitat values constant for an additional 50 years.

Calibration for the Draft RMP/EIS

The northern spotted owl HexSim model developed by the U.S. Fish and Wildlife Service (USDI FWS 2011, Schumaker *et al*. 2014) is an individual-based, spatially explicit, population simulation model. The U.S. Fish and Wildlife Service parameterized the model based on empirically derived estimates of age-

specific survival, fecundity, territory and home-range size, and dispersal (USDI FWS 2011 and Schumaker *et al*. 2014). The U.S. Fish and Wildlife Service used its relative habitat suitability surface in HexSim to represent resource quality (higher values were of greater quality than lower values). Each of the eleven modeling regions (USDI FWS 2011, p. C-13) had different resource targets for northern spotted owls, and resource targets varied in relation to home range size (larger targets in areas with larger home ranges). For home range size variation, many empirical studies existed and the U.S. Fish and Wildlife Service used them to guide its decisions in the development of HexSim (USDI FWS 2011, pp. Appendix C, and Schumaker *et al*. 2014). However, other than variation in home range size, no empirical information existed to guide specific decisions on resource targets. Because resource targets—as represented by relative habitat suitability—are not real, on-the-ground quantities, they can have no empirical basis; they only can be associated with on-the-ground resources. Thus, the authors of the U.S. Fish and Wildlife Service's northern spotted owl HexSim models varied resource targets until resulting simulated population sizes were similar to empirically estimated populations of northern spotted owls (USDI FWS 2011, pp. Appendix C, and Schumaker *et al*. 2014). This model calibration happened by 'tuning' (i.e., varying) resource targets by modeling region. The U.S. Fish and Wildlife Service (USDI FWS 2011, pp. Appendix C) also calibrated its HexSim model for dispersal such that simulated northern spotted owls that dispersed did so in a way that resulted in similar dispersal distance profiles to those estimated from empirical studies. For this portion of the calibration, the U.S. Fish and Wildlife Service tuned the model by varying the attraction/repulsion of various habitats (relative habitat suitability values) as well as the maximum number of 86.6-ha hexagons a dispersing owl could move through while attempting to find a territory (USDI FWS 2011, Schumaker *et al*. 2014).

The BLM initially intended to use the 2012 GNN version of Model 13 for other lands within the northern spotted owl's range. However, as the BLM evaluated how Model 13 would be used for HexSim population dynamics modeling, it evaluated a range of factors that, instead, suggested using the U.S. Fish and Wildlife Service MaxEnt model projected to newly available 2012 GNN variables for other lands:

- The U.S. Fish and Wildlife Service HexSim model had been developed to work with and calibrated to the U.S. Fish and Wildlife Service 2006 GNN MaxEnt relative habitat suitability model, and had been demonstrated to be well-calibrated to those data (USDI FWS 2011, pp. Appendix C).
- The BLM's 2006 GNN version of Model 13 demonstrated a high degree of correlation to the U.S. Fish and Wildlife Service 2006 GNN model (correlation coefficient of 0.867).
- The decision area accounts for about 4 percent of lands in the northern spotted owl's range. As such, relative habitat suitability values on BLM-administered lands would likely have a proportionally small effect on overall population response.
- The U.S. Fish and Wildlife Service initially calibrated its HexSim model by adjusting model parameters (i.e., resource targets) separately for each of its eleven modeling regions. The decision area is constrained to four of those regions. This meant that, by using the U.S. Fish and Wildlife Service 2006 GNN MaxEnt relative habitat suitability surface, five of the eleven modeling regions would require no recalibration at all. And, because of the high degree of correlation between the U.S. Fish and Wildlife Service's model and Model 13, the other modeling regions probably would require only minor recalibration.

Given these conditions, the BLM determined that using the U.S. Fish and Wildlife Service 2012 GNN model for other lands was reasonable and would require less calibration and re-development of HexSim than would be required using the BLM 2012 GNN Model 13 relative habitat suitability surfaces for those lands.

The U.S. Forest Service released its 2012 GNN data at about the same time the BLM reached this phase in the project; up to this point, the latest release of these data was for 2006. To create the new 2012 version of the U.S. Fish and Wildlife Service MaxEnt model, the BLM generated a full set of model

variable surfaces from the 2012 GNN data, using the same GNN attributes and methods used by U.S. Fish and Wildlife Service to generate the original 1996 and 2006 covariate rasters (USDI FWS 2011, Appendix C). The BLM then projected the original U.S. Fish and Wildlife Service 1996 MaxEnt model to the 2012 covariate rasters separately for each of the eleven U.S. Fish and Wildlife Service modeling regions and merged them into a single, seamless, range-wide relative habitat suitability surface.

To derive the relative habitat suitability surface needed to calibrate HexSim, the BLM then replaced the pixels in the U.S. Fish and Wildlife Service 2012 GNN model for the decision area with data from the final BLM 2013 Woodstock Model 13 raster.

Because the BLM created new MaxEnt surfaces for the decision area, the BLM sought to evaluate whether the 'default settings' of HexSim, as used by the U.S. Fish and Wildlife Service, would work well for the BLM, or whether further calibration (fine tuning) was needed before running population simulations. In its calibration/tuning of the northern spotted owl HexSim model, the U.S. Fish and Wildlife Service (USDI FWS 2011, pp. Appendix C) found that time-step 50 represented a reasonable approximation of the present (at the time the U.S. Fish and Wildlife Service did its work). The only differences between the data feeding into the northern spotted owl HexSim models by the U.S. Fish and Wildlife Service and this effort by the BLM were that:

- The U.S. Fish and Wildlife Service and the BLM used different MaxEnt relative habitat suitability surfaces for the decision area, and;
- The relative habitat suitability surface for the decision area was estimated for 2013. The BLM projected the U.S. Fish and Wildlife Service 1996 GNN MaxEnt models using GNN data from 2012 (as opposed to 2006, as used by the U.S. Fish and Wildlife Service) for other lands.

Thus, this new 'base' relative habitat suitability surfaces used by the BLM used the identical MaxEnt models for all lands except BLM-administered lands in the planning area, and, for those lands, the BLM developed a new MaxEnt model (Model 13). Since the correlation between the relative habitat suitability surfaces developed by the U.S. Fish and Wildlife Service and Model 13 was so high, the BLM anticipated that its HexSim model would require minor, or no, recalibration.

The BLM began recalibration by using the U.S. Fish and Wildlife Service default HexSim settings, and evaluated population estimates for the same eight demographic study areas for which the U.S. Fish and Wildlife Service had data (USDI FWS 2011, pp. C-71 – C-75). The BLM ran 20 replicates of HexSim (without environmental stochasticity; see Northern Spotted Owl, Chapter 3) for 70 time-steps. Replicates refer to the number of distinct simulations that are run. Because HexSim is not a deterministic model, several replicates are needed to get an estimate of mean responses (i.e., different replicates will almost always vary in their specific population responses). The BLM chose 70 time-steps because it initially wanted to evaluate whether, using default settings, simulated demographic study area population sizes were more/less similar to empirically-estimated populations before, during, or after time-step 50: the time-step that the U.S. Fish and Wildlife Service (USDI FWS 2011, pp. C-71 – C-75) found to be a good approximation of 'now.' The BLM used the mean population among the 20 replicates to estimate simulated population size. For the eight demographic study areas, the BLM used the mean of the three years with the largest population to estimate population size (USDI FWS 2011, pp. C-71 – C-75).

Using default parameters in the northern spotted owl HexSim model, the BLM found that mean population size of territorial owls on the eight demographic study areas at time-step 59 corresponded most closely with the empirical population estimates. For the demographic study areas, empirical estimates of populations ranged from 30 to 130, with the total population on the eight study areas being 756. At time-step 59, mean simulated estimates of populations ranged from 32 to 145, with a total population of 763. The pairwise percent differences between empirical and simulated populations on each of the study areas varied from 0.54 percent to 41.75 percent, with a mean percentage difference of 4.7 percent. Time-step 55

had the smallest mean percent difference (-2.3 percent) but the estimate of total population size on the eight study areas was 6 percent higher than the empirical estimates. In contrast, the time-step 59 estimated total population size on the eight study areas was 0.95 percent larger than the empirical estimate. **Figure T-17** compares empirical and time-step 59 population estimates in each of the study areas.

Because the default parameters worked well, the BLM did not further attempt to fine-tune any parameter settings and used the default settings. The only difference between the U.S. Fish and Wildlife Service's (USDI FWS 2011) and BLM's use of the spotted owl HexSim model was that the U.S. Fish and Wildlife Service used time-step 50 to represent the current year and the BLM used time-step 59.

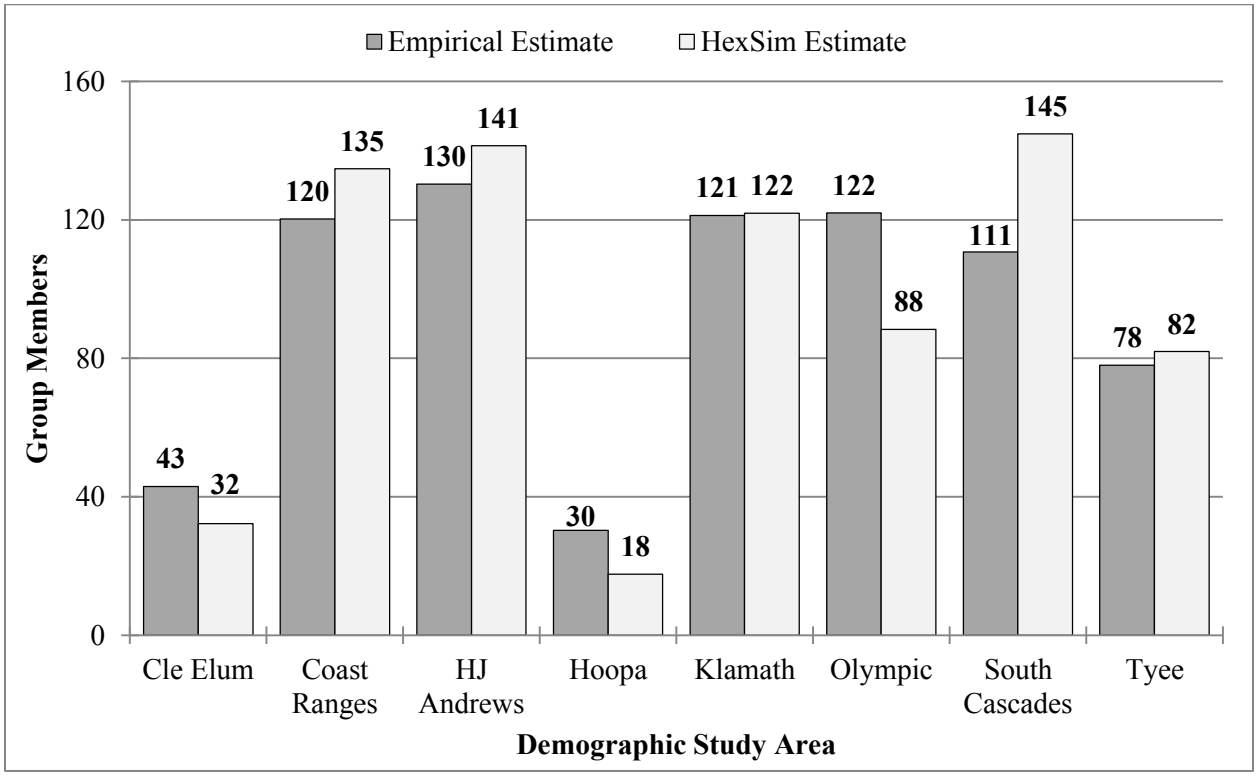


Figure T-17. Comparison of the mean of estimates of territorial northern spotted owls on eight demographic study areas estimated in the field (empirical estimates, n = mean of three highest years between 1996 and 2006) and estimated using the BLM northern spotted owl HexSim model (mean from 20 replicates of HexSim at time-step 59)

Additional Calibration for the Proposed RMP/Final EIS

The northern spotted owl HexSim model that the BLM used for its Draft RMP/EIS was essentially identical to that used by the U.S. Fish and Wildlife Service to inform its decisions on northern spotted owl recovery and the delineation of northern spotted owl critical habitat. The U.S. Fish and Wildlife Service model relied heavily on demographic parameters from the 2011 northern spotted owl meta-analysis (Forsman *et al*. 2011). Since publication of the Draft RMP/EIS, Dr. Katie Dugger, Oregon State University, the principal author of the 2016 northern spotted owl meta-analysis (Dugger *et al*. 2016), provided the BLM with five additional years of (not-yet-published) meta-analysis results on northern spotted owl adult fecundity and survival, and barred owl encounter rates.

Fecundity

Dr. Dugger provided meta-analysis results for the eight northern spotted owl demographic study areas on Federal land that are used to monitor the Northwest Forest Plan. Fecundity data were stratified among three northern spotted owl age classes: 1-year olds (S1), 2-year olds (S2), and greater than or equal to 3-year olds (adults). The northern spotted owl HexSim model that the BLM used for the Draft RMP/EIS , which relied on fecundity data from Forsman *et al*. 2011, assumed mean fecundity values of 0.070, 0.202, and 0.330 for S1, S2, and adults, respectively. Mean (un-weighted) fecundity values among the eight demographic study areas from the 2016 meta-analysis were 0.068, 0.215, and 0.326 for S1, S2, and adults, respectively. Since these values for each age class were nearly identical, the BLM did not change fecundity values in its HexSim model for the Proposed RMP/Final EIS.

Survival

The U.S. Fish and Wildlife Service used data from Forsman *et al*. 2011 (p. 32, Table 12) to stratify survival rates among S1, S2, and adult owls. The authors of the 2016 meta-analysis did not use the same analytic approach used by Forsman *et al*. (2011). Forsman *et al*. based their estimates of age-specific survival on model averaging. In contrast, for the 2016 meta-analysis, Dugger *et al*. (2016) based their results on the best random effects model for each demographic study area. In addition, Dugger *et al*. estimated only adult survival whereas Forsman *et al*. estimated survival for each age class. As with the fecundity data, Dugger *et al*. provided estimates of adult survival for the eight Federal land demographic study areas.

For each of the eight demographic study areas, the BLM estimated mean annual survival from the 2016 meta-analysis and compared them to the model-averaged rates estimated by Forsman *et al*. (2011) for the same demographic study areas. For the eight demographic study areas, the estimates by Forsman et al. were larger for three demographic study areas, smaller for three demographic study areas, and identical for two demographic study areas. The average difference between the Dugger *et al*. and Forsman *et al*. estimates was 0.0039 (range -0.003 to 0.025). The grand mean of estimates according to Dugger *et al*. and Forsman *et al*. were 0.8502 and 0.8463, respectively.

The BLM did not change survival values in its HexSim model for the Proposed RMP/Final EIS, because (1) estimates of adult survival by Dugger *et al*. and Forsman *et al*. 2011 were so similar, (2) both sets of authors used different approaches to calculate survival, and (3) Dugger *et al*. did not calculate survival for all age classes.

Barred Owl Encounter Rates

Dr. Dugger provided updated estimates of barred owl encounter rates (the proportion of northern spotted owl territories on which surveyors detected barred owls) for each of the eight Federal land demographic study areas. She provided the estimates for each year since the studies began (or when barred owls first were recorded) through 2013. For the eight demographic study areas, the highest barred owl encounter rates occurred in 2013 for four demographic study areas. Seven of the eight demographic study areas show very strong linear time trends in barred owl encounter rates.

For each demographic study area, the BLM compared the mean barred owl encounter rate for the years 2007–2009 and 2011–2013. The mean percent change for all demographic study areas between these two means was 24.04 percent (range 8.37–83.33). Mean change for 2008–2013 was 36.87 percent, and for 2009–2013 was 26.48 percent. Slopes of individual demographic study area linear regressions (barred owl encounter rate × time) averaged 0.02 (range 0.004–0.041). Thus, the barred owl encounter rates, on average, increased by about 2 percent per year in the eight demographic study areas from approximately 1990-2013.

In the U.S. Fish and Wildlife Service's HexSim model, the U.S. Fish and Wildlife Service based barred owl encounter rates on demographic study area data provided by Forsman *et al*. (2011). Some demographic study areas are completely within one of the U.S. Fish and Wildlife Service's modeling regions, whereas other demographic study areas straddle multiple modeling regions, and some modeling regions have no demographic study area. Thus, the U.S. Fish and Wildlife Service used a combination of empirical data and professional judgment to ascribe barred owl encounter rates to each of the eleven U.S. Fish and Wildlife Service modeling regions.

For those demographic study areas within a single discrete modeling region, the BLM used the 2013 barred owl encounter rate from the demographic study area. For those modeling regions where it was less clear, the BLM applied the 26.48 percent increase (i.e., the average observed rate of change for all demographic study areas during 2009–2013) to the rates used by U.S. Fish and Wildlife Service in its HexSim model. Forsman *et al*. (2011) presented data on barred owl encounter rates through 2008. Thus, the BLM determined that using the average percentage increase on demographic study areas from 2009 to 2013, as the inflation factor was warranted. **Table T-7** compares the barred owl encounter rates used by the BLM for the Draft RMP/EIS and the Proposed RMP/Final EIS.

Table T-7. Barred owl encounter rates used by the BLM for the Draft RMP/EIS and Proposed RMP/Final EIS

Modeling Region	Estimated Barred Owl Encounter Rates Used for the Draft RMP	Estimated Barred Owl Encounter Rates Used for the Proposed RMP/Final EIS
North Coast and Olympics*	0.505	0.515
East Cascades-North	0.296	0.374
West Cascades-North	0.320	0.405
West Cascades-Central	0.325	0.411
Oregon Coast*	0.710	0.831
West Cascades-South*	0.364	0.442
Inner California Coast Range	0.213	0.269
East Cascades-South*	0.180	0.228
Klamath-Siskiyou-East*	0.245	0.411
Klamath-Siskiyou-West*	0.315	0.398
Redwood Coast	0.205	0.259

* Modeling regions entirely or partially in the planning area

Mean barred owl encounter rates for the eleven modeling regions are 0.334 (Draft RMP/EIS) and 0.413 (Proposed RMP/Final EIS). Among the eight demographic study areas, Dugger *et al*. (2016) calculated a mean barred owl encounter rate in 2013 of 0.449.

Hypothetical Barred Owl Control Areas

For the Draft RMP/EIS, the BLM evaluated northern spotted owl population responses to all alternatives, and to the No Timber Harvest reference analysis, using the observed estimated barred owl encounter rates shown in Table 3-263 of the Draft RMP/EIS (USDI BLM 2015, p. 778). The BLM also evaluated Alternative C and the No Timber Harvest reference analysis using modified barred owl encounter rates developed by the U.S. Fish and Wildlife Service, also shown in **Table 3-263**. The BLM did the supplemental analyses to evaluate the degree to which BLM land use allocations could affect northern spotted owl population responses if the U.S. Fish and Wildlife Service implemented a barred owl control program.

As shown on pp. 783–804 of the Draft RMP/EIS, the BLM determined that northern spotted owl population responses to all of the alternatives, and to the No Timber Harvest reference analysis, were virtually identical because they primarily were determined by the observed estimated barred owl encounter rates (i.e., the degree of observed competitive interactions between northern spotted owls and barred owls). Since observed estimated barred owl encounter rates from the 2016 meta-analysis increased in all modeling regions (**Table T-7**), the BLM determined that it would learn nothing more by using the increased rates for the Proposed RMP/Final EIS.

Instead, the BLM simulated northern spotted owl population responses under Alternative C, the Proposed RMP, and the No Timber Harvest reference analysis using modified barred owl encounter rates in simulated barred owl control areas and observed estimated barred owl encounter rates (**Table T-7**, Column 3) in the remainder of each modeling region. The BLM did this to simulate range-wide northern spotted owl population responses under each scenario if the U.S. Fish and Wildlife Service were to implement a barred owl control program. Applying the modified barred owl encounter rates only in control areas more realistically simulates the true effects of a barred owl control program. This was a refinement to how the BLM simulated a barred owl control program for the Draft RMP/EIS, in which the BLM applied the modified barred owl encounter rate specific to each modeling region to all lands in the modeling region.

The BLM delineated hypothetical barred owl control areas and modified barred owl encounter rates with assistance from Jeffrey Dunk, Humboldt State University, David LaPlante, Natural Resource Geospatial, and Betsy Glenn, U.S. Fish and Wildlife Service, who helped the BLM develop its analytical assumptions. The BLM began with the assumptions that barred owl control would occur—

- Throughout the northern spotted owl's range;
- On approximately 10 percent of the forested landscape in each modeling region;
- In the Late-Successional Reserve on Federal lands, on State lands, and in northern spotted owl critical habitat on Federal and State lands;
- In aggregations of the best northern spotted owl habitat; and
- Within one mile of an improved road.

To delineate hypothetical control areas, the BLM segregated all lands in each modeling region into 20 resource bins according to relative habitat suitability value (those pixels with a relative habitat suitability value of 96 or higher were placed in Bin 1; those with values 91–95 were placed in Bin 2, etc.). The BLM then confined its analysis to those bins with relative habitat suitability values of 35 or higher (i.e., nesting-roosting habitat in 13 resource bins).

The BLM delineated the Late-Successional Reserve on Federal lands, State lands, and northern spotted owl critical habitat on Federal and State lands into five distance bins based on their distance from an improved road (i.e., those lands within 0.25 mile, 0.50 mile, 0.75 mile, and 1.0 mile of an improved road, and beyond 1.0 mile of an improved road). The BLM then confined its analysis to those bins within 1.0 mile of an improved road (i.e., 4 distance bins).[55]

This generated a digital map of Federal and State lands segregated into 52 bins (13 resource bins × 4 distance bins) based on relative habitat suitability value and distance to an improved road. That is, the 30 × 30-m pixels with highest habitat suitability values and lands nearest roads were placed in lower-numbered bins, respectively, and the BLM multiplied the two bin values for each pixel to rank the pixels, with the lowest multiples receiving the highest rank. The BLM then used the zonation model developed

[55] The BLM used a Fibonacci sequence where 0.25- and 0.5-mile bands equaled 1, 0.7-mile bands equaled 2, and 1.0-mile bands equaled 3.

by the U.S. Fish and Wildlife Service (USDI FWS 2011, pp. Appendix C, and USDI FWS 2012) to aggregate Federal and State lands into barred owl control areas based on relative habitat suitability value and nearness to an improved road until 10 percent of the forested landscape in each modeling region had been delineated. This process led to the highest value habitat areas within appropriate land allocation categories and closest to a road being included in the 'target area' first, followed by successively lower value habitats down to a value of 35 and greater distances out to 1.0 mile.

However, in the North Coast and Olympics and West Cascades-North modeling regions, zonation delineated only 4.8 percent of the forested landscape in each modeling region, due primarily to the acres of roadless lands, such as in Olympic National Park. The BLM conferred with the U.S. Fish and Wildlife Service, which recommended that the BLM expand the control areas in other modeling regions until it achieved a range-wide total of 10 percent (Betsy Glenn, U.S. Fish and Wildlife Service, pers. com. to Eric Greenquist, September 11, 2015). The U.S. Fish and Wildlife Service made this recommendation because the added acres mostly would occur in regions with the largest northern spotted owl populations, which is how the U.S. Fish and Wildlife Service most likely would design a control program. **Figure T-18** shows the hypothetical control areas delineated by zonation.

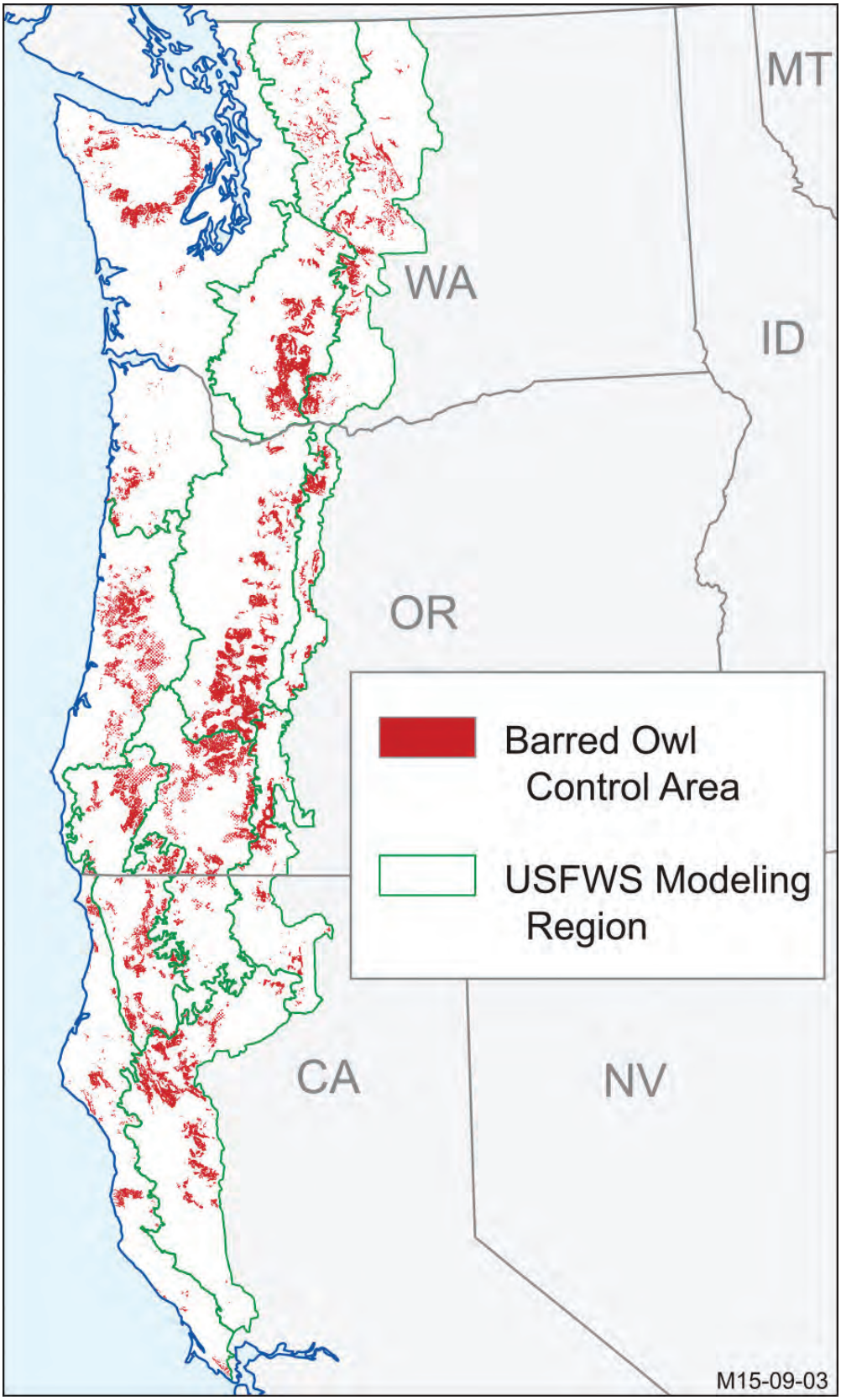


Figure T-18. Hypothetical barred owl control areas in the United States' portion of the northern spotted owl's range

Modified Barred Owl Encounter Rates

As the BLM explained on pp. 778–780 of the Draft RMP/EIS, when simulating northern spotted owl responses to a barred owl control program, the BLM used the estimated observed barred owl encounter rates (Table 3-263, p. 778 of the Draft RMP/EIS) during the first decade (2013–2023) and the modified barred owl encounter rates (same table) during 2023–2063. In two modeling regions with the highest estimated observed encounter rates, the BLM phased in the modified rates over the first two decades (2013–2033) (USDI BLM 2015, p. 779).

However, with the delineation of hypothetical control areas for the Proposed RMP/Final EIS, the BLM, based on the recommendation of the U.S. Fish and Wildlife Service (Betsy Glenn, U.S. Fish and Wildlife Service, personal communication to Eric Greenquist, September 1, 2015), used the observed estimated barred owl encounter rates shown in the third column of **Table T-7** but, beginning with the second decade (i.e., during 2023–2063), reduced the barred owl encounter rate in each of the hypothetical control areas to 0.15 to simulate the effects of a targeted barred owl control program (i.e., the BLM continued to use the observed estimated encounter rates outside the hypothetical control areas).

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Appendix U – Wild and Scenic River Suitability Report Summary

This appendix summarizes the studies completed on 51 rivers, and provides summarized information on the six river segments the BLM found to be suitable. Full text of the two Suitability Reports is available online at: http://www.blm.gov/or/plans/rmpswesternoregon/recreation.php.

This appendix additionally summarizes the range of river segments recommended for inclusion in the National Wild and Scenic Rivers System (National System) considered among the alternatives within this Final EIS. The full evaluation and analysis of the study rivers across the range of alternatives and the Proposed RMP is included in Chapter 3 – Wild and Scenic Rivers.

Introduction, Project Area, and Preliminary Determinations

In October 1990, the US Department of the Interior, Bureau of Land Management's (BLM) western Oregon districts (Coos Bay, Eugene, Klamath Falls Field Office, Medford, Roseburg, and Salem) completed the eligibility phase of a Wild and Scenic River (WSR) evaluations as part of the resource management plan revision process (USDI BLM 1995). The cumulative result of this planning effort was the identification of 51 eligible river segments across western Oregon.

This current study process assessed the suitability of these 51 river segments that have been previously identified as eligible components of the National System. The project area for this suitability study includes all BLM-administered river segments within the BLM's western Oregon district boundaries that have been determined to meet the eligibility criteria for Wild and Scenic Rivers.

Why Conduct a Suitability Study and Why Now?

Section 5(d)(1) of the WSR Act (Pub. L. 90-542; 16 U.S.C. 1271–1287) directs Federal agencies to consider potential Wild and Scenic Rivers in the land use planning process. To fulfill this requirement, whenever the BLM undertakes a land use planning effort, the BLM may choose to analyze river and stream segments that might be eligible or suitable for inclusion in the National System. The BLM has made this decision.

Steps in the Wild and Scenic River Study Process

A WSR study process is composed of two main components: the eligibility phase and the suitability phase. The BLM has completed the eligibility phase and the suitability phase for all eligible rivers within the planning area for the western Oregon RMP. The eligibility and suitability phases were conducted in accordance with BLM Manual 6400 – Wild and Scenic Rivers – Policy and Program Direction for Identification, Evaluation, Planning, and Management (USDI BLM 2012), The Wild and Scenic River Study Process Technical Report (Interagency Wild and Scenic Rivers Coordinating Council 1999), and with the Wild and Scenic Rivers Act.

Eligibility Phase

The eligibility studies completed in 1990 determined 51 individual segments within BLM-administered lands in western Oregon met the eligibility criteria for inclusion into the National System. Under the 1995 RMPs, the Records of Decision included these 51 rivers segments as eligible candidates for the National System. These segments are currently managed under interim protection until the BLM evaluates their suitability. **Table U-1** identifies the 51 eligible rivers, their outstandingly remarkable values, tentative classifications, total miles, and acres of BLM-administered lands within study river corridors.

Table U-1. All eligible Wild and Scenic River segments within the decision area

Study River Name	Outstandingly Remarkable Values	Tentative Classification	River Length (Miles)	BLM-administered Lands (Acres)
Alsea River	Recreation, Fish, Wildlife	Recreational	1.1	404
Antelope Creek	Fish	Recreational	1.3	718
Applegate River	Fish	Recreational	1.3	839
Big Butte Creek	Fish	Recreational	2.0	706
Cheney Creek	Fish	Recreational	2.2	711
Clackamas River	Recreation, Fish, Wildlife	Recreational	0.0	30
Cow Creek	Fish, Wildlife, Historical, Cultural	Recreational	10.0	3,339
Drift Creek	Fish	Recreational	0.4	150
Elk Valley Creek	Fish	Recreational	1.6	464
Fall Creek - Eugene	Recreation	Recreational	0.4	87
Fall Creek - Salem	Fish	Recreational	2.4	670
Kilches River	Recreation, Fish, Wildlife	Recreational	0.0	66
Lake Creek Segment B	Recreation, Fish	Recreational	0.9	483
Left Fork Foots Creek	Fish	Recreational	0.1	131
Little Applegate River	Fish	Recreational	1.7	1,368
Little Luckiamute River	Ecology	Recreational	0.3	40
Little North Santiam River	Scenery, Recreation, Fish, Wildlife	Recreational	3.5	1,205
Lobster Creek Segment B	Fish	Recreational	0.1	352
Luckiamute River	Ecology	Recreational	2.2	624
McKenzie River Segment B	Scenery, Recreation, Fish, Wildlife	Recreational	1.0	56
Middle Santiam River	Cultural, Ecology	Recreational	0.6	193
Nehalem River	Recreation	Recreational	0.2	40
Nelson Creek	Fish	Recreational	2.6	833
Nestucca River Segment B*	Scenery, Recreation, Fish, Wildlife	Recreational	0.6	212
North Fork Clackamas River	Fish	Scenic (Seg. 1) Recreational (Seg. 2)	1.4	389
North Fork Gate Creek	Fish	Recreational	0.6	199
North Fork Siletz River	Fish, Wildlife, Ecology	Scenic	3.5	990
North Fork Trask River	Recreation, Fish	Recreational	3.0	778

Study River Name	Outstandingly Remarkable Values	Tentative Classification	River Length (Miles)	BLM-administered Lands (Acres)
North Santiam River	Scenery, Recreation, Fish, Wildlife (Seg. A)	Scenic (Seg. A)	1.2	376
	Recreation, Fish, Wildlife (Seg. B)	Recreational (Seg. B)	2.7	
Quines Creek	Fish	Recreational	1.9	816
Riffle Creek	Fish	Recreational	2.1	762
Rogue River	Recreation, Fish	Recreational	1.5	754
Sams Creek	Fish	Recreational	7.3	497
Sandy River	Scenery, Recreation, Fish, Cultural	Recreational	0.7	1,519
Siletz River	Scenery, Recreation, Fish, Wildlife	Recreational	2.0	54
Sixes River	Fish, Wildlife, Historical	Recreational	1.4	281
South Fork Coos River	Recreation, Fish, Wildlife	Recreational	1.0	551
South Fork Coquille	Fish, Cultural	Recreational	0.6	152
South Fork Gate Creek	Fish	Recreational	1.4	108
South Fork Little Butte Creek	Fish	Recreational	0.0	452
South Fork Trask River	Fish	Recreational	1.4	69
South Umpqua	Fish, Wildlife, Historical, Cultural	Recreational	0.0	602
South Yamhill River†	Cultural, Ecology	Recreational	4.7	0
Table Rock Fork – Molalla River	Scenery, Cultural	Recreational	0.4	1,480
Trask River	Recreation	Recreational	1.2	444
Tualatin River	Cultural	Recreational	18.0	326
Umpqua River	Scenery, Recreation, Geology, Fish, Wildlife, Historical, Cultural, Ecology	Recreational	4.2	2,403
West Fork Illinois River	Scenery	Scenic	1.1	1,154
Willamette River	Recreation, Fish, Wildlife, Historical, Cultural, Ecology,	Recreational	0.0	83
Wilson River	Recreation, Fish, Wildlife	Recreational	1.3	109
Yaquina River	Fish, Wildlife	Recreational	3.5	270
		Totals	**100.9**	**29,339**

* The BLM concluded through the suitability assessment that a joint suitability study with the U.S. Forest Service is needed to make a determination about the segment's suitability. This segment will continue to receive protection until completion of the joint study.

† The BLM discovered through a revalidation of the eligibility determinations that were made in 1992 that the South Yamhill River corridor does not include any BLM-administered lands. Therefore, this segment that was previously determined eligible did not move forward for suitability evaluation as part of this RMP revision.

Suitability Phase

The purpose of the suitability phase of the study process is to determine whether eligible segments would be appropriate additions to the National System by considering tradeoffs between corridor development and river protection. The suitability evaluation does not result in actual designation but only a determination of suitability, which provides a basis for determining which rivers should be recommended for inclusion into the National System. The BLM cannot administratively designate a segment via a planning decision or other agency decision into the National System, and no segment studied is designated or would be automatically designated as part of the National System. Rivers found not suitable by the BLM would be dropped from further consideration for inclusion into the National System.

Suitability Determinations

Of the 51 stream segments determined to be eligible in the 1990 RMP process, the BLM determined that 6 segments meet the suitability criteria for recommendation into the National System, 43 segments were found not suitable during the BLM's review, one segment (Nestucca River Segment B) was found to warrant further evaluation under a joint study with the U.S. Forest Service to determine suitability, and one segment (South Yamhill River) was removed from suitability evaluation because the corridor contained no BLM-administered lands. **Table U-2** shows the six rivers found suitable.

Table U-2. Eligible rivers within the decision area that the BLM identified as meeting suitability criteria

River Segment Name	District	Suitable River Tentative Classification	River Miles
Little North Santiam River	Salem	Recreational	3.5
North Fork Siletz River	Salem	Scenic	3.5
Rogue River	Medford	Recreational	2.1
Sandy River	Salem	Recreational	7.3
Table Rock Fork – Molalla River	Salem	Recreational	4.7
West Fork Illinois River	Medford	Scenic	4.2
		Total Miles	**25.3**

The following sections summarize the data collected in tables (**Table U-3** through **Table U-8**) followed by **Map U-1** through **Map U-6** for each of the six suitable rivers.

Little North Santiam River

Table U-3. Little North Santiam River study segment

Segment Description:	Willamette National Forest boundary to confluence with North Santiam River
Total Segment Length:	17.18 miles
Length on BLM Land:	3.5 miles
Total Segment Length:	4,748 acres
Area on BLM Land:	1,205 acres
Preliminary Classification:	Recreational
Outstandingly Remarkable Values (ORVs):	Scenery, Recreation, Fish, Wildlife

North Fork Siletz River

Table U-4. North Fork Siletz River study segment

Segment Description:	Headwaters to confluence with South Fork Siletz River
Total Segment Length:	10.60 miles
Length on BLM Land:	3.50 miles
Total Segment Length:	3,047 acres
Area on BLM Land:	990 acres
Preliminary Classification:	Scenic
Outstandingly Remarkable Values (ORVs):	Fish, Wildlife, Ecology

Rogue River

Table U-5. Rogue River study segment

Segment Description:	Lost Creek Dam downstream to the confluence of the Applegate River
Total Segment Length:	63.24 miles
Length on BLM Land:	2.10 miles
Total Segment Length:	19,798.13 acres
Area on BLM Land:	753.85 acres
Preliminary Classification:	Recreational
Outstandingly Remarkable Values (ORVs):	Recreation, Fish

Sandy River

Table U-6. Sandy River study segment

Segment Description:	Mt. Hood National Forest boundary to the east boundary of Sec. 36, T. 1 S., R. 4 E., W. M. near Dodge Park
Total Segment Length:	26.29 miles
Length on BLM Land:	7.27 miles
Total Segment Length:	8,043.17 acres
Area on BLM Land:	1,518.39 acres
Preliminary Classification:	Recreational
Outstandingly Remarkable Values (ORVs):	Scenery, Recreation, Fish, Cultural

Table Rock Fork – Molalla River

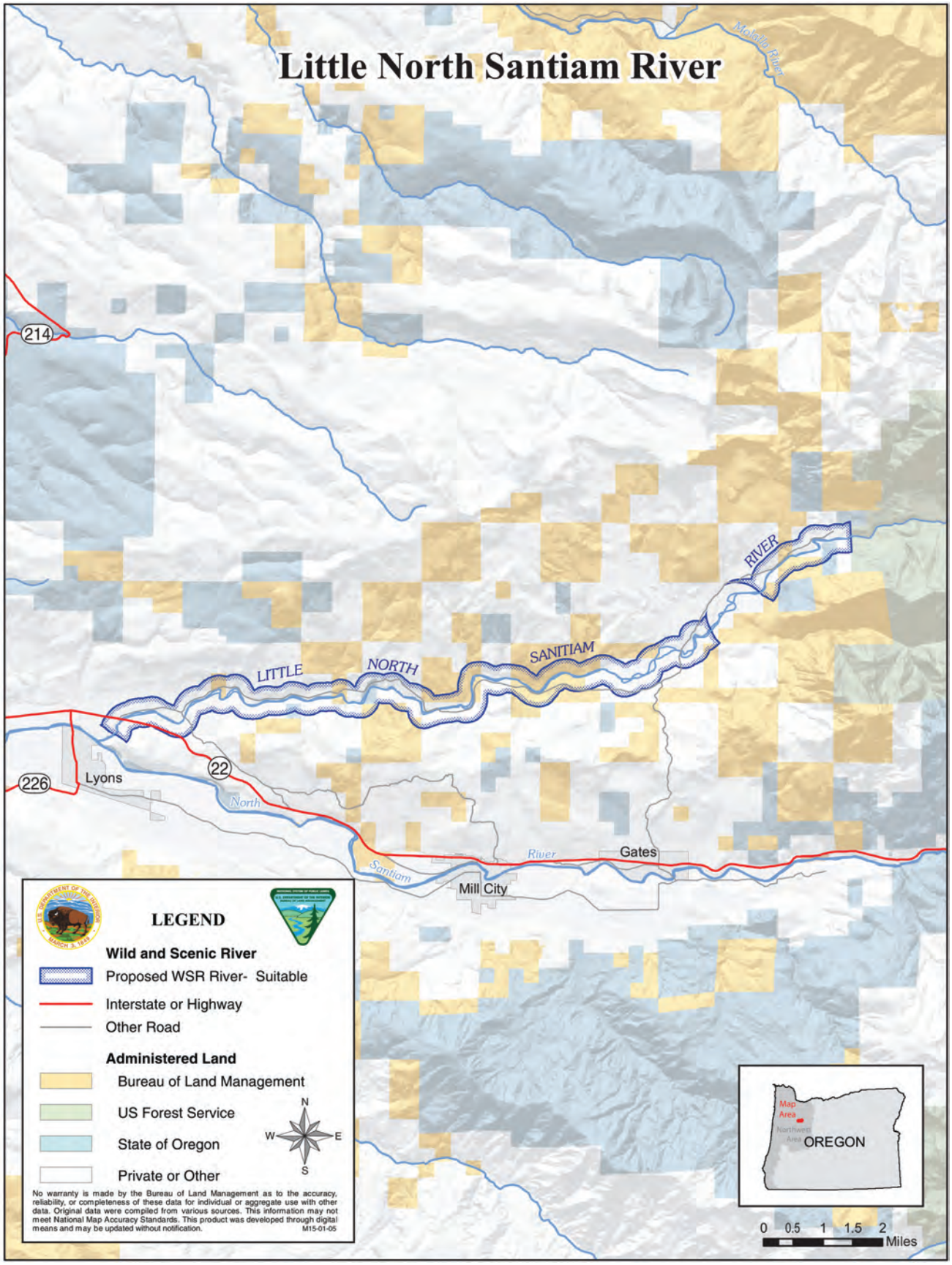
Table U-7. Table Rock Fork Molalla River study segment

Segment Description:	Headwaters to confluence with Molalla River
Total Segment Length:	13.41 miles
Length on BLM Land:	4.69 miles
Total Segment Length:	4,134.58 acres
Area on BLM Land:	1,480 acres
Preliminary Classification:	Recreational
Outstandingly Remarkable Values (ORVs):	Scenery, Cultural

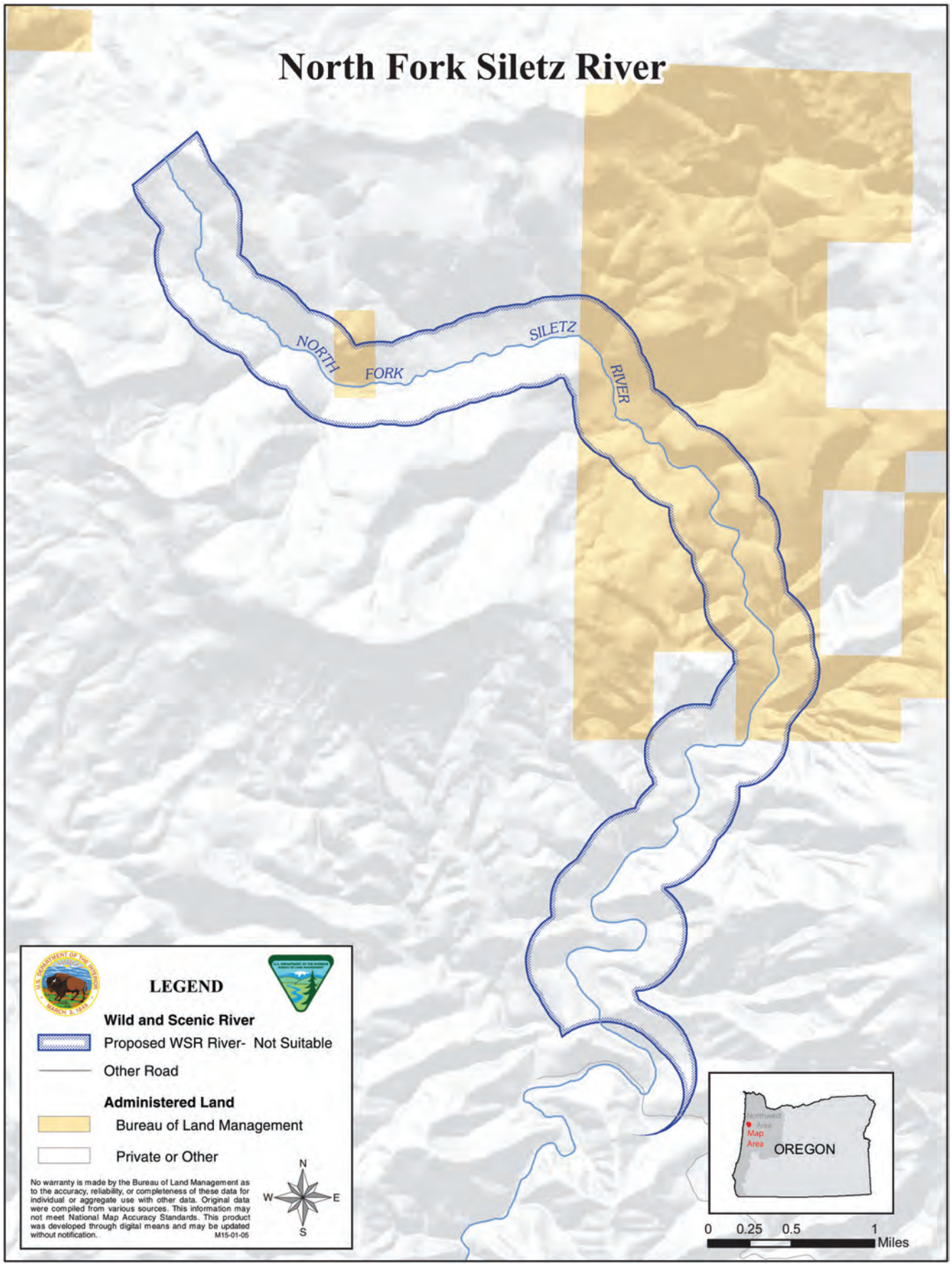
West Fork Illinois River

Table U-8. West Fork Illinois River study segment

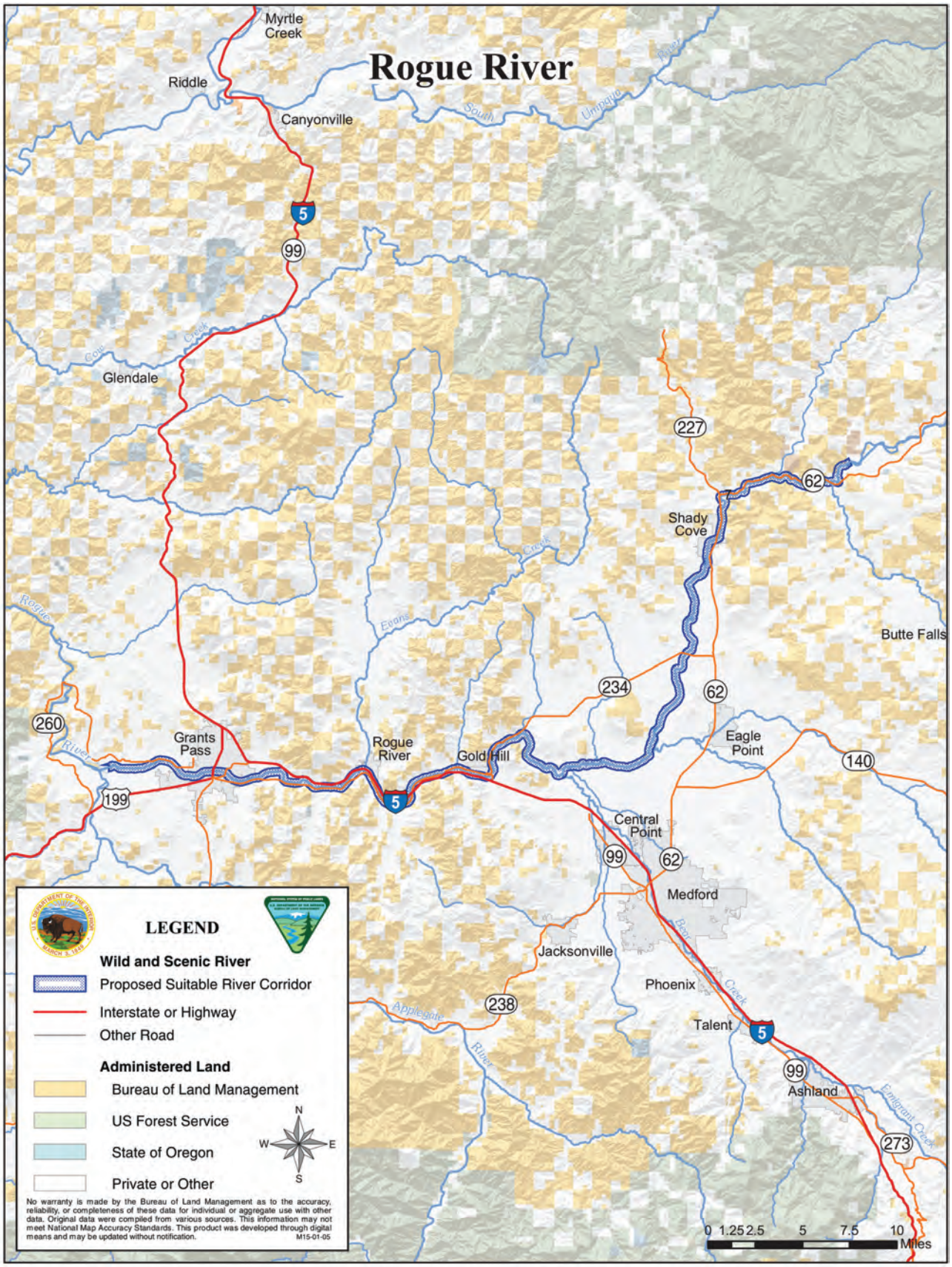
Segment Description:	Oregon/California state line downstream to 0.4 miles above the confluence with the East Fork Illinois River
Total Segment Length:	17.03 miles
Length on BLM Land:	4.19 miles
Total Segment Length:	5,248 acres
Area on BLM Land:	1,154 acres
Preliminary Classification:	Scenic
Outstandingly Remarkable Values (ORVs):	Scenery



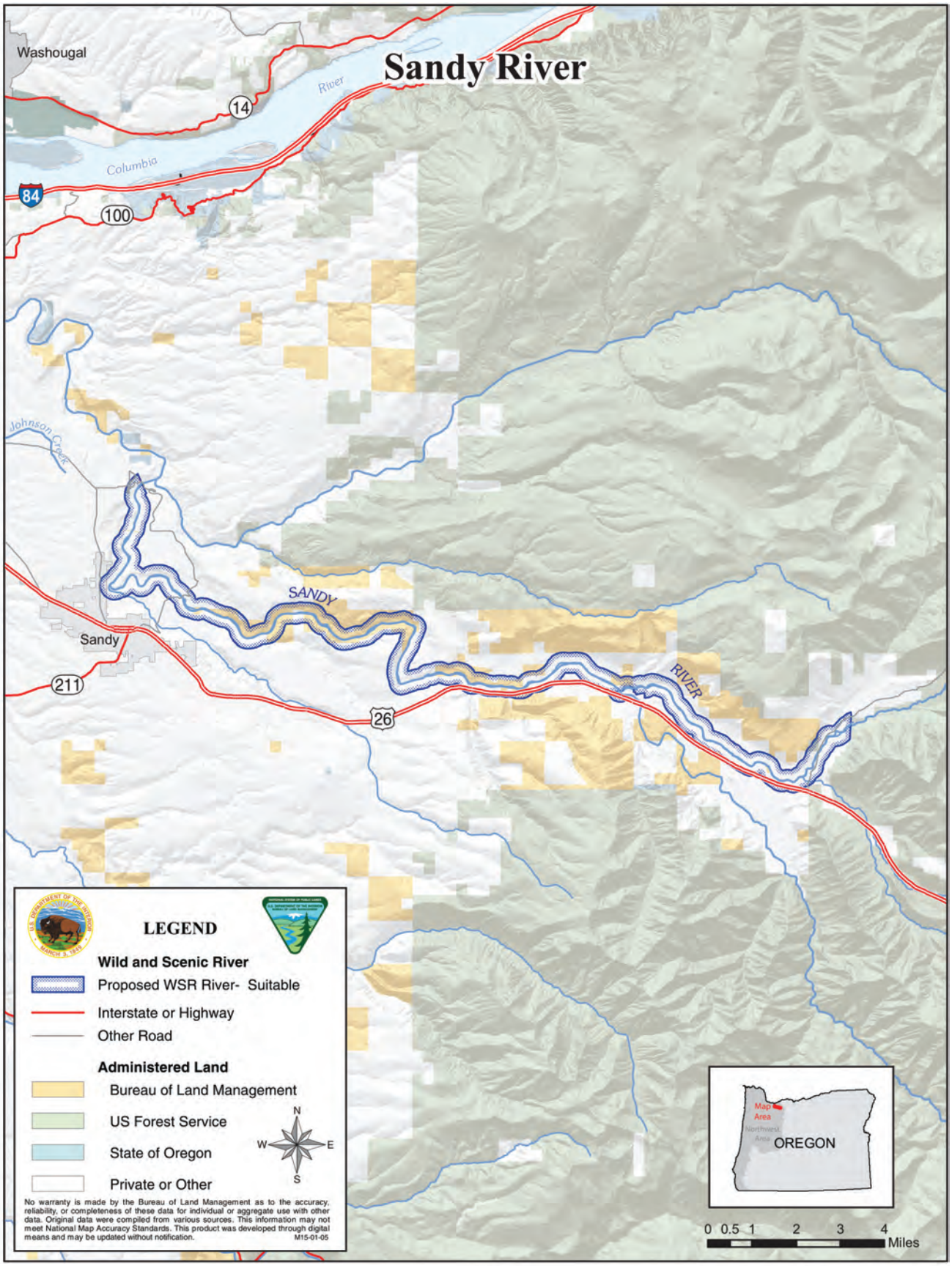
Map U-1. Little North Santiam River study segment



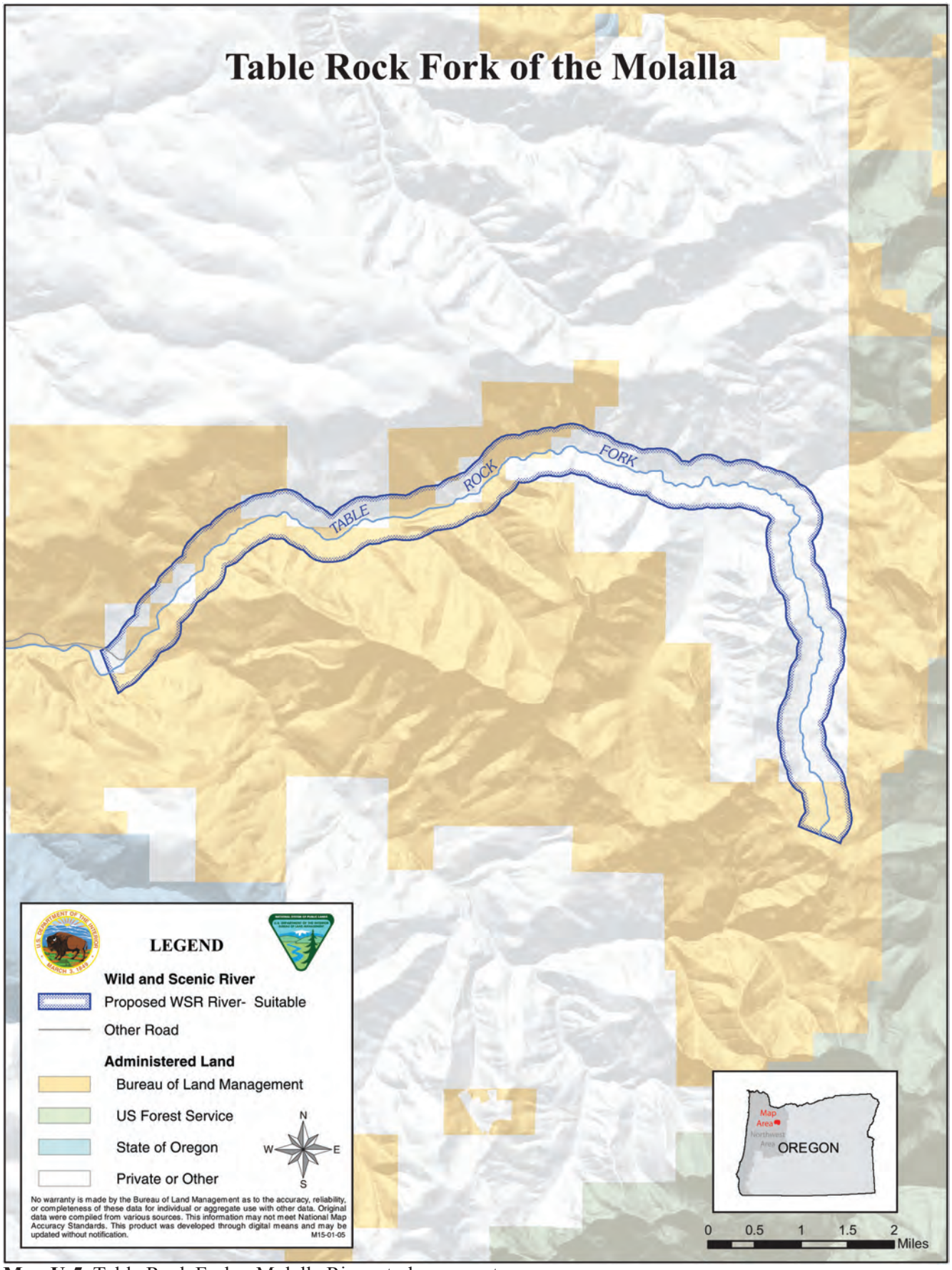
Map U-2. North Fork Siletz River study segment



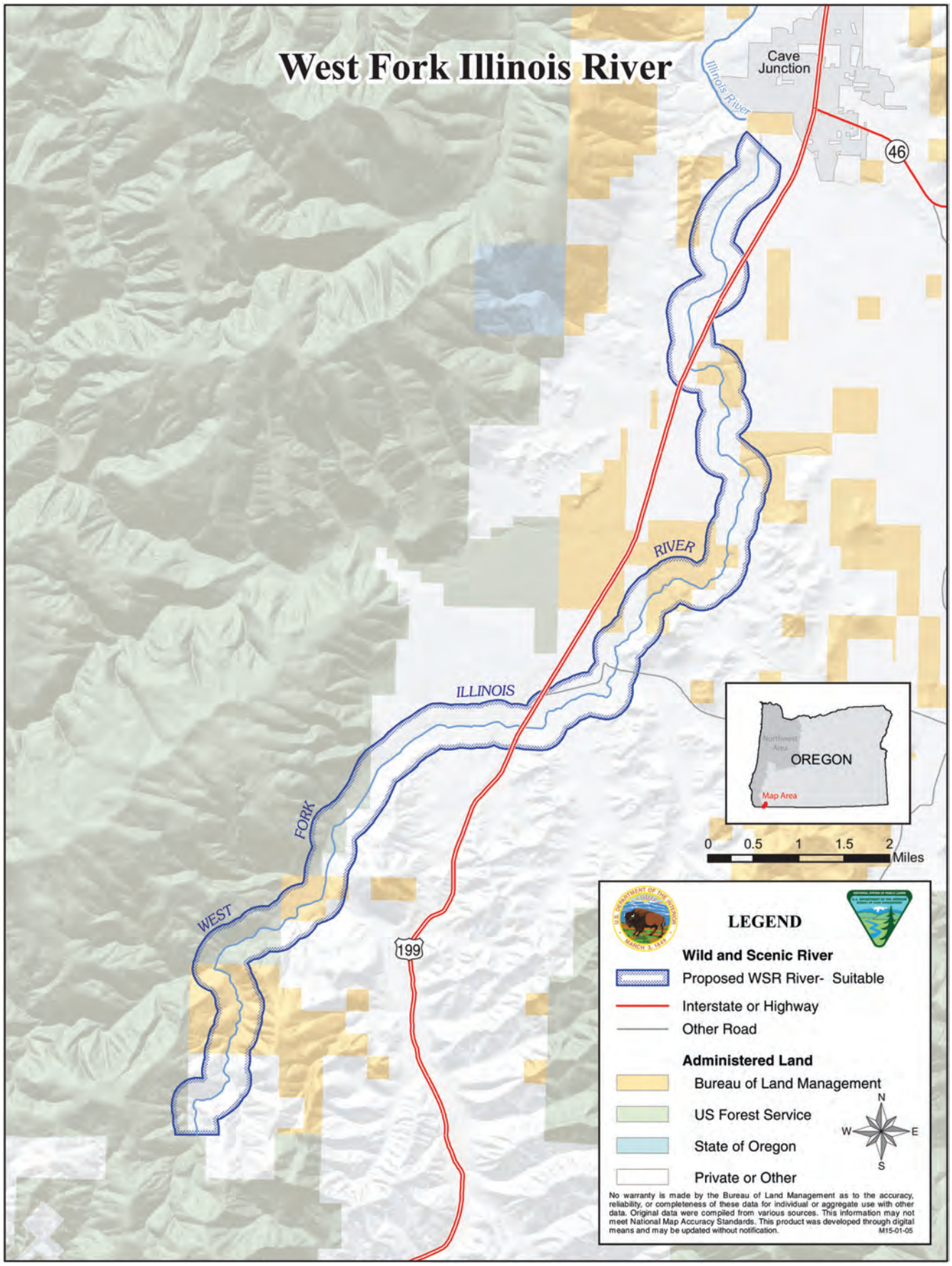
Map U-3. Rogue River study segment



Map U-4. Sandy River study segment



Map U-5. Table Rock Fork – Molalla River study segment



Map U-6. West Fork Illinois River study segment

Suitability Reports

The Wild and Scenic River Suitability Reports on the western Oregon BLM's eligible river segments were published in May 2015. For additional detailed information for each eligible river segment, reference the Wild and Scenic River Suitability Reports that have been published as a separate document to supplement the RMPs for Western Oregon planning process. Based on the number of eligible rivers that the BLM studied, suitability reports have been broken out into two regions. The Northwest WSR Suitability Report covers eligible rivers within the Coos Bay, Eugene, and Salem Districts. The Southwest WSR report covers eligible rivers in the Medford and Roseburg Districts. These reports are available on the RMPs for Western Oregon website at:
http://www.blm.gov/or/plans/rmpswesternoregon/recreation.php.

Land Use Plan Alternatives

Chapter 3 of the Proposed RMP/Final EIS describes the effects that management actions associated with each alternative would have on the outstandingly remarkable values (ORVs), water quality, free-flowing characteristics, and tentative classification of eligible segments. The effect of the alternatives on eligible river segments is assessed by considering the extent to which each alternative protects the ORVs and tentative classification. The analysis conducted for this planning effort for water quality determined that no alternatives would result in changes to water quality within the decision area (see the Hydrology section in Chapter 3). As that analysis has determined that there would be no changes under the alternatives, the indicator of water quality has been dropped from the discussion for affects to eligible rivers. No actions included in any of the alternatives would change current free-flowing values of any of the 51 eligible segments. As there is no action upon which to measure differences for this indicator, it was dropped from consideration for affects to eligible rivers, as the BLM assumes there would be no change to free-flowing characteristics under any of the alternatives or the Proposed RMP.

The BLM considers tentative classifications and ORVs protected for a given eligible segment when that segment is recommended for inclusion into the National System under an alternative. The BLM considers these factors are left unprotected when a particular segment is not recommended for inclusion into the National System. Where an alternative does not protect a particular segment, the analysis considers the potential effect of other management on the two factors. The analysis contained in this EIS is summarized below.

No Action Alternative

Under the No Action alternative, the BLM would continue to manage the 51 segments identified as eligible during the 1995 RMP process to protect their ORVs, free-flowing condition, water quality, and tentative classification as wild, scenic, or recreational until suitability is determined on the 100.9 river miles and 29,339 acres within the study river corridors. Under this protective management, the BLM would not approve any action that would adversely affect the 51 segments' ORVs and the BLM assumes that these characteristics would persist.

Alternative A

Under Alternative A, the BLM would determine that all 51 eligible river segments in the planning area are not suitable for inclusion into the National System. The BLM would no longer manage these 100.9 river miles and 29,339 acres of land to protect their ORVs and tentative classification. While management under the guidance of WSR would not occur, the BLM assumed that this change in management would only negatively affect miles and acres of eligible rivers that occur in land use allocations or special

management areas where management direction would be in conflict with retention of the ORVs and tentative classification.

Alternatives B and C/Proposed RMP

Under Alternatives B and C, and the Proposed RMP, the BLM would recommend six segments for potential inclusion into the National System (**Table U-2**). The BLM would continue to manage these six segments, totaling 25.3 river miles and 7,102 acres of land, to ensure the continued protection of their ORVs, free-flowing condition, water quality, and tentative classification until Congress makes a determination whether to designate the segment as part of the National System. The BLM would not recommend 43 segments for inclusion into the National System. While management under the guidance of WSR would not occur, the BLM assumed that this change in management would only negatively affect miles and acres of eligible rivers that occur in land use allocations or special management areas where management direction would be in conflict with retention of the ORVs and tentative classification. The Nestucca River segment B would continue to receive protection until completion of a joint suitability study with the U.S. Forest Service to evaluate suitability is completed.

Alternative D

Under Alternative D, the BLM would recommend all 51 eligible segments for inclusion into the National System. The BLM would continue managing the segments to protect the ORVs, free-flowing condition, water quality, and tentative classification. Implementation of Alternative D would result in effects similar to or the same as those described under the No Action alternative, as the BLM would provide protection to these river segments until Congress makes a determination whether to designate the segments as part of the National System (**Appendix B**), and the BLM assumes that these characteristics would persist.

Appendix V – Monitoring Plan for the Proposed RMPs

Monitoring is an essential component of an RMP. Monitoring provides information to determine whether the BLM is following the RMP management direction (implementation monitoring) and to verify if the implementation of the RMP is achieving plan-level desired results (effectiveness monitoring).

The monitoring plan for the Proposed RMP focuses specifically on monitoring the implementation and effectiveness of the RMP and is not intended as an all-encompassing strategy that addresses all ongoing monitoring and research efforts. This monitoring plan does not attempt to address research-based questions. There are many ongoing research-based efforts in which the BLM participates that address evaluating whether the RMP is based on correct assumptions (validation monitoring).

The use of this monitoring plan by all BLM offices in the decision area would provide a basis for consistent and coordinated monitoring, and allow district information to be compiled and considered at the scale of the entire decision area. The BLM would evaluate the monitoring questions at each monitoring interval to ascertain if the questions, reporting, methods, sample size, or intervals need to be changed. The BLM would make such changes to the monitoring plan through plan maintenance.

Effectiveness Monitoring

The BLM would continue to rely on the existing interagency effectiveness monitoring modules to address key questions about whether the RMP is effectively meeting its objectives. The existing interagency effectiveness modules are aquatic and riparian ecosystems, late-successional and old growth, marbled murrelet, northern spotted owl, socioeconomic, and tribal. Although there are differences in the objectives in the 1995 RMP and this Proposed RMP, the key questions that the existing interagency effectiveness modules are designed to answer are still relevant to the objectives of the Proposed RMP, as detailed below. These key questions address fundamental conditions and processes that underlie the objectives of both the 1995 RMP and this Proposed RMP. As such, answering these key questions through effectiveness monitoring will continue to provide a basis for the BLM to determine whether the RMP is effectively meeting its objectives.

The aquatic and riparian ecosystems effectiveness monitoring program assesses status and trends in watershed condition to answer the basic question:

- Is implementation of the RMP maintaining and restoring aquatic and riparian ecosystems to desired conditions on Federal lands in the planning area?

This monitoring effort determines riparian watershed condition status for every 6th field watershed (with > 5 percent Federal ownership along the stream length) based on upslope and riparian data derived from GIS layers and satellite imagery. In-channel attributes are also measured using a statistically valid survey design to assess aquatic watershed condition. Changes in riparian and aquatic conditions provide information for tracking status and trend based on management activities, natural disturbance, and wildfire. More information on the aquatic and riparian ecosystems effectiveness monitoring is contained in the 20-year Monitoring Report (Miller *et al*. 2015), which is incorporated here by reference.

The late-successional and old growth (LSOG) ecosystems effectiveness monitoring program characterizes the status and trend of older forests to answer the basic question:

- Is implementation of the RMP maintaining and restoring late-successional and old growth forest ecosystems to desired conditions on Federal lands in the planning area?

This monitoring effort determines the current status of forest vegetation from classification of satellite imagery and analysis of inventory and other available data. Remote sensing change detection and trend analysis provide information for tracking losses and gains in forest conditions from management activities, natural succession, and wildfire. More information on the late-successional and old growth ecosystems effectiveness monitoring is contained in the 20-year Monitoring Report (Davis *et al*. in press), which is incorporated here by reference.

The marbled murrelet effectiveness monitoring program assesses status and trends in marbled murrelet populations and nesting habitat to answer the basic questions:

- Are the marbled murrelet populations associated with the planning area stable, increasing, or decreasing?
- Is implementation of the RMP maintaining and restoring marbled murrelet nesting habitat?

This monitoring effort determines marbled murrelet population size and trends by sampling of populations in near-shore waters, using standardized and consistent methodology. Trends in the amount, quality, and distribution of nesting habitat in the planning area are evaluated periodically using a model approach that applies current vegetation maps along with other data derived from GIS layers and other available sources. More information on the marbled murrelet effectiveness monitoring is contained in the 20-year Monitoring Report (Falxa *et al*. 2015), which is incorporated here by reference.

The northern spotted owl effectiveness monitoring program assesses status and trends in northern spotted owl populations and habitat to answer the basic questions:

- Will implementing the RMP reverse the downward trend in spotted owl populations?
- Is implementation of the RMP maintaining and restoring owl habitat necessary to support viable owl populations?

Population monitoring documents survival, reproductive success, and annual rate of population change in northern spotted owl demographic study areas. Maps depicting habitat suitability are produced using habitat models applied to current vegetation maps developed by the LSOG monitoring program along with other available data sources. More information on the northern spotted owl effectiveness monitoring is contained in the draft 20-year Monitoring Report (Davis *et al*. 2015), which is incorporated here by reference.

The socio-economic effectiveness monitoring program assesses social and economic impacts of Federal forest management, framed as two questions:

- Are predictable levels of timber and non-timber resources available and being produced?
- Are communities and economies experiencing positive or negative changes that may be associated with Federal forest management?

The key objectives of the socio-economic effectiveness monitoring program are to identify communities experiencing significant positive or negative conditions or trends, as well as those that are not, and to improve understanding of the relationship between Federal forest management and social and economic change. To address the objectives above, the monitoring program analyzes trends in data for timber and non-timber resources. The monitoring program considers social and economic indicators derived from U.S. census data, analysis of quantitative data from agency databases, along with other available data. More information on the socioeconomic effectiveness monitoring is contained in the 20-year Monitoring Report (Grinspoon *et al*. 2015), which is incorporated here by reference.

The tribal effectiveness monitoring program addresses conditions, trends, and access to resources protected by treaty or of interest to American Indian tribes, the condition of and access to religious and cultural heritage sites, and the quality of the government-to-government relationship. The basic effectiveness monitoring questions are:

- How well and to what degree is government-to-government consultation being conducted under the RMP?

- Have the goals and objectives of the consultation been achieved?
- Is the consultation occurring because of effects on resources of tribal interest on Federal lands or trust resources on tribal lands?

Effectiveness monitoring data are collected during interviews using a standardized questionnaire developed by Federal agency officials. All federally recognized Tribes with Tribal lands and/or territories within the RMP area will be invited to participate in interviews. More information on the tribal effectiveness monitoring is contained in the 20-year Monitoring Report (Vinyeta and Lynn 2015), which is incorporated here by reference.

The interagency effectiveness monitoring modules would continue to report every 5 years. The BLM would continue to use these reports to state the findings and conclusions made through monitoring, and to serve as a report to managers and the public. Effectiveness monitoring reports would also include analysis of whether the BLM is achieving desired conditions based on effectiveness monitoring questions and, where possible, inform adaptive management.

In addition to the six interagency effectiveness monitoring modules, the BLM would conduct effectiveness monitoring of hazardous fuels treatments through the Fuels Treatment Effectiveness Monitoring (FTEM) system. The FTEM is a centralized interagency web-based hub for recording on-the-ground documentation describing the effect of hazardous fuels reduction treatments on the wildland fire environment, framed around two key questions:

- Did the fire behavior change as a result of the treatment (as planned in the treatment objectives)?
- Did the treatment contribute to control of the fire?

The FTEM system is intended to identify the extent which hazardous fuels treatments are affecting the wildland fire environment. Field personnel from each field office will fill out an online form for every hazardous fuels reduction treatment intersected by a wildfire, within 90 days of the wildfire burning in the treated area.

The BLM will conduct monitoring of employment effects on low-income populations in Coos and Curry Counties.[56] The Proposed RMP/Final EIS identified that the RMP will have disproportionately negative employment effects on low-income populations in Coos and Curry counties. Although the BLM will monitor the level and type of timber harvest, payments to counties, and changes in resource conditions, these measurements will not tell the BLM how low-income populations are being affected. The BLM will conduct monitoring, that will identify and track appropriate indicators of social and economic conditions. The BLM will conduct primary research, such as focus groups or interviews with community residents, leaders, and others, to supplement and interpret the secondary data. The results of the monitoring will allow the BLM and its partners to identify environmental justice impacts that have not been mitigated through the RMP as implemented or by other means, pointing the way toward potential mitigation actions.

Implementation Monitoring

The implementation monitoring plan for the Proposed RMP would assess the level of management activity and would examine if the BLM is implementing actions in accordance with management direction of the RMP.

[56] This monitoring component is not effectiveness monitoring in the same sense as the other components described in this section, in that it would not be directly evaluating whether the RMP is effectively meeting its objectives. Instead, this monitoring would evaluate whether the employment effects in Coos and Curry Counties identified in the Proposed RMP/Final EIS are occurring as analyzed and would identify any potential mitigation measures that would be revealed by the monitoring of effects, such as changes to the intensity or extent of management actions under specific resource programs.

The BLM would employ sampling or evaluation of a subset of implementation actions. The BLM has designed the monitoring plan for the Proposed RMP to avoid prohibitive costs and effectively answer monitoring questions and reporting levels of activities. It is not necessary or desirable for the BLM to monitor every implementation action of an RMP. The BLM would select projects to be monitored based on those that would yield a greater amount of information or be more beneficial. For example, a random sample may result in monitoring of a relatively small straightforward project that would yield limited information, whereas a more sophisticated or complex project might be available for monitoring that would yield more information or be more effective. As much as possible, project implementation monitoring would be integrated among resources and programs. This integration saves time and costs, and helps build common information and understanding between various resources and programs.

The BLM would conduct sampling at the level of the entire administrative unit to which the resource management applies (e.g., Medford District or Klamath Falls Field Office).

The BLM would report implementation monitoring results annually in a monitoring report, which may be combined with other documents, such as an annual program summary. The monitoring report would report, track, and assess the progress of plan implementation, state the findings and conclusions made through monitoring, and serve as a report to managers and the public. Monitoring reports would also include any discussions and analysis of non-compliance and recommendations for corrective action.

Some management direction in the Proposed RMP is not measurable or quantifiable, or does not have a standard or threshold of acceptability, and therefore would not lend itself to being addressed through monitoring questions that are almost always dependent on a quantifiable basis of measurement. The level of activity for certain management direction that does not have standards or thresholds of acceptability would be monitored in the form of a program reporting item. The BLM will use the information in the program reporting items, to assess the level of management activity and examine if the BLM is implementing actions consistent with the analytical assumptions in the Proposed RMP/Final EIS.

In some cases, where monitoring indicates very high compliance with the plan, the BLM would subsequently adjust the frequency or interval of monitoring for cost and time efficiency.

Monitoring of certain questions would not take place in the early years of implementation, because the BLM would not yet have completed projects and, therefore, would not be ready for monitoring. Although incomplete projects may be informally examined by managers to assess progress towards implementing management actions and achieving objectives, the evaluation of incomplete projects would not be part of formal plan monitoring. Not all programs or resources have monitoring questions.

Monitoring Questions

Late-Successional Reserve

M1. Monitoring Question: Have the number of snags been created in the appropriate size classes as described in the management direction (**Appendix B**, **Table B-3**)?

Monitoring Requirement: Evaluate at least one completed timber sale in a Late-Successional Reserve per field office. Report the number of snags created > 20” DBH and > 10” DBH per project.

Monitoring Interval: Annual; change interval to once every 3 years if 3 consecutive years of monitoring show 100 percent compliance.

M2. Monitoring Question: Has the amount of down woody material described in the management direction been retained when implementing fuels or prescribed fire treatments (**Appendix B**, **Table B-4**)?

Monitoring Requirement: Evaluate at least one fuels or prescribed fire treatment in the Late-Successional Reserve per field office. Report the percent cover of down woody material and the method used to measure percent cover.

Monitoring Interval: Annual; change interval to once every 3 years if 3 consecutive years of monitoring show 100 percent compliance.

Late-Successional Reserve – Dry

M3. Monitoring Question: Have the Medford District and the South River Field Office of the Roseburg District applied selection harvest or commercial thinning to meet decadal acreage targets set forth in the RMP? Note that acreage in untreated skips counts towards total treatment acreage for this calculation.

Monitoring Requirement: Report acres of thinning and selection harvest sold and the cumulative total since approval of the plan. Also, report as an annual average and compare with the annual average required to meet decadal acreage targets.

Monitoring Interval: Annual.

Riparian Reserve

***Note*:** Monitoring questions M4–M9 do not apply to Eastside Management Area – Riparian Reserve.

M4. Monitoring Question: Is the width of the Riparian Reserve established adjacent to regeneration harvests in the Moderate Intensity Timber Area or Low Intensity Timber Area in accordance with the RMP?

Monitoring Requirement: Evaluate all streams within at least one completed timber sale per field office.

Monitoring Interval: Annual – change interval to once every 3 years if 3 consecutive years of monitoring show 100 percent compliance.

M5. Monitoring Question: When thinning treatments are applied in the Riparian Reserve along fish-bearing streams and perennial streams, is a minimum of 30 percent canopy closure and 60 trees per acre retained? Are thinning treatments excluded from the inner zone of the Riparian Reserve along perennial and intermittent fish-bearing streams?

Monitoring Requirement: Evaluate all fish-bearing streams and perennial streams treated within at least one completed thinning timber sale per field office.

Monitoring Interval: Annual – change interval to once every 3 years if 3 consecutive years of monitoring show 100 percent compliance.

M6. Monitoring Question: When thinning treatments are applied in the Riparian Reserve along intermittent non-fish-bearing streams, is a minimum of 30 percent canopy closure and 60 trees per acre retained? Are thinning treatments excluded within inner zone of the Riparian Reserve along intermittent non-fish bearing streams?

Monitoring Requirement: Evaluate 0.25 mile of streams within thinning projects completed within the past year per field office.

Monitoring Interval: Annual – change interval to once every 3 years if 3 consecutive years of monitoring show 100 percent compliance.

M7. Monitoring Question: Were Best Management Practices that were identified as applicable (as indicated through NEPA decision record or contract stipulations) applied during project implementation?

Monitoring Requirement: Evaluate at least one project with identified Best Management Practices per field office. Projects from any land use allocation may be selected for evaluation.

Monitoring Interval: Annual – change interval to once every 3 years if 3 consecutive years of monitoring show 100 percent compliance.

M8. Monitoring Question: Have the number of snags been created in the appropriate size classes as described in the management direction (**Appendix B**, **Table B-3**)?

Monitoring Requirement: Evaluate at least one completed timber sale that includes Riparian Reserve per field office. Report the number of snags created > 20" DBH and > 10" DBH per project.

Monitoring Interval: Annual – change interval to once every 3 years if 3 consecutive years of monitoring show 100 percent compliance.

M9. Monitoring Question: Has the amount of down woody material described in the management direction been retained when implementing fuels or prescribed fire treatments (**Appendix B**, **Table B-4**)?

Monitoring Requirement: Evaluate at least one fuels or prescribed fire treatment in the Riparian Reserve per field office. Report the percent cover of down woody material and the method used to measure percent cover.

Monitoring Interval: Annual – change interval to once every 3 years if 3 consecutive years of monitoring show 100 percent compliance.

Note: Monitoring question M10 applies only to Eastside Management Area – Riparian Reserve.

M10. Monitoring Question: Has the amount of streams in proper functioning condition been maintained or increased? (Eastside Management Area – Riparian Reserve only)

Monitoring Requirement and Monitoring Interval: Monitoring and reporting would be through the use of the statewide report, Table 1 from USDI TR-1737-9 1993 (or similar), of lotic and lentic waterbodies in properly functioning; functioning at risk with trend up, down or not apparent; and not properly functioning. (*Note*: Table 1 is available online, with instructions, at http://www.blm.gov/nstc/library/pdf/Final%20TR%201737-9.pdf and is also provided below (**Table V-1** for reference purposes.)

State: _____

Table V-1. Example of Table 1–Functioning Condition Status from USDI TR-1737-9 (1993)

Habitat Types	Proper Functioning Condition	Functional – At Risk			Non-functional	Unknown	Totals
		Trend Up	Trend Not Apparent	Trend Down			
Riverine Miles (Lotic)							
Non-riverine Acres (Lentic)*							

* Report only acres associated with lentic riparian-wetland areas. Do not include acres associated with lotic riparian-wetland areas.

Eastside Management Area

M11. Monitoring Question: Are snags and coarse woody debris retained in accordance with RMP requirements?

Monitoring Requirement: Evaluate at least one completed timber sale.

Monitoring Interval: Annual, or each year in which there is a completed timber sale.

M12. Monitoring Question: Is a stand average relative density of 15–55 maintained after commercial harvest conducted for the removal and sale of timber and biomass?

Monitoring Requirement: Evaluate at least one completed timber sale.

Monitoring Interval: Annual, or each year in which there is a completed timber sale.

Harvest Land Base

M13. Monitoring Question: Has the allowable sale quantity been offered for sale within the variation provided for in the plan?

Monitoring Requirement: Report annual sale quantity offered for sale by sustained-yield unit and the cumulative total since approval of the plan. Also report as volume offered by harvest type (selection harvest, commercial thinning, regeneration harvest, and timber salvage) by sustained-yield unit.

Monitoring Interval: Annual.

M14. Monitoring Question: Have the number of snags been created in the appropriate size classes as described in the management direction (**Appendix B**, **Table B-2**)?

Monitoring Requirement: Evaluate at least one completed timber sale per field office. Report the number of snags created > 20" DBH and > 10" DBH per project.

Monitoring Interval: Annual – change interval to once every 3 years if 3 consecutive years of monitoring show 100 percent compliance.

M15. Monitoring Question: Are regeneration harvest areas, salvage harvest areas, and group selection openings being reforested in accordance with the RMP?

Monitoring Requirement: Evaluate at least one completed timber sale per field office.

Monitoring Interval: Annual – change interval to once every 3 years if 3 consecutive years of monitoring show 100 percent compliance.

Harvest Land Base – Uneven-Aged Timber Area

M16. Monitoring Question: Is a stand average relative density of 20–45 percent maintained after commercial harvest?

Monitoring Requirement: Evaluate at least one completed timber sale per field office. Report the stand average relative density per stand treated within each timber sale evaluated.

Monitoring Interval: Annual – change interval to once every 3 years if 3 consecutive years of monitoring show 100 percent compliance.

Harvest Land Base – Moderate Intensity Timber Area and Low Intensity Timber Area

M17. Monitoring Question: Is a stand average relative density of 25–45 percent maintained after commercial thinning?

Monitoring Requirement: Evaluate at least one completed timber sale per field office. Report the stand average relative density per stand treated within each timber sale evaluated.

Monitoring Interval: Annual – change interval to once every 3 years if 3 consecutive years of monitoring show 100 percent compliance.

M18. Monitoring Question: Are trees retained after regeneration harvest in accordance with targets set forth in the RMP?

Monitoring Requirement: Evaluate at least one completed timber sale per field office.

Monitoring Interval: Annual – change interval to once every 3 years if 3 consecutive years of monitoring show 100 percent compliance.

Air Quality

M19. Monitoring Question: Have smoke intrusions occurred in areas designated as Class I for air quality and non-attainment occurred as a result of BLM prescribed fire?

Monitoring Requirement: Report intrusions through Oregon Department of Forestry as required under the Oregon Smoke Management Plan.

Monitoring Interval: Annual.

Areas of Critical Environmental Concern

M20. Monitoring Question: Are important and relevant values being maintained or restored?

Monitoring Requirement: Evaluate 20 percent of the Areas of Critical Environmental Concern.

Monitoring Interval: Rotate the monitoring of Areas of Critical Environmental Concern, so that all of the areas would be monitored over a 5-year period.

Rare Plants and Fungi

M21. Monitoring Question: Is management of plant species that are listed under the Endangered Species Act consistent with recovery plans and designated critical habitat?

Monitoring Requirement: Evaluate at least two completed projects per field office that 'may affect' ESA-listed species.

Monitoring Interval: Annual – change interval to once every 3 years if 3 consecutive years of monitoring show 100 percent compliance.

M22. Monitoring Question: Have protection measures maintained populations of BLM special status plant and fungi species?

Monitoring Requirement: Evaluate at least two completed projects per field office in which the BLM implemented protection measures for BLM Special Status plant and fungi species.

Monitoring Interval: Annual.

Cultural and Paleontological Resources Including American Indian Traditional Uses

M23. Monitoring Question: Were previously unknown sites discovered within project areas after the commencement of ground-disturbing activities? If yes, how many?

Monitoring Requirement: Evaluate at least 20 percent of management activities per field office that involve ground disturbance that have been completed within the past year.

Monitoring Interval: Annual

M24. Monitoring Question: Have ground-disturbing actions avoided previously recorded sites that are listed (or eligible for listing) on the National Register of Historic Places?

Monitoring Requirement: Evaluate 100 percent of recorded listed or eligible sites that lie within the boundaries of a ground-disturbing project after the project is completed. Report number of sites present and number of sites avoided.

Monitoring Interval: Annually when listed or eligible sites are present and avoidance prescribed.

M25. Monitoring Question: Are mitigation measures employed on sites that are listed (or eligible for listing) on the National Register of Historic Places prior to disturbance (when disturbance cannot be practically avoided) through practices such as data recovery, including excavation, relocation, or documentation?

Monitoring Requirement: Evaluate 100 percent of sites that are listed (or eligible for listing) on the National Register of Historic Places that were at risk of loss from ground disturbing management activities that have been completed within the past year. Report number of sites at risk and number of sites that were mitigated and with what methods.

Monitoring Interval: Annual.

M26: Monitoring Question: Are cultural and paleontological resources that are threatened by natural processes or human activity (other than Federal undertakings) stabilized and protected or excavated and the data recovered where warranted by the scientific importance of the site?

Monitoring Requirement: Evaluate 100 percent of cultural and paleontological resources threatened or impacted by events that have happened within the past year. Report number of sites threatened or impacted and report number of sites stabilized or protected and with what measures.

Monitoring Interval: Annual.

Energy and Minerals

M27. Monitoring Question: Has the level of opportunities for the exploration and development of locatable, leasable, and salable mineral resources been maintained?

Monitoring Requirement: Identify new closures and withdrawals.

Monitoring Interval: Five years.

Fire and Fuels Management

M28. Monitoring Question: Were fuels managed to reduce wildfire hazard, risk to communities, and negative impacts to ecosystems, and highly valued resources?

Monitoring Requirement: Summarize the primary and secondary reason for treatments and the primary and secondary initiative for all treatments, based on spatial inventory treatment data.

Monitoring Interval: Annual.

M29. Monitoring Question: Have fuels treatments created fuel beds and fuel breaks intended to reduce potential fire behavior, reduce potential wildfire severity, or improve fire management opportunities?

Monitoring Requirement: Evaluate at least one treatment per field office.

Monitoring Interval: Annual.

M30. Monitoring Question: Did risk-based wildfire management decisions implemented in response to natural ignitions include an examination of the full range of fire management options?

Monitoring Requirement: Evaluate 100 percent of Wildland Fire Decision Support System decisions completed.

Monitoring Interval: Annual.

M31. Monitoring Question: Did land management treatments intersected by wildfires change fire behavior, minimize negative wildfire effects and damage to resource values, or positively contribute toward fire management opportunities?

Monitoring Requirement: Complete a treatment effectiveness assessment of 100 percent of treatments intersected by wildfire.

Monitoring Interval: Annual.

Hazardous Materials

M32. Monitoring Question: Has the response to hazardous material incidents included cleanup, proper notifications, criminal investigations, and site assessments as applicable?

Monitoring Requirement: Evaluate 100 percent of hazardous material incidents.

Monitoring Interval: Annual.

M33. Monitoring Question: Are hazardous materials stored, treated, and disposed of in accordance with applicable laws and regulations?

Monitoring Requirement: Evaluate 100 percent of district-stored, treated, and disposed hazardous materials.

Monitoring Interval: Annual.

Invasive Species – Port-Orford-cedar Root Disease (*Phytophthora lateralis*)

M34. Monitoring Question: Are General Direction requirements from the Record of Decision and Resource Management Plan Amendment for Management of Port-Orford-cedar in Southwest Oregon, Coos Bay, Medford, and Roseburg Districts (USDI BLM 2004) for maintaining and reducing the risk of *Phytophthora lateralis* infections being implemented?

Monitoring Requirement: Describe the general activities accomplished for maintaining and reducing the risk of *Phytophthora lateralis* infections, which may include modifying Port-Orford-cedar bough collection permits to include prevention practices, applying adaptive management, community outreach, and eradication activities.

Monitoring Interval: Annual.

M35. Monitoring Question: Are project-specific management actions applied as required in the Record of Decision and Resource Management Plan Amendment for Management of Port-Orford-cedar in Southwest Oregon, Coos Bay, Medford, and Roseburg Districts (USDI BLM 2004) when a need is indicated by using the Port-Orford-cedar Risk Key on page 32?

Monitoring Requirement: Describe where Port-Orford-cedar root disease management actions have been incorporated into project-specific implementation monitoring programs. Port-Orford-cedar root disease management actions could include seasonal restrictions, using uninfested water, unit scheduling, designating access routes, and public education through signage in site-specific project design and implementation.

Monitoring Interval: Annual.

Lands, Realty, Access, and Transportation

M36. Monitoring Question: Have the acres of O&C lands of all classifications and the acres of O&C and public domain lands that are available for harvesting been reduced through disposal, exchange, or purchase?

Monitoring Requirement: Review O&C lands records through the Oregon State Office. Evaluate total net change in land tenure of O&C lands in the decision area. Evaluate changes at 10-year intervals keyed from 1998, the date of the legislation that provides for no net loss of O&C lands.

Monitoring Interval: Three years.

Livestock Grazing

Note: Monitoring questions **M37** through **M39** apply only to the Medford District and the Klamath Falls Field Office of the Lakeview District.

M37. Monitoring Question: Has the condition of public rangelands been maintained or improved compared to the baseline year of 2015?

Monitoring Requirement and Monitoring Interval: In 'I' category allotments, examine trend plots every five years, determine condition every 10 years, and record utilization data every other year. In 'M' allotments, determine trend and condition every ten years and utilization every five years. Monitoring in 'C' allotments is limited to periodic inventories and observations to measure long-term resource condition changes.[57]

M38. Monitoring Question: Are areas disturbed by natural and human-induced events (including wildland fire, prescribed burns, timber-management treatments, and juniper reduction treatments) rested from livestock grazing? Is livestock grazing resumed only after a determination that soil and vegetation has recovered sufficient to support livestock grazing (except where livestock grazing would either not impede site recovery, or where livestock grazing could be used as a tool to aid in achieving recovery objectives)?

Monitoring Requirement: Evaluate 10 percent of disturbance events.

Monitoring Interval: Annual; change interval to once every 3 years if 3 consecutive years of monitoring show 100 percent compliance.

M39. Monitoring Question: For streams with ESA-listed or anadromous fish species, is livestock restricted from riparian areas during spawning, incubation, and until 30 days following the emergence of juveniles from spawning beds?

Monitoring Requirement: Evaluate 20 percent of streams with ESA-listed or anadromous fish species within active grazing allotments.

Monitoring Interval: Annual; change interval to once every 3 years if 3 consecutive years of monitoring show 100 percent compliance.

Recreation

M40. Monitoring Question: Are Special Recreation Management Areas managed in accordance with their planning frameworks?

Monitoring Requirement: Evaluate 20 percent of the Special Recreation Management Areas.

Monitoring Interval: Annual. The monitoring of Special Recreation Management Areas would be rotated so that over a five-year period 100 percent of the areas would be monitored.

[57] Grazing allotments are assigned to one of three management categories: (I) Improve (M) Maintain, and (C) Custodial.

Soils

M41. Monitoring Question: Have land management actions created more than a 20 percent level of detrimental soil conditions at the unit treatment scale?

Monitoring Requirements: Evaluate 10 percent of each treatment unit per Field Office that has the potential to affect the existing soil resource condition. Use Forest Soil Disturbance Monitoring Protocol (Page-Dumroese *et al*. 2009a, 2009b) to determine level of compaction and disturbance, amount of organic matter removed, and extent and intensity of prescribed burning or fuel reduction treatment areas.

Monitoring Interval: Annual – change interval to once every 3 years if 3 consecutive years of monitoring show 100 percent compliance.

Visual Resource Management

M42. Monitoring Question: Is the level of change in character for the areas designated to be managed as VRM Class I, II, and III consistent with RMP requirements?

Monitoring Requirements: Evaluate 20 percent of activities that have the potential to affect the existing character in VRM Class I, II, and III.

Monitoring Interval: Annual – change interval to once every 3 years if 3 consecutive years of monitoring show 100 percent compliance.

Wild Horses

M43. Monitoring Question: Is the population of wild horses in the Pokegama Herd Management Area maintained at the appropriate management level of 30–50 head?

Monitoring Requirement: Report on population surveys or censuses.

Monitoring Interval: Five years.

M44. Monitoring Question: Are horses from other herd areas periodically introduced to the Pokegama herd to maintain the genetic diversity of the herd?

Monitoring Requirement: Report all introductions.

Monitoring Interval: Five years.

M45. Monitoring Question: Are water developments maintained or established to provide season-long water for wild horses within the herd management area?

Monitoring Requirement: Evaluate 100 percent of water developments.

Monitoring Interval: Annual; change interval to once every 3 years if 3 consecutive years of monitoring show 100 percent compliance.

Wilderness Characteristics

M46. Monitoring Question: Are wilderness characteristics maintained in accordance with RMP requirements?

Monitoring Requirements: Report all management activities that would adversely affect wilderness characteristics in Wilderness Study Areas and Wilderness Areas and District-Designated Reserve – Lands Managed for their Wilderness Characteristics. Monitor for amount of degradation or loss of inventoried wilderness characteristics resulting from undue or unnecessary degradation as a result of human or natural causes.

Monitoring Interval: Five years.

Wild and Scenic Rivers

M47. Monitoring Question: Are the outstandingly remarkable values of designated Wild and Scenic river corridors (including those classified as Wild, Scenic, or Recreational) being maintained?

Monitoring Requirements: Evaluate 100 percent of BLM-authorized activities that have the potential to affect the outstandingly remarkable values of Wild and Scenic River corridors.

Monitoring Interval: Annual – change interval to once every 3 years if 3 consecutive years of monitoring show 100 percent compliance.

M48. Monitoring Question: Are the outstandingly remarkable values of the eligible Nestucca River Segment B and suitable Little North Santiam River, North Fork Siletz River, Rogue River, Sandy River, Table Rock Fork – Molalla River, and West Fork Illinois River Wild and Scenic river corridors (including those classified as Wild, Scenic, or Recreational) being maintained?

Monitoring Requirements: Evaluate 100 percent of BLM-authorized activities that have the potential to affect the outstandingly remarkable values of these Wild and Scenic River corridors.

Monitoring Interval: Annual; change interval to once every 3 years if 3 consecutive years of monitoring show 100 percent compliance.

Wildlife

M49. Monitoring Question: Is management of species that are listed under the Endangered Species Act consistent with recovery plans and designated critical habitat?

Monitoring Requirement: Evaluate at least two completed projects per field office that 'may affect' ESA-listed species.

Monitoring Interval: Annual – change interval to once every 3 years if 3 consecutive years of monitoring show 100 percent compliance.

M50. Monitoring Question: Have BLM actions in the Harvest Land Base caused the abandonment (i.e., caused a site to not be occupied during the year following the BLM action) of more than 10 percent of northern spotted owl occupied sites in the Harvest Land Base during the first decade of RMP implementation, more than an additional 15 percent of northern spotted owl occupied sites in the Harvest Land Base during the second decade of RMP implementation, and more than an additional 20 percent of northern spotted owl occupied sites in the Harvest Land Base per decade beginning with the third decade of RMP implementation?

Monitoring Requirements: The BLM State Office wildlife program lead will coordinate this monitoring requirement. BLM wildlife biologists in each district will estimate the number of sites in the Harvest Land Base occupied by a northern spotted owl territorial pair or resident single. Biologists will base their estimates on the most recent year of protocol surveys supplemented by the previous four years of protocol surveys and, if no protocol surveys of a site has been completed during the previous five years, by the most recent ten years of protocol surveys. BLM wildlife biologists in each district will examine all actions in the Harvest Land Base implemented under the RMP and estimate the number of northern spotted owl occupied sites in the Harvest Land Base that have been abandoned by northern spotted owls due to BLM actions in the Harvest Land Base. Although the behaviors of individual northern spotted owl pairs and singles vary, in general, the following are evidence that BLM actions caused site abandonment:

- The BLM modified or removed habitat in the nest patch, which commonly extends 300 meters from the occupied site.
- Following a BLM action in the 500-acre core use area surrounding the occupied site, less than 250 acres of the core use area supported nesting-roosting habitat, when all land ownerships are considered, regardless of the amount of nesting-roosting habitat in this area before the BLM action.
- Following a BLM action in the median provincial home range areas surrounding the occupied site, less than 40 percent of the home range area supported nesting-roosting habitat, when all land ownerships are considered, regardless of the amount of nesting-roosting habitat in this area before the BLM action.

If, following a BLM action, survey indicates that a site is occupied by a territorial pair or resident single, the biologist will determine that the BLM action did not cause site abandonment.

The State Office wildlife program leader will collect results from all BLM districts, make the plan-wide monitoring calculations, and report the results to the U.S. Fish and Wildlife Service.

Monitoring Interval: Biologists will annually document all BLM actions associated with northern spotted owl occupied sites in the Harvest Land Base, and every 5 years will estimate the percent of occupied sites in the Harvest Land Base that were abandoned due to BLM actions implemented under the RMP.

M51. Monitoring Question: Have BLM actions avoided adverse effects to Fender's blue butterfly, Oregon silverspot butterfly, Taylor's checkerspot butterfly, streaked horned lark, vernal pool fairy shrimp, Oregon spotted frog, Lower Columbia River Distinct Population Segment of Columbian white-tailed deer, or western snowy plover, except when done in accordance with an approved recovery plan, conservation agreement, species management plan, survey and monitoring protocol, or critical habitat rule, and when the action is necessary for the conservation of the species?

Monitoring Requirements: Evaluate at least 20 percent of actions that 'may affect' Fender's blue butterfly, Oregon silverspot butterfly, Taylor's checkerspot butterfly, streaked horned lark, vernal pool fairy shrimp, Oregon spotted frog, Lower Columbia River distinct population segment of Columbian white-tailed deer, or western snowy plover.

Monitoring Interval: Annual – change interval to once every 3 years if 3 consecutive years of monitoring show 100 percent compliance.

Program Reporting Items

Program reporting items involve activities that are related to: (1) certain analytical assumptions that are pertinent to non-specific management actions; or (2) analytical assumptions pertinent to the analysis of environmental consequences in the Proposed RMP/Final EIS. Not all programs or resources have reporting items.

Late-Successional Reserve

R1. Program Reporting Item: Report the volume of non-ASQ timber offered for sale from the Late-Successional Reserve. Reporting would be annual.

Riparian Reserve

***Note*:** Program Reporting Item R2 *does not* apply to Eastside Management Area – Riparian Reserve**.**

R2. Program Reporting Item: Report the volume of non-ASQ timber offered for sale from the Riparian Reserve. Reporting would be annual.

R3. Program Reporting Item: Report the number of fish-passage blockages that have been corrected and the number of resulting miles of stream habitat that are newly accessible. Reporting would be annual.

R4. Program Reporting Item: Report the miles of permanent road construction, road renovation, road improvement, and road decommissioning within the Riparian Reserve. Reporting would be annual.

R5. Program Reporting Item: Report the overall level of stream and riparian restoration activities (e.g., placement of large wood and boulders in streams, planting, and thinning). Report the level of stream restoration activities in high intrinsic potential streams, or streams with high priority fish populations. Reporting would be annual.

Eastside Management Area

R6. Program Reporting Item: Report the acres of group selection, commercial thinning, density management, and regeneration harvest. Reporting would be annual, or each year in which there is an completed timber sale.

Harvest Land Base

R7. Program Reporting Item: Report acres by treatment type for silvicultural treatments listed in the following table by Harvest Land Base sub-allocation. Compare against modeling results for the appropriate decade of implementation; see **Table V-2** and **Table V-3** for decade one and two values. See the Proposed RMP/Final EIS for subsequent decades. Report commercial thinning, selection harvest, regeneration harvest, and timber salvage harvest as acres sold, and report other treatment type categories as acres treated. Reporting would be annual.

Table V-2. Decade 1 modeled acres by treatment type by Harvest Land Base sub-allocation

Decade 1 Treatment Type‡	Coos Bay			Eugene			Klamath Falls				Medford				Roseburg				Salem			Grand Total (Acres)
	MITA (Acres)	LITA (Acres)	Total (Acres)	MITA (Acres)	LITA (Acres)	Total (Acres)	UTA (Acres)	MITA (Acres)	LITA (Acres)	Total (Acres)	UTA (Acres)	MITA (Acres)	LITA (Acres)	Total (Acres)	UTA (Acres)	MITA (Acres)	LITA (Acres)	Total (Acres)	MITA (Acres)	LITA (Acres)	Total (Acres)	
Commercial Thinning*	840	430	1,270	3,000	420	3,420	-	-	-	-	-	200	1,410	1,610	-	4,200	4,580	8,780	6,310	910	7,220	**22,300**
Selection Harvest*	-	-	-	-	-	-	5,750	-	-	5,750	28,170	-	-	28,170	1,810	-	-	1,810	-	-	-	**35,730**
Regeneration Harvest*	2,620	510	3,130	9,460	980	10,440	-	110	340	450	-	420	2,590	3,010	-	3,110	3,020	6,130	11,120	1,100	12,230	**35,380**
Timber Salvage Harvest*	-	-	-	-	-	-	-	-	-	-	1,940	-	-	1,940	80	220	-	300	-	-	-	**2,240**
Reforestation†	3,320	650	3,970	12,580	1,300	13,890	1,150	140	430	1,710	6,670	480	2,980	10,130	380	4,160	3,780	8,310	13,350	1,320	14,670	**52,690**
Manual Cutting	4,450	870	5,320	8,510	880	9,400	580	60	180	810	7,880	500	3,110	11,490	300	2,590	2,360	5,250	11,790	1,170	12,960	**45,230**
Mulching	-	-	-	-	-	-	350	30	100	480	980	60	360	1,400	260	2,260	2,050	4,580	-	-	-	**6,450**
Tubing	1,810	350	2,160	9,460	980	10,440	120	10	30	160	340	30	180	550	260	2,300	2,080	4,640	5,560	550	6,110	**24,060**
Shading	-	-	-	950	100	1,040	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**1,050**
Trapping	-	-	-	-	-	-	-	-	-	-	650	40	230	920	-	-	-	-	1,670	170	1,830	**2,760**
Scalping	-	-	-	-	-	-	-	-	-	-	660	40	260	960	-	-	-	-	-	-	-	**960**
Pre-commercial Thinning	3,110	810	3,920	10,900	1,200	12,100	810	160	790	1,760	4,810	460	4,070	9,330	260	3,700	3,640	7,610	12,870	1,150	14,010	**48,740**
Pruning	260	50	310	1,890	200	2,090	230	20	70	320	330	20	130	480	20	200	180	400	560	60	610	**4,220**
Stand Conversion	100	20	120	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**120**

* Acreage includes untreated portion of stand (i.e., skips, aggregate retention areas)

† Natural and artificial reforestation

‡ These estimates represent analytical results based on the vegetation modeling assumptions described in **Appendix C**. The BLM has made these assumptions and estimations solely for analytical purposes. These acreages of silvicultural treatments by district office and by Harvest Land Base sub-allocation for each decade do not represent management direction or restrictions on silvicultural treatments under the RMP. Silvicultural treatments would be implemented consistent with the management direction for the Harvest Land Base sub-allocation and consistent with project-level analysis and decision-making.

Table V-3. Decade 2 modeled acres by treatment type by Harvest Land Base sub-allocation

Decade 2 Treatment Type‡	Coos Bay			Eugene			Klamath Falls				Medford				Roseburg				Salem			Grand Total (Acres)
	MITA (Acres)	LITA (Acres)	Total (Acres)	MITA (Acres)	LITA (Acres)	Total (Acres)	UTA (Acres)	MITA (Acres)	LITA (Acres)	Total (Acres)	UTA (Acres)	MITA (Acres)	LITA (Acres)	Total (Acres)	UTA (Acres)	MITA (Acres)	LITA (Acres)	Total (Acres)	MITA (Acres)	LITA (Acres)	Total (Acres)	
Commercial Thinning*	2,350	520	2,870	11,300	1,100	12,400	-	-	20	20	-	50	640	690	-	2,510	5,710	8,220	13,590	1,590	15,180	**39,380**
Selection Harvest*	-	-	-	-	-	-	7,360	-	-	7,360	27,840	-	-	27,840	2,210	-	-	2,210	-	-	-	**37,410**
Regeneration Harvest*	1,680	500	2,180	4,450	770	5,220	-	90	350	440	-	200	2,610	2,810	-	3,090	3,380	6,470	8,750	980	9,730	**26,850**
Timber Salvage Harvest*	-	-	-	-	-	-	-	-	-	-	1,610	-	-	1,610	-	80	580	660	-	-	-	**2,270**
Reforestation†	2,140	630	2,770	5,920	1,020	6,940	1,470	110	440	2,020	6,450	230	3,010	9,680	440	3,960	4,950	9,350	10,500	1,170	11,680	**42,440**
Manual Cutting	2,860	850	3,710	4,010	690	4,700	740	50	180	960	7,640	240	3,140	11,010	350	2,470	3,090	5,920	9,280	1,040	10,310	**36,630**
Mulching	-	-	-	-	-	-	440	30	110	570	950	30	370	1,340	310	2,150	2,700	5,160	-	-	-	**7,090**
Tubing	1,160	340	1,510	4,450	770	5,220	150	10	40	190	330	10	180	530	310	2,180	2,730	5,230	4,380	490	4,870	**17,530**
Shading	-	-	-	450	80	520	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**530**
Trapping	-	-	-	-	-	-	-	-	-	-	630	20	240	880	-	-	-	-	1,310	150	1,460	**2,350**
Scalping	-	-	-	-	-	-	-	-	-	-	640	20	260	920	-	-	-	-	-	-	-	**920**
Pre-commercial Thinning	1,680	500	2,180	4,450	770	5,220	1,030	90	350	1,470	4,630	200	2,610	7,440	310	3,170	3,960	7,440	8,750	980	9,730	**33,480**
Pruning	170	50	220	890	150	1,040	290	20	70	380	320	10	130	460	20	190	240	450	440	50	490	**3,040**
Stand Conversion	70	20	90	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**90**

* Acreage includes untreated portion of stand (i.e., skips, aggregate retention areas).

† Natural and artificial reforestation

‡ These estimates represent analytical results based on the vegetation modeling assumptions described in **Appendix C**. The BLM has made these assumptions and estimations solely for analytical purposes. These acreages of silvicultural treatments by district office and by Harvest Land Base sub-allocation for each decade do not represent management direction or restrictions on silvicultural treatments under the RMP. Silvicultural treatments would be implemented consistent with the management direction for the Harvest Land Base sub-allocation and consistent with project-level analysis and decision-making.

Rare Plants and Fungi

R8. Program Reporting Item: Report the acres of activities designed to maintain or restore natural plant communities on non-forest and non-commercial lands. Reporting would be annual.

Energy and Minerals

R9. Program Reporting Item: Report the number of biomass utilization projects. Reporting would be annual.

Fire and Fuels Management

R10. Program Reporting Item: Report the number of acres of hazardous fuels treatments by treatment type and by land use allocation (i.e., under burning, broadcast burning, hand pile and burn, landing pile and burn, machine pile and burn, slash and scatter, and mastication). Reporting would be annual.

Forest Management

R11. Program Reporting Item: Report the number of acres of silvicultural treatments by treatment type and by land use allocation, including commercial thinning, selection harvest, regeneration harvest, timber salvage harvest, reforestation (natural and artificial), manual cutting, mulching, tubing, shading, trapping, scalping, pre-commercial thinning, non-commercial thinning, pruning, and stand conversion. Report acres of commercial thinning, selection harvest, regeneration harvest, and timber salvage harvest as acres sold; report all other treatment types as acres treated. Reporting would be annual.

Invasive Species

R12. Program Reporting Item: Report the number of acres of manual, mechanical, cultural, chemical, and biological treatments used to manage invasive species infestations. Reporting would be annual.

R13. Program Reporting Item: Report the number of acres of invasive species inventories. Reporting would be annual.

R14. Program Reporting Item: Report the number of acres of inventory, manual, mechanical, cultural, and chemical treatments used to manage sudden oak death (*Phytophthora ramorum*) infections. Reporting would be annual.

Livestock Grazing

R15. Program Reporting Item: Report the findings of livestock grazing allotments towards meeting the Standards for Rangeland Health and Guidelines for Livestock Grazing Management for Public Lands Administered by the Bureau of Land Management in the States of Oregon and Washington (USDI BLM 1997). Reporting would be annual.

R16. Program Reporting Item: Report the number of acres of prescribed livestock grazing used to control invasive plants, reduce fire danger, or accomplish other management objectives. Reporting would be annual.

R17. Program Reporting Item: Report the acres or number of range improvements. Reporting would be annual.

Socioeconomic

R18. Program Reporting Item: Report the payments to counties associated with BLM-administered lands including O&C, Coos Bay Wagon Roads, and Public Domain lands. Reporting would be annual.

R19. Program Reporting Item: Report receipts from timber sales, special forest products, recreation, and permits. Reporting would be annual.

R20. Program Reporting Item: Report appropriations; number of full time and temporary employees; and major new facility developments or improvements. Reporting would be annual.

Recreation

R21. Program Reporting Item: Report the number of service-oriented and outreach programs, including interpretation and education provided to visitors. Reporting would be annual.

R22. Program Reporting Item: Report the status of development of comprehensive travel management plans for off-highway vehicle management areas and travel management areas. Reporting would be annual.

R23. Program Reporting Item: Within Special Recreation Management Areas (SRMAs), conduct visitor studies or on-site monitoring to assess recreation outcome attainment, targeted recreation activity participation, and protection of recreation setting characteristics during the primary recreation use season. Reporting would be conducted along a rotating schedule, focusing on a cross section of SRMAs within one district each year. Monitoring cycle would run every six years between districts.

Special Forest Products

R24. Program Reporting Item: Report the number of permits for harvest and collection of special forest products. Reporting would be annual.

Soils

R25. Program Reporting Item: When greater than 20 percent of the acres treated in any manner have detrimental soil disturbance resulting from timber harvest or fuel reduction treatments, report the total number of treatment units and the representative percentage of total acres sampled these units entail. Base reporting on evaluation of at least 10 percent of the total number of completed timber harvest units and 10 percent of completed fuel reduction treatment units. Reporting would be annual.

Wildlife

R26. Program Reporting Item: Report the survey effort for marbled murrelet and the outcomes of that survey effort. For each survey polygon, report: acres of survey, years surveys were conducted, age of stand at time of survey, presence/absence of platform trees, protocol used for the survey, and occupied or presence detections of marbled murrelet. For consistency, an example table format is presented below (**Table V-4**). Reporting would be annual.

Table V-4. Marbled murrelet survey reporting

Survey Polygon (Name)	Survey Area (Acres)	Survey Date(s) (Years)	Stand Age (Years)	Protocol Used	Marbled Murrelet Detections		
					Occupied	Presence	None
Sample Project	*000*	*20XX-20XX*	*000*	*Citation*	*X*	*X*	*X*

R27. Program Reporting Item: Report the number of newly discovered occupied marbled murrelet sites. For each newly discovered occupied marbled murrelet site, report: name of site (master site number), associated survey that discovered the site, survey dates (years of survey), and acreage included in the occupied site designation. For consistency, an example table format is presented below (**Table V-5**). The table should present a running list of all occupied sites designated and the cumulative number and acreage of occupied sites. Reporting would be annual.

Table V-5. Marbled murrelet occupied site

Survey Dates (Years)	Occupied Site Name	Associated Survey (Name)	Area Designated (Acres)
20XX, 20XX	*Sample Project (MSNO XXXX)*	*Sample Project*	*000*
Cumulative Total	***000 sites***	**-**	***000***

R28. Program Reporting Item: Report the amount of marbled murrelet nesting habitat that was modified or removed within the Harvest Land Base *without* pre-disturbance surveys (i.e., 35–50 miles from the Pacific Ocean except within exclusion Areas C and D as described in Chapter 3 of the Proposed RMP/Final EIS). For stands of marbled murrelet nesting habitat modified or removed without surveys, report: harvest type, acres, date of treatment, and age at time of treatment. For consistency, an example table format is presented below (**Table V-6**). Reporting would be annual.

Table V-6. Marbled murrelet nesting habitat modified or removed *without* surveys

Project (Name)	Harvest Type	Area (Acres)	Date Modified/ Removed (Year)	Stand Age at the Time of Modification/Removal (Years)
Sample Project	*Harvest Type*	*000*	*20XX*	*000*

R29. Program Reporting Item: Report the survey effort for the red tree vole north of Highway 20 within the North Oregon Coast DPS and the outcomes of that survey effort. For each survey polygon, report: acres of survey, year surveys were conducted, age of stand at time of survey, protocol used for the survey, number of active or inactive red tree vole sites discovered, and the total acreage of habitat areas established associated with the discoveries. For consistency, an example table format is presented below (**Table V-7**). Reporting would be annual.

Table V-7. Survey reporting for the North Oregon Coast DPS of the red tree vole

Survey Polygon (Name)	**Survey Area (Acres)**	**Survey Date (Years)**	**Stand Age (Years)**	**Protocol Used**	**Red Tree Vole Discoveries**			
					Active Sites (Number)	***Inactive Sites (Number)***	***None (Number)***	***Total Habitat Area (Acres)***
Sample Project	*000*	*20XX*	*000*	*Citation*	*000*	*000*	*000*	*000*

R30. Program Reporting Item (Coos Bay District only): Report number, type, and acres (as appropriate) of restoration actions for the western snowy plover. Reporting would be annual.

R31. Program Reporting Item: (Medford and Salem Districts and Klamath Falls Field Office only) Report number and acres of deer and elk forage planting projects within deer and elk management areas. Reporting would be annual.

R32. Program Reporting Item (applies to Eastside Management Area only)**:** Report acres of thinning or removal of encroaching western juniper. Reporting would be annual.

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Appendix W – Responses to Comments

This appendix summarizes the substantive comments that the BLM received during the public comment period for the Draft RMP/EIS and provides the BLM responses to those comments.

On April 24, 2015, the BLM released the Draft RMP/EIS announcing a 90-day comment period that would conclude on July 23, 2015. On July 13, 2015, the BLM extended the comment period on the Draft RMP/EIS until August 21, 2015. The BLM received approximately 4,500 comments on the Draft RMP/EIS during the comment period. The BLM received comments from individuals, groups, organizations, businesses, elected officials, Federal, state, and local government agencies, and Tribes. All comments submitted to the BLM during the comment period are available at http://www.blm.gov/or/plans/rmpswesternoregon/comments.php.

The BLM considered all comments submitted during the comment period. The BLM treated all submissions equally and did not give different consideration to submissions based on geographic location, organizational affiliation, or other status of the respondents. Additionally, the BLM did not give different consideration to comments based on the number of submissions making the same comment.

The BLM reviewed comments to identify substantive comments, which are comments that—

- Question, with reasonable basis, the accuracy of information in the Draft RMP/EIS,
- Question, with reasonable basis, the adequacy of, methodology for, or assumptions used for the environmental analysis,
- Present new information relevant to the analysis,
- Present reasonable alternatives other than those analyzed in the Draft RMP/EIS, and
- Cause changes or revisions in one or more of the alternatives (USDI BLM 2008, p. 66).

The BLM summarized these substantive comments into 'comment summaries.' Comment summaries are statements that identify and describe specific issues or concerns. The BLM combined similar concerns voiced in multiple letters into one comment summary.

This appendix presents the comment summaries and the BLM responses by issue topic. The comment summaries and responses are intended to be explanatory in nature; if there are any inadvertent contradictions between this appendix and the main chapters of the Proposed RMP/Final EIS, the main chapters of the Proposed RMP/Final EIS present the controlling information.

Comment Summaries and Responses to Comments

Purpose and Need for Action

1. **Comment Summary:** The RMP gives more weight to the ESA than the O&C Act. The O&C Act should have priority because it is more specific. Timber production is the overriding objective on O&C lands. Secondary uses, such as recreation and the protection of watersheds and wildlife habitat, are permitted, but they must be accomplished simultaneously, in coordination with and not at the expense of, timber production to benefit local communities.

   Response: The O&C Act established sustained-yield timber production as the primary or dominant use of O&C lands in western Oregon. However, when implementing the O&C Act, the BLM must do

so in full compliance with a number of subsequent laws that direct how the BLM accomplishes the statutory direction. The BLM based the purpose and need for this RMP revision on the laws that apply to the BLM. The BLM designed the alternatives to make a substantial and meaningful contribution to meeting each of the purposes (USDI BLM 2015, pp. 10–11). Thus, all of the purposes of the action are essential, and none has more importance than other purposes or 'overrides' other purposes. An alternative that would fail to meet any one of the purposes would not be a reasonable alternative.

2. **Comment Summary:** The BLM continues to base its approach on a narrow interpretation of BLM O&C statutory requirements that has resulted in timber dominance biases throughout the DEIS. We request that you at least consider the case law review provided by Scott and Brown (2007) that runs contrary to your interpretations of the O&C Act.

   Response: The Draft RMP/EIS provided excerpts of the relevant provisions of the O&C Act and other major authorizing laws and regulations (USDI BLM 2015, pp. 13–14). The BLM has not interpreted the O&C Act, beyond the section in Chapter 1 of the Draft RMP/EIS on the O&C Act and the FLPMA. In that section the BLM stated, "Based on the language of the O&C Act, the O&C Act's legislative history, and case law, it is clear that sustained-yield timber production is the primary or dominant use of the O&C lands in western Oregon" (USDI BLM 2015, p. 15). While this statement is arguably an interpretation, it represents the plain language in existing case law on the O&C Act. The commenter suggests that the interpretation in Scott and Brown (2007) is contrary to the BLM interpretation. The BLM has reviewed Scott and Brown (2007), an article published in the Journal of Environmental Law and Litigation, which provides the authors' views of the history of the O&C lands and the O&C Act. To the extent the above cited statement in the Draft RMP/EIS represents BLM legal interpretation, it relies on existing case law. The interpretation of the purpose of the O&C Act in Scott and Brown (2007) rests on the assertion that case law on the O&C Act was wrongly decided. It is beyond the scope of an RMP to address whether court decisions were wrongly decided.

   The commenter does not explain how they believe that the BLM presenting excerpts from the O&C Act or stating the interpretation of the O&C Act in existing case law has resulted in "timber dominance biases" in the RMP revision. The BLM based the purpose and need for this RMP revision on the laws that apply to the BLM. One of the purposes is to provide a sustained yield of timber. Neither the commenter nor Scott and Brown (2007) argue that the provision of sustained yield of timber is not a mandate of the O&C Act. Nonetheless, this is one of several purposes, all of which are essential, and none has more importance than other purposes.

   Also in the section in Chapter 1 of the Draft RMP/EIS on the O&C Act and the FLPMA, the BLM provided the explanation of how the BLM will apply the direction in the O&C Act to resources managed under the authority of the FLPMA (USDI BLM 2015, pp. 14–19). This discussion arguably represents interpretation by the BLM of the requirements of the O&C Act and the FLPMA. The commenter does not raise issue with these explanations.

3. **Comment Summary:** The O&C Act specifically mandates that BLM forest management must have the objective of "contributing to the stability of local communities and industries" 43 USC 1181(a). Resource based industries have high rates of volatility and are therefore unpredictable. The increase in timber production with this plan may not be productive in the long term despite what models show. Introducing greater instability to local economies is an inappropriate outcome for BLM land management.

Response: One of the purposes for the RMP revision is to provide for a sustained yield of timber. The O&C Act requires that the O&C lands be managed "for permanent forest production, and the timber thereon shall be sold, cut, and removed in conformity with the principal of sustained yield for the purpose of providing a permanent source of timber supply, protecting watersheds, regulating stream flow, and contributing to the economic stability of local communities and industries, and providing recreational facilities" (43 U.S.C. 1181a). This passage of the O&C Act establishes "contributing to the economic stability of local communities and industries" as one of the purposes for which the O&C Act authorizes and directs the selling, cutting, and removing of timber in conformity with the principle of sustained yield. It would be inconsistent with the plain language of the O&C Act to interpret "contributing to the economic stability of local communities and industries" as a goal separate from or competing with sustained-yield timber production (i.e., selling, cutting and removing timber in a particular manner and intensity, within certain time-frames, and in particular locations as the exclusive means of achieving the O&C Act goals). The commenter's unsubstantiated speculation that timber production may not be "productive in the long-term" does not alter the clear legal mandate from the O&C Act to provide for a sustained yield of timber.

The Draft RMP/EIS analyzed the current conditions and trends in economic conditions and analyzed the effects of the alternatives on timber production (USDI BLM 2015, pp. 478–480, 484–488, 509–516). This analysis specifically and quantitatively describes changes in timber supply, demand, and value of timber over time, and acknowledges likely future changes in timber markets based on reasonable assumptions. This analysis looks in detail at the effects of the alternatives on community stability and resilience, and acknowledges the inherent volatility related to natural resource goods, such as timber production. This analysis also describes in detail the importance of timber production from the decision area under the alternatives and the Proposed RMP to jobs and earnings. The commenter does not identify any flaws in this methodology or errors in the analysis. The commenter makes assertions and predictions related to the influence of timber production on communities, but provides no information different than that used in the analysis.

4. **Comment Summary:** The purpose and need statement improperly makes recovery of the northern spotted owl a required component of the RMP although there is no statutory requirement in the ESA or any other statute to pursue recovery. Large blocks of old-growth spotted owl habitat should not be a required component of the RMP. Protection of old growth forests on O&C lands is not justified, as it is not contributing to the conservation of the spotted owl. Competition from the barred owl overrides any other conservation measures.

   Response: It is within the BLM's discretion to include contributing to the conservation and recovery of threatened and endangered species as one of the purposes for this RMP revision. The ESA (Endangered Species Act) requires Federal agencies to use their legal authorities to promote the conservation purposes of the ESA. The ESA defines 'conservation' as the methods and procedures, which are necessary to bring any endangered or threatened species to the point at which the measures provided pursuant to the ESA, are no longer necessary. Thus, it is within the BLM's authority under this mandate in the Endangered Species Act to pursue the conservation and recovery of the northern spotted owl as part of the purpose for this action. The Draft RMP/EIS explained why this purpose for the northern spotted owl necessarily includes maintaining large, contiguous blocks of late-successional forest and maintaining older and more structurally-complex, multi-layered conifer forests, based on the existing scientific information and the results of previous analyses. The commenter does not specifically address the information in the Draft RMP/EIS explaining why maintaining large, contiguous blocks of late-successional forest and maintaining older and more structurally-complex, multi-layered conifer forests are necessary components of northern spotted owl conservation.

Among the existing information on the conservation needs of the northern spotted owl, the BLM addressed recommendations in the recovery plan for the northern spotted owl. Recovery plans are advisory in nature, rather than regulatory. However, the recovery plan for the northern spotted owl provides information and advice relevant to the BLM's purpose of contributing to the conservation and recovery of the northern spotted owl, because recovery plans describe reasonable actions and criteria that the U.S. Fish and Wildlife Service considers necessary to recover ESA-listed species. As detailed in the Draft RMP/EIS, the BLM considered information from the recovery plan in formulating the purpose for the action, but did not rely on the information in the recovery plan exclusively, in part because as the commenter points out, the recovery plan is advisory rather than a binding, regulatory requirement.

As concluded in the Draft RMP/EIS, the northern spotted owl population is under severe biological stress in much of western Oregon, and this population risk is predominately due to competitive interactions between northern spotted owls and barred owls (USDI BLM 2015, pp. 774–804). This conclusion is consistent with the recovery plan findings, as well as BLM's independent findings through the Draft RMP/EIS. The Draft RMP/EIS acknowledges that habitat management by the BLM alone will not be sufficient to produce stable populations of northern spotted owls in some (though not all) of the provinces within the planning area. The Draft RMP/EIS specifically details the indispensable role of habitat on BLM-administered lands in several provinces. The Draft RMP/EIS further identifies and analyzes the effects of a potential mitigation measure of BLM participation in barred owl management (USDI BLM 2015, pp. 40, 778–804). The Draft RMP/EIS concludes that habitat management by the BLM combined with the mitigation measure related to barred owl management would result in substantially improved outcomes for the northern spotted owl populations. Barred owl management alone, without maintaining large blocks of habitat and reserving older, more structurally-complex forest, would not meet the purpose of the action to contribute to the conservation and recovery of the northern spotted owl. The Draft RMP/EIS describes in detail the continuing conservation needs of the northern spotted owl related to habitat management by the BLM (USDI BLM 2015, pp. 774–804). Thus, the analysis in the Draft RMP/EIS supports the conclusion that the greatest contribution to conservation and recovery of the northern spotted owl by the BLM would come from a combination of habitat management and participation in barred owl management.

Additionally, contributing to the conservation and recovery of the northern spotted owl would contribute to the additional purpose of providing a sustained yield of timber, particularly in light of the guidance for the RMP revision to provide a high degree of predictability and consistency about implementing land management actions and a high degree of certainty of achieving desired outcomes (see the Guidance for Development of All Action Alternatives section in Chapter 1). Contributing to the conservation and recovery of the northern spotted owl is necessary to ensure predictable supply of sustained-yield timber production in the future. Further population declines of the northern spotted owl could result in additional restrictions on timber harvest, disrupting and limiting the BLM's ability to provide a sustained yield of timber. By protecting and managing habitat now, and participating in barred owl management, the BLM can best avoid future, disruptive restrictions on sustained-yield timber production.

5. **Comment Summary:** The purpose and need statement needs to include reducing catastrophic fire risk. It appears that every action alternative developed by the BLM will include logging techniques known by the agency to increase fire hazard. This directly inhibits the alleged purpose and need of increasing fire resiliency.

Response: The purpose of the action includes restoring fire-adapted ecosystems to increase fire resiliency. The Draft RMP/EIS explained that the northern spotted owl recovery plan recommends active management within the dry forest landscape to restore ecosystem resiliency. Additionally, in order to provide for a sustained yield of timber from public lands under the O&C Act, BLM management must account for potential loss of this timber to fire. To the extent possible within the decision area, increasing fire resiliency will positively influence fire risk (USDI BLM 2015, p. 10). Adding an additional purpose of reducing catastrophic fire risk would not result in any different alternatives than those considered in the Draft RMP/EIS.

Contrary to the commenter's assertion, the analysis in the Draft RMP/EIS clearly describes that the management approach in the Uneven-Aged Timber Area would result in greater resistance to replacement fire and that the action alternatives as a whole would result in an overall increase in fire resistance relative to current conditions (USDI BLM 2015, pp. 188–195). Furthermore, all alternatives would reduce the fire hazard relative to current conditions (USDI BLM 2015, pp. 200–204). The commenter does not identify any errors in the analysis.

6. **Comment Summary:** Addressing climate change and maximizing carbon storage should be part of the purpose and need for action.

   Response: The BLM based the purpose and need for this RMP revision on the laws that apply to the BLM. The BLM has no specific legal mandate to address climate change and maximize carbon storage comparable to the legal mandates reflected in the purpose and need for this RMP revision, such as, for example, the purpose of contributing to the conservation and recovery of threatened and endangered species in accordance with the Endangered Species Act. As such, addressing climate change and maximizing carbon storage are not part of the purpose and need for this RMP revision.

   The BLM has various climate-related policies, including the following:

   - Executive Order 13514, which directs agencies to measure, manage, and reduce greenhouse gas emissions toward agency-defined targets for agency actions such as vehicle fleet and building management
   - Executive Order 13653, which directs agencies to assess climate change related impacts on and risks to the agency's ability to accomplish its missions, operations, and programs and consider the need to improve climate adaptation and resilience
   - Secretarial Order 3289, which establishes a Department of the Interior approach for applying scientific tools to increase understanding of climate change and to coordinate an effective response to its impacts
   - Departmental Manual 523 DM 1, which directs the Department of the Interior agencies to integrate climate change adaptation strategies into programs, plans, and operations

   These policies address topics related to greenhouse gas emissions and climate change, but none directs the BLM to manage BLM-administered lands specifically for carbon storage. This RMP revision is consistent with these policies to the extent they address topics within the scope of this planning effort.

   The Draft RMP/EIS analyzed the effects of the alternatives on carbon storage and greenhouse gas emissions, assessed climate change-related impacts, and considered potential effects of the alternatives in adapting to climate change (USDI BLM 2015, pp. 132–164).

The Draft RMP/EIS analysis demonstrates that the No Timber Harvest reference analysis represents the management approach that would maximize carbon storage (USDI BLM 2015, pp. 134–136), which is not a reasonable alternative. Specifically, a purpose of maximizing carbon storage would conflict with the purpose of providing a sustained yield of timber, which is an explicit legal mandate for the BLM from the O&C Act.

The Draft RMP/EIS demonstrates that it would not be possible for the BLM to design alternatives specifically to "address climate change." The BLM can only address potential effects of the alternatives in adapting to climate change in general, qualitative terms, because of the uncertainties associated with projecting future climate change, and the uncertainties associated with the interaction of future climate change and land management approaches (USDI BLM 2015, pp. 157–159).

7. **Comment Summary:** The stated obligation to provide revenues to Oregon counties by means of increased harvest on BLM-administered forested land is, at present, a politically created necessity and definitely not one arising from a dearth of actual potential revenue sources. Admittedly, these particular tax issues are the province of the elected government of the state of Oregon and are not within the administrative or constitutional purview of the Federal Government or its agencies. However, the prominent citation of this revenue requirement in the purpose and need section of the Draft RMP/EIS makes them an absolutely legitimate and most germane subject for discussion.

   Response: The commenter mischaracterizes the purpose and need for action in the Draft RMP/EIS. The purposes of the action include providing a sustained yield of timber. The purposes of the action do not include, as the commenter mistakenly claims, providing revenues to Oregon counties. The commenter mistakenly claims that the purpose and need section of the Draft RMP/EIS prominently cites "this revenue requirement." The O&C Act directs that the U.S. Government shall distribute a portion of the receipts from timber sales on O&C lands to the counties with O&C lands. While this distribution of a portion of timber receipts is indisputably a requirement on the U.S. Government under the O&C Act, the purpose and need for this RMP revision does not specifically include providing revenues to counties. In fact, the only mention of revenues in the purpose and need section is to recite the FLPMA passage that specifically provides that if there is any conflict between its provisions and the O&C Act related to management of timber resources or the disposition of revenues from the O&C lands and resources, the O&C Act prevails (i.e., takes precedence) (43 U.S.C. 1701 note (b), USDI BLM 2015, p. 6).

   The purposes of the action do not include, as the commenter mistakenly claims, increasing the timber harvest in the decision area. The purposes of the action include providing a sustained yield of timber, but that discussion does not specify any qualitative or quantitative target for timber production, beyond the broad direction that alternatives must make a substantial and meaningful contribution to meeting each of the purposes for the action (USDI BLM 2015, pp. 6, 10–11). In fact, several of the action alternatives would produce less sustained-yield timber harvest than the No Action alternative. The commenter's characterization of the purpose and need for action is mistaken and ignores the plain language in the purpose and need discussion in the Draft RMP/EIS.

8. **Comment Summary:** The BLM states that a purpose is to coordinate with the Coquille Tribe on management of "adjacent and nearby" BLM lands. This purpose will undermine Congressional intent by weakening standards on adjacent Federal lands, for the express purpose of ensuring the Tribal forest is managed different than the rest of BLM lands.

Response: The purposes of the action include coordinating management of lands surrounding the Coquille Forest with the Coquille Tribe. However, the commenter mistakenly claims that this purpose would somehow weaken standards on adjacent Federal lands. There is nothing in the purpose of coordinating with the Coquille Tribe that necessarily would require "weakening standards." The alternatives in the Draft RMP/EIS consider a range of management approaches, some of which increase protection for some resources and decrease protection for other resources. The commenter does not specify which "standards" they believe would be weakened.

Furthermore, the commenter mistakenly claims that there is an "express purpose" of ensuring that the Coquille Forest would be managed differently than the BLM-administered lands. The Draft RMP/EIS made no such statement of purpose. In fact, the Draft RMP/EIS stated that the management of the Coquille Forest is subject by law to the standards and guidelines of forest plans for adjacent or nearby Federal forested land and that the analysis of effects to BLM-administered forested land would generally reflect the analysis of effects to resources on the Coquille Forest under each alternative (USDI BLM 2015, pp. 10, 661–662). The BLM has added additional text to this discussion in the Proposed RMP/Final EIS to clarify the relationship between the RMP and the management of the Coquille Forest.

9. **Comment Summary:** The EIS should explain the need for logs sourced from public lands, when hundreds of millions of board feet are harvested in Oregon and exported to our commercial competitors every year.

   Response: The need to source logs from BLM public lands within the planning area is described in the purpose and need for action (see Chapter 1). The purpose of the action includes providing a sustained yield of timber. The O&C Act requires that the Oregon and California Railroad Revested Lands and reconveyed Coos Bay Wagon Road Grant lands (O&C lands) be managed "for permanent forest production, and the timber thereon shall be sold, cut, and removed in conformity with the principal of sustained yield for the purpose of providing a permanent source of timber supply, protecting watersheds, regulating stream flow, and contributing to the economic stability of local communities and industries, and providing recreational facilities" (43 U.S.C. 1181a). For the public domain lands, the FLPMA requires that public lands be managed "on the basis of multiple use and sustained yield unless otherwise specified by law" (43 U.S.C. 1701 [Sec. 102.a.7]). The FLPMA also requires that "the public lands be managed in a manner which recognizes the Nation's need for domestic sources of minerals, food, timber, and fiber from the public lands" (43 U.S.C. 1701 [Sec. 102.a.12]).

   The Draft RMP/EIS explained that public lands have been a major supplier of timber to mills in western Oregon for decades (USDI BLM 2015, pp. 484–486). Once timber is harvested, it flows across the region to various processing centers. There are few restrictions on how federal timber flows across western United States, with the exception of the ban on the export of timber from federal lands and substituting timber from federal lands for exported private timber. The amount of timber harvest on other lands and the movement of harvested timber do not alter the applicable statutes, regulations, and policies that direct that the BLM-administered lands in the planning area provide a sustained yield of timber.

Relationship of the RMPs to the Northwest Forest Plan

10. **Comment Summary:** In proposing such substantive changes as outlined in the action alternatives, the BLM needs to more clearly explain why they are proposing such a substantial departure from the science-based NWFP.

    Response: The Draft RMP/EIS described the need for revising the RMPs: the substantial, long-term departure from the timber management outcomes predicted under the 1995 RMPs and new scientific information and policies related to the northern spotted owl (USDI BLM 2015, p. 5). The BLM planning regulations require that RMPs "shall be revised as necessary based on monitoring and evaluation findings, new data, new or revised policy, and changes in circumstances affecting the entire plan or major portions of the plan" (43 CFR 1610.5–6). The BLM has formulated a purpose for the RMP revision consistent with applicable statutes, regulations, and policies (USDI BLM 2015, pp. 5–10). Finally, the Draft RMP/EIS explained the relationship of the RMP revision to the Northwest Forest Plan, and specifically, how the BLM addressed the Aquatic Conservation Strategy of the Northwest Forest Plan in the RMP revisions (USDI BLM 2015, pp. 20–23).

    Since the adoption of the Northwest Forest Plan, there has been a robust debate about effective riparian management strategies for conservation and recovery of ESA-listed fish. Some reviews have argued that active management in riparian forests results in short-term adverse effects on fish habitat and water quality and have proposed increased restrictions on active management within Riparian Reserve to maximize stream shading and the total number of trees available for recruitment to streams (e.g., Frissell *et al*. 2014, Pollock and Beechie 2014). Other reviews have argued that a reliance on passive restoration will compromise attainment of long-term ecological goals and have proposed more and varied active management approaches within Riparian Reserve to facilitate the growth of larger trees and the development of more complex and diverse riparian forests (e.g., Reeves *et al*. in press).

    The purpose and need for this RMP revision clearly identified new scientific information that the Northwest Forest Plan did not address; the alternatives in the Draft RMP/EIS address this new scientific information. The analysis supporting the Northwest Forest Plan was largely based on information in the FEMAT Report, which addressed a very large and diverse assessment area. In contrast, the Draft RMP/EIS contains detailed information on conditions within the much smaller planning area and includes quantified modeling and analysis specific to the alternatives in the Draft RMP/EIS. The BLM based the analysis is the Draft RMP/EIS on detailed information that was not available when the Northwest Forest Plan was approved and presents objective, reproducible analytical conclusions. The analytical methodology and data in the Draft RMP/EIS is sound.

    This comment from the August 21, 2015 letter from NMFS to the BLM includes the characterization of the action alternatives as presenting a "substantial departure" from the Northwest Forest Plan, which is not well founded. Each action alternative differs in some components from the Northwest Forest Plan (i.e., the No Action alternative), as is appropriate given the purpose and need for the RMP revision and the new information. However, for many resources, some action alternatives are more protective than the No Action alternative; some action alternatives are less protective. For many important features and outcomes, all action alternatives are more protective than the No Action alternative (e.g., the extent of the Late-Successional Reserve, the protection of older, more structurally-complex forest, the no-thin inner zone of the Riparian Reserve, habitat development for the fisher).

In a December 18, 2015 letter from NMFS to the BLM,[58] NMFS clarified that they believe that the approach in the Northwest Forest Plan is not the only approach that would ensure the protection and recovery of threatened and endangered fish, and that the best available science also supports an approach modified from Alternative A or D that would include a one site-potential tree height Riparian Reserve on fish-bearing streams and perennial streams.

11. **Comment Summary:** The Northwest Forest Plan, particularly the Aquatic Conservation Strategy, Survey and Manage program, and reserves, should be treated as a conservation baseline below which any reductions in buffer widths and protections are treated as inconsistent with the Plan's ecosystem management and biodiversity emphasis.

    Response: The range of alternatives in an EIS for an RMP must present reasonable alternatives to accomplishing the stated purpose and need for action. As explained in the Draft RMP/EIS, the purpose and need for this RMP revision is different from the purpose and need for the Northwest Forest Plan and the 1995 RMPs (USDI BLM 2015, pp. 20–21). The Northwest Forest Plan is not a statute or regulation, and the BLM is not required to retain the purpose and need for the Northwest Forest Plan. The BLM adopted a purpose and need for this RMP revision that is consistent with the agency's discretion and obligations under the FLPMA, O&C Act, ESA, Clean Water Act, and other applicable statutes, as detailed in Chapter 1. While the Northwest Forest Plan is represented in the analysis as the No Action alternative, the reasonable action alternatives to accomplish the purpose and need for this RMP revision include alternatives that differ from the Northwest Forest Plan. The Draft RMP/EIS explained why some elements of the Northwest Forest Plan are not included in the action alternatives in the Draft RMP/EIS, with specific detail on the Survey and Manage program and the Aquatic Conservation Strategy (USDI BLM 2015, pp. 21–23). Nevertheless, the No Action alternative does include all of the elements of the Northwest Forest Plan, and, thus, the BLM has retained the discretion to include these elements in the development of the Proposed RMP, because they are analyzed in detail in the Draft RMP/EIS. Because the range of alternatives represents the full spectrum of reasonable alternatives to accomplishing the purpose and need for this RMP revision, the range of alternatives is appropriate.

    Furthermore, as detailed in the response above, the Northwest Forest Plan (i.e., the No Action alternative) is intermediate among the action alternatives for many important features and outcomes and less protective than all of the action alternatives for many important features and outcomes. Thus, the Proposed RMP and several of the action alternatives would provide greater protections than the Northwest Forest Plan for some resources. Additionally, as noted above, in a December 18, 2015 letter from NMFS to the BLM, NMFS clarified that they believe that the approach in the Northwest Forest Plan is not the only approach that would ensure the protection and recovery of threatened and endangered fish, and that the best available science also supports an approach modified from Alternatives A or D that would include a one site-potential tree height Riparian Reserve on fish-bearing streams and perennial streams.

[58] The BLM includes discussion of the December 18, 2015 letter from NMFS in these responses because the letter provides information from a cooperating agency with special expertise relevant to this comment response (see Chapter 4). NMFS provided this letter not only in their role as a cooperating agency but also in the context of the ESA consultation process. Finally, this letter has particular relevance to these comment responses, because the letter directly modifies or alters the comments in their August 21, 2015 letter submitted during the Draft RMP/EIS public comment period.

12. **Comment Summary:** The Aquatic Conservation Strategy should be maintained under all action alternatives and protection strengthened.

    Response: As detailed in the Draft RMP/EIS, implementation of the No Action alternative has been resulting in improvements in watershed condition (USDI BLM 2015, pp. 221–223, 231, 291–294). The Northwest Forest Plan included the Aquatic Conservation Strategy to fulfill nine broad and aspirational objectives. The management objectives for the Riparian Reserve in the action alternatives and Proposed RMP do not explicitly include the nine Aquatic Conservation Strategy objectives as presented in the Northwest Forest Plan. However, the management objectives and management direction of the Proposed RMP provide a comparable overall management approach to resources, as summarized in **Table W-1** below.[59]

Table W-1. Comparison of Northwest Forest Plan Aquatic Conservation Strategy objectives and the Proposed RMP

Northwest Forest Plan Aquatic Conservation Strategy Objectives	Proposed RMP Management Objectives and Management Direction
1 – *Maintain/restore watershed and landscape-scale features to ensure protections of aquatic systems*	**Riparian Reserve management objective** – *Maintain and restore natural channel dynamics and processes and the proper functioning condition of riparian areas, stream channels and wetlands by providing forest shade, sediment filtering, wood recruitment, stability of stream banks and channels, water storage and release, vegetation diversity, nutrient cycling and cool and moist microclimate.* **Riparian Reserve management direction** – *Design culverts, bridges, and other stream crossings for the 100-year flood event, including allowance for bed load and anticipated floatable debris. Design stream crossings with ESA-listed fish to meet design standards consistent with existing ESA consultation documents that address stream crossings in the decision area.* **Hydrology management direction** – *Implement road improvement, storm proofing, maintenance, or decommissioning to reduce or eliminate chronic sediment inputs to stream channels and waterbodies. This could include maintaining vegetated ditch lines, improving road surfaces, and installing cross drains at appropriate spacing.*
2 – *Maintain/restore spatial and temporal connectivity within and between watersheds*	**Fisheries management objective** – *Maintain and restore access to stream channels for all life stages of aquatic species.* **Fisheries management direction** – *Replace stream crossings that currently or potentially block or hinder fish passage with crossings that allow aquatic species to pass at each life stage and at a range of flows.*
3 – *Maintain/restore the physical integrity of the aquatic system*	**Riparian Reserve management objective** – *Maintain and restore natural channel dynamics and processes and the proper functioning condition of riparian areas, stream channels and wetlands by providing forest shade, sediment filtering, wood recruitment, stability of stream banks and channels, water storage and release, vegetation diversity, nutrient cycling and cool and moist microclimate.* **Riparian Reserve management objective** – *Maintain water quality and streamflows within the range of natural variability, to protect aquatic*

[59] This comparison gives pertinent examples of management objectives and management direction of the Proposed RMP that address similar resources as the nine Aquatic Conservation Strategy objectives and is not intended to provide a complete description of how the Proposed RMP would address these resources (**Appendix B** – Management Objectives and Direction).

Northwest Forest Plan Aquatic Conservation Strategy Objectives	Proposed RMP Management Objectives and Management Direction
	biodiversity, provide quality water for contact recreation and drinking water sources. **Fisheries management objective** – *Improve the distribution and quantity of high quality fish habitat across the landscape for all life stages of ESA-listed, BLM special status species, and other fish species.* **Fisheries management direction** – *Create spawning, rearing, and holding habitat for fish using a combination of accepted techniques including log and boulder placement in stream channels, tree tipping, and gravel enhancement.*
4 – *Maintain/restore water quality*	**Riparian Reserve management objective** – *Maintain water quality and streamflows within the range of natural variability, to protect aquatic biodiversity, provide quality water for contact recreation and drinking water sources.* **Riparian Reserve management objective** – *Meet ODEQ water quality criteria.* **Riparian Reserve management objective** – *Maintain high quality water and contribute to the restoration of degraded water quality for 303(d)-listed streams.* **Riparian Reserve management objective** – *Maintain high quality waters within ODEQ-designated Source Water Protection watersheds.* **Hydrology management objective** – *Maintain water quality within the range of natural variability that meets ODEQ water quality standards for drinking water, contact recreation, and aquatic biodiversity.*
5 – *Maintain/restore the sediment regime*	**Riparian Reserve management objective** – *Maintain and restore natural channel dynamics and processes and the proper functioning condition of riparian areas, stream channels and wetlands by providing forest shade, sediment filtering, wood recruitment, stability of stream banks and channels, water storage and release, vegetation diversity, nutrient cycling and cool and moist microclimate.* **Hydrology management direction** – *Implement road improvement, storm proofing, maintenance, or decommissioning to reduce or eliminate chronic sediment inputs to stream channels and waterbodies. This could include maintaining vegetated ditch lines, improving road surfaces, and installing cross drains at appropriate spacing.* **Hydrology management direction** – *Suspend commercial road use where the road surface is deteriorating due to vehicular rutting or standing water, or where turbid runoff may reach stream channels.* **Hydrology management direction** – *Decommission roads that are no longer needed for resource management and are at risk of failure or are contributing sediment to streams, consistent with valid existing rights.*
6 – *Maintain/restore timing, magnitude, duration of instream flows*	**Riparian Reserve management objective** – *Maintain water quality and streamflows within the range of natural variability, to protect aquatic biodiversity, provide quality water for contact recreation and drinking water sources.* **Riparian Reserve management direction** – *Design culverts, bridges, and other stream crossings for the 100-year flood event, including allowance for bed load and anticipated floatable debris. Design stream crossings with ESA-listed fish to meet design standards consistent with existing ESA consultation*

Northwest Forest Plan Aquatic Conservation Strategy Objectives	Proposed RMP Management Objectives and Management Direction
	documents that address stream crossings in the decision area.
7 – *Maintain/restore floodplain inundation and water table elevation*	**Riparian Reserve management objective** – *Maintain water quality and streamflows within the range of natural variability, to protect aquatic biodiversity, provide quality water for contact recreation and drinking water sources.* **Riparian Reserve management direction** – *Design culverts, bridges, and other stream crossings for the 100-year flood event, including allowance for bed load and anticipated floatable debris. Design stream crossings with ESA-listed fish to meet design standards consistent with existing ESA consultation documents that address stream crossings in the decision area.*
8 – *Maintain/restore riparian plant species/structural diversity*	**Riparian Reserve management objective** – *Maintain and restore natural channel dynamics and processes and the proper functioning condition of riparian areas, stream channels and wetlands by providing forest shade, sediment filtering, wood recruitment, stability of stream banks and channels, water storage and release, vegetation diversity, nutrient cycling and cool and moist microclimate.* **Riparian Reserve management direction** (Class II and III outer zones) – *Thin stands as needed to promote the development of large, open grown trees, develop layered canopies and multi-cohort stands, develop diverse understory plant communities, and allow for hardwood vigor and persistence. Apply silvicultural treatments to increase diversity of riparian species and develop structurally-complex stands.*
9 – *Maintain/restore habitat to support plant, invertebrate, and vertebrate riparian-dependent species*	**Riparian Reserve management objective** – *Contribute to the conservation and recovery of ESA-listed fish species and their habitats and provide for conservation of special status fish and other special status riparian associated species.* **Riparian Reserve management objective** – *Maintain and restore natural channel dynamics and processes and the proper functioning condition of riparian areas, stream channels and wetlands by providing forest shade, sediment filtering, wood recruitment, stability of stream banks and channels, water storage and release, vegetation diversity, nutrient cycling and cool and moist microclimate.* **Rare Plants and Fungi management objective** – *Provide for conservation and contribute toward the recovery of plant species that are listed, or are candidates for listing, under the ESA.* **Rare Plants and Fungi management objective -** *Provide for the conservation of Bureau special status plant and fungi species.* **Wildlife management objective** – *Conserve and recover species that are listed, or are candidates for listing, under the ESA and the ecosystems on which they depend.* **Wildlife management objective** – *Implement conservation measures that reduce or eliminate threats to Bureau Sensitive species to minimize the likelihood of and need for listing of these species under the ESA.*

The Proposed RMP addresses all four components of the Aquatic Conservation Strategy: Riparian Reserve, Key Watersheds, Watershed Analysis, and Watershed Restoration. For each of these

components, the Proposed RMP has updated or modified the component, in light of the purpose and need for the RMP revision, the management objectives in the Proposed RMP, new scientific information, and the BLM's experience in implementing the 1995 RMPs. The Draft RMP/EIS explained the relationship between the alternatives in the Draft RMP/EIS and the Aquatic Conservation Strategy of the Northwest Forest Plan (USDI BLM 2015, pp. 22–23).

The Proposed RMP addresses all components of the Aquatic Conservation Strategy, in an updated and modified form. For those resources addressed by the Aquatic Conservation Strategy that are related to the purposes of this RMP revision, including the conservation and recovery of threatened and endangered fish species, the Proposed RMP would provide comparable protection to the No Action alternative.

13. **Comment Summary:** The interim Riparian Reserve identified in the FEMAT Report was designed to benefit fish as well as riparian species. The DEIS/RMP failed to take a holistic multispecies perspective with proposed riparian reserve widths in action alternatives. We assert that RMP programmatic planning and analysis must value the multispecies benefits of a two tree riparian reserve and not discount them as if salmonids were the only species of concern. The DEIS analysis of riparian reserve does not address all the values provided by riparian reserve. The analysis focused exclusively on ESA-listed fish and water quality, but riparian reserve also provides value to non-aquatic species such as the spotted owl, marbled murrelet, and Pacific fisher, which spend disproportionate time on lower slopes near streams. The FEIS should expand the buffer widths in Riparian Reserve to account for increasing stressors from potential extreme weather events (floods, droughts) due to climate change.

    Response: Consistent with the purpose and need for this RMP revision, the BLM established management objectives for the Riparian Reserve in the action alternatives and the Proposed RMP that focused on fish habitat and water quality. This is in contrast to the nine, broad objectives of the Aquatic Conservation Strategy of the Northwest Forest Plan, which included supporting well-distributed populations of riparian-dependent species, based on the U.S. Forest Service's organic statute and implementing regulation. For this RMP revision, the BLM adopted a purpose and need that is consistent with the agency's discretion and obligations under the FLPMA, O&C Act, ESA, Clean Water Act, and other applicable statutes. The BLM based the management objectives for the Riparian Reserve in the action alternatives and the Proposed RMP on this purpose and need.

    Although the management objectives for the Riparian Reserve in the action alternatives and Proposed RMP do not explicitly include the nine Aquatic Conservation Strategy objectives as presented in the Northwest Forest Plan, the Proposed RMP does contain comparable management objectives and management direction, as summarized above. Furthermore, the discussion in the Draft RMP/EIS analyzed the effect of the different Riparian Reserve strategies on the resources associated with the nine Aquatic Conservation Strategy objectives. The commenter mistakenly asserts that the analysis did not address the effect of the different Riparian Reserve strategies on non-aquatic species. The different Riparian Reserve strategies and different analytical assumptions related to Riparian Reserve management were all included in the vegetation modeling, which in turn informed the analysis of effects on all species, including the northern spotted owl, marbled murrelet, and fisher (USDI BLM 2015, pp. 100–102, 987–1043). These disclosures of terrestrial species effects presented a reasoned analysis based on detailed, quantitative information, including the effects of past actions and reasonably foreseeable future actions, and thus provided a 'hard look' at the effects of the alternatives, including changes in Riparian Reserve design.

The commenter does not explain how increasing the Riparian Reserve widths would account for "increasing stressors from potential extreme weather events." For example, the analysis of stream shading in the Draft RMP/EIS demonstrated that reducing the Riparian Reserve width from two site-potential tree heights under the No Action alternative to one site-potential tree height under Alternatives A and D, coupled with the management direction within the Riparian Reserve under Alternatives A and D, would not result in a measurable difference in stream shading. This conclusion is consistent with the FEMAT Report (FEMAT 1993, pp. V-27 – V-28). The commenter does not explain why they believe the second site-potential tree height width is necessary to provide stream shading or to provide other functions of the Riparian Reserve, or how extreme weather events, such as floods and droughts, would alter the stream shading or other functions of the Riparian Reserve. The BLM analysis does not support the commenter's view that the second site-potential tree height is necessary to achieve the purpose and need of this RMP revision and management objectives of the Proposed RMP.

14. **Comment Summary:** A recent review of the NWFP's ACS in light of scientific advances since 1993 (Frissell *et al*. 2014) documented a host of reasons to recommend that Riparian Reserve should be expanded and logging activities within them reduced compared to the baseline NWFP (this is contrary to the BLM DEIS and therefore the DEIS remains out-of step with current science).

    Response: The BLM has reviewed Frissell *et al*. 2014, as detailed in the Fisheries section of Chapter 3. This unpublished report to the Coast Range Association does not present any new scientific information. Although it presents numerous citations to existing scientific information (many of which are also cited in the Draft RMP/EIS), the report itself is a collection of policy recommendations and critiques of administrative policies and legislative proposals, which are generally reflected in the substantive comments on the Draft RMP/EIS summarized in this appendix. As such, Frissell *et al*. 2014 does not provide any new scientific information relevant for the analysis of the effects of the alternatives.

15. **Comment Summary:** The Riparian Reserve created by the Northwest Forest Plan (USDA and USDI 1994) was developed by a broad group of scientists and reflected the general scientific consensus at the time as to the level of protection needed for the recovery of salmon over a 100-year time frame and was considered by the Federal courts to be the "bare minimum" necessary for the recovery of salmon. Several Riparian Reserve options proposed at that time were more protective than the current proposed BLM DEIS Riparian Reserve, but were rejected as inadequate. The DEIS is (implicitly) making an extraordinary claim; that the FEMAT science team (and the Federal courts) were in error, and that up to 81 percent of the existing Riparian Reserve network can be opened for substantially increased levels of timber harvest (i.e., the Preferred Alternative B), with little effect on salmon and other riparian-dependent species and the habitat upon which they depend.

    Response: The management objectives for the Riparian Reserve in the FEMAT Report (which supported the Northwest Forest Plan) included supporting well-distributed populations of riparian-dependent species. The FEMAT Report concluded that the cumulative effectiveness of riparian buffers would be maximized within a distance of one site-potential tree height from the channel or less (FEMAT Report, pp. V-27 – V-29). The only effects that the FEMAT Report identified for riparian buffers beyond one site-potential tree height from streams were for effects on riparian microclimate and wildlife habitat. These are effects that were relevant to the Riparian Reserve management objective in the Northwest Forest Plan of supporting well-distributed populations of riparian-dependent species; but the FEMAT Report contains no analysis that riparian buffers of two site-potential tree heights are necessary for the protection of ESA-listed fish or water quality, which

are management objectives for the Riparian Reserve in the action alternatives and Proposed RMP in this RMP revision. Two of the action alternatives in the Draft RMP/EIS, Alternatives A and D, would include a Riparian Reserve of one site-potential tree height on all streams. The FEMAT Report did not directly consider such a Riparian Reserve design. Nevertheless, the analytical conclusions in the FEMAT Report support that such a design would maximize the cumulative effectiveness of such a buffer for effects on fish habitat. Thus, for the purposes of the management objectives for action alternatives and Proposed RMP in this RMP revision, the commenter's assertion that the FEMAT Report "rejected as inadequate" the Riparian Reserve designs in all of the action alternatives in Draft RMP/EIS is not well founded.

Moreover, the Draft RMP/EIS does not claim, implicitly or explicitly, that the FEMAT science team was in error. The management objectives for the Riparian Reserve in the FEMAT Report (and Northwest Forest Plan) differ from the management objectives for the Riparian Reserve in the action alternatives in the Draft RMP/EIS.

This comment, included in the August 21, 2015 letter from NMFS to BLM, concluding that "up to 81 percent of the existing Riparian Reserve network can be opened for substantially increased levels of timber harvest" under Alternative B is based on incorrect analysis, as explained below in response to a similar comment. The acreage available for sustained-yield timber harvest would be substantially smaller under Alternative B than under the No Action alternative. In a December 18, 2015 letter from NMFS to the BLM, NMFS acknowledged that these comments were in error and asked that they be ignored.

The Draft RMP/EIS does not claim, implicitly or explicitly, that the action alternatives would have "little effect on salmon and other riparian-dependent species" As explained above, the Draft RMP/EIS analyzed the effects of the alternatives on ESA-listed fish and water quality (USDI BLM 2015, pp. 219–233, 286–318). That analysis demonstrated the comparative effect of the alternatives. The Draft RMP/EIS does not make any conclusion about whether such effects are "little."

The comment from NMFS does not specify which Federal court they claim considers the Riparian Reserve design in the Northwest Forest Plan to be the "bare minimum" necessary for the recovery of salmon, but the BLM is unaware of any such court ruling. There is no such finding in *Seattle Audubon Society v. Lyons*, 871 F. Supp. 1291 (W.D. Wash. June 6, 1994), which addressed challenges to the Northwest Forest Plan. In a December 18, 2015 letter from NMFS to the BLM, NMFS specifically withdrew all of their comments related to interpreting judicial decisions on the Northwest Forest Plan. NMFS specifically clarified that they believe that the approach in the Northwest Forest Plan does not represent a minimum level of protection. As noted above, NMFS clarified that the best available science also supports an approach modified from Alternative A or D that would include a one site-potential tree height Riparian Reserve on fish-bearing streams and perennial streams.

16. **Comment Summary:** The BLM should fully comply with the Survey and Manage provisions of the Northwest Forest Plan in all the alternatives until Federal agencies protect all remaining late-successional habitat and the reserves are fully functional. The program might not be needed if coarse filter reserves and older forests were fully functional, but that is not the case. Abandonment of the Survey Manage program will increase extinction rates, cause the loss of ecological processes, and reduce small Sensitive species buffers that greatly augment habitat connectivity in the highly fragmented landscape of western Oregon BLM lands. The BLM must discuss how the decreased protection for Survey and Manage species will affect the functionality of the Northwest Forest Plan for the U.S. Forest Service. The Survey and Manage program has resulted in significant gains in

knowledge, reduced uncertainty about conservation, and developed useful new inventory methods for rare species. The BLM presents no quantified analysis of the population levels or trends for any of the Survey and Manage species to be dropped from the program or the handful that would be managed as Bureau Sensitive species.

Response: The Survey and Manage measures were included in the Northwest Forest Plan to respond to a goal of ensuring viable, well-distributed populations of all species associated late-successional and old-growth forests. As explained in the Draft RMP/EIS, this goal of the Northwest Forest Plan was founded on a U.S. Forest Service planning regulation, which did not and does not apply to the BLM, and is not a part of the purpose for this RMP revision (USDI BLM 2015, pp. 21–22). The BLM based the purpose for this RMP revision on the statutes and regulations that apply to the BLM, as detailed in Chapter 1. The BLM will not use the RMP revision process to adopt regulations like those that apply only to the U.S. Forest Service. Because the range of alternatives represents the full spectrum of reasonable alternatives to accomplishing the purpose and need for this RMP revision, as described below, the range of alternatives is appropriate.

The species viability goal of the Northwest Forest Plan is not part of the purpose for this RMP revision. The Draft RMP/EIS explained that the purpose and need for the RMP revision differs from the purpose and need for the Northwest Forest Plan and reflects the BLM's determination that it can achieve the goals of the O&C Act and other applicable statutes without the Survey and Manage measures (USDI BLM 2015, pp. 20–22). The commenter argues that the Survey and Manage measures must be included in the RMP because it is still needed. The Northwest Forest Plan did not include the Survey and Manage measures simply for the sake of having a Survey and Manage approach. Had that been the case, the Survey and Manage measures would have been reflected in the Purpose and Need statement of the Northwest Forest Plan and included in the design of one or more of its alternatives. Instead, the Survey and Manage measures were only first identified in the Final Supplemental EIS for the Northwest Forest Plan as one mitigation measure to increase the likelihood of achieving "viable populations, well-distributed across their current range, of species known (or reasonably expected) to be associated with old-growth forest conditions" (USDA FS and USDI BLM, 1994, p. 3&4-129) – a goal which was founded on a U.S. Forest Service planning regulation that, as explained above, did not and does not apply to the BLM.

The Draft RMP/EIS explained that the BLM does not need the Survey and Manage measures to avoid species extinctions or to achieve the purposes of the RMP revision or to meet BLM's obligations under applicable law and regulation. The Proposed RMP represents a management approach that provides habitat for species "associated with old-growth forest conditions." As detailed in the analysis in the Proposed RMP/Final EIS, the Proposed RMP would—

- Allocate a larger Late-Successional Reserve network than the No Action alternative;[60]
- Reserve all of the older and more structurally-complex forests, which generally represents "old-growth forest conditions" and thus, by definition, provides high quality habitat for Survey and Manage species;
- Reserve more of the combined mature and structurally-complex forest—which provides potential habitat for Survey and Manage species—than the No Action alternative;
- Provide management direction within the Harvest Land Base to provide for snags, down woody debris, leave trees and islands, and a diversity of tree species in the canopy layer,

[60] The Final Supplemental EIS for the Northwest Forest Plan identified that the Late-Successional Reserve network provides key benefits to Survey and Manage species (USDA FS and USDI BLM 1994a, pp. 3&4-114 – 3&4-177). All action alternatives and the Proposed RMP would allocate a Late-Successional Reserve network larger than what is provided in the Northwest Forest Plan and thus would generally provide a larger network of habitat for Survey and Manage species.

which would maintain diversity at the stand level, providing a variety of unique habitat conditions to support diverse fungi, lichens, bryophytes, and vascular plants, including Survey and Manage species; and

- Continue to provide management for many of the Survey and Manage species as Bureau Sensitive species (see the Rare Plants and Fungi and Wildlife sections of Chapter 3).

As a result of these allocations and management direction, the Proposed RMP would protect the majority of the currently known sites of Survey and Manage species in the reserve land use allocations and would provide a greater increase in the amount of potential habitat for Survey and Manage species over time than the No Action alternative, as detailed in the Rare Plants and Fungi and Wildlife sections of Chapter 3 and **Appendix S** – Other Wildlife (e.g., **Table 3-2**, **Table 3-3**, **Table 3-4**, **Table S-5**, **Table S-6**).

The BLM has other management tools besides allocating reserves for conserving species that are associated with late-successional and old-growth forests. Although the species viability goal of the Northwest Forest Plan is not part of the purpose for this RMP revision, the BLM would provide management for Survey and Manage species that are also Bureau Sensitive species, consistent with BLM policy, under all action alternatives and the Proposed RMP. As detailed in the Rare Plants and Fungi and Wildlife sections of Chapter 3, **Appendix N** – Rare Plants and Fungi, and **Appendix S** – Other Wildlife, of the 35 Survey and Manage plant and fungi species in the decision area, 5 are also Bureau Sensitive species, and of the 13 Survey and Manage wildlife species in the decision area, 4 are also Bureau Sensitive species. The BLM Special Status Species policy directs that the BLM address Bureau Sensitive species and their habitats in the planning process, and, when appropriate, identify and resolve significant land use conflicts with Bureau Sensitive species. In implementing the RMP, the BLM will ensure that actions affecting Bureau Sensitive species will be carried out in a way that is consistent with the objectives for managing those species and their habitats at the appropriate spatial scale. The application of the BLM Special Status Species policy to provide specific protection to species that are listed by the BLM as Sensitive "… on lands governed by the O&C Act must be consistent with timber production as the dominant use of those lands" (USDI BLM 2008, BLM Manual 6840 – Special Status Species Management, sections 6840.06.2A – 6840.06.2E). The BLM has addressed the Survey and Manage species that are also Bureau Sensitive species in the analysis for this RMP revision, and has resolved land use conflicts as discussed below. Therefore, even if habitat and site protection described above were not sufficient to provide adequate habitat for such species, before they could need listing under the ESA, the BLM would be able to include such species on the BLM Sensitive species list and provide necessary additional management to avoid the need for listing.

The commenter suggests that the Survey and Manage measures must be included in the RMP to prevent loss of ecological processes, such as nutrient cycling and nitrogen fixation. The analysis in the Draft RMP/EIS does not support the conclusion that the Survey and Manage measures are necessary to preserve ecological processes. Survey and Manage species undoubtedly provide ecological processes including nitrogen fixation and nutrient cycling. However, the analysis in the Draft RMP/EIS demonstrates that such loss of Survey and Manage species is not reasonably foreseeable under the action alternatives, given that the action alternatives would generally provide more habitat for Survey and Manage species than the No Action alternative and that the BLM would provide management for Survey and Manage species that are also Bureau Sensitive species. Additionally, the Survey and Manage species are, by definition, rare and limited in occurrence. Thus, any speculative loss of ecological processes would be extremely limited in geographic scope, and it would not be possible to detect any measurable difference among the alternatives in providing these

ecological processes. There is no scientific method by which the BLM could measure the possible loss of ecological processes related to Survey and Manage species in the analysis.

The commenter asserts that the Survey and Manage measures must be included in the RMP to provide habitat connectivity. As explained above, all action alternatives and the Proposed RMP would generally provide a larger network of habitat for Survey and Manage species and that the amount of habitat for Survey and Manage species would generally increase over time, as detailed in the Rare Plants and Fungi and Wildlife sections of Chapter 3 and **Appendix S** – Other Wildlife.

The commenter asserts that the BLM must address how eliminating the Survey and Manage measures will affect the "functionality" of the Northwest Forest Plan for the U.S. Forest Service. As described above, all action alternatives and the Proposed RMP would generally provide a larger network of habitat for Survey and Manage species and that the amount of habitat for Survey and Manage species would generally increase over time. Thus, all action alternatives and the Proposed RMP would generally provide a comparable or greater contribution to habitat for Survey and Manage species than the current condition. In addition, the majority of currently known sites for Survey and Manage species would be generally protected in the reserve land use allocations under the action alternatives and the Proposed RMP. The action alternatives and the Proposed RMP would provide continued management of Survey and Manage species that are Bureau Sensitive species. In light of this approach, the analysis in the Proposed RMP/Final EIS does not support the conclusion that the any of the action alternatives or the Proposed RMP would result in a loss of "functionality" of the Northwest Forest Plan for the U.S. Forest Service.

The commenter urges retaining the Survey and Manage measures because these measures have produced new information and new inventory methods. The BLM does not dispute that the implementation of the Survey and Manage measures has resulted in an increase in information about such species and the development of inventory methods. While this increase in knowledge is an inevitable and beneficial result of such a program, it is not necessary to achieve the purposes of the RMP revision or to comply with any law or regulation applicable to the BLM.

The commenter states that the Draft RMP/EIS does not include quantified population analysis of the Survey and Manage species. The commenter is correct. Analysis in an EIS must provide a 'hard look' at the effects of the alternatives. A 'hard look' is a reasoned analysis containing quantitative or detailed qualitative information (USDI BLM 2008, p. 55). The Draft RMP/EIS detailed the methodology for analyzing the effects of the alternatives on Survey and Manage species based on habitat abundance (USDI BLM 2015, pp. 423, 682–683). This analysis provided detailed and quantitative information, which supported reasoned analytical conclusions about the effects of the alternatives on Survey and Manage species (USDI BLM 2015, pp. 428–439, 683–694). The Proposed RMP/Final EIS has added discussion to explain why the BLM did not provide a quantified population analysis of the Survey and Manage species (see the Summary of Analytical Methods in the Rare Plants and Fungi and Wildlife sections of Chapter 3). Survey and species data on Survey and Manage species are incomplete and insufficient to provide for any meaningful analysis of population trends. Instead, the BLM conducted the analysis of effects on Survey and Manage species using the available information related to habitat conditions for these species.

17. **Comment Summary:** By considering action alternatives that would change the BLM's land management, the agency is essentially considering pulling out of the multi-agency Northwest Forest Plan. The BLM cannot do this without causing the entire Northwest Forest Plan to crumble; that is, although the action agency here is the BLM, its decisions will by necessity change the validity of the U.S. Forest Service's actions and land management assumptions. The DEIS fails to address or

analyze the environmental and cumulative impacts of these alternatives on the continuing validity of the Northwest Forest Plan as a whole.

Response: The Draft RMP/EIS clearly states that this RMP revision would replace the 1995 RMPs and thereby replace the Northwest Forest Plan for the management of BLM-administered lands in western Oregon (USDI BLM 2015, p. 21). The analysis in the Draft RMP/EIS assumed that the U.S. Forest Service would continue to manage their lands within the analysis area consistent with their existing plans (i.e., the Northwest Forest Plan) (USDI BLM 2015, pp. 95–96). Thus, the analysis in the Draft RMP/EIS presents a cumulative analysis of the BLM managing of BLM-administered lands under each alternative and the U.S. Forest Service managing of National Forests under the Northwest Forest Plan.

Whether the U.S. Forest Service would need to conduct additional analysis for implementation of U.S. Forest Service projects, and whether the U.S. Forest Service would continue to elect to manage National Forests under the Northwest Forest Plan in the future are questions beyond the scope of this RMP revision process.

Range of Alternatives

18. **Comment Summary:** The No Action alternative of the Draft RMP/EIS is based on implementation of the original 1995 RMPs "as written," not as currently practiced, which makes comparisons of it to the action alternatives false and the entire analysis flawed.

    Response: The No Action alternative for a RMP revision is no change from the current management direction or level of management intensity. In the case of this RMP revision, the implementation of the 1995 RMPs has not been consistent with the assumptions of the 1995 RMPs, as detailed in the BLM plan evaluations (USDI BLM 2012). As explained in the Draft RMP/EIS, this long-standing failure to implement the 1995 RMPs as written is part of the stated need for the RMP revision (USDI BLM 2015, p. 5). The Draft RMP/EIS further explained that the BLM cannot analyze continuation of the current practices as the No Action alternative, because the current practices have been variable and are not sustainable, preventing the projection of the current practices into the future (USDI BLM 2015, pp. 77–78). Due to this variability in implementation, there is no particular 'snapshot' in time that the BLM could reasonably select as representative of the 1995 RMPs as implemented; any selection of such a 'snapshot' in time would be arbitrary, since past practice provides no rational basis upon which to project the continuation of practices at any given point in time into the future. The No Action alternative in the Draft RMP/EIS explicitly represents no change from the current management direction and thus constitutes the appropriate benchmark for comparison to the action alternatives.

    The Proposed RMP/Final EIS has added discussion of an alternative that would implement the 1995 RMPs at the sustained-yield timber harvest levels declared in the 1995 RMPs, and provided an explanation of why this alternative was considered but not analyzed in detail.

    Nevertheless, the Draft RMP/EIS and the Proposed RMP/Final EIS describe the combined effects of past implementation of the 1995 RMPs, in that the analyses identify a baseline of current conditions that reflects the effects of the actual implementation to date. As explained in the Draft RMP/EIS, the analyses incorporated the aggregate effect of past actions, including the actual implementation of the 1995 RMPs, into the existing baseline information (USDI BLM 2015, p. 94). The analyses of the effects of the alternatives compare future resource condition against this baseline, thus providing a

comparison of the effects of the alternatives to the baseline condition created by the actual implementation of the 1995 RMPs.

19. **Comment Summary:** The BLM should have analyzed the Natural Selection alternative in detail. The Natural Selection alternative limits harvest of timber to dead and dying trees because it can generate better wood, has hugely less impact on habitats than green tree removal and it retains optimal photosynthesis and tree productivity. The Natural Selection alternative produces more timber over the long term than other alternatives. The average volume of timber production across the landscape under the Natural Selection alternative is greater than BLM's preferred alternatives [*sic*] because it doesn't produce areas with little or no production. The Natural Selection alternative offers scientifically sound, ecologically credible and legally responsible solutions to the critical issues of the 21st century including, global climate change, species extinctions, and social-economic conditions.

    Response: The range of alternatives in an EIS for an RMP must present reasonable alternatives to accomplishing the stated purpose and need for action. As explained in the Draft RMP/EIS, the BLM did not analyze the Natural Selection alternative in detail, because it is not a reasonable alternative. Specifically, limiting the harvest of timber to trees that are dead or are dying would not be consistent with the requirements of the O&C Act and would not respond to the purpose for the action (USDI BLM 2015, p. 79). The commenter asserts that the Natural Selection alternative would, in fact, produce more sustained-yield timber than any of the alternatives analyzed in detail (i.e., more than the 486 MMbf/year under Alternative C), but provides neither an estimate of the amount of timber the Natural Selection alternative would provide or support for this claim. It would not be possible to quantify the amount of annual timber harvest for a program that would limit timber harvest to dead and dying trees because of the inherent unpredictability in the number of trees dying each year, their location, or their suitability for wood products. The commenter does not explain why they believe the Natural Selection alternative would produce more timber than any of the alternatives, or why such harvest would represent the annual productive capacity of the forest. Because the Natural Selection alternative would not offer for sale the annual productive capacity of the forest, it is not consistent with the O&C Act. Because the Natural Selection alternative would not provide a sustained yield of timber, it does not respond to the purpose for the action. Therefore, the Natural Selection alternative is not a reasonable alternative and need not be analyzed in detail.

20. **Comment Summary:** A small diameter alternative needs to be considered in the FEIS in order to provide an adequate range of alternatives under NEPA. None of the BLM alternatives focus exclusively on small diameter restoration treatments as the primary objective and thus the DEIS remains out-of-compliance with NEPA and best available science. Based on prior calculations (Kerr 2011) and a one-time entry for timber volume, this could potentially generate about 1.6 billion board feet from the Matrix and Adaptive Management Areas.

    Response: The range of alternatives in an EIS for an RMP must present reasonable alternatives to accomplishing the stated purpose and need for action. One of the purposes of the action is to provide for a sustained yield of timber. The Draft RMP/EIS explains that sustained yield of timber is the timber volume that a forest can produce in perpetuity at a given intensity of management (USDI BLM 2015, p. 892). An alternative designed for "one-time entry" with restoration as the primary objective would not provide sustained yield of timber. Limiting timber harvest to "one-time entry" and establishing restoration of some resource condition as the primary objective would preclude producing a given volume of timber in perpetuity at a given intensity of management, as required by the O&C Act and specifically described in the purpose for the action. Therefore, such an alternative

would not be a reasonable alternative. The Proposed RMP/Final EIS added discussion of this suggested alternative as an alternative considered but not analyzed in detail (see Chapter 2).

21. **Comment Summary:** Maximum timber production allowable under the O&C Act should be used as the baseline against which alternatives are compared. This maximized analysis should be the base point on which all other alternatives are measured against and compared, to reflect the true economic value of what these alternatives are costing our local communities.

    Response: An alternative that would provide "maximum timber production allowable under the O&C Act" would not be a reasonable alternative, because it would not meet other purposes of the action, including contributing to the conservation and recovery of threatened and endangered species, providing clean water, and restoring fire-adapted ecosystems. The Draft RMP/EIS does estimate the maximum timber production allowable under the O&C Act, noting that the amount is approximately the same as the amount estimated in the 2008 FEIS—1.2 billion board feet per year (USDI BLM 2015, pp. 261–262). Beyond approximating this timber volume, the BLM did not identify any need to use the "maximum timber production allowable under the O&C Act" as a reference analysis in comparison to the effects of the alternatives. The commenter does not explain how further analysis of this reference analysis would assist in interpreting the results of the analysis, beyond asserting that it is the appropriate baseline. The "maximum timber production allowable under the O&C Act" would produce substantially more timber harvest, and consequently higher payments to counties, than the alternatives; further analysis could give more precision to this analytical conclusion, but would not alter this conclusion. In summary, the "maximum timber production allowable under the O&C Act" is not a reasonable alternative; the amount of the "maximum timber production allowable under the O&C Act" is disclosed in the Draft RMP/EIS; and further analysis of the "maximum timber production allowable under the O&C Act" would not improve the analysis of the effects of the alternatives and is not essential to a reasoned choice among the alternatives.

22. **Comment Summary:** We recommend that at least two other alternatives be added to the final analysis. The first would be one that truly integrates and balances ecological, social, and economic values. The second would be a more "robust" alternative with a target harvest volume closer to biological growth.

    Response: The range of alternatives in an EIS for an RMP must present reasonable alternatives to accomplishing the stated purpose and need for action. When there are potentially a very large number of alternatives, such as this RMP revision, only a reasonable number of alternatives, covering the full spectrum of alternatives, must be analyzed in the EIS. The commenter does not specify the alternatives that they believe are reasonable and are not within the spectrum of alternatives analyzed in detail in the Draft RMP/EIS. The alternatives in the Draft RMP/EIS do "integrate and balance ecological, social, and economic values," to the extent those values are represented by the purposes of the action. The commenter does not specifically describe an alternative "with a target harvest volume closer to biological growth" that would meet the purposes of the action. The BLM presumes that such an alternative would be substantially similar to a "maximum timber production allowable under the O&C Act" alternative, which would not be a reasonable alternative, as explained in the comment above. The BLM has analyzed in detail the full spectrum of alternatives that would accomplish the purpose of the action. That is, it would not be possible to construct an alternative with more timber harvest that meets all of the purposes of the action.

23. **Comment Summary:** The design of the alternatives for conservation needs of the spotted owl far exceeds a need-based standard.

    Response: For the BLM to consider alternatives reasonable, alternatives must accomplish the purposes of the action, which include contributing to the conservation and recovery of threatened and endangered species, including the northern spotted owl. The BLM based the analysis of the effects of the alternatives on northern spotted owls, in part, on an evaluation of how the alternatives would address the conservation needs of the northern spotted owl (USDI BLM 2015, pp. 746–826). The commenter confuses the design of the alternatives with the analysis of the effects. Although the analysis of effects included an evaluation relative to the conservation needs of the northern spotted owl, the BLM designed the alternatives to contribute to the conservation and recovery of the northern spotted owl, among other purposes. The purpose of the action is not to satisfy a "need-based standard" for the northern spotted owl and no more; the purpose of the action includes contributing to the recovery of the northern spotted owl, which the alternatives do to varying degrees. Therefore, the alternatives presented in the Draft RMP/EIS represent reasonable alternatives to accomplishing the purpose of contributing to the conservation and recovery of the northern spotted owl, among other purposes. The commenter points to no legal constraint that would limit the purpose of BLM's action to a "need-based standard" of spotted owl conservation.

24. **Comment Summary:** The range of alternatives is too narrow and needs to include an alternative with a larger Harvest Land Base. The BLM may have arbitrarily limited the size of the Harvest Land Base in any action alternative to 30 percent of the forest land in the decision area (DEIS p. 246). We recommend an additional action alternative that maximizes the size of the Harvest Land Base and reduces reserves to the minimum necessary.

    Response: The range of alternatives in an EIS for an RMP must present reasonable alternatives to accomplishing the stated purpose and need for action. The commenter mistakenly claims that the BLM limited the size of the Harvest Land Base and misunderstood the cited passage in the Draft RMP/EIS. The passage in the Draft RMP/EIS describes the outcome of the design of the alternatives, not a rule or limitation that the BLM imposed upon the design of the alternatives. The BLM designed the alternatives to meet all of the purposes of the action, and the resultant range of alternatives includes a Harvest Land Base that ranges from 12 to 30 percent of the decision area. Alternative C allocated the largest Harvest Land Base that would meet all of the purposes of the action. Alternative C allocated a Late-Successional Reserve network based, in part, on large blocks of habitat to meet size and spacing requirements, but no larger. To reduce the Late-Successional Reserve from Alternative C would not meet the size and spacing requirements described in the Draft RMP/EIS (USDI BLM 2015, pp. 7, 62, 750). Alternative C would provide the least improvement in marbled murrelet nesting opportunities and would increase the risk of nest predation compared to the other alternatives, and would provide no protection for future occupied nest sites in the Harvest Land Base (USDI BLM 2015, pp. 724–736). To provide less protection for the marbled murrelet would not meet the purpose of contributing to the conservation and recovery of the marbled murrelet. Alternative C allocated the smallest Riparian Reserve of any of the alternatives. The analysis in the Draft RMP/EIS identified lower potential wood supply and more susceptibility to increased water temperatures than the other alternatives (USDI BLM 2015, pp. 224–228, 232–233). To allocate a smaller Riparian Reserve would not meet the purposes of contributing to the conservation and recovery of ESA-listed fish and providing clean water. An alternative with a larger Harvest Land Base than the alternatives analyzed in detail would not meet all of the purposes of the action.

25. **Comment Summary:** The RMP should consider an alternative that would choose the 50 percent of the moist forest landscape with the highest structural complexity weighted by the value of a structurally-complex forest at that location. Management activities in this SC area can only promote or enhance the structural complexity of these stands. We envision that these large blocks of structurally-complex forest will migrate across the landscape as adjacent stands mature and become more ecologically valuable. Structurally-complex stands that fall out of the "best 50 percent" are available for variable retention harvest. Treat all dry forest stands that are not on a trajectory to achieve historic fire resilience within the next 30 years.

    Response: The Proposed RMP/Final EIS added discussion of this suggested alternative as an alternative considered but not analyzed in detail (see Chapter 2).

26. **Comment Summary:** The RMP should include an additional alternative which increases habitat for wildlife associated with early successional forests.

    Response: The range of alternatives in an EIS for an RMP must present reasonable alternatives to accomplishing the stated purpose and need for action. Habitat for wildlife associated with early successional forests is not one of the purposes for the action. The commenter does not explain how such an alternative would better respond to the purpose and need for action than the alternatives analyzed. Nevertheless, under all alternatives, the amount of early successional forest habitat would increase in abundance in 50 years. The commenter does not identify a need for a larger increase in the abundance of early successional forest habitat than would occur under the alternatives analyzed.

27. **Comment Summary:** All alternatives fall short of the requirement of the O&C Act when it comes to minimum harvest levels. Harvest levels and annual sale quantities (ASQs) need to be evenly distributed throughout the entire 2.4 million acres of BLM managed territory.

    Response: The O&C Act does not establish a minimum harvest level. As explained in the Draft RMP/EIS, the O&C Act requires that the BLM offer for sale annually "… not less than one-half billion feet board measure, <u>or</u> not less than the annual sustained-yield capacity when the same has been determined and declared …"(emphasis added). Previous BLM planning has determined and declared the annual sustained-yield capacity, as does this RMP revision, rendering obsolete the requirement to offer for sale "… not less than one-half billion feet board measure." The O&C Act does not establish a minimum harvest level in determining and declaring the annual sustained-yield capacity or how timber harvest should be distributed within the O&C lands.

28. **Comment Summary:** Sub-alternative B should be considered as a separate alternative on the issue of climate change because it decreases the Harvest Land Base and increases reserve areas.

    Response: As explained in the Draft RMP/EIS, Sub-alternative B is identical to Alternative B with the sole exception that Sub-alternative B included protection of the northern spotted owl habitat in all known and historical northern spotted owl sites (USDI BLM 2015, p. 53). The Draft RMP/EIS explained that the BLM focused the analysis of Sub-alternative B on the effects on timber production and northern spotted owls, because the modification from Alternative B would vary the approach to an element of northern spotted owl conservation, and the change in the sub-alternative would directly and explicitly alter the approach to timber production (USDI BLM 2015, p. 34). Sub-alternative B is almost identical in design to Alternative B, which is analyzed for all resources addressed in the Draft RMP/EIS, including climate change. The BLM NEPA Handbook explains that an alternative need not

be analyzed in detail if it is substantially similar in design to an alternative that is analyzed in detail (USDI BLM 2008, p. 52). Therefore, Sub-alternative B need not be fully analyzed for all resources, such as climate change.

29. **Comment Summary:** The action alternatives will open to timber harvest between 54 and 81 percent (509,000–780,000 acres) of the existing Riparian Reserve acreage, with the amounts varying by Alternatives A through D. The proposed DEIS alternatives will open Riparian Reserve acreage to timber harvest, either through transfer to commercial logging lands ("Matrix" lands) or by allowing heavy thinning (75–80 percent tree removal) in the outer zone of the Riparian Reserve.

    Response: This analysis in this comment from NMFS is incorrect and fundamentally mischaracterizes the land use allocations of the action alternatives. The commenter erroneously assumed that all acres that would be in the Riparian Reserve under No Action alternative but not under the action alternatives would be reallocated from Riparian Reserve to Harvest Land Base. In fact, most acres that would be within the Riparian Reserve under the No Action alternative but are not in the Riparian Reserve under action alternatives would be in Late-Successional Reserve or other reserve allocations under the action alternatives, and are not "open to timber harvest." The Harvest Land Base in the action alternatives would range from 14 to 30 percent of the BLM-administered lands. The data provided in the Draft RMP/EIS demonstrates the error of the commenter's analysis clearly. For example, the commenter claims that 555,662 acres would be "Transferred to matrix [sic] lands" under Alternative B; Table 2-5 in the Draft RMP/EIS shows that the Harvest Land Base in Alternative B, in its entirety, is only 556,335 acres. As noted in the Draft RMP/EIS, the Harvest Land Base in Alternative B (556,335 acres) would be substantially smaller than the Matrix under the No Action alternative (691,998 acres) (USDI BLM 2015, pp. 29, 47). In a December 18, 2015 letter from NMFS to the BLM, NMFS acknowledged that these comments were in error and asked that they be ignored.

    This comment from NMFS mischaracterizes Riparian Reserve thinning in both the No Action alternative and the action alternatives. The phrase "heavy thinning" is undefined and open to multiple interpretations. Characterizing thinning solely by the number of trees removed— "(75–80 percent tree removal)"—is not informative without additional stand metrics because of the variation in tree sizes in different stand conditions. The BLM included management direction that required that thinning retain both a threshold amount of canopy cover and a density of trees per acre. Alternatives B and C include management direction that requires that thinning in the outer zone of the Riparian Reserve must maintain at least 50 percent canopy cover and 80 trees per acre. The requirement to maintain at least 50 percent canopy cover ensures that at least half of the canopy of the stand would remain after thinning. Alternatives A and D include management direction that requires that Riparian Reserve thinning in the outer zone of the Riparian Reserve must maintain at least 30 percent canopy cover and 60 trees per acre (USDI BLM 2015, pp. 946, 959, 972, 981).

    The commenter erroneously characterizes the entire outer zone in the Riparian Reserve in all action alternatives as "heavy thinning in RR allowed." The action alternatives have specific and limited purposes for thinning the Riparian Reserve, which would not be relevant in most stand and site conditions. For example, given the management direction for thinning in the action alternatives, such thinning would rarely if ever be needed or appropriate in mature or structurally-complex stands, which currently comprise half of the acreage within one site-potential tree height of streams (USDI BLM 2015, p. 225). The Draft RMP/EIS explained that the analysis modeled timber harvest in the outer zone under the action alternatives only in stands 30–80 years old (USDI BLM 2015, p. 1028). Even in younger, managed stands, many stands would not need thinning for the purposes described in the management direction. The Draft RMP/EIS further explained that the analysis assumed only a

portion of the eligible acres would be thinned under the action alternatives, ranging from 15 percent under Alternatives A and D to 50 percent under Alternatives B and C, in light of the differing purposes for outer zone thinning in those action alternatives (USDI BLM 2015, pp. 1029–1033). Notwithstanding these statements and analysis in the Draft RMP/EIS, the commenter mistakenly asserts that all of the outer zone would be "open to timber harvest" under the action alternatives.

This comment from NMFS erroneously characterizes that there would be no "heavy thinning" allowed in the Riparian Reserve under the No Action alternative. The BLM and U.S. Forest Service implementation of the Northwest Forest Plan has routinely included thinning similar to that described for the action alternatives over the past 20 years of implementation. As stated in the Draft RMP/EIS, the BLM has thinned 17,461 acres within the Riparian Reserve since 1995 (USDI BLM 2015, p. 219). In fact, the modeling for the analysis in the Draft RMP/EIS reveals that the acreage of Riparian Reserve thinning would increase from current levels if the BLM were to adopt the No Action alternative, resulting in approximately 31,407 acres of Riparian Reserve thinning in the next decade. Notwithstanding this empirical information and modeling results, the commenter characterizes the entirety of the Riparian Reserve under the No Action alternative as a 'no-cut' area. The modeling for the analysis in the Draft RMP/EIS further shows that the acreage of Riparian Reserve thinning would be substantially higher under the No Action alternative than for any of the action alternatives, which would range from 3,655 to 15,958 acres of Riparian Reserve thinning in the next decade. In a December 18, 2015 letter from NMFS to the BLM, NMFS acknowledged that these comments misrepresented the implementation of the Northwest Forest Plan and asked that these comments be ignored.

30. **Comment Summary:** General descriptive sections of riparian management in the DEIS assert that tree removal in the outer Riparian Reserve will be in the upwards range of 75–80 percent removal (e.g., 60–80 TPA retention in stands that average 316 TPA DEIS **Figure 3-51**) whereas the analytical section of the DEIS indicates about 62 percent average removal (i.e., 120 TPA retention/196 TPA removal—see DEIS **Table C-12**). Further, in some instances the amount of tree removal is described in terms of canopy cover, whereas elsewhere it is described in terms of relative density.

    Response: The commenter confuses management direction, which provides rules for implementation, with analytical assumptions about reasonably foreseeable implementation used in the modeling. For example, Alternative A includes management direction to "Thin stands as needed to ensure that stands are able to provide stable wood to the stream. Maintain at least 30 percent canopy cover and 60 trees per acre expressed as an average across the riparian reserve portion of the stand" (USDI BLM 2015, p. 946). The restrictions of 30 percent canopy cover and 60 trees per acre are not analytical assumptions or targets, but minimum thresholds that cannot be exceeded. The BLM described Riparian Reserve stand thinning thresholds in the action alternatives by canopy cover and trees per acre at the express request of NMFS staff working with the Riparian Technical Team (see Chapter 4).

    The commenter misreads Table C-12 in the Draft RMP/EIS, which clearly states a modeling assumption for the Riparian Reserve of pre-commercial thinning to 120 trees per acre. This is not the commercial thinning resulting in tree removal from the Riparian Reserve. As explained in **Appendix C** – Vegetation Modeling and in the **Glossary**, pre-commercial thinning is the practice of reducing the density of trees within a stand, in which the trees killed are generally not merchantable and are not removed from the treated area (USDI BLM 2015, pp. 889, 1012).

    The commenter correctly notes that the effects analysis and management direction describe a variety of different measures of stand conditions, but does not assert that the Draft RMP/EIS used any

inappropriate measures or suggest any alternative measures. The Draft RMP/EIS included different measures of stand conditions where appropriate for different purposes.

31. **Comment Summary:** The stated purpose for 'restoration' thinning in Riparian Reserve is to create structurally-complex forest habitat (Alternatives B and C), to produce large wood that is of a size sufficient to remain 'stable' in streams (Alternatives A and D), to reduce fire risk (Alternative A) or the non-conservation goal of allowing for commercial harvest (Alternatives A, B, C, and D), but specific criteria or determining when such 'restoration' is needed are lacking.

    Response: The commenter is correct in identifying the purposes of Riparian Reserve thinning to create structurally-complex forest habitat or to reduce fire risk in Alternatives B and C, to produce large wood that is of a size sufficient to remain 'stable' in streams, or reduce fire risk in Alternatives A and D. However, the commenter is in error in stating that the action alternatives have a goal of allowing for commercial harvest in the Riparian Reserve. The action alternatives would allow the BLM to make merchantable timber from thinning in the outer zone of Riparian Reserve available for sale under some circumstances, but only as a by-product of thinning needed to accomplish the purposes described above. The allowance to use commercial harvest to accomplish Riparian Reserve objectives does not differ under the No Action alternative and the action alternatives, though the specific restoration purpose of that thinning differs. Commercial timber harvest is not a goal of the Riparian Reserve under the No Action alternative or any of the action alternatives.

    The action alternatives and the Proposed RMP contain management direction that specifies when and where the BLM would implement Riparian Reserve thinning. The BLM would determine whether a specific Riparian Reserve stand needs thinning consistent with the management direction of the approved RMP as part of project-level design and analysis.

32. **Comment Summary:** Fixed width riparian retention figures do not allow for adaptive management practices that account for unique features within each management area.

    Response: The Northwest Forest Plan explicitly provided for adaptive modification of Riparian Reserve widths. This provision in the Northwest Forest Plan failed to result in adaptive modification of Riparian Reserve widths. The Proposed RMP includes Riparian Reserve widths that vary by classes of subwatersheds. However, neither the Proposed RMP nor the action alternatives would allow for adaptive modification of Riparian Reserve widths without an RMP amendment. Providing a fixed width of Riparian Reserve is consistent with the guidance for the development of the alternatives described in the Draft RMP/EIS, which directed that the BLM develop alternatives to provide a high degree of predictability and consistency about implementing land management actions and a high degree of certainty of achieving management objectives (USDI BLM 2015, p. 12).

33. **Comment Summary:** The BLM failed to consider a full range of alternatives related to wildfire and fuels management. The BLM later states, "All of the alternatives have similar management objectives and management direction regarding noncommercial natural hazardous fuels reduction treatments. Therefore, the BLM assumed in this analysis that similar types and amounts of treatments that have occurred over the past decade would continue in the future under any of the alternatives…" In essence, this is a "No Action Alternative" and for this reason the BLM needs to revise the RMP/DEIS because it did not consider a range of alternatives for fire. While the BLM asserts there would be no difference between alternatives relative to wildfire response, it is ignoring that the differences are there given the variations in Late Successional Reserve; post fire management of Late Successional

Reserve; snag retention; and, the variations in road systems. The BLM needs to address wildfire response both in the context of active fire as well as post fire activities.

Response: The alternatives considered in the Draft RMP/EIS do not vary the approach to natural hazardous fuels reduction treatments or wildfire management. The BLM treats natural hazardous fuels based on existing fuel hazards and operational constraints. The BLM has no basis for an alternate approach to treating natural hazardous fuels that would result in different effects on stand-level fire resistance, fire hazard, or landscape fire resilience, and the commenter suggests no alternate approach. The Draft RMP/EIS explained that increasing landscape-level fire resilience and stand-level fire resistance and decreasing stand-level fire hazard would increase the effectiveness of hazardous fuels treatments, and the alternatives do consider a range of approaches related to resilience, resistance, and hazard. However, it is not possible to determine any specific change in the effectiveness of hazardous fuels treatments resulting from the alternatives (USDI BLM 2015, pp. 211–212).

The alternatives considered in the Draft RMP/EIS do not vary the approach to wildfire management. The Draft RMP/EIS explained that the full range of wildfire response tactics would be available under all alternatives, and the maintenance of fire suppression-related infrastructure would not change among alternatives (USDI BLM 2015, p. 212). The BLM has no basis for an alternate approach to wildfire management that would result in different effects, and the commenter suggests no alternate approach. The commenter asserts, without foundation, that differences in Late Successional Reserve, post-fire management of Late-Successional Reserve, snag retention, and the variations in road systems would result in difference in wildfire management.

The BLM does not agree that the allocation of lands to the Late-Successional Reserve in and of itself would have any measurable or meaningful effect on wildfire management, and the commenter does not explain how they believe that the allocation of lands to the Late-Successional Reserve would affect wildfire management.

Snag retention requirements in post-fire management in the Late-Successional Reserve that leave snags in place could pose operational challenges for wildfire management if such stands experience an additional future wildfire. As noted in the Draft RMP/EIS, the BLM would be able to conduct salvage harvest for purpose of protecting human safety under all alternatives (USDI BLM 2015, p. 212). Nevertheless, any difference in the abundance of snags in a particular stand in the Late-Successional Reserve, either because of not conducting salvage harvest or in response to snag retention requirements, would represent a very small portion of the overall landscape. As noted in the Draft RMP/EIS, approximately 153,500 acres of the decision area have burned in the last 44 years, with 16 percent of the area burning twice (USDI BLM 2015, pp. 1051–1052). The acreage that has experienced two wildfires over nearly half a century constitutes less than 1 percent of the decision area. Any difference in wildfire management because of wildfire reoccurring in such stands in the Late-Successional Reserve and posing operational challenges in wildfire management would be small in extent, immeasurable, and speculative.

Finally, the commenter contends that differences in road systems under the alternatives would alter wildfire management. As detailed in the Draft RMP/EIS, the alternatives would result very small increases in the road network, the differences in the amount of new road construction among the alternatives would be negligible relative to the extent of the existing road network, and the BLM has no reasonable basis on which to forecast any difference among the alternatives in the amount of road decommissioning that the BLM would implement. As a result, there is no basis upon which the road system would differ under the alternatives in way that would measurably or meaningfully affect wildfire management.

In summary, the BLM analyzed in detail the full spectrum of alternatives that would accomplish the purpose of the action. The BLM has no apparent basis for an alternate approach to natural hazardous fuels reduction or wildfire management, and the commenter suggests none. Constructing a hypothetical variation in approach to natural hazardous fuels reduction or wildfire management would not improve the analysis of the effects of the alternatives and is not essential to a reasoned choice among the alternatives.

Proposed RMP

34. **Comment Summary:** Recommend fish stream Riparian Reserve be defined as 50 percent of the site potential tree height, with a suggested 70–105' width on each side. These are similar, but wider, to the Oregon Forest Practices Act buffers, which Watershed Research Cooperative science finds sufficiently protects fish and water. Recommend non-fish stream treed buffer be defined as 30 percent of Site Potential Tree height, with a suggested 30'–50' width each side. These are similar, but wider, to the OR Forest Practices Act buffers, which Watershed Research Cooperative science is finding sufficiently protects fish and water. Riparian Reserve buffer widths should be defined as slope distance. Active management of riparian areas should be encouraged to promote habitat diversity, productivity and function for the designated use—fish or domestic or irrigation. Small non-fish streams need only minimal buffering—primarily limited machine/log skid activity, wildlife tree location, two to four wildlife trees/acre along a stream, vegetation retention, hardwood and reforestation incentives, etc. Fish streams without salmon, steelhead or bull trout should receive a significantly narrower Riparian Reserve buffer.

    Response: Alternative C allocated the smallest Riparian Reserve of any of the alternatives. The analysis in the Draft RMP/EIS identified lower potential wood supply and more susceptibility to increased water temperatures than the other alternatives (USDI BLM 2015, pp. 224–228, 232–233). The Riparian Reserve widths and management recommended by the commenter would be smaller than the Riparian Reserve in Alternative C and would result in less potential wood supply to streams and a greater risk of stream temperature increases than Alternative C. Furthermore, the lack of a buffer on "small non-fish streams," as recommended by the commenter, would result in sediment delivery to streams that would not meet the purposes of contributing to the conservation and recovery of ESA-listed fish and providing clean water. The 2008 FEIS concluded that even a more substantial buffer on non-fish-bearing streams would pose a risk of increased fine sediment delivery to streams from harvest units (USDI BLM 2008, pp. 765). To allocate a Riparian Reserve as suggested by the commenter would not meet the purposes of contributing to the conservation and recovery of ESA-listed fish and providing clean water.

35. **Comment Summary:** The State requests that the management practices in the RMP align with the Statewide Riparian Management Policy that "sustain streamside and wetland riparian functions that support desirable water quality, native fish populations, and wildlife across the state." Those practices may include recruitment of large woody debris to the stream channel, maintaining shade, capturing fine sediment, thermal heterogeneity, and physical habitat complexity and connectivity.

    Response: The Proposed RMP would "sustain streamside and wetland riparian functions that support desirable water quality, native fish populations, and wildlife across the state." The analysis in the Proposed RMP/Final EIS concludes that the Proposed RMP would be as effective as or more

effective than all other alternatives, including the No Action alternative, in protecting water quality, fish habitat, and riparian habitat (see the Fisheries, Hydrology, and Wildlife sections of Chapter 3).

36. **Comment Summary:** The U.S. Fish and Wildlife Service supports the Riparian Reserve approach embodied in Alternative A because it provides significant protection for stream shading, sediment delivery and aquatic species, while providing more opportunities for restoration forestry projects than the design in the other alternatives, including Alternative D.

    Response: The Proposed RMP incorporates a Riparian Reserve approach similar to Alternative A for streams in Class I and Class II subwatersheds, as described in Chapter 2 of the Proposed RMP/Final EIS. The BLM developed this Riparian Reserve approach for the Proposed RMP together with the U.S. Fish and Wildlife Service, National Marine Fisheries Service, and Environmental Protection Agency, as described in Chapter 4 of the Proposed RMP/Final EIS.

37. **Comment Summary:** The process for identifying and managing Key Watersheds should be refined. The existing network of Key Watersheds on BLM land does not align well with those areas which are the most important for listed fish, and also does not align well with source water watersheds (those that provide drinking water). Watersheds containing both high intrinsic potential (HIP) habitat for coho salmon or steelhead and critical habitat should receive specific management consideration by being managed to minimize risk to shade, temperature, and large wood inputs, and maximize certainty around achievable outcomes. This can be accomplished by a strategy built around the concepts included in Alternatives A or D. In watersheds that contain neither HIP nor critical habitat, intermittent and non-fish bearing streams should be managed to ensure the protection and maintenance of water quality; those streams in "non-key" watersheds should at a minimum receive protection consistent with the riparian strategy presented in Alternative B.

    Response: The BLM has addressed the concept of Key Watersheds in the Proposed RMP by varying the Riparian Reserve design and management based on the importance of the watershed to ESA-listed fish. The BLM developed this Riparian Reserve approach for the Proposed RMP together with the U.S. Fish and Wildlife Service, National Marine Fisheries Service, and Environmental Protection Agency, as described in Chapter 4 of the Proposed RMP/Final EIS. Under the Proposed RMP, the Riparian Reserve design in subwatersheds that are important to ESA-listed fish is based on the management concepts in Alternatives A and D, as detailed in Chapter 2 of the Proposed RMP/Final EIS. The BLM based this delineation on critical habitat and high intrinsic potential streams, as the commenter recommends. Under the Proposed RMP, the Riparian Reserve design in watersheds that do not have critical habitat for fish or high intrinsic potential streams is based on the management concepts in Alternatives B and C for non-fish-bearing intermittent streams in watersheds, as the commenter recommends.

38. **Comment Summary:** The FEIS/Proposed RMP should clarify how watershed analysis will be brought forward in RMP implementation. Watershed-scale information is critical for decision-makers to establish the contextual basis for land use activities. In the BLM's equivalent of watershed analysis, the FEIS should include additional detail about how watershed information will be utilized and incorporated in the implementation of the RMP.

    Response: The BLM has addressed the concept of watershed analysis in **Appendix X** – Guidance for Use of the Completed RMPs in the discussion of watershed-scale information for implementation actions.

39. **Comment Summary:** The State recommends Best Management Practices related to roads specify that new and replacement stream crossing structures will be consistent with ODFW fish passage laws in the RMP.

    Response: The Proposed RMP includes management direction and Best Management Practices that ensure that new and replacement stream crossing structures would be consistent with both fish and aquatic organism passage criteria set forth by NMFS and Oregon State fish passage laws (**Appendix B** – Management Objectives and Direction, – Best Management Practices).

40. **Comment Summary:** The BLM should not conduct salvage logging after natural disturbances in Key Watersheds, Riparian Reserve, Late Successional Forest Reserve, and designated critical habitat of listed species. Scientific consensus on the inadvisability of post-disturbance logging largely emerged in the years just after FEMAT, hence it is incumbent on BLM to strengthen aquatic protections. It is incumbent on BLM to explain its rationale if it chooses to not implement such recommendations to improve watershed, water, and fish resource protection from post-fire logging.

    Response: The Proposed RMP prohibits salvage logging after disturbances in the Late-Successional Reserve and Riparian Reserve, except when necessary to protect public safety, or to keep roads and other infrastructure clear of debris (**Appendix B** – Management Objectives and Direction). This prohibition is consistent with the management objectives of maintaining and developing habitat for northern spotted owls and contributing to the conservation and recovery of ESA-listed fish species and their habitats and providing for conservation of Bureau Special Status fish and other Bureau Special Status riparian associated species, respectively. In the Harvest Land Base, including portions of designated critical habitat within the Harvest Land Base, the Proposed RMP directs timber salvage harvest after disturbance events, with restrictions and requirements, to recover economic value and to minimize commercial loss or deterioration of damaged trees. The management objectives for the Harvest Land Base focus on timber production, and specifically include recovering economic value from timber harvested after disturbance, such as a fire, windstorm, disease, or insect infestations. Therefore, it would be inconsistent with the management objectives to prohibit timber salvage in the Harvest Land Base, whether it is within a watershed with designated critical habitat or not. The BLM forecasted salvage harvest in the Harvest Land Base in the vegetation modeling. The BLM would implement such salvage harvest in the Harvest Land Base consistent with management direction regarding retention of live trees and snags and reforestation (**Appendix B** – Management Objectives and Direction). In addition, the Riparian Reserve management along all streams would ensure that salvage harvest in the Harvest Land Base, like green tree harvest in the Harvest Land Base, would have no effect on ESA-listed fish.

41. **Comment Summary:** All alternatives of the RMP should maintain and expand the Adaptive Management Area network. Building collaborative process into the mandates of the BLM will build trust, encourage transparency, and create more positive outcomes from local land management projects. More specifically, the Applegate Valley AMA should be maintained.

    Response: The BLM encourages and supports collaborative processes to support local land management projects. The Proposed RMP/Final EIS includes discussion of the adaptive management process and how the BLM will use adaptive management in the implementation of the RMP. However, the BLM does not believe that a separate land use allocation is needed to support such

collaborative processes. Nothing in the Proposed RMP would preclude the continued collaborative process that has been developed associated with the Applegate Valley Adaptive Management Area.

42. **Comment Summary:** The BLM should adopt an alternative that minimizes carbon emissions and timber harvest and maximizes forest carbon storage.

    Response: The BLM has developed the Proposed RMP to be the best approach to meeting all of the purposes of the action. Maximizing carbon storage and minimizing greenhouse gas emissions are not among the purposes of the action. As explained in the Draft RMP/EIS, the BLM has no specific legal or regulatory mandate or policy direction to manage BLM-administered lands for carbon storage. In addition, the BLM has various climate-related policies, but none provides an authority for the BLM to manage the decision area to minimize carbon emissions above the statutory mandate to manage for a sustained yield of timber (USDI BLM 2015, pp. 79–80).

    The BLM has broad authority to analyze and address through the planning process the causes of climate change, the effects of the alternatives on carbon storage and greenhouse gas emissions, and the effects of climate change combined with the effects of the alternatives. Nevertheless, this broad authority does not equate to a specific mandate to minimize greenhouse gas emissions or maximize carbon storage. Furthermore, the BLM cannot stretch its mandate to provide a sustained yield of timber to encompass maximizing carbon storage or minimizing greenhouse gas emissions.

    The Draft RMP/EIS analyzed the effects of the alternatives on carbon storage and greenhouse gas emissions. That analysis demonstrated that there is a general trade-off between the level of sustained-yield timber production and the level of carbon storage and that the level of sustained-yield timber production and associated prescribed burning generally would reflect the level of greenhouse gas emissions. As such, the management approach that would maximize carbon storage and minimize greenhouse gas emissions would be the No Timber Harvest reference analysis, which would not be a reasonable alternative (USDI BLM 2015, pp. 132–140). To the extent that carbon storage represents a trade-off with sustained-yield timber production, managing for carbon storage would frustrate the BLM's ability to provide for a sustained yield of timber.

43. **Comment Summary:** The FEIS should map connectivity corridors, climate refugia, and include these areas in Wild and Scenic and Wilderness Study Area proposals to build a robust climate conservation strategy.

    Response: It would not be appropriate to include connectivity corridors and climate refugia in Wild and Scenic River and Wilderness Study Area proposals, as the commenter recommends.

    As explained in the Draft RMP/EIS, in order to be eligible for inclusion into the National Wild and Scenic River System, a river segment must be free flowing and contain at least one river-related value considered outstandingly remarkable. Under the 1995 RMPs, the BLM found 51 river segments eligible. The BLM further evaluated each eligible river segment to determine whether it is suitable for inclusion into the National System. The suitability analysis provides the basis for determining which rivers to recommend to Congress as potential additions to the National System. The BLM has identified six segments that the BLM believes meet the suitability criteria for inclusion in the National Wild and Scenic River System (USDI BLM 2015, pp. 847–851). However, connectivity corridors and climate refugia are not among the criteria for establishing suitability criteria for inclusion in the National Wild and Scenic River System.

As explained in the Draft RMP/EIS, the BLM's authority to conduct wilderness reviews, including the establishment of new Wilderness Study Areas, expired on October 21, 1993, pursuant to Section 603 of the FLPMA. The BLM retained the authority under Sections 201 and 202 of the FLPMA to inventory wilderness characteristics and to consider such information during land use planning (USDI BLM 2015, p. 371). However, connectivity corridors and climate refugia are not among the criteria for evaluating wilderness characteristics.

Effects Analysis

44. **Comment Summary:** The 50-year time frame that all models are based on is unrealistic because of so many other variables that could be happening in 50 years to change all the circumstances.

    Response: The time frames for the analysis of effects vary by issue. However, the BLM did analyze many issues over a 50-year time frame. This time frame for analysis is necessary to address the long-term effects of the agency action, which is required by the Council on Environmental Quality regulations for implementing the National Environmental Policy Act (40 CFR 1502.16). The BLM NEPA Handbook instructs that the time frames for analysis should be based on the duration of the direct and indirect effects of the proposed action and alternatives, rather than the duration of the action itself (USDI BLM 2008, p. 58). In addition, analyzing effects over this long time frame helps illuminate differences among the effects of the alternatives that may not be apparent over shorter time frames.

45. **Comment Summary:** The BLM has chosen to bypass or avoid independent peer review of the scientific information contained in the DEIS. All models and scientific assessments contained in the DEIS should undergo independent scientific peer review.

    Response: There is no requirement under NEPA or the BLM planning regulations for an agency to conduct peer review on an RMP/EIS. In 2004, the Office of Management and Budget (OMB) issued a memorandum requiring peer review for government science documents under the authority of the Information Quality Act. That memorandum gave examples of the types of science assessments that would require peer review, including "state-of-science reports; technology assessments; weight-of-evidence analyses; meta-analyses; health, safety, or ecological risk assessments; toxicological characterizations of substances; integrated assessment models; hazard determinations; or exposure assessments" (Office of Management and Budget 2004, p. 11). An RMP/EIS does not constitute a government science document for the purposes of that OMB memorandum.

    The BLM NEPA Handbook explains,

    > "Analytical documents to support Federal agency decision-making include EISs and EAs, but neither are considered publications of scientific research subject to peer review. You may choose to have your NEPA analysis reviewed by members of the scientific community as part of public review of the document. Such review may be desirable to improve the quality of the analysis or share information; this does not constitute formal peer-review" (BLM 2008, p. 55).

    Although there is no requirement for peer review of an RMP/EIS, the BLM did elect to have portions of the Draft RMP/EIS reviewed by members of the scientific community. The Proposed RMP/Final EIS has added description to **Appendix T** – Northern Spotted Owl that details the review that the BLM conducted on the northern spotted owl analytical methodology.

46. **Comment Summary:** RMP uses the wrong baseline in annual timber harvest in Alternatives, leading to false results. The Socioeconomic section's key points state: "The annual harvest value of timber, compared to $23 million to 2012, would increase under all alternatives." (DRMP/EIS, page 472.) The baseline for comparison under NEPA is the current plan, which in the DRMP/EIS is the "No Action Alternative as written." Using the correct baseline, only Alternative C would have an increase in value of the timber. The current implementation, as reflected in the 2012 baseline, represents a substantial departure from the current plan and reflects and unsustainable harvest of relatively low value timber with high associated logging costs.

    Response: The No Action alternative presents the effects of implementing the 1995 RMPs as written. The Draft RMP/EIS analyzes the effects of the No Action alternative on the annual harvest value of timber. The analysis in the Draft RMP/EIS compared the effects of all alternatives to the current condition of the resource at issue—the annual harvest value of timber—and so therefore the analysis reflects all past timber harvest that occurred under the existing RMP. The most recent data available when the BLM was preparing the Draft RMP/EIS was for 2012. The analysis in the Draft RMP/EIS allows for comparison of the effects of the alternatives, including the No Action alternative relative to the conditions in 2012 and comparison of the effects of the alternatives, including the No Action alternative, relative to each other in the future. As evidenced by the commenter's points, the commenter was able to discern accurately from the analysis in the Draft RMP/EIS the relative changes in value among the alternatives and compare the changes to the current condition. It is not clear what "false results" the commenter perceives or what information they believe the Draft RMP/EIS omitted.

47. **Comment Summary:** The Oregon Department of Forestry is currently conducting an analysis of Riparian Management Areas for private forest management activities under Oregon's Forest Practices Act to inform rule making by the Oregon Board of Forestry (BOF). Their decisions, which will focus on the watershed effects of contemporary timber harvest (active management) should be considered and where appropriate incorporated into the RMP/EIS for Western Oregon.

    Response: On November 5, 2015, the Oregon Board of Forestry voted to develop administrative rules that create a 60-foot buffer on small fish-bearing streams and an 80-foot buffer on medium-sized fish-bearing streams. These rules do not apply to BLM-administered lands. As of the preparation of the Proposed RMP/Final EIS, the State of Oregon has not yet developed these administrative rules. In the identification of Alternative B as the preferred alternative, the BLM seeks to develop a Proposed RMP that would reduce the risk of adverse effects to ESA-listed fish and water quality compared to Alternative B. Given that the Riparian Reserve width on all fish-bearing streams under Alternative B would be one site-potential tree height (which generally varies from 140 to 240 feet width in the planning area), and that the BLM seeks to reduce the risk of adverse effects to ESA-listed fish and water quality compared to Alternative B, an alternative that would provide a substantially smaller Riparian Reserve than Alternative B would not be reasonable.

48. **Comment Summary:** The BLM has a history of deliberately circumventing the Northwest Forest Plan and Aquatic Conservation Strategy. The Aquatic Conservation Strategy is not currently being followed and that the DEIS "action" alternatives will never be followed. The cumulative impacts of continuing to ignore these legally required, fundamental aquatic ecosystem protections must be fully evaluated in the FEIS.

Response: The BLM has monitored implementation of the 1995 RMPs, consistent with the monitoring plans included in the 1995 RMPs. The BLM has documented this implementation annually through the individual district Annual Program Summaries (USDI BLM 2015, p. 21). The BLM implementation monitoring has found very high compliance of individual projects with the management direction of the RMP. This detailed record of implementation monitoring contradicts the commenter's assertion that the BLM has "a history of deliberatively circumventing" the RMP. Regardless of whether BLM actions have deliberately circumvented the RMP as the commenter asserts or have complied with the 1995 RMPs as the BLM asserts, the effects of those actions are included in the environmental baseline used in the effects analysis (USDI BLM 2015, pp. 99, 987–999).

The BLM has conducted periodic RMP evaluations (USDI BLM 2012). Plan evaluations review the RMP to determine whether the BLM is implementing the plan decisions as expected and the associated NEPA analyses are still valid. The most recent plan evaluation concluded that the current forest management approach deviates from the RMP assumptions in the extent of timber harvest compared to RMP assumptions used to determine the declared ASQ, notably reduced levels of regeneration harvest. The plan evaluation did not find that this deviation is resultant from the BLM taking any actions that do not comply with the RMP or "deliberatively circumvent" the RMP.

The commenter asserts that the BLM will never follow any of the action alternatives. The BLM analyzes alternatives in an RMP/EIS based on effects that are reasonably foreseeable (40 CFR 1508.8(b)) and assumes that implementation of actions in compliance with an approved RMP are reasonably foreseeable future actions. Reasonably foreseeable future actions are those for which there are existing decisions, funding, formal proposals, or which are highly probable, based on known opportunities or trends (BLM 2008, p. 59). The commenter provides no foundation for their assertion that the BLM will never follow any of the action alternatives. Moreover, if the commenter's assertion were true, it would be impossible to predict future implementation of the RMP. The commenter does not explain how the BLM could forecast the effects of the BLM <u>not</u> following the action alternatives in future implementation.

49. **Comment Summary:** BLM's large-scale re-formulation of the area and location of forest reserves calls for a fundamental re-analysis of the adequacy of the DEIS alternatives to support the habitat conditions necessary for recovery of listed fish and conservation of other values fish and wildlife species [sic]. The DEIS lacks such an analysis, ignoring without explanation that the FEMAT in 1993 provided an exemplary template for how to conduct such analyses in a defensible way using best available scientific information to inform planning design and NEPA analysis of large-scale forest management programs.

    Response: The FEMAT Report provided the information available at the time on the effects of various alternatives on aquatic and riparian species, which formed the basis for the analysis in the supplemental EIS for the Northwest Forest Plan. However, the information in the FEMAT Report was limited to generalized statements across a very large and diverse assessment area and the use of expert panels. In contrast, the Draft RMP/EIS contains detailed information on conditions within the much smaller planning area and conducts quantified modeling and analysis specific to the alternatives in the Draft RMP/EIS. The BLM based the analysis is the Draft RMP/EIS on detailed information that was not available when the Northwest Forest Plan was approved and presents objective, reproducible analytical conclusions. The analytical methodology and data in the Draft RMP/EIS is sound.

50. **Comment Summary:** It appears upon analysis that the BLM applies the wrong hierarchy of Standards and Guidelines during their implementation of their RMPs (i.e., the mapping/display hierarchy on ROD page A5, instead of the correct hierarchy of S&G application on ROD page C-1) for the various land allocations. In short, the BLM is admitting to the public that they generally treat the Riparian Reserve in LSR as full on management zones. This issue relates directly to the failure to adequately describe and analyze the No Action alternative. In the case of the BLM RMP DEIS, the No Action alternative should be all of the following: what the 1995 RMPs say (as written), what they legally require (as amended by NWFP and ACS), and how the BLM actually implements them, particularly within the designated Riparian Reserve and LSR. Unlike what BLM asserts these are not "no holds barred" management zones. Using the correct hierarchy of S&Gs the Riparian Reserve protections add to LSR protections. Riparian Reserve standards are more precautionary than LSR standards with respect to aquatic conservation.

    Response: The commenter misunderstands the data in the Draft RMP/EIS. The presentation of the acreage by land use allocation for the No Action alternative by two different hierarchies only addresses the data question of how to account for those areas that are allocated to both Late-Successional Reserve and Riparian Reserve under the No Action alternative. As explained in the Draft RMP/EIS, the data presented in the Northwest Forest Plan and the 1995 RMP counted such acres as Late-Successional Reserve, and that data is displayed in the Draft RMP/EIS (USDI BLM 2015, pp. 28–32). The Draft RMP/EIS further displayed the acreage data for the No Action alternative if such acres are counted as Riparian Reserve, to facilitate direct comparison with the acreage by allocation of the action alternatives (USDI BLM 2015, pp. 32–33). This display of acreage data does not make any statement relevant to the management direction (i.e., 'standards and guidelines') or implementation practices in the areas that are allocated to both Late-Successional Reserve and Riparian Reserve under the No Action alternative. The Draft RMP/EIS acknowledges that in these areas of overlapping allocations, the management objectives and management direction of both the Late-Successional Reserve and Riparian Reserve apply.

    The BLM concurs with the commenter that the No Action alternative should be "what the 1995 RMPs say (as written)." However, the commenter's statement that the No Action alternative should also be "what they legally require (as amended by the NWFP and ACS)" is mistaken. The Northwest Forest Plan did not amend the 1995 RMPs. The BLM developed the1995 RMPs to be consistent with the already-adopted Northwest Forest Plan. Thus, there is no difference between the commenter's characterizations of "what the 1995 RMPs say" and "what they legally require." The commenter further asserts that the No Action alternative should be "how the BLM actually implements them." In the case of management within the overlapping acres of Late-Successional Reserve and Riparian Reserve, the BLM contends that this is the same as "what the 1995 RMPs say," based on the implementation monitoring documented in district Annual Program Summaries. However, there are other aspects of RMP implementation—notably timber harvest in the Matrix—in which "what the1995 RMPs say" differs from "how the BLM actually implements them." The BLM documented this difference in the most recent plan evaluation (USDI BLM 2012). The Draft RMP/EIS also describes this difference and explains why the No Action alternative in this RMP revision is the 1995 RMPs as written, rather than attempting to project the current implementation practices (USDI BLM 2015, pp. 77–79).

The NEPA and Planning Processes

51. **Comment Summary:** The purpose of the "Affected Environment" section in NEPA is to describe all issues and resource concerns that occur presently on the landscape, so as not to miss any type of

impact as well as to inform cumulative impacts analysis. The BLM must go back and describe all the resources that are affected by the RMP revisions in a correctly formulated "Affected Environment" section, before selecting "methods" for analysis. Then the BLM must evaluate all direct, indirect, and cumulative impacts to the affected resources. A perfect example of this is Key Watersheds. The Affected Environment includes a system of Tier 1 and Tier 2 Key Watersheds. The Affected Environment section should explain this fact as part of the baseline environmental and resource conditions, and present why this is so.

Response: The commenter is mistaken about the nature of the description of the Affected Environment in a NEPA analysis. According to CEQ regulations,

> *"The environmental impact statement shall succinctly describe the environment of the area(s) to be affected or created by the alternatives under consideration. The descriptions shall be no longer than is necessary to understand the effects of the alternatives. Data and analyses in a statement shall be commensurate with the importance of the impact, with less important material summarized, consolidated, or simply referenced"* (40 CFR 1502.15).

The BLM NEPA Handbook further explains,

> *"The affected environment section succinctly describes the existing condition and trend of issue-related elements of the human environment that may be affected by implementing the proposed action or an alternative. ... The affected environment section of the environmental analysis is defined and limited by the identified issues"* (USDI BLM 2008, p. 53).

The purpose of the affected environment section is not to describe the condition and trend of all resources, but rather to describe the condition and trend of resources related to the identified issues.

The Draft RMP/EIS explained that the BLM conducted scoping to help identify issues and then presented the preliminary issues in the Planning Criteria for public review and comment (USDI BLM 2015, pp. 863–864). The BLM has used the results of this scoping and public involvement to define the issues for analysis and has structured the analysis in the Draft RMP/EIS by these defined issues, consistent with CEQ regulations and the BLM NEPA Handbook.

The commenter's assertion that the Affected Environment includes Key Watersheds demonstrates the commenter's error on this matter. The Key Watersheds are a feature of the 1995 RMPs (i.e., the No Action alternative) and the Draft RMP/EIS describes Key Watersheds as such (USDI BLM 2015, pp. 22–23, 27–28). The Affected Environment describes the existing condition and trend of resources. The resources at issue are various elements of the environment, such as water temperature, water flows, sediment routing, and fish habitat. The Key Watersheds identified in the No Action alternative, in and of themselves, do not constitute a resource needing analysis. The Draft RMP/EIS described the current condition and trend of these resources in all watersheds in the decision area, including the Key Watersheds identified in the No Action alternative (USDI BLM 2015, pp. 217–235, 286–320). The analysis of the No Action alternative included the management of Key Watersheds, and, to the extent that there are any differences in environmental effects from the designation of Key Watersheds, such differences are reflected in the analysis of the No Action alternative. The Proposed RMP carries forward the concept of Key Watersheds from the No Action alternative, in that it varies riparian management based on the importance of the subwatershed to the conservation and recovery of ESA-listed fish. Similarly, the analysis of the Proposed RMP in the Proposed RMP/Final EIS also reflects the differences in environmental effects from the designation of the three subwatershed classes, and reflects the difference in environmental effects of changing the Key Watershed designations in the No Action alternative to the three subwatershed classes of the Proposed RMP (see the Fisheries and Hydrology sections of Chapter 1).

52. **Comment Summary:** The BLM should have a discrete cumulative effects section, outlining effects of each alternative pursuant to NEPA. The BLM does not provide detail or clear rationale on its analysis. Its analysis of reasonably foreseeable future effects is extremely narrow. The BLM postpones its analysis to other district or site-specific plans. The BLM deflects its duty to analyze cumulative effects in the current RMP/DEIS, stating that "[t]here are other broad-scale analyses currently underway that the BLM considers as reasonably foreseeable actions for analyzing cumulative effects" (DEIS, p. 95).

Response: The CEQ regulations require that an EIS analyzes the environmental effects of the alternatives and defines effects as including direct and indirect effects (40 CFR 1502.16, 1508.8). The CEQ regulations also define cumulative impacts as "the impact on the environment which results 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" (40 CFR 1508.7). The CEQ regulations do not identify any format requirements for cumulative effects analysis and do not require a "discrete cumulative effects section." The BLM NEPA Handbook lays out the steps in cumulative effects analysis but explains that there is not a required format or presentation of cumulative effects (BLM 2008, pp. 57–61).

The Draft RMP/EIS explained that there is not a discrete and separate section labeled as cumulative effects. The discussion of effects on each resource incorporates the effects of past actions, and describes other present actions and reasonably foreseeable actions to provide context in which the BLM examined incremental effects, thus revealing the cumulative effects of the alternatives (USDI BLM 2015, pp. 93–94). It would not be helpful to provide a separate section labeled as cumulative effects in this analysis, because all of the effects of the RMP are cumulative in nature. The effects of the RMP on any resource are generally indirect effects that arise from the implementation actions that the BLM would conduct in conformance with the RMP. The analysis of effects in the Draft RMP/EIS does not address the effects of an individual future implementation action, but the cumulative effects of implementation of entire programs of actions (i.e., a collection of reasonably foreseeable future actions) under each alternative. The analysis addresses the cumulative effect of implementing a combination of multiple programs under each alternative. The analysis summarizes the effects of past actions in creating the current condition and trend of resources, as explained in the Draft RMP/EIS. The analysis incorporates the effects of reasonably foreseeable future actions by others, as explained in the Draft RMP/EIS. For specific issues, the analysis in the Draft RMP/EIS then evaluated how these effects combined to form analytical conclusions about the cumulative effects.

For example, the analysis of marbled murrelet nesting habitat—

- Summarized the effects of past actions in creating the current amounts of nesting habitat;
- Analyzed the combined effects of all BLM programs under the RMP that would remove nesting habitat over time;
- Analyzed the effects of reasonably foreseeable future actions by others that would remove nesting habitat over time;
- Analyzed the effects of forest development on BLM-administered lands in creating nesting habitat over time; and
- Analyzed the effects of forest development on other lands in creating nesting habitat over time.

The analysis combined all of these effects to describe the amount of nesting habitat under each alternative, over time, as a result of all actions that would affect nesting habitat, on BLM-administered lands and across all lands. The BLM provided reasoned conclusions about the cumulative effect of the alternatives on marbled murrelet nesting habitat (USDI BLM 2015, pp. 724–730). This constitutes a complete cumulative effects analysis, consistent with CEQ regulations and

the BLM NEPA Handbook. To create a discrete and separate section labeled as cumulative effects within this analysis would provide no additional information and would not improve the quality of the analysis.

The commenter mischaracterizes the statement on page 95 of the Draft RMP/EIS and provides an incomplete quotation. The full passage in the Draft RMP/EIS reads, "There are other broad-scale analyses currently underway that the BLM considers as reasonably foreseeable actions for analyzing cumulative effects, including the U.S. Forest Service revision of the Okanagan-Wenatchee Forest Plans and the Jordan Cove Energy and Pacific Connector Pipeline Project." The Draft RMP/EIS proceeds to provide lengthy specific discussions of these two reasonably foreseeable future actions and how they are addressed in the Draft RMP/EIS (USDI BLM 2015, pp. 95–96). This passage does not postpone analysis to other districts or site-specific plans, as the commenter alleges, but addresses the cumulative effects of these other actions to the extent they are reasonably foreseeable. This passage specifically identifies which other broad-scale analyses are currently underway that the BLM considers as reasonably foreseeable actions, and specifically addresses them in this Draft RMP/EIS.

53. **Comment Summary:** A monitoring plan should be included as an appendix to the FEIS/ROD. The monitoring plan should establish how watershed-scale information/watershed analysis will inform monitoring priorities; lay out monitoring questions that will be used to inform the adaptive management process; and discuss how localized monitoring information will be compiled and placed in a broader, regional context.

    Response: The Proposed RMP/Final EIS includes a monitoring plan for the Proposed RMP in **Appendix V** – Monitoring Plan for the Proposed RMPs. That appendix includes explanation of the RMP monitoring in the context of other, broader monitoring efforts. In addition, **Appendix X** – Guidance for Use of the Completed RMPs includes discussion about how the BLM will consider and incorporate watershed-scale information and describes the adaptive management process.

54. **Comment Summary:** In crafting this RMP, the BLM has failed to coordinate with Josephine County.

    Response: The FLPMA requires the BLM to coordinate with local governments. Under the FLPMA, the BLM is required to assure that consideration is given to those state, local, and tribal plans that are germane in the development of land use plans for public lands, assist in resolving to the extent practical, inconsistencies between Federal and non-Federal Government plans, and shall provide for meaningful public involvement of state and local government officials. The FLPMA further states that land use plans shall be consistent with state and local plans to the maximum extent while remaining consistent with Federal law and the purpose of the FLPMA.

    The BLM reviewed the action alternatives in the Draft RMP/EIS for consistency with Josephine County's Natural Resource Coordination Plan, dated February 18, 2015, and did not find any major apparent inconsistencies. The comment does not identify any specific areas where the action alternatives in the Draft RMP/EIS would be inconsistent with Josephine County plans and policies including the Natural Resource Coordination Plan.

    At the beginning of the RMP revision process, the BLM invited all counties within the planning area to be cooperating agencies in the RMP revision, consistent with 40 CFR 1501.6. Josephine County declined to be a cooperating agency. On April 28, 2015, the BLM again invited Josephine County to be a cooperating agency, but Josephine County again elected not to become a cooperating agency.

Sixteen counties within the planning area are cooperating agencies in the RMP revision (USDI BLM 2015, pp. 866–867).

55. **Comment Summary:** The Deer Creek Valley Natural Resources Conservation Association requested that they be included on the interdisciplinary team for the RMP, but was denied and told by the BLM that "we need to be fair to all stakeholders by providing information and the opportunity for input to all non-governmental entities at the same time." However, the fire and fuels analysis uses input from The Nature Conservancy, which is a non-governmental entity.

    Response: The Nature Conservancy conducted analysis under contract to the BLM for the Fire and Fuels analysis, as explained in the Draft RMP/EIS (USDI BLM 2015, pp. 177, 1113–1114), because of their specialized knowledge and expertise, consistent with 40 CFR 1506.5(c). The Proposed RMP/Final EIS has added discussion to provide more detail about this contracted work. The Nature Conservancy was not on the Interdisciplinary Team and had no role in the analysis other than the specified analysis of landscape resilience in the Fire and Fuels section. The commenter, Mary Camp, representing the Deer Creek Valley Natural Resources Conservation Association requested that a team from the Deer Creek Valley Natural Resources Conservation Association be included on the Interdisciplinary Team. The BLM declined this request, informing her that including members of the Deer Creek Valley Natural Resources Conservation Association on the Interdisciplinary Team would not be fair to other stakeholders and could be inconsistent with the Federal Advisory Committee Act. The only members of the Interdisciplinary Team that are not BLM staff are those contractors described in the Draft RMP/EIS (USDI BLM 2015 pp. 177, 875).

56. **Comment Summary:** The Draft EIS has little to say about the process that would lead the agency to decision-making regarding project design and implementation (placement) beyond generalized identification of expected yield. There is little direction on "where to go, when, and why." The BLM should consider incorporating a spatially explicit, prioritized treatment landscape into future agency planning across the Medford District BLM. Such an effort could better identify restoration need, maximize acres treated as a primarily goal (as opposed to volume generated) and work to strategically achieve key goals, including the reduced risk of fire to homes in the Fuels Management Emphasis Area.

    Response: The management direction for the action alternatives includes abundant management direction regarding project design and implementation "beyond generalized identification of expected yield." For example, all action alternatives include management direction for Riparian Reserve that includes delineation of an inner zone, in which certain activities are prohibited, and an outer zone, in which specific restoration activities, such as stand thinning and fuels treatments, are directed for specific purposes. For example, all action alternatives include management direction for post-fire salvage harvest, which prohibits salvage harvest in some land use allocations and directs it in other land use allocations for specific purposes (USDI BLM 2015, pp. Appendix B). However, the action alternatives appropriately do not include a spatially explicit, prioritized plan for fuels treatments. Such implementation decisions depend upon site- and project-specific conditions that are best assessed by the BLM in project planning and design, rather than in the RMP revision. The Proposed RMP/Final EIS has added explanation of how the BLM will implement the approved RMPs (**Appendix X** – Guidance for the Use of the Completed RMPs).

Air Quality

57. Comment Summary: RMP does not discuss techniques for reducing air quality impacts, such as use of forest residues in biodigestion, after disclosing that air quality will decrease under all alternatives.

Response: As explained in the Draft RMP/EIS, 'air quality' has a specific regulatory meaning tied to Smoke Sensitive Receptor Areas (SSRAs), air quality non-attainment and maintenance areas, and mandatory Class I areas. The Draft RMP/EIS disclosed an increased risk of adverse effects on air quality (USDI BLM 2015, pp. 119–120), but that does not mean that prescribed burning will result in degradation of overall air quality. The intent of the Oregon Smoke Management Plan is to avoid adverse impacts to SSRAs and mandatory Class I areas. Compliance with the Oregon Smoke Management Plan would adequately manage those risks prohibiting smoke intrusions into SSRAs.

The BLM has encouraged the use of harvest residues for wood energy or other uses since 2001 as part of the National Fire Plan. While biodigestion is not currently available, the BLM makes biomass available for utilization as described in the Sustainable Energy section of Chapter 3, and, when economically feasible, the biomass may be utilized at one of the cogeneration facilities in the planning area. However, the Draft RMP/EIS explained that such use of biomass as an energy source remains low to non-existent due to the low value of the product, high transportation costs, and lack of facilities that would use the material (USDI BLM 2015, pp. 629–630). Specifically, the use of biodigestion on a scale that could affect the air quality analysis is not reasonably foreseeable at this time. One company announced plans to construct a cellulosic ethanol plant in Longview, Washington, but later cancelled these plans. In June 2015, the State of Oregon announced grant opportunities to explore the construction of new biomass heating, co-generation, manufacturing, or other facilities that would use woody biomass from forest and fuels management projects, but whether any new facilities will result from this grant opportunity and that would service any part of western Oregon is unknown.

58. Comment Summary: The DEIS fails to address the predictable increase in wildfire from the various types of reserves. The DEIS fails to analyze and display the environmental and economic consequences of smoke pollution for wildfires and prescribed burning. Please refer to the January/February 2006 Journal of Forestry article titled, 'Investment in Fuel Removals to Avoid Forest Fires Result in Substantial Benefits' by C.L. Mason *et al*.

Response: The BLM disagrees that it is predictable that wildfires and wildfire emissions would increase as a result of establishing the various reserves. The Draft RMP/EIS explained that the BLM would conduct thinning in most of the reserves to reduce the risk of uncharacteristic wildfires and reduce potential wildfire spread and intensity under all action alternatives (USDI BLM 2015, pp. 914–916). The BLM has reviewed Mason *et al*. (2006) and found it to be of limited applicability to the concern raised. Both the scientific literature and experience on recent wildfires around the western United States have established the economic and ecological values of thinning to reduce crown fire risks. While the scientific literature demonstrates the increased potential for larger and more severe wildfires in reserves due to changes in the fuelbed characteristics, whether that potential would be realized in the BLM-administered lands in the planning area is not known, since realizing that potential depends on ignitions, which are inherently uncertain. The literature also is clear that landscape context matters; some areas would remain at lower risk due to the lack of ignitions and alterations in surrounding fuelbeds. The Draft RMP/EIS disclosed the potential for further degradation in air quality arising from changes in fire season length and fire severity resulting from climate change (USDI BLM 2015, p. 122).

The Draft RMP/EIS analyzed the effects of wildfires only to the extent that wildfire would have a cumulative effect together with the effects of the alternatives. Wildfire is not an effect of the BLM action. The Draft RMP/EIS displayed the expected change in emissions from prescribed fire and wildfire in combination (USDI BLM 2015, pp. 118, 120). The Draft RMP/EIS analyzed smoke from wildfires not as an effect of the alternatives, but as a reasonably foreseeable occurrence as part of the cumulative effects analysis to provide context. The Proposed RMP/Final EIS has altered the analysis to display the expected emissions from wildfire separately from prescribed fire to distinguish the effects of the alternatives from other effects. The Draft RMP/EIS disclosed the potential for adverse impacts to Smoke Sensitive Receptor Areas, air quality non-attainment and maintenance areas, and to mandatory Class I areas from prescribed burning, including a discussion of wildfire smoke (USDI BLM 2015, pp. 119–122).

The Draft RMP/EIS discussed the potential indirect environmental effects of emissions under the alternatives, considered in the context of the potential indirect environmental effects of emissions from wildfires (USDI BLM 2015, pp. 105–122). The commenter does not identify any indirect environmental effects of prescribed burning that the Draft RMP/EIS did not analyze. To ascribe indirect economic effects from prescribed burning would be speculative; any economic impact would depend on a large number of variables, such as timing and duration of the smoke, locations affected, and specific economic sectors potentially adversely affected. While the health effects of smoke are well documented in the scientific literature, the economic impacts are not. The commenter does not offer any information that would allow the BLM to analyze the indirect economic effect of emissions from prescribed burning.

Areas of Critical Environmental Concern

59. **Comment Summary:** The BLM should revise the EIS to include designation of the Hoxie Creek potential ACEC in all alternatives because it has been found to meet ACEC eligibility criteria, and it requires special management attention to protect its relevant and important values. The Hoxie Creek potential ACEC contains old-growth forest that must be maintained to contribute to northern spotted owl recovery, has unique ecological and recreational values needing protection, and is unsuitable for timber production due to tree regeneration problems.

    Response: The BLM considers potential ACECs for designation where special management to protect relevant and important values is identified as needed, where their management would not conflict with Congressional reserves or lands under the National Landscape Conservation System, and where special management to retain relevant and important values would not preclude sustained yield forest management in areas allocated to timber production on O&C lands.

    Consistent with the authority provided by the FLPMA to designate potential ACECs, the BLM evaluated nominated and existing ACECs to determine whether relevant and important values are present and if special management is needed to maintain those values. The Hoxie Creek potential ACEC continues to meet the relevance and importance criteria; however, it occurs within the Harvest Land Base land use allocation under Alternatives B and C. The special management attention required to maintain the relevant and important values conflicts with the management direction of the Harvest Land Base, which is designed to meet the purpose and need described in Chapter 1 for managing O&C lands. Under Alternatives A and D, and the Proposed RMP, the Hoxie Creek potential ACEC occurs within the Late-Successional Reserve land use allocation, and the special management attention required to maintain the relevant and important values are already provided for by the management direction for the Late-Successional Reserve.

Because of these reasons, the BLM would not designate Hoxie Creek potential ACEC as an ACEC under any alternative.

The BLM may manage areas identified as unsuitable for sustained-yield timber production (e.g., areas or soil conditions for which regeneration would be difficult) through the Timber Production Capability Classification (TPCC) system for other uses, if those uses are compatible with the reason for which the BLM has reserved these lands (as identified by the TPCC codes). The BLM will periodically add or remove areas to those areas reserved through updates to the TPCC system, when examinations indicate the change to be appropriate. BLM describes the TPCC system and its use in the Woodstock vegetation model in **Appendix C** – Vegetation Modeling. Neither site-specific evaluation by BLM staff nor the TPCC codes for the Hoxie Creek potential ACEC used in the Woodstock model have identified stand growth concerns warranting Hoxie Creek stands' inclusion in a TPCC district-designated reserve.

Analysis of northern spotted owls, forest management, recreation, and wildlife all considered the lands within the potential Hoxie Creek ACEC for management by the underlying land use allocation by each alternative and determined impact to these resources accordingly.

60. Comment Summary: The BLM should revise the EIS to include designation of the Upper Klamath and Upper Klamath Addition potential ACECs in all alternatives because BLM has determined they meet ACEC eligibility criteria, and require special management attention to protect their relevant and important values. The Upper Klamath and Upper Klamath Addition potential ACECs support fisheries, endangered fish, water quality, recreation, unique cultural and historic values needing protection by way of ACEC designation.

Response: The BLM considers potential ACECs for designation where special management to protect relevant and important values is identified as needed, where their management would not conflict with Congressional reserves or lands under the National Landscape Conservation System, and where special management to retain relevant and important values would not preclude sustained-yield forest management in areas allocated to timber production on O&C lands.

The Upper Klamath and Upper Klamath Addition potential ACECs has been found to contain relevant and important values for historical, cultural, and scenic resources; fish and wildlife resources; and unique ecological communities.

Consistent with the authority provided by the FLPMA to designate potential ACECs, the BLM evaluated nominated and existing ACECs to determine whether relevant and important values are present and if special management is needed to maintain those values. The Upper Klamath and Upper Klamath Addition potential ACECs continue to meet the relevance and importance criteria; however, varying portions of these ACECs overlap the O&C Harvest Land Base under the alternatives. The majority of the potential ACECs occur within the Harvest Land Base land use allocation under Alternatives B and C. The special management attention required to maintain the relevant and important values conflict with the management direction of the Harvest Land Base, which is designed to meet the purpose and need described in Chapter 1 for managing the O&C lands. The portions of these potential ACECs outside of the Harvest Land Base under these alternatives do not meet the criteria for ACEC designation. The BLM would not designate these potential ACECs under Alternatives B and C.

Under Alternatives A and D, and the Proposed RMP, the vast majority of the Upper Klamath and Upper Klamath Addition potential ACECs occur outside of the Harvest Land Base. The BLM revised the boundaries of the Upper Klamath and Upper Klamath Addition potential ACECs for these alternatives to exclude areas in the Harvest Land Base. The revised boundaries are available for review on the RMP's online Interactive Map. With these boundary revisions, the special management attention required for the revised Upper Klamath and Upper Klamath Addition potential ACECs would not conflict with managing O&C lands under Alternatives A and D, and the Proposed RMP. Therefore, the BLM would designate these potential ACECs under these alternatives.

Analysis of fisheries, endangered fish, water quality, recreation, and cultural resources all considered the lands within the Upper Klamath and Upper Klamath Addition potential ACECs for management by ACEC designation or by the underlying land use allocations by each alternative, and determined impact to these resources accordingly. The BLM incorporated protection for fisheries and water quality into the Riparian Reserve land use allocation and associated management direction. The Upper Klamath River Wild and Scenic River and the associated recreation management area provide for recreation opportunities in the upper Klamath River.

61. **Comment Summary:** The BLM should revise the EIS to include protections of municipal water supplies and habitat for salmonids and lamprey from mining projects proposed in and near the North Fork Chetco, North Fork Hunter Creek, and Hunter Creek Bog potential ACECs. The BLM should require coordination with the U.S. Forest Service to protect these values from mining projects proposed next to the Hunter Creek Bog potential ACEC.

    Response: The BLM would designate the North Fork Chetco, North Fork Hunter Creek, and Hunter Creek Bog potential ACECs under all of the action alternatives, including the Proposed RMP. **Table F-2** in **Appendix F** – Areas of Critical Environmental Concern provides information about the special management direction that BLM would apply to these areas upon designation. These areas would be open to leasable mineral entry with no surface occupancy, closed to salable mineral entry, and the BLM would recommend these areas to petition for withdrawal from locatable mineral entry. As such, mining projects within these ACECs would be required to adhere to these special management requirements under all action alternatives.

    In addition to the minerals management provided through special management for the ACECs, **Appendix B** – Management Objectives and Direction provides minerals management direction on all lands. Under the action alternatives, including the Proposed RMP, the BLM would manage lands within, adjacent to, and upstream from potential ACECs consistent with management direction in **Appendix B** – Management Objectives and Direction. This management direction addresses notice-level mining proposals and Plans of Operation located within lands or waters known to contain proposed or ESA-listed threatened or endangered species or their proposed or designated critical habitat.

    Consistent with NEPA requirements, BLM would coordinate with adjacent land managers, including the U.S. Forest Service, on an as needed basis during site-specific project planning and during RMP implementation.

62. **Comment Summary:** The BLM should revise the EIS to expand the Wassen Creek potential ACEC to protect potential wilderness.

Response: The BLM considers potential ACECs for designation where special management to protect relevant and important values is identified as needed, where their management would not conflict with Congressional reserves or lands under the National Landscape Conservation System, and where special management to retain relevant and important values would not preclude sustained-yield forest management in areas allocated to timber production on O&C lands. In preparation for the plan revisions, the BLM reviewed the Wassen Creek potential ACEC and, through this review, refined the boundaries to exclude areas that do not contain relevant and important values and incorporate other areas that do. Coincidentally, the revised Wassen Creek potential ACEC boundary now includes more inventoried lands with wilderness characteristics.

Consistent with the authority provided by the FLPMA to designate potential ACECs, the BLM evaluated nominated and existing ACECs to determine whether relevant and important values are present and if special management is needed to maintain those values. Relevant and important values for the Wassen Creek potential ACEC include scenic, fish and wildlife, and natural process values. BLM describes the special management needs for these values in **Appendix F** – Areas of Critical Environmental Concern. Management for wilderness characteristics would be consistent with most, but not all of the special management needed for the Wassen Creek potential ACEC's relevant and important values.

The BLM would not include the management for wilderness characteristics of any inventoried lands with wilderness characteristics under Alternative D. In addition, under Alternative D, a portion of the Wassen Creek potential ACEC includes areas in the Harvest Land Base allocated to timber production on O&C lands. The special management attention required to maintain the relevant and important values conflicts with the management direction of the Harvest Land Base, which is designed to meet the purpose and need described in Chapter 1 for managing the O&C lands. Therefore, under Alternative D the BLM would revise the boundaries of the Wassen Creek potential ACEC to exclude areas in the O&C Harvest Land Base and would designate the remaining area as an ACEC. The Wassen Creek ACEC designation under Alternative D would overlap with inventoried lands with wilderness characteristics, and would provide some protection of those wilderness characteristics through special management of the ACEC.

In contrast, under Alternatives A, B, and C, and the Proposed RMP, the BLM would include the management for wilderness characteristics for inventoried lands with wilderness characteristics and there are no O&C timberlands underlying the potential ACEC. Under these alternatives, the BLM would designate the revised Wassen Creek ACEC that includes the lands with wilderness characteristics.

63. **Comment Summary:** The BLM should revise the EIS to include designation of the Moon Prairie potential ACEC in all alternatives because BLM determined it meets the ACEC eligibility criteria, and it requires special management attention to protect its relevant and important values. The Moon Prairie potential ACEC contains a late-successional forest with slow growing Pacific yew and is unsuitable for timber production due to tree regeneration problems.

    Response: The BLM considers potential ACECs for designation where special management to protect relevant and important values is identified as needed, where their management would not conflict with Congressional reserves or lands under the National Landscape Conservation System, and where special management to retain relevant and important values would not preclude sustained-yield forest management in areas allocated to timber production on O&C lands.

The BLM would not designate the Moon Prairie ACEC under Alternatives A, B, C, or D. Consistent with the authority provided by the FLPMA to designate potential ACECs, the BLM evaluated nominated and existing ACECs to determine whether relevant and important values are present and if special management is needed to maintain those values. The Moon Prairie potential ACEC continues to meet the relevance and importance criteria; however, it occurs within the Harvest Land Base land use allocation under Alternative B. The special management attention required to maintain the relevant and important values conflicts with the management direction of the Harvest Land Base, which BLM designed to meet the purpose and need described in Chapter 1 for managing the O&C lands.

Under Alternatives A, C, and D, the Moon Prairie potential ACEC occurs within the Late-Successional Reserve land use allocation, and the special management attention required for maintaining the relevant and important values of the ACEC are provided by the management direction for the Late-Successional Reserve. Thus, designation of Moon Prairie as an ACEC is unnecessary to maintain the relevant and important values under Alternatives A, C, and D.

In preparation for the Proposed RMP and FEIS, BLM refined the boundaries of the Moon Prairie potential ACEC to remove the portion within the Late-Successional Reserve and retain the portion within the Harvest Land Base. Uneven-aged timber management in the revised potential ACEC would contribute to improving forest structure and fire resiliency. Therefore, the BLM would designate this smaller, refined boundary of the Moon Prairie ACEC under the Proposed RMP.

The BLM describes the Timber Productivity Capability Classification (TPCC) and its use in the Woodstock vegetation model in **Appendix C** – Vegetation Modeling. The BLM may manage areas identified as unsuitable for sustained-yield timber production through the TPCC system for other uses, if those uses are compatible with the reason for which the BLM has reserved these lands (as identified by TPCC codes). Neither site-specific evaluation by BLM staff nor the TPCC codes for the Moon Prairie potential ACEC used in the Woodstock vegetation model have identified stand growth concerns warranting Moon Prairie stands' inclusion in a TPCC district-designated reserve. The BLM will periodically add additional areas to those areas reserved through updates to the TPCC system, when examinations indicate that an area meets the criteria for reservation.

64. Comment Summary: The BLM used an incorrect justification to determine the Umpqua River Wildlife Area ACEC no longer meets the ACEC criteria.

Response: The BLM did make an error in the Draft RMP/EIS explaining why the Umpqua River Wildlife Area ACEC no longer meets the ACEC criteria. BLM revised the rationale in the Final EIS to correct the error. The bald eagle is the single relevant and important value needing special management for the Umpqua River Wildlife Area ACEC. Over time, the bald eagle population has grown and the species has been delisted and BLM continues to provide protection under the Bureau's Special Status Species program and the Bald and Golden Eagle Protection Act. The bald eagle and this population no longer meet the ACEC criteria.

65. Comment Summary: The BLM should revise the EIS to include designation of the Spencer Creek potential ACEC in all alternatives because BLM determined it meets the ACEC eligibility criteria, and it requires special management attention to protect its relevant and important values. The Spencer Creek potential ACEC contains a natural ecosystem within a unique watershed and provides habitat for important and threatened species.

Response: The BLM considers potential ACECs for designation where special management to protect relevant and important values is identified as needed, where their management would not conflict with Congressional reserves, or lands under the National Landscape Conservation System, and where special management to retain relevant and important values would not preclude sustained yield forest management in areas allocated to timber production on O&C lands.

Consistent with the authority provided by the FLPMA to designate potential ACECs, the BLM also evaluated nominated and existing ACECs to determine whether relevant and important values are present and if special management is needed to maintain those values.

The Spencer Creek potential ACEC continues to meet the relevance and importance criteria; however, it occurs within the Harvest Land Base land use allocation under Alternatives B, C, and D. The special management attention required to maintain the relevant and important values conflicts with the management direction of the Harvest Land Base, which BLM designed to meet the purpose and need described in Chapter 1 for managing the O&C lands.

Under Alternative A and the Proposed RMP, the Spencer Creek potential ACEC occurs within the Late-Successional Reserve and Riparian Reserve land use allocations, and the special management attention required to maintain the relevant and important values are already provided for by the management direction for the Late-Successional Reserve and Riparian Reserve. No additional management attention is needed to maintain the relevant and important values.

For these reasons, the BLM would not designate the Spencer Creek ACEC under any alternative or the Proposed RMP.

66. **Comment Summary:** The BLM should revise the EIS to designate the Baker Cypress, Cobleigh Road, Poverty Flat, Round Top Butte, and Table Rocks potential ACECs as *closed* OHV Management Areas to protect relevant and important values.

    Response: The BLM reconsidered the designations for public motorized access for potential ACECs in preparation for the Proposed RMP/Final EIS. The BLM changed the designations for public motorized access for many areas, including Baker Cypress, Cobleigh Road, Poverty Flat, Round Top Butte, and Table Rocks potential ACECs to *closed* in the Proposed RMP.

67. **Comment Summary:** Table Rocks ACEC should be retained as an ACEC and not changed to an RMA as the table tops are home to very rare plants and animals that would be negatively impacted by a recreation-focused land use management plan.

    Response: A SRMA designation ensures that the important recreation values at Table Rocks (hiking and environmental education) are protected through the establishment of supporting management actions and allowable use decisions that are reflected in the Recreation Management Area framework for the Table Rocks SRMA. These restrictions ensure the protection of the recreation setting characteristics and the relevant and important ACEC values. These designations have been analyzed in the Proposed RMP/Final EIS and have been found to be compatible.

68. **Comment Summary:** The BLM should revise the EIS to allow neither timber harvesting nor vegetation management to promote the development or maintenance of late seral habitat in the Little North Fork Wilson potential ACEC to protect listed salmonids.

Response: The BLM considers potential ACECs for designation where special management to protect relevant and important values is identified as needed, where their management would not conflict with Congressional reserves or lands under the National Landscape Conservation System, and where special management to retain relevant and important values would not preclude sustained yield forest management in areas allocated to timber production on O&C lands.

Consistent with the authority provided by the FLPMA to designate potential ACECs, the BLM evaluated nominated and existing ACECs to determine whether relevant and important values are present and if special management is needed to maintain those values. The special management attention required to maintain the relevant and important values includes vegetation management to promote the development and maintenance of late-seral habitat. Many forest stands within the potential ACEC, which might be good candidates for vegetation treatments, are less than sixty years old and adjacent to existing roads.

Analysis of fisheries considered the lands within the potential Little North Fork Wilson ACEC for management by the underlying land use allocations by each alternative and determined the impact to these resources accordingly. The Proposed RMP/Final EIS provides for ESA-listed fish habitat in the Riparian Reserve land use allocation and the associated management direction in **Appendix B** – Management Objectives and Direction.

69. **Comment Summary:** The State recommends existing Little Grass Mountain ACEC in the BLM Salem District continue to be included as an ACEC in the EIS.

    Response: The BLM evaluates existing, potential, and nominated ACECs to determine if they meet the criteria of relevance and importance as defined in 43 CFR 1610.7–2 at the beginning of land use planning processes. A Salem District Office interdisciplinary team evaluated the existing Little Grass Mountain ACEC and determined that it did not meet the importance criteria. The grassy bald at Little Grass Mountain does not contain any values to set it apart from other Coast Range Grassy Balds and therefore, does not meet the importance criteria. Little Grass Mountain did not move forward in the planning process to be considered as a potential ACEC and was not analyzed in the EIS because it does not meet the basic ACEC criteria.

70. **Comment Summary:** The BLM should revise the EIS to analyze the previously nominated BLM Tract T. 20 S., R.3 W., Sec. 31, SW 1/4 for both an Environmental Education Area (EEA) and Cottage Grove Old Growth ACEC designation in all alternatives. BLM omitted the nominated EEA from Appendix N in the Draft EIS.

    Response: The BLM considers potential ACECs for designation where special management to protect relevant and important values is identified as needed, where their management would not conflict with Congressional reserves or lands under the National Landscape Conservation System, and where special management to retain relevant and important values would not preclude sustained-yield forest management in areas allocated to timber production on O&C lands.

    Consistent with the authority provided by the FLPMA to designate potential ACECs, the BLM also evaluated nominated and existing ACECs to determine whether relevant and important values are present and if special management is needed to maintain those values. The Cottage Grove Old Growth potential ACEC continues to meet the relevance and importance criteria; however, it occurs within the Harvest Land Base land use allocation under Alternatives A, B, and C. The special

management attention required to maintain the relevant and important values conflicts with the management direction of the Harvest Land Base, which is designed to meet the purpose and need described in Chapter 1 of the EIS for managing the O&C lands. The BLM would not designate the Cottage Grove Old Growth potential ACEC as an ACEC under Alternatives A, B, and C. The BLM would designate the Cottage Grove Old Growth potential ACEC under Alternative D and the Proposed RMP.

Consistent with the analytical methods described on page 110 of the Planning Criteria (USDI BLM 2014), the BLM's inventory determined this BLM-administered tract of land is not legally accessible to the public. The BLM would not consider areas without legal public access as Extensive Recreation Management Areas (ERMAs) or Special Recreation Management Areas (SRMAs) and would not include them in **Appendix O** – Recreation.

71. **Comment Summary:** The BLM should revise the EIS to include designation of the former Long Gulch potential ACEC in all alternatives because it meets ACEC eligibility criteria, and it requires special management attention to protect its relevant and important values. The former Long Gulch potential ACEC overlays lands with wilderness characteristics and must be maintained to protect resident northern spotted owls and the low elevation, old-growth forest.

    Response: The BLM evaluates existing, potential, and nominated ACECs to determine if they meet the criteria of relevance and importance as defined in 43 CFR 1610.7–2 at the beginning of land use planning processes. A Medford District Office interdisciplinary team evaluated the former Long Gulch potential ACEC and determined that it did meet the relevance and importance criteria for natural systems. Only the unique trellised drainage pattern met the importance criteria because it is more than locally significant. The Medford District Office interdisciplinary team determined that maintenance of the trellised drainage pattern does not require special management. The former Long Gulch potential ACEC did not move forward in the planning process a potential ACEC for analysis in the EIS because it does not require special management.

72. **Comment Summary:** The BLM should revise the EIS to retain existing ACECs because these ACECs contribute to protecting watersheds, regulating stream flows, contributing to economic stability of local communities, and provide recreational facilities as mandated in the O&C Act.

    Response: The BLM considers potential ACECs for designation where special management to protect relevant and important values is identified as needed, where their management would not conflict with Congressional reserves or lands under the National Landscape Conservation System, and where special management to retain relevant and important values would not preclude sustained-yield forest management in areas allocated to timber production on O&C lands.

    Consistent with the authority provided by the FLPMA to designate potential ACECs, the BLM also evaluated nominated and existing ACECs to determine whether relevant and important values are present and if special management is needed to maintain those values. Some potential ACECs continue to meet the relevance and importance criteria and occur within the Harvest Land Base land use allocation under some of the alternatives. Under some alternatives and potential ACECs, the special management attention required to maintain the relevant and important values conflicts with the management direction of the Harvest Land Base, which is designed to meet the purpose and need described in Chapter 1 for managing the O&C lands.

An ACEC designation is the principle BLM designation for public lands where special management is required to protect important natural, cultural, and scenic resources, or to identify natural hazards. Contributions toward meeting watershed protection, regulating stream flows, contributing to economic stability and recreation facility provision objectives associated with ACEC designations are incidental unless they have been evaluated and determined to meet the basic ACEC relevance and importance criteria.

73. **Comment Summary:** The BLM should consider the management recommendations for biological diversity and forest composition, structure, and function as described on page 201 of the Topsy/Pokegama Landscape Analysis (USDI BLM 1995) related to the relevant and important values' special management need for all potential ACECs within its geographic scope when developing the EIS.

    Response: Consistent with the authority provided by the FLPMA to designate potential ACECs, the BLM evaluated nominated and existing ACECs to determine whether relevant and important values are present and if special management is needed to maintain those values. The BLM considered the recommendations in the landscape analysis when evaluating areas within the geographic scope of the Topsy/Pokegama Landscape Analysis and when determining their need for special management under the alternatives.

74. **Comment Summary:** The EIS should be revised to include definitions for the alternative columns in Table F-1 of Appendix F.

    Response: The Proposed RMP/Final EIS has been revised to include definitions for the alternative columns in **Table F-1** of **Appendix F** – Areas of Critical Environmental Concern.

75. **Comment Summary:** Maintain Key Watershed designation. The designation of Key Watersheds identifies and prioritizes the management of areas of refugia that are crucial to at-risk and listed fish species and the provision of high quality water for over 1.8 million Oregonians who rely on BLM land for drinking water.

    Response: Chapter 1 describes how BLM would evaluate ACEC nominations, address components of the Aquatic Conservation Strategy, and work with the National Marine Fisheries Service, Oregon Department of Environmental Quality, and the Environmental Protection Agency to develop alternatives to facilitate Endangered Species Act consultation and to satisfy State and Federal water quality rules at the RMP level. Under all alternatives in the EIS, the BLM has generated the equivalent of watershed analysis as needed for NEPA analysis or ESA consultation for implementation actions taken in the future consistent with the plan.

    During scoping for this revision, the BLM included in the Notice of Intent an invitation for ACEC nominations with a June 7, 2012 due date to ensure the nominations would be considered in the analysis. BLM would consider ACEC nominations after determining they meet the relevance and importance criteria and the relevant and important values would require special management attention for their protection. ACEC nominations received between the Draft EIS and preparation of the Final EIS are too late for consideration in this revision.

    However, BLM would evaluate proposals for ACEC nominations at any time. Areas found by the BLM to meet the ACEC criteria and require special management attention would receive temporary

management including reasonable measures necessary to protect the relevant and important resource values from degradation until the BLM fully evaluates the potential ACEC through the resource management planning process.

76. **Comment Summary:** The State recommends the BLM revise the EIS to consider a new interagency ACEC nomination for "hydrologically unique watersheds that support cold water refugia to aquatic biota." The BLM would collaborate with ODFW and DEQ to develop the ACEC nomination.

    Response: Recommendations for a collaboratively developed ACEC nomination received between the Draft RMP/EIS and preparation of the Proposed RMP/Final EIS are too late for consideration in this revision.

    During scoping for this revision, the BLM included in the Notice of Intent an invitation for ACEC nominations with a June 7, 2012, due date to ensure the nominations would be considered in the analysis. BLM would consider ACEC nominations after determining they meet the relevance and importance criteria and the relevant and important values would require special management attention for their protection. At this time, the recommendation is not complete enough for the BLM to evaluate as an ACEC nomination.

    However, the BLM would evaluate proposals for ACEC nominations at any time. Areas found by the BLM to meet the ACEC criteria and that require special management attention would receive temporary management including reasonable measures necessary to protect the relevant and important resource values from degradation until BLM fully evaluates the potential ACEC through the resource management planning process.

    Chapter 1 describes how the BLM would evaluate ACEC nominations and how BLM would work with the National Marine Fisheries Service, Oregon Department of Environmental Quality and the Environmental Protection Agency to develop alternatives to facilitate Endangered Species Act consultation and to satisfy State and Federal water quality rules at the RMP level.

77. **Comment Summary:** The BLM should identify potential climate refugia (e.g., low elevation river corridors, north-facing slopes, elevational and latitudinal corridors, and related high elevation land-bridges, see Olson *et al*. 2012) and include these in a climate-robust reserve design as ACECs or other protective designations.

    Response: The BLM has designed land use allocations to respond to the purpose and need. There is no purpose and need that would result in a designation of "climate refugia" on the landscape. The BLM has considered ACECs in this analysis based upon nominations received and consideration of special management and relevant and important values.

Climate Change

78. **Comment Summary:** The carbon analysis is superficial and misrepresents what would occur. Carbon calculations must account for the current amount of carbon stored in the area, the risk of loss due to natural events and ecosystem processes, transformation into other forms of long-term storage, the emissions of wood substitutes for construction and substitutes for fossil fuels, and the changing rates of CO_2 uptake as a forest ages.

Response: As explained in the Draft RMP/EIS (USDI BLM 2015, pp. Appendix G) the carbon analysis includes the current amount of carbon stored in the area, probable loss due to wildfire, and long-term carbon storage in harvested wood products. The BLM lacks the data necessary to evaluate potential carbon losses from insects and disease. Only a few studies have measured and analyzed carbon losses from decay (respiration) and only under specific circumstances and forest types that the BLM cannot extrapolate to cover the decision area. Incorporating decay rates is not a common practice in carbon calculations globally or nationally. The BLM incorporated carbon losses from thinning into the changes in volume as stands are harvested in the Woodstock model. All alternatives would increase carbon storage over time, indicating that carbon sequestration would occur. Discussion of the emissions of wood substitutes for construction material is outside the scope of this analysis. Discussion of the substitution of wood for fossil fuels in energy production would be speculative at this time, as there are no known facilities in operation, construction, or planned that would use wood or forest residues for biofuel production within or near the decision area.

79. **Comment Summary:** The carbon analysis holds the effect of wildfire constant, which contradicts the findings of differences in fire resistance in the Fire and Fuels section.

    Response: As stated in the Draft RMP/EIS, the Fire and Fuels section analyzed the potential impacts of the different alternatives on wildfire risk, but the BLM has no method to translate these changes in risk into meaningful differences in wildfire occurrence and wildfire effects for the alternatives (USDI BLM 2015, p. 212). The Draft RMP/EIS discussed the potential for additional loss of carbon due to increased wildfire occurrence and severity (USDI BLM 2015, p. 156).

80. **Comment Summary:** The carbon storage analysis misuses the Carbon OnLine Tool (COLE).

    Response: The BLM recognizes that the data available in the Carbon OnLine Tool (COLE) represents smoothed values and includes stands that are uneven-aged. The area the BLM analyzed includes uneven-aged stands and most alternatives include uneven-aged management over a portion of the decision area. The BLM explored various methods for estimating the carbon in the understory as stands age, but found no other methods that could be coupled with the volume and stand age information provided by the Woodstock model. Most carbon estimation procedures focus solely on the harvestable trees, leaving the BLM with few options to account for all components of aboveground carbon. The commenter does not offer an analytical methodology that they believe would be superior.

    The Proposed RMP/Final EIS has added comparison of these analytical results with results from other analyses. In comparing the estimates in the Draft RMP/EIS with the most recent estimates made by the U.S. Forest Service, the BLM estimates were comparable, providing confidence that the BLM's methods provide a reasonable estimation of effects. As stated in the Draft RMP/EIS, different carbon storage analysis methods will produce different estimates (USDI BLM 2015, pp. 133, 1106). Although the BLM reported the estimated net carbon storage for each alternative, the BLM considers the relative differences between the alternatives as more informative than the absolute calculated values.

81. **Comment Summary:** The DEIS is incomplete in not presenting the best science on carbon flux using regionally specific models such as Landcarb.

Response: The BLM evaluated the use of Landcarb to estimate carbon storage for the different alternatives. In its present form, Landcarb can only analyze landscape-scale carbon for the western Cascades, which does not cover the entire analysis area. Landcarb analyzes carbon for all Federal lands in aggregate, which does not allow the BLM to evaluate the effects of the alternatives on the land base separately from other Federal lands. These two factors alone made Landcarb an unsuitable method for estimating carbon storage in this analysis. The Carbon OnLine Tool contains regionally-specific data that encompasses the entire planning area. As discussed in Appendix G of the Draft RMP/EIS, the BLM tailored the carbon estimates by generating reports specific to the county or counties in which each BLM office occurs (USDI BLM 2015, pp. 1103–1104).

82. **Comment Summary:** Carbon stored in wood products should not be included in the carbon estimates.

    Response: The Intergovernmental Panel on Climate Change (IPCC) considers carbon stored in wood products as an important carbon pool (e.g., Chapter 4 in IPCC Guidelines for National Greenhouse Gas Inventories, 2006). The Environmental Protection Agency reports carbon stored in harvested wood products in use and in solid waste disposal sites (landfills) as a carbon sink in its annual greenhouse gas inventories for the United States. The BLM followed these standards in including carbon stored in harvested wood products as part of the carbon storage estimations.

83. **Comment Summary:** The BLM should include current and regionally appropriate literature from Krankina *et al*. (2014).

    Response: The BLM reviewed Krankina *et al*. (2014) and determined it would not add substantial information to the analysis. The carbon storage estimations in Krankina *et al*. (2014) are for 2008 and the data do not identify the amount of carbon estimated to occur on BLM-administered lands within the planning area. The BLM carbon analysis used data current as of 2013. The Proposed RMP/Final EIS has added discussion that places the estimated carbon storage and carbon density estimates in context with U.S. Forest Service lands, State of Oregon lands, and private lands.

84. **Comment Summary:** The DEIS should include a recommendation for a carbon tax on logging older forests on BLM land in Oregon.

    Response: The BLM has no authority to impose taxes. Policy recommendations by the BLM to Federal, State, or local government entities with the authority to impose taxes would be beyond the scope of a BLM RMP.

85. **Comment Summary:** The RMP as proposed would contribute to climate change by reducing the amount of carbon stored in the ecosystem.

    Response: The commenter is mistaken. The Draft RMP/EIS clearly stated that all alternatives, including the No Action alternative, would increase net carbon stores over time on the BLM-administered lands within the decision area (USDI BLM 2015, p. 135). The commenter identified no error in this analysis.

86. **Comment Summary:** The carbon section should include a literature review on the importance of older forests in carbon storage.

Response: A literature review of the importance of older forests for carbon storage is not necessary to understand the potential impacts of the alternatives on carbon storage on BLM-administered lands. Since the analysis includes all stands, including older stands, it includes the importance of older stands in carbon storage. An extensive discussion of the role of older forests in storing carbon would not improve the quality of the analysis or provide for a reasoned choice among alternatives. The BLM has not included such a literature review in keeping with CEQ direction that environmental analyses should not be encyclopedic in nature but should focus on the information relevant to the decisions to be made (40 CFR 1500.4).

87. **Comment Summary:** Carbon benefits of fuel reduction logging are scientifically controversial.

Response: The BLM agrees that there is scientific uncertainty about the potential effects of hazardous fuels treatments on carbon storage by altering the effects of wildfire on carbon storage. The Draft RMP/EIS acknowledged that hazardous fuels treatments can affect wildfire risk, but the BLM has no method to translate these changes of risk into meaningful differences in wildfire occurrence and wildfire effects for the alternatives (USDI BLM 2015, p. 212). Many studies have demonstrated the ability of certain hazardous fuels prescriptions to reduce the potential and actual emissions from wildfire at the stand scale, but have not been able to provide the same evidence at the landscape scale, largely due to the lack of sufficiently sized fuels treatments to test hypotheses. Most analyses examining the carbon implications of thinning to reduce wildfire emissions are conducted using a static climate instead of a changing climate and the associated changing wildfire risks, largely due to the complexity of incorporating such factors. Further, the Draft RMP/EIS did not claim that hazardous fuels reduction treatments would increase carbon storage, but that hazardous fuels treatments have the potential to reduce carbon losses and greenhouse gas emissions from wildfires by moderating fire behavior and the amount of fuels consumed.

Many studies indicate that the carbon storage capability of western forests will decline to some degree, especially after mid-century. The Proposed RMP/Final EIS added information specific to western Oregon discussing potential productivity declines, which would affect potential carbon storage regardless of the presence or absence of wildfires and thinning to reduce hazardous fuels. Several studies have shown that thinning to reduce hazardous fuels would have dubious carbon benefits within forests with long fire return intervals, but that there may be some benefit in forests with short fire return intervals. The Proposed RMP/Final EIS has expanded the discussion of the effects of thinning on carbon storage in different forest conditions.

88. **Comment Summary:** The DEIS does not link the potential impact of climate change on critical tree species to the alternatives to know which alternative best meets societal need for minimizing carbon emissions while maximizing carbon storage over the coming decades.

Response: The BLM does not have any effective method to link information about potential changes in forest composition and productivity to the alternatives. Climate change adaptation and mitigation largely occurs at the project level, as managers need to consider how climate change may affect specific sites, which is beyond the scope of this analysis. Projections of vegetation change with changing climate conditions include uncertainty over the exact type of change, the rate, and the magnitude. Evaluating how growth and yield would change as forests change, with and without management, would depend greatly on what climate projection is used. The BLM has no basis for

determining which climate model is 'correct.' Furthermore, the vegetation modeling relies on growth and yield modeling based on empirical measurements for a vast array of stand conditions (USDI BLM 2015, pp. 991–999). It would be impossible to produce growth and yield modeling for the stand conditions across the decision area based on a projection of how such stands would grow in the future. As a result, the carbon analysis can only examine the effects of different forest management approaches over time assuming stand growth and yield based on empirical measurements (i.e., the current conditions). The commenter does not explain how the BLM could reasonably link the potential changes in forest composition and productivity to the alternatives.

The purpose and need for this RMP revision does not include meeting a "societal need for minimizing carbon emissions while maximizing carbon storage." As stated in the response above, the BLM based the purpose and need for this RMP revision on the laws that apply to the BLM. The BLM has no specific legal mandate to address climate change and maximize carbon storage comparable to the legal mandates reflected in the purpose and need for this RMP revision, such as, for example, the purpose of contributing to the conservation and recovery of threatened and endangered species in accordance with the Endangered Species Act. Therefore, even if the BLM were able to link information about potential changes in forest composition and productivity as a result of climate change to the alternatives, this information would not be relevant to evaluating how well the alternatives would respond to the purpose and need for action.

89. **Comment Summary:** The EIS analysis should clearly disclose the carbon consequences of different stream buffer widths, reserves verses the harvest land base, reserve size, degree of management allowed in reserves, thinning verses regeneration harvest, and different age limits.

    Response: The analysis in the Draft RMP/EIS discloses the effects of these factors in the analysis of net carbon storage. The alternatives in the Draft RMP/EIS differ in their "stream buffer widths, reserves verses the harvest land base, reserve size, degree of management allowed in reserves, thinning verses regeneration harvest, and different age limits," and the Draft RMP/EIS quantitatively compares the net carbon storage of the different alternatives over time. The analysis does not attempt to particularize the carbon effects of individual land use allocations within each alternative, which would be impossible given the integrated nature of the alternatives and the vegetation modeling. Regardless, a lengthy discussion of the specific effect of individual land use allocations would not improve the quality of the analysis or provide for a reasoned choice among the alternatives.

90. **Comment Summary:** The carbon analysis should incorporate the concept of carbon debt to evaluate the short- and long-term trade-offs of logging verses conserving and restoring mature and old-growth forests.

    Response: The BLM investigated the scientific literature concerning the carbon debt concept. This literature discusses the term primarily in connection with conversion of tropical forests to crops for use in commercial-scale bioenergy production and on the use of boreal forest for the production of commercial-scale liquid biofuels. There are no known plants operating, under construction, or planned within or near the decision area that would use timber or forest residues to produce liquid biofuels. Given this literature, the BLM determined that a discussion of carbon debt would not improve the quality of the analysis or provide for a reasoned choice among the alternatives. In addition, all alternatives would result in increases in net carbon storage over time, suggesting that no carbon debt would be incurred by the various levels of timber harvest in each alternative.

91. **Comment Summary:** The carbon analysis does not separate carbon stored in wood products verses carbon stored in live trees.

    Response: The Proposed RMP/Final EIS has added discussion disclosing the estimated range of carbon stored in wood products.

92. **Comment Summary:** The greenhouse gas emissions analysis from forestry operations should be analyzed in relation to CEQ's recommended thresholds and include a social cost of carbon calculation. The BLM should remain below the CEQ threshold in order to comply with the White House interest in reducing climate change impacts.

    Response: The commenter is mistaken about the nature of the suggested threshold in the draft CEQ guidance; the CEQ suggested this as a threshold for when to analyze greenhouse gas emissions, not a target for management of emissions. In 2014, the CEQ released revised draft guidance for public comment that describes how Federal departments and agencies should consider the effects of greenhouse gas emissions and climate change in their NEPA reviews (CEQ 2014). This revised draft guidance includes the suggestion to use annual emissions of 25,000 Mg CO_2e as a reference point for indicating when a quantitative analysis of greenhouse gas emissions may be warranted. This guidance also clearly states that this suggested reference point is not a target that land management agencies must attain. In accordance with this draft guidance, the BLM quantitatively estimated expected greenhouse gas emissions from forest management operations, prescribed burning, and livestock grazing as well as from wildfire in the Draft RMP/EIS (USDI BLM 2015, pp. 136–140). In addition, the Draft RMP/EIS analyzed the social cost of carbon (USDI BLM 2015, pp. 502–523). The commenter identifies no error in those analyses.

93. **Comment Summary:** The BLM's atmospheric CO_2 levels (p. 137) need to be updated to account for the global level of 400 ppm that was crossed last year.

    Response: The atmospheric CO_2 concentration that the BLM reported in the Draft RMP/EIS is an average annual concentration as reported by the Global Carbon Project (GCP). The GCP has not updated this value for 2014 in time for the preparation of the Proposed RMP/Final EIS. The Proposed RMP/Final EIS has updated this information to acknowledge that the data available from the Earth System Research Laboratory indicates that the preliminary global average atmospheric CO_2 concentrations reached 397.15 ppm in 2014. At the Mauna Loa Observatory, atmospheric CO_2 concentrations exceeded 400 ppm in April through June of 2014 and in February through July of 2015.

94. **Comment Summary:** The BLM should not compare logging greenhouse emissions to the entire state of Oregon or the nation but to similarly scaled industries in Oregon.

    Response: Cumulative effects analysis of greenhouse gas levels is challenging, in part, because of the difficulty in setting the geographic scope for the analysis. The Draft RMP/EIS placed BLM greenhouse gas emissions from harvest operations and prescribed burning into context with emissions from harvest operations and prescribed burning of other forest managers in western Oregon. The cumulative effects analysis of greenhouse gas emissions in the Draft RMP/EIS presented the incremental effect of the alternatives within the context of cumulative greenhouse gas emission at multiple spatial scales, including state and national total emissions (USDI BLM 2015, pp. 139–140). The Proposed RMP/Final EIS added discussion of how the proportion of BLM greenhouse gas

emissions might change relative to other forest managers (see the Climate Change section of Chapter 3). The commenter provided no indication as to what industries they consider as "similarly scaled" to BLM land management in western Oregon or how placing the BLM emissions in a different context would improve the quality of the analysis or provide for a reasoned choice among alternatives.

95. **Comment Summary:** Carbon emissions from logging and foregone opportunities for increased carbon storage in forests directly conflict with state, Federal, and international greenhouse gas reduction goals.

    Response: The commenter is mistaken. As clearly stated in the Draft RMP/EIS, all alternatives would increase carbon storage relative to the current condition, supporting state, national, and international goals to increase carbon storage (USDI BLM 2015, pp. 132–136).

    The Federal government has not established any specific goals with respect to carbon storage and does not require that Federal agencies maximize carbon storage. Executive Order 13653, issued on November 6, 2013, directs the Federal agencies to develop or modify programs and policies to promote "…greater climate resilience and carbon sequestration, or other reductions to the sources of climate change." In response, DOI updated the climate adaptation plan in 2014. The only specific direction with respect to carbon storage or carbon sequestration is to consider developing a formal policy for DOI bureaus to incorporate carbon storage as an explicit element of resource management plans (DOI Climate Change Adaptation Plan, p. 43). As of the preparation of the Proposed RMP/Final EIS, neither DOI nor the BLM has issued either draft or final policy that sets carbon storage goals.

    The State of Oregon established statewide goals for greenhouse gas emissions reduction, but the focus of reductions is on transportation and energy production and use. The Proposed RMP would support the State's 2004 strategy for greenhouse gas reductions by increasing carbon storage.

96. **Comment Summary:** The BLM discussion of greenhouse gas emissions is too perfunctory and essentially dismisses the emissions problem on the basis that these forests represent a small percentage of the total emissions of the U.S.

    Response: The BLM disagrees that the analysis of greenhouse gas emissions is "too perfunctory." Analysis in an EIS must provide a 'hard look' at the effects of the alternatives. A 'hard look' is a reasoned analysis containing quantitative or detailed qualitative information (USDI BLM 2008, p. 55). The Draft RMP/EIS presents background on the role of greenhouse gas emissions in climate change, quantitatively analyzes the greenhouse gas emissions under each alternative, and places those emissions in context of statewide and national emissions and in the context of other forest managers with respect to harvest operations and prescribed burning (USDI BLM 2015, pp. 136–140). The Draft RMP/EIS provides a reasoned analysis to present analytical conclusions on the comparative effects of the alternatives on greenhouse gases. Thus, the Draft RMP/EIS took a 'hard look' at greenhouse gas emissions. The Draft RMP/EIS presents no conclusion about the extent to which the BLM will consider greenhouse gas emissions in the eventual selection of the RMP. The commenter identifies no error in this analysis.

97. **Comment Summary:** An additional issue of importance is assessing the carbon cost of management versus the carbon cost of no management. From a carbon storage perspective, the critical question is

how much carbon is emitted through management to prevent wildfire compared to that which would be lost by wildfire.

Response: The Draft RMP/EIS quantitatively analyzed the effects on carbon storage of management action under the alternatives and the effects of wildfire on carbon storage (USDI BLM 2015, pp. 132–135). The Proposed RMP/Final EIS added discussion of the potential effects of hazardous fuels treatments on carbon storage (see the Climate Change section of Chapter 3). The BLM does not claim that forest management would prevent wildfires from occurring, just that management could reduce wildfire intensity and severity, potentially reducing greenhouse gas emissions from wildfire, particularly in forests adversely affected by fire suppression (USDI BLM 2015, pp. 158–159). The Draft RMP/EIS acknowledged that hazardous fuels treatments can affect wildfire risk, but the BLM has no method to translate these changes in risk into meaningful differences in wildfire occurrence and wildfire effects for the alternatives (USDI BLM 2015, p. 212). The commenter presents no additional information that would allow the BLM to analyze quantitatively the changes in wildfire occurrence and effects in response to hazardous fuels treatments or other management actions.

98. **Comment Summary:** Error in **Figure 3-29** concerning annual minimum temperature for the Willamette Basin.

    Response: The Proposed RMP/Final EIS corrected this figure (see the Climate Change section in Chapter 3).

99. **Comment Summary:** The description of regional climates is oversimplified; the Willamette Valley has a Mediterranean climate.

    Response: The Draft RMP/EIS described regional climate types to provide background to the analysis. Whether the discussion characterizes the Willamette Valley as a maritime or Mediterranean climate type would not alter the analysis of environmental effects of the alternatives or the analytical conclusions. Climatologists and geographers over time have classified the climate of the Willamette Valley as maritime and as Mediterranean. Two climate classification schemes are available—Köppen-Gieger and modified Thornthwaite (Kottek *et al.* 2006, Grundstein 2008). The Köppen-Geiger system uses monthly average temperatures and the degree of difference between winter and summer precipitation to identify climate categories (Kottek *et al.* 2006). In contrast, the modified Thornthwaite system uses potential evapotranspiration and a moisture index (Grundstein 2008). Climate scientists and geographers use the Köppen-Geiger system more widely than the modified Thornthwaite, but recognize both. The Köppen-Geiger system for the years 1951 through 2000 classified all or nearly all of western Oregon, including the Cascade Mountains, as warm temperate with warm, dry summers (Kottek *et al.* 2006), which is typically labeled as coastal Mediterranean or Mediterranean. There are some differences on the far northwest Oregon coast in the available maps of this classification. The modified Thornthwaite scheme classifies the Willamette Valley as cool-wet, the same as the Oregon coast, and the interior valleys of southwest Oregon as cool-moist based on climate data from 1970 through 1999 (Grundstein 2008). The presence or absence of a fog belt is not relevant under both classification systems. The maritime influence on climate is strongest in winter and weakest in summer across the state beyond the immediate coast. However, the Willamette Valley does experience a stronger maritime influence in summer than southwest Oregon, as conditions are typically cooler and moister with more episodes of low cloud cover and light rain; the period of hottest weather is also shorter. The BLM also asked the Oregon Climate Change Research Institute whether the Willamette Valley climate should be considered as Mediterranean or maritime (K. Dello,

2015 personal communication); they stated that maritime was a better description, but also that such designations were not meaningful scientifically.

100. Comment Summary: The estimates of climate change vulnerability in **Table 3-24** should include the drought tolerance ratings from Niinemets and Valladares (2006).

Response: The Draft RMP/EIS used information from Devine *et al*. (2012), which includes a drought tolerance rating relative to all other trees in a particular subregion as part of the habitat affinity score used to develop an overall climate change vulnerability score (USDI BLM 2015, pp. 145–147). The BLM reviewed the information contained in Niinemets and Valladares (2006) and concluded that adding the drought tolerance rating from that source would not change the analysis or add value to the table. The Devine *et al*. (2012) data show how the climate vulnerability of a species may vary between northwest and southwest Oregon, whereas the Niinemets and Valladares (2006) data does not. Thus Devine *et al*. (2012) provides more specific and relevant information for this analysis than Niinemets and Valladares (2006).

101. Comment Summary: Expand the fire discussion to include more information on how fire regimes will change as climate changes.

Response: The Proposed RMP/Final EIS has added discussions of potential changes in fire risk as climate changes (see the Climate Change section of Chapter 3). As discussed in the Draft RMP/EIS, scale mismatches and the lack of important bottom-up controls on fire in current projections means that the BLM cannot be very specific about how and where fire regimes might change as climate changes particularly given that the mixed severity fire regime category is very broad (USDI BLM 2015, p. 156). Within the mixed severity regimes, the proportion of high and low severity patches may shift, but the fire regime could remain in the mixed severity category. Further, the breakpoints between low, mixed, and high severity regimes are completely subjective, with various scientists providing different breakpoints. The BLM typically uses the breakpoints incorporated into LANDFIRE (6–25 percent stand-replacement equals low severity, 25–75 percent stand-replacement equals mixed, and greater than 75 percent stand-replacement equals high severity), which is a national program widely used by agencies and fire scientists and fire ecologists. In addition, as the Draft RMP/EIS pointed out, current projections assume that past climate-fire relationships will persist into the future (USDI BLM 2015, p. 156). If these relationships do not persist, the BLM has no method to determine how and where fire regimes would change.

102. Comment Summary: Thinning as a climate change adaptation strategy will not increase drought resistance in the long-term.

Response: The Draft RMP/EIS stated that Joyce *et al.* (2009), Spies *et al.* (2010), and Peterson *et al.* (2011) summarized specific actions recommended for responding to climate change, including thinning forest stands to reduce competition and drought stress (USDI BLM 2015, p. 158). The Draft RMP/EIS does not contain an analytical conclusion that thinning, as a climate change adaptation strategy, will increase drought resistance in the long term. The Draft RMP/EIS simply described recommendations in the existing literature.

103. Comment Summary: Page 156 claims that more fires equals more homogeneity and that this is bad for biodiversity. Regionally specific studies on mixed severity regimes should be cited instead.

Response: The Draft RMP/EIS did not claim that more fires would result in more homogeneity and hence lower biodiversity. Instead, the Draft RMP/EIS stated that the likelihood of such outcomes would increase as climate changes and assuming that current fire-climate relationships persist into the future. It also states that the outcomes of future fires also depend on bottom-up controls that are not incorporated into current projections of wildfires, indicating some uncertainty that the stated potential outcomes would occur. The Draft RMP/EIS cited multiple studies concerning projections of increased burn severity (USDI BLM 2015, pp. 155–156). The Proposed RMP/Final EIS has added discussion and cited additional studies regarding future changes in wildfires, primarily to the drier forests of the planning area.

104. Comment Summary: The section on fire, page 155, needs a comprehensive literature review including recent studies that show no increase in fire extent or severity in this region.

Response: The Draft RMP/EIS reported an increase in the proportion of high-severity fire within forests in the entire state of Oregon based on Monitoring Trends in Burn Severity data and stated that establishing any similar trend or lack of trend is not possible within the planning area due to inadequate data (USDI BLM 2015, p. 149). The Draft RMP/EIS cited relevant literature on the effects of climate change on wildfire, sufficient to understand the potential cumulative effect of climate change and future wildfires together with the effects of the alternatives (USDI BLM 2015, pp. 148–149, 155–156). A literature review of the effects of climate change on wildfire is not necessary to understand the potential impacts of the alternatives. An extensive review of the literature on the effect of climate change on wildfires would not improve the quality of the analysis or provide for a reasoned choice among alternatives. The BLM has not included such a literature review in keeping with CEQ direction that environmental analyses should not be encyclopedic in nature but should focus on the information relevant to the decisions to be made (40 CFR 1500.4).

105. Comment Summary: The RMP should incorporate projections of climate change into vegetation and fire behavior modeling.

Response: The Draft RMP/EIS acknowledged the potential effects of climate change on stand growth. Separate from the vegetation modeling with Woodstock, the BLM reviewed bioclimatic envelope model projections and evaluated the potential effects and associated uncertainty of projected climate changes on a variety of forest management outcomes for the planning area conducted using the Climate extension of the Forest Vegetation Simulator model (USDI BLM 2015, pp. 152–154). The Draft RMP/EIS explicitly explained why the vegetation modeling did not incorporate projections of climate change into the simulation of the growth of stands through time. Specifically, to translate these broad regional predictions of climate change with substantial uncertainties to projections of how and when specific groups of forest stands would change in their patterns of growth and response to treatment over the next several decades would be so speculative as to be arbitrary (USDI BLM 2015, p. 100). Furthermore, the vegetation modeling relies on growth and yield modeling based on empirical measurements for a vast array of stand conditions (USDI BLM 2015, pp. 991–999). It would be impossible to produce growth and yield modeling for the stand conditions across the decision area based on a projection of how such stands would grow in the future. The commenter does not address these explanations.

The Draft RMP/EIS discussed the potential effects of climate change on future wildfire occurrence and severity. The Draft RMP/EIS identified that most climate change projections indicate that wildfires are likely to get larger and more severe in the future. The Draft RMP/EIS explicitly

explained why the vegetation modeling did not incorporate projections of the effects of climate change on future wildfire occurrence and severity. Specifically, the inherent challenges in predicting future stochastic events coupled with the uncertainties in climate change predictions make it impossible to forecast specifically when and where future wildfires would occur differently than they have occurred in the recent past (USDI BLM 2015, pp. 99, 1053–1055). The commenter does not address these explanations.

106. Comment Summary: The FEIS should identify and discuss climate refugia, reserve redundancy, and reserve connectivity as strategies to address climate change.

Response: The Proposed RMP/Final EIS added discussion concerning the potential role of various types of reserves to serve as climate change refugia (see the Climate Change section of Chapter 3). The Draft RMP/EIS discussed the potential role of reserves in providing connectivity and redundancy for a wide range of resources (see, for example, USDI BLM 2015, pp. 217–235, 354–356, 701–708, and 738–818).

107. Comment Summary: The DEIS claims that the region is getting drier even though precipitation is either equivocal or projected to increase.

Response: The 'dryness' of an area is a function of both precipitation and temperature as is readily demonstrated by climate data around the world. Two regions may have very similar average annual precipitation but the region with a higher average temperature is drier than the region with a lower average temperature and generally supports less vegetation. This difference is due to fundamental ecosystem processes concerning evapotranspiration demand. As evapotranspiration demand increases, a region becomes effectively drier. Every biogeographic vegetation model uses this fundamental property to assess how climate influences vegetation distribution and how climate change may alter vegetation distribution. As stated in the Draft RMP/EIS, the low increase in precipitation when combined with the more substantial increases in temperature, particularly in minimum temperature, indicates the region is becoming effectively drier (USDI BLM 2015, p. 143).

108. Comment Summary: The wildlife and wildlife habitat section on page 157 lacks a comprehensive literature review and is missing citations relevant to the region.

Response: As stated in the Draft RMP/EIS, a comprehensive review of the impacts of climate change on all fish and wildlife species found within the planning area is not possible (USDI BLM 2015, p. 150). Instead, the discussion focused on two key species relevant to the purpose and need—northern spotted owl and marbled murrelet—as illustrative. The Draft RMP/EIS cited relevant literature on the possible impacts of climate change to northern spotted owls and marbled murrelet (USDI BLM 2015, p. 157). A literature review of the effects of climate change on wildlife is not necessary to understand the potential impacts of the alternatives. An extensive review of the literature on the effect of climate change on wildlife would not improve the quality of the analysis or provide for a reasoned choice among alternatives. The BLM has not included such a literature review in keeping with CEQ direction that environmental analyses should not be encyclopedic in nature but should focus on the information relevant to the decisions to be made (40 CFR 1500.4).

109. Comment Summary: The recommended actions on page 158 for building resilience are incomplete (e.g., Black *et al*. 2013). What evidence does BLM have that insect outbreaks can be suppressed by thinning?

Response: The Draft RMP/EIS does not claim that thinning will suppress insect outbreaks. Instead, it cited several climate change adaptation review papers that recommend thinning to increase resistance to insects, among other disturbance factors (USDI BLM 2015, p. 158). The BLM reviewed Black *et al*. (2013) and determined it does not add any additional information to the discussion in the Draft RMP/EIS. Black *et al*. (2013) discusses whether thinning can reduce the spread of large landscape-scale outbreaks once bark beetles have reached epidemic proportions. Neither the Draft RMP/EIS nor the climate change adaptation review papers cited in the Draft RMP/EIS assert that thinning could reduce outbreaks once they reach epidemic proportions. Black *et al*. (2013, p. 62) also reports that thinning can reduce the susceptibility to insect attack, thus supporting the adaptive strategy recommended in the climate change adaptation review papers cited in the Draft RMP/EIS.

110. Comment Summary: The discussion on the bottom of page 159 is not based on the best science in assuming that reserves are less resilient and resistant to climate change than managed areas.

Response: The Draft RMP/EIS did not claim that reserves are necessarily less resilient and resistant to climate change than actively managed areas. The Draft RMP/EIS stated that decreasing the management options decreases the opportunities for the BLM to take actions intended to adapt to climate change (USDI BLM 2015, p. 159). The previous paragraphs in this section discussed how active management provides opportunity for the BLM to increase resistance and resilience to climate change in keeping with the types of strategies identified in the Draft RMP/EIS (USDI BLM 2015, pp. 158–159). The Proposed RMP/Final EIS has added discussion to clarify the potential risks associated with minimally managed reserves under changing climate conditions (see the Climate Change section of Chapter 3).

111. Comment Summary: The DEIS is incorrect in stating that large-scale thinning to reduce crown fire potential and provide biomass for wood energy would reduce CO_2 emissions. Thinning would result in long-term carbon emissions because many of the areas thinned would not experience fire during the period of treatment effectiveness. Thinning also does not reduce fire occurrence, particularly during extreme conditions and especially in the climate-driven fire systems such as this region.

Response: The Draft RMP/EIS did not state that large-scale thinning to reduce crown fire potential would reduce CO_2 emissions as a blanket conclusion. The Draft RMP/EIS reported the findings from several studies that indicate thinning and prescribed burning in forests adversely affected by fire suppression, largely the drier forests, indicate that such reductions are possible (USDI BLM 2015, p. 159). The Draft RMP/EIS made no claims nor cited any studies concerning the effects of thinning and prescribed burning on the potential future emissions from forests not adversely affected by fire suppression, largely the moister forests. The Draft RMP/EIS did not assume that thinning for bioenergy production would occur, nor did it discuss the potential effects of wood harvested for bioenergy on future CO_2 emissions. As discussed in the Draft RMP/EIS, biomass for energy use, primarily personal use firewood, is a by-product of forest management for other purposes, with low utilization of this potential resource (USDI BLM 2015, pp. 497–498).

Whether thinned areas would or would not experience fire during the period of treatment effectiveness is not known nor is it discussed. While the probability of any specific location burning

is very low, several hundred to tens of thousand acres in western Oregon burn every year, primarily in the drier forests (see the Fire and Fuels section of Chapter 3).

The Draft RMP/EIS did not state or conclude that thinning would reduce wildfire occurrence. Instead, the Draft RMP/EIS stated that thinning could moderate wildfire effects (USDI BLM 2015, pp. 158–159). Fire occurrence depends on ignitions. Fire effects depend on the combination of fuels characteristics, weather, and topography at the time and location of the wildfire (USDI BLM 2015, pp. 173–177).

112. Comment Summary: The RMP should project the forest composition of southern Oregon under the alternatives as climate changes.

Response: The Draft RMP/EIS discussed how climate change could potentially alter forest composition and productivity. The Draft RMP/EIS reviewed bioclimatic envelope model projections and evaluated the potential effects and associated uncertainty of projected climate changes on a variety of forest management outcomes for the planning area conducted using the Climate extension of the Forest Vegetation Simulator model (USDI BLM 2015, pp. 152–154). However, the BLM has no methodology for projecting how forests within southern Oregon or the rest of the planning area would actually change or at what specific rate. Species change ranges as individuals, not as community groups, and bottom-up controls on species migration (competition, soils, topography, disturbance regimes, and so forth) generally are not widely incorporated into various models of changing species ranges largely due to lack of suitable information how these factors affect species distributions. The BLM has no way to determine which climate change model is the most appropriate for determining the magnitude and rate of change. Lastly, as the climate change impacts literature makes clear, climate change is not linear, but proceeds at an irregular rate. All these variables mean that any projections the BLM would make about the composition of southern Oregon forests arising from climate change with or without the management direction proposed in the different alternatives would be speculative.

113. Comment Summary: It would aid readers to explicitly state in the Key Points which alternative increases carbon storage the most and which increases it the least and which alternative emits the most greenhouse gases and which the least.

Response: The Proposed RMP/Final EIS has added the suggested information to the key points (see the Climate Change section of Chapter 3).

114. Comment Summary: Contrary to the DEIS analysis, logging will reduce forest resilience and BLM needs to recognize this. There is strong evidence that unmanaged forests have great capacity for self-correction and self-organization. The BLM should look carefully at all the evidence, including competing experts' viewpoints before concluding that logging is beneficial. Complex native forests are more resilient to climate change than logged forests and simplified plantations.

Response: There is scientific uncertainty about the potential effects of different forest management strategies on forest resilience in the face of climate change. The Proposed RMP/Final EIS has added discussion and citations regarding competing viewpoints on this topic (see the Climate Change section of Chapter 3). While the science is clear that complex forests have more resilience to a variety of disturbances than simplified forests, there is less evidence that logged forests have less resilience than unlogged forests, particularly to climate change. "Logging" is a very broad term that applies to a

wide range of tree removal, both commercial and non-commercial, and ranging from relatively light thinning of the lower tree canopy to clearcutting with no retention of any trees. Further, 'complexity' has many facets, not all of which confer resilience to all disturbances and to climate change. Whether 'logged' forests are less resilient to climate change depends on what is removed, what remains, and, in the case of regeneration harvesting, what is planted. Thinning, particularly in drier forests, to increase resistance to a variety of stressors including climate change is a very common recommendation from forest scientists who have studied the implications of climate change on forests (USDI BLM 2015, pp. 157–158).

115. Comment Summary: The DEIS on page 149 and in **Appendix D** contradict each other. DEIS (p 149) says "*analysis of Oregon large fires using data from the Monitoring Trends in Burn Severity site* (http://mtbs.gov/index.html*) indicates that the proportion of high-severity fire in forests generally has increased by 11percent since 1984, with much of the increase since 2000.*" This appears to be contradicted in DEIS **Appendix D** which *... examined the MTBS data for any obvious temporal trends in wildfire severity, but did not detect a strong signal (**Figure D-6**). Over the course of 25 years, there appears to be a slight increase in the percentage of area burned by low and moderate severity wildfire, and a slight decrease in the percent of area burned in high severity wildfire, although these trends are not statistically significant. ... While several studies have indicated that high severity fires are increasing across the western United States (Westerling et al. 2006, Dillon et al. 2011a, Miller et al. 2012), no such trends were apparent in the observed record within the range of the northern spotted owl (**Figure D-6**).*

Response: The Proposed RMP/Final EIS has rewritten the relevant sentence from page 149 of the Draft RMP/EIS to make it clear that the information on page 149 and Appendix D of the Draft RMP/EIS do not contradict each other. The two passages address wildfire trends at different scales. The statement in the Draft RMP/EIS on page 149 refers to all forests in the entire State of Oregon, while Appendix D refers to fires within the range of the northern spotted owl. The Draft RMP/EIS also states that there are too few fires that have originated, either on BLM-administered lands or in western Oregon, to draw any conclusions on how fire severity and fire season severity may be changing (USDI BLM 2015, p. 149).

116. Comment Summary: DEIS (pp. 149–150) describes increasing stream temperatures as a result of climate change. The BLM needs to disclose the likely consequences on cold-water fish and other temperature-sensitive aquatic organisms.

Response: The Draft RMP/EIS identified the groups of species most vulnerable to climate change, including cold-water fish and other species with narrow temperature requirements (USDI BLM 2015, p. 157). The Draft RMP/EIS clearly described the effects of stream temperature on fish (USDI BLM 2015, pp. 232–233). Given the uncertainties associated with predictions of increasing stream temperatures, especially the interaction of increasing air temperatures and changes in stream shading (USDI BLM 2015, pp. 156–157, 232–233, 290–294), more detailed predictions of the consequences of climate change on cold-water fish and other temperature-sensitive aquatic organisms is not possible. The Proposed RMP/Final EIS has added discussion concerning the potential role of inner zones of Riparian Reserve (where thinning is restricted) in the action alternatives in providing climate refugia (see the Climate Change section of Chapter 3).

117. Comment Summary: The DEIS does not identify mitigation measures to address the likely effects of increasing spring precipitation on northern spotted owl nesting success.

Response: Mitigation is an important mechanism Federal agencies can use to minimize the potential adverse environmental impacts associated with their actions (CEQ 2011, p. 4). An EIS must identify all relevant and reasonable mitigation measures. (CEQ, "Forty Most Asked Questions …" 46 FR 18027). The commenter does not identify any specific relevant and reasonable measure that they believe would reduce or avoid the effect of increasing spring precipitation. Measures that would reduce greenhouse gas emissions or increase carbon storage would not be relevant and reasonable measures to reduce or avoid the effect of increasing spring precipitation; it is currently beyond the scope of existing science to identify a specific source of greenhouse gas emissions and designate it as the cause of specific climate impacts in a specific location. Thus, it would not be possible for the BLM to identify any relevant and reasonable measures to reduce or avoid the effect of increasing spring precipitation. Regardless of whether the BLM could identify such mitigation measures and evaluate their effectiveness, such measures would not be relevant to this RMP revision. The mitigation measures discussed in an EIS address the effects of the proposed action. Increasing spring precipitation is not an effect of the BLM action.

118. Comment Summary: The DEIS does not adequately address the current scientific understanding of the breadth of ways that anticipated climate change will alter the way we expect ecosystems to respond to forest management actions, particularly in regards to aquatic resources (e.g., see Dale *et al.* 2001, Dalton *et al.* 2013). Watershed resilience in the face of climate change can best be maintained by protecting and restoring the suite of natural processes and conditions that characterize natural forested riparian areas and floodplains (Seavy *et al.* 2009, Furniss *et al.* 2010). This is exactly what the ACS was originally designed to accomplish.

Response: The BLM analyzed the ways climate change may interact with BLM management actions in western Oregon, including water and aquatic resources, using the current scientific understanding (USDI BLM 2015, pp. 141–159). The spatial distribution and magnitude of future temperature and precipitation changes in the planning area are likely to be highly variable (Dalton *et al.* 2013). Shorter-term climate patterns are influenced by the Pacific Decadal Oscillation and El Niño-Southern Oscillation and deviate from longer-term trends (Dalton *et al.* 2013). As well, watershed characteristics (e.g., location, elevation, geology, vegetation, and dominant precipitation), lead to highly variable effects to a climate change trend. The commenter does not address the analysis of climate change in the Draft RMP/EIS or identify any errors or deficiencies in that analysis.

The commenter suggests that protecting natural processes and conditions within Riparian Reserve would lead to increased adaptability and resilience to climate change. The analysis in the Draft RMP/EIS has shown that the Riparian Reserve design and accompanying management direction under the alternatives would maintain resilient forested riparian areas in a managed landscape. Specifically, the Riparian Reserve would contribute to the conservation and recovery of ESA-listed fish species and their habitats; maintain and restore natural channel dynamics and processes and the proper functioning condition of riparian areas, stream channels, and wetlands; maintain high quality water (including Source Water Protection watersheds); and contribute to the restoration of degraded water quality.

The commenter suggests that the No Action alternative is the best strategy for maintaining watershed resilience in the face of climate change. Given that the BLM fully analyzed the No Action alternative in the Draft RMP/EIS, it is unclear how the commenter feels the Draft RMP/EIS did not adequately address watershed resilience in the face of climate change. Nevertheless, as shown by the analysis in the Proposed RMP/Final EIS (see the Fisheries and Hydrology sections of Chapter 3), the Proposed RMP would have effects on aquatic resources that would be similar to the No Action alternative.

Therefore, the Proposed RMP would provide a comparably effective strategy for maintaining watershed resilience in the face of climate change.

119. Comment Summary: The RMP/DEIS failed to analyze cumulative stream temperature (climate change) increases, which are due in part to logging. Past logging on O&C lands has measurably contributed to CO_2 pollution, thus triggering the required NEPA cumulative impacts of increased stream temperature. The DEIS/RMP failed to disclose the feedback loop of logging/increased CO_2 and resulting ongoing/future increased stream temperatures.

Response: The Draft RMP/EIS analyzed the effect of timber harvest under the alternatives on stream temperature (USDI BLM 2015, pp. 286–297) and acknowledged the potential future effect of climate change on stream temperatures (USDI BLM 2015, pp. 149–150). As explained in response to a similar comment below under Hydrology, it is not possible to forecast quantitatively how future riparian forest stand development would interact with increasing annual and seasonal air temperatures to affect stream temperature. The Draft RMP/EIS acknowledged that timber harvest creates greenhouse gas emissions, and that greenhouse gas emissions contribute to climate change (USDI BLM 2015, pp. 136–139, 141–142). However, it is not possible to ascribe any specific change in climate conditions to a specific emission of greenhouse gases. Furthermore, to the extent that past timber harvest in the decision area has contributed to changing climate conditions, the description in the Draft RMP/EIS of current condition and trend of climate conditions incorporates the effects of past timber harvests. As explained in the Draft RMP/EIS, the analysis generally relies on an aggregate description of the current condition and trend of resources, rather than delving into the historical details of individual past actions (USDI BLM 2015, p. 94). Finally, the commenter is incorrect in referring to ongoing increased stream temperatures. The Draft RMP/EIS explained that, in spite of predictions about potential future stream temperature increases, average maximum stream temperatures have generally been decreasing over the past decades (USDI BLM 2015, pp. 143, 293–294).

Fire and Fuels

120. Comment Summary: The BLM should revise the EIS to describe how actions are consistent with local and state fire protection plans and policies.

Response: The FLPMA requires that the BLM consider the policies of approved state and tribal land resource management programs and develop land use plans that are consistent with state and local plans to the maximum extent possible consistent with Federal law (43 CFR 1610.3–1). In this particular instance, the Oregon Department of Forestry's firefighting policy is to "Put out fires quickly at the smallest possible size" (http://www.oregon.gov/ODF/Fire/Pages/default.aspx, accessed January 14, 2016), whereas Federal Fire policy states that—

- The protection human life is the first priority and that no natural or cultural resource, home, or item of property is worth a human life.
- The full range of fire management activities will be used to help achieve ecosystem sustainability, including its interrelated ecological, economic, and social components.
- 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 fires 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 response to the fire (USDA and USDI 2009, p. 10).

As such, the Proposed RMP includes a management objective to participate with communities bordering Federal lands in partnership with local, State and Federal stakeholders to reduce the risks and threats from wildland fire. The Proposed RMP also includes management direction to apply the full range of fire management options in responding to natural ignitions or escaped prescribed fires. The BLM may use these fires to achieve management objectives when expected fire behavior and potential effects of a fire, or a part of a fire, are aligned with the management objectives and direction of the underlying land use allocation and affected resources (**Appendix B** – Management Objectives and Direction). This objective and direction in the Proposed RMP addresses the requirement of the FLPMA to develop land use plans consistent with State and local plans to the maximum extent consistent with Federal law.

The BLM added clarification to the Proposed RMP/Final EIS in the background of Issue 3 in the Fire and Fuels section to indicate that the BLM participates in the local and state fire protection plans, policies, and the Community Wildfire Protection Plan process.

121. Comment Summary: The BLM should revise the EIS to include different management objectives for the 'dry' and 'very dry' forest types for wildfire resiliency, given the projected climate patterns and the lifespan of the RMP.

Response: The BLM included management objectives for wildfire resiliency for dry and very dry forest types in the action alternatives and the Proposed RMP, and varied these objectives by varying the land use allocations in dry and very dry forest types. The BLM establishes management objectives for land use allocations and, as such, land use allocations that address dry forest management (e.g., Uneven-aged Timber Management and Late-Successional Reserve – Dry) provide variations to objectives that specifically address wildfire resiliency (**Appendix B** – Management Objectives and Direction).

The BLM classified forest types as dry and very dry based upon potential vegetation types and location (USDI BLM 2015, pp. 1002–1003). The BLM analyzed varying management objectives and applied differing management direction to dry and very dry forest types by varying land use allocation definitions of dry under the alternatives. For example, the Harvest Land Base allocates the Uneven-aged Timber Management under Alternative B to both dry and very dry forests, whereas Alternatives C and D only allocates the Uneven-aged Timber Area to very dry forests. The Proposed RMP allocates the Uneven-Aged Timber Management to both dry and very dry forests on the Medford District and Klamath Falls Field Office, and to very dry forests within the South River Field Office of the Roseburg District.

122. Comment Summary: Proposed BLM timber management in the DEIS will increase fire and fuel hazards in western Oregon forests. The proposal to increase even-aged, regeneration harvesting on public lands is irresponsible and will significantly increase fire/fuel hazards throughout western Oregon. The RMP admits that many of the alternatives provided in the DEIS will increase fire and fuel hazards by increasing logging slash, encouraging young age classes less resilient to fire.

Response: The commenter is mistaken. Based on analysis in the Draft RMP/EIS, all action alternatives would reduce the acres of High and Moderate fire hazard (USDI BLM 2015, p. 202). The commenter is also mistaken that the action alternatives would increase even-aged, regeneration harvesting. Compared to the No Action alternative, all of the action alternatives would reduce the

amount of regeneration harvest in the dry forests. The acres in activity fuel risk categories (USDI BLM 2015, pp. 209–211) provide an estimate of potential future work needed to reduce the risk associated with harvest activity fuels. Historically, the BLM has treated residual activity fuels following timber management activities for both site preparation and hazardous fuels reduction purposes. The commenter is mistaken in that many of the alternatives will increase fire and fuel hazards by increasing logging slash. As described in the Draft RMP/EIS, Alternatives B and C would result in more acres of activity fuels in the High risk category than the No Action alternative, and Alternatives A and D would result in fewer acres. All action alternatives would result in fewer acres of activity fuels in the Very High risk category than the No Action alternative (USDI BLM 2015, pp. 210–211). Furthermore, all alternatives include management direction to treat activity fuels, which would reduce the potential for activity fuels to contribute to fire hazard. The analysis of the Proposed RMP in this Proposed RMP/Final EIS confirms these results, and would result in trends described above similarly to Alternative B (see Chapter 3 Fire and Fuels Issues 3 and 4).

123. Comment Summary: The BLM should revise the EIS because it fails to address, adequately, the predictable increase in wildfire, pests, disease, and storm damage due to overcrowded forests in large block forests and Riparian Reserve. Alternatives that increase Reserve acreages will increase the risk of catastrophic wildfires by allowing more land to be unmanaged.

Response: The BLM does not agree that allocating lands to Late-Successional Reserve or Riparian Reserve will result in "overcrowded forests" or a "predictable increase in wildfire, pests, disease, and storm damage." The action alternatives and the Proposed RMP management direction in reserve land use allocations, especially in the dry forest, direct the BLM to manage stands to maintain landscape resilience and reduce the potential for uncharacteristic disturbances (**Appendix B** – Management Objectives and Direction). Management direction in the Proposed RMP includes direction to treat 21,500 acres per decade within Late-Successional Reserve – Dry. The Draft RMP/EIS specifically discusses analytic results for reserve management effects on fire resistance and fire hazard within Wildland Development Areas (USDI BLM 2015, pp. 195, 202, 1134–1135).

124. Comment Summary: Classifying the region's forests into dry and moist (DEIS, p. 178) has regionally specific biases. DellaSala *et al.* (2013) indicate that mixed evergreen forests experience mixed-severity fire regimes that cannot be classified using binary classifications systems. Classification uncertainty that was not accounted for in BLM's models needs to be discussed as using a simplistic binary classification will bias model outputs resulting in over-emphasis on thinning that could result in type conversions (DellaSala *et al.* 2013). BLM needs to represent the disagreement in the literature between Franklin and Johnson's (2013) approach (ecoforestry) vs. criticisms by DellaSala *et al.* (2013) as regional uncertainty and lack of scientific agreement.

Response: The Draft RMP/EIS extensively described the classification process for moist and dry forest delineations (USDI BLM 2015, pp. 179–180, 1002–1005). As explained in the Draft RMP/EIS, the process for moist and dry forest delineations included eco-typing conducted by regional resource experts and reviews of these classifications by local resource experts. In no way does this classification discount that mixed evergreen forests experience mixed-severity fire regimes. The Proposed RMP/Final EIS has expanded this discussion to acknowledge other types of vegetation classification systems.

125. Comment Summary: Fire models used in developing RMP alternatives should be approached with caution. The EIS is based on untested models (e.g., LANDFIRE, class condition mapping) that

have known over-prediction biases regarding high-severity fire. BLM applies TNC fire mapping built on LANDFIRE and fire regime condition class datasets that have not been ground truthed for prediction bias. Model uncertainty needs to be clearly specified in the FEIS. BLM's reference conditions need to be compared to back-casting and historical accounts of forests in order to be regionally appropriate and not based on a non-validated model. This needs to be corrected by BLM by including back-casting studies to help validate fire models (Whitlock 1992; Colombardi and Gavin 2010; Baker 2011, 2014; and Dipaolo and Hosten 2015).

Response: The BLM Fire Planning Handbook indicates that Land Use Planning must incorporate FRCC (Fire Regime Condition Class) or similar concept (USDI BLM 2012, pp. 2–6). As stated in the Draft RMP/EIS, the BLM built the analytic methods in Issue 1 upon the conceptual framework of the LANDFIRE Fire Regime Condition Class (FRCC) concept (USDI BLM 2015, p. 177). The Draft RMP/EIS discussed several model uncertainties and potential deficiencies as part of the analysis of fire resiliency (USDI BLM 2015, pp. 177–178, 1113–1126). As stated in the Draft RMP/EIS, the BLM base the natural range of variability on LANDFIRE Biophysical Setting models. These models are based on literature, local data, and expert estimate. Further descriptions and references for the biophysical setting models are located on the LANDFIRE Program website (http://www.landfire.gov/). Use of the LANDFIRE FRCC represents high quality information and follows specific policy direction outlined in the BLM Fire Planning Handbook. The Proposed RMP/Final EIS has expanded the discussion in the Summary of Analytical Methods in Issue 1 to include an acknowledgement of different positions on historic range of variability.

126. Comment Summary: The BLM should revise the EIS to include a lightning strike analysis to determine the risk of losing large blocks of habitat, and the contribution of these landscape features to an overall increase of wildfire risk across the landscape.

Response: The BLM did not conduct a lightning strike analysis, because it would not provide information necessary to make a reasoned choice between alternatives. The alternatives would have no effect on lightning strikes, and the BLM has no reasonable basis on which to evaluate different effects of lightning strikes under the alternatives. The Draft RMP/EIS included analysis to identify relative risks of large and high-severity wildfires, based on historic fire size, frequency, and severity, independent of wildfire ignition cause, to incorporate potential wildfire effects on northern spotted owl habitat (**Appendix H** – Fire and Fuels). This analysis includes the evaluation of lands for their relative suitability risk for wildfires, which gives a general sense of forest conditions and their locations within the planning area landscape that are most suitable for wildfires. The BLM incorporated predictions of fire size, location, and severity into the vegetation modeling.

127. Comment Summary: Higher fire severity increases the likelihood of transferring wildfire to adjoining forestland owners. The BLM should analyze fire severity across the landscape as a function of management direction under each alternative in the EIS. The State recommends the BLM should work with ODF to develop a high level metric to assess the overall potential transfer of wildfires between BLM and private lands.

Response: The Draft RMP/EIS analyzed the effects of the alternatives on fire resistance and fire hazard, as such; alternatives resulting in higher fire hazard or lower fire resistance would increase the likelihood of transferring wildfire to adjoining landowners. The BLM determined that at this scale and scope of analysis, general assumptions regarding forest structure and probable fire interaction provided a robust and consistent basis for comparing the effects of the alternatives at an appropriate scale. The Draft RMP/EIS did not analyze the effects of the alternatives on fire severity

directly, because such an analysis would require fine-scale, stand-specific data, particularly related to surface fuels and canopy base height changes over time by alternative, which is impractical at this scale of analysis. The BLM has clarified information pertaining to ownership patterns and transfer of risk in the Background of Fire and Fuels Issue 3.

128. Comment Summary: Fire risk should be a decision factor among components of alternatives. Simple metrics, such as acres treated, can give some rough estimates towards reducing fire risk and would be helpful in evaluating management components. With the information provided in the Draft RMP/EIS, it is difficult to assess the percentage of acres of dry forests that would be treated over the first decade.

Response: The Draft RMP/EIS did include information on acres treated relative to fire risk. The analysis described the acres in need of residual harvest activity fuels treatment, and estimated the acres of natural hazardous fuels treatments, activity fuels treatments, and silvicultural treatments by decade for each alternative (USDI BLM 2015, pp. 240–211, 212, 279–280). As concluded in the analysis, the size of the Harvest Land Base and the timber management type and intensity influence the amount of acres in each risk category by alternative. The acreage in activity fuels risk categories provides an estimate of potential future work needed to reduce the risk associated with activity fuels.

The purpose and need for the RMP revision includes restoring fire-adapted ecosystems by increasing fire resiliency, and the purpose and need noted that active management could positively influence fire risk (USDI BLM 2015, p. 10). As such, the BLM will consider how well the alternatives respond the purpose of increasing fire resiliency and will evaluate effects of the alternatives on fire risk in reaching a decision in the RMP revision.

129. Comment Summary: The BLM should revise the EIS to incorporate projections of climate change into fire behavior modeling.

Response: The Draft RMP/EIS discussed the potential effects of climate change on future wildfire behavior. The Draft RMP/EIS identified that most climate change projections indicate that wildfires are likely to get larger and more severe in the future. The Draft RMP/EIS explicitly explained why the vegetation modeling did not incorporate projections of the effects of climate change on future wildfire occurrence and severity. Specifically, the inherent challenges in predicting future stochastic events coupled with the uncertainties in climate change predictions make it impossible to forecast specifically when and where future wildfires would occur differently than they have occurred in the recent past (USDI BLM 2015, pp. 99, 1053–1055). The commenter does not address these explanations.

130. Comment Summary: The BLM should revise the EIS to prohibit salvage harvesting after wildfires. Unsalvaged, naturally regenerating stands subjected to high-severity fire should be maintained on the landscape to provide important habitat and stand development functions and be allowed to regenerate on their own. Logging is not the ecological equivalent to high-severity wildfire and salvage logging destroys the natural and biological legacies in post fire landscapes that allow for complex forest regeneration.

Response: The Draft RMP/EIS included varied approaches to salvage harvest after disturbances such as wildfire (USDI BLM 2015, pp. 41–74). Several action alternatives would prohibit salvage harvest in some land use allocations, except where necessary to protect public safety or to keep roads and

other infrastructure clear of debris. Under the Proposed RMP, salvage harvesting would be permissible to recover economic value or minimize economic loss only in the Harvest Land Base. The Proposed RMP would prohibit salvage harvesting in Riparian Reserve and Late-Successional Reserve, except where necessary to protect public safety or to keep roads and other infrastructure clear of debris.

An alternative that would prohibit salvage harvest on all lands, including the Harvest Land Base would not be reasonable because it would not respond to the purpose and need for the RMP revision. The Harvest Land Base has management objectives for sustained-yield timber production, which is how the alternatives respond to the purpose of the action to provide for a sustained yield of timber. It would be unreasonable to prohibit salvage harvest of timber after disturbances in a land use allocation dedicated to timber production.

131. Comment Summary: The BLM should revise the EIS to avoid post-fire logging in dense, mature/old forest stands that experience intense fire; as such, areas tend to provide the highest quality, and spatially rarest, complex early seral forest habitat (Swanson *et al*. 2011, DellaSala *et al*. 2014). The restoration of fire as a process should be a goal in these stands.

Response: The Proposed RMP would prohibit salvage harvest in Late-Successional Reserve, which includes older, structurally-complex conifer forest, except where necessary to protect public safety or to keep roads and other infrastructure clear of debris.

The Proposed RMP includes management objectives and management direction related to the management of fire as a process on the landscape, including management to restore and maintain ecosystem resilience to wildfire, including the application of prescribed fire, and responding to wildfires in a manner that provides for public and firefighter safety, while meeting land management objectives (**Appendix B** – Management Objectives and Direction).

132. Comment Summary: The BLM should revise the EIS because it fails to adequately address the direct, indirect, and cumulative impacts that post-fire salvaging has on post-fire logging feedback loops (i.e., whereby areas that burn in a fire are logged and planted with commercial species only to burn more intensely in the next fire, and then are logged again later).

Response: There is scientific controversy over the question of whether post-fire salvage harvest creates conditions that result in more intense re-burning. A recent publication found that post-fire logging reduced woody surface fuels up to four decades following a wildfire in Eastern Washington (Peterson, Dodson, and Harrod 2015). Alternatively, a study from the Klamath Region found that areas that had been salvaged-logged and then planted following the Silver Fire in 1987 burned more severely in 2002, relative to previously unmanaged areas (Thompson, Spies, and Ganio 2008). These researchers also found that following severe wildfire in this region, young vegetation is at increased risk of re-burning at high-severity, regardless of whether it has been managed. The Proposed RMP/Final EIS has expanded the discussion of this conflicting science and the BLM identifies how this scientific conflict influences the BLM's ability to predict resource impacts in the Fire and Fuels section of Chapter 3.

133. Comment Summary: The BLM should revise the EIS because all alternatives proposed fail to adequately address post-disturbance salvage (or fuels mitigation) as a viable alternative to reducing high-intensity fires on the landscape.

Response: All alternatives in the Draft RMP/EIS addressed post-disturbance salvage harvest and fuels treatments. The Draft RMP/EIS included varied approaches to salvage harvest after disturbances such as wildfire (USDI BLM 2015, pp. 41–74). The commenter does not identify an approach to post-disturbance salvage or fuels mitigation that they believe that the BLM did not analyze in the Draft RMP/EIS.

134. Comment Summary: The BLM should revise the EIS to integrate fish and wildlife habitat objectives and mitigation actions into fire restoration and rehabilitation programs and actions intended to manage fuels or salvage burned-over areas.

Response: The alternatives considered in the Draft RMP/EIS included management direction and Best Management Practices designed to integrate aquatic habitat objectives and northern spotted owl recovery objectives. Under all alternatives, the Riparian Reserve and Late-Successional Reserve incorporate direction for the management of fuels in a manner that is beneficial to habitat objectives (USDI BLM 2015, pp. Appendix B). Specific Best Management Practices, designed to meet water quality goals, apply to fire and fuels management actions, including those for fire restoration and rehabilitation (USDI BLM 2015, pp. Appendix I). The commenter does not identify an approach to integrating habitat objectives and fire restoration and rehabilitation that they believe that the BLM did not analyze in the Draft RMP/EIS.

135. Comment Summary: The BLM should revise the EIS to include partial salvage approaches in land use allocations. The Draft RMP/EIS presents a range of post-fire salvage options, both within the Harvest Land Base and the reserves, that largely either salvage or not within entire land use allocations. Application of 'partial salvage' approaches could be useful in optimizing ecological function, reducing fire transfer risk to adjoining lands, retaining access needs, and providing for firefighter safety in subsequent fire events.

Response: The Draft RMP/EIS included varied approaches to salvage harvest after disturbances such as wildfire (USDI BLM 2015, pp. 41–74). The commenter mischaracterizes the approach to salvage in the alternatives as "either salvage or not." Several action alternatives would prohibit salvage harvest in some land use allocations under some circumstances, and would direct salvage in some land use allocations under some circumstances. Under the Proposed RMP, salvage harvesting would be permissible to recover economic value or minimize economic loss only in the Harvest Land Base. The Proposed RMP would prohibit salvage harvesting in Riparian Reserve and Late-Successional Reserve, except where necessary to protect public safety or to keep roads and other infrastructure clear of debris.

136. Comment Summary: BLM needs to manage fire prevention on O&C lands to protect private land. The EIS needs to address more than just fire resilience, but also wildfire response—both in the context of active fire as well as post-fire restoration, harvest, and reforestation activities. Congress recognized that to avoid problems, the fire protection on O&C lands must be in conformity with the fire protection programs of the State of Oregon.

Response: The Draft RMP/EIS explained that the full range of wildfire response tactics would be available under all alternatives. Maintenance of fire suppression-related infrastructure would not change among alternatives. The ability to conduct salvage harvest for purposes of protecting human health and safety within the dry forest would be available under all alternatives. Because these factors

would not differ among the alternatives, there is no reasonable basis on which to identify a difference in the effect of the alternatives on wildfire response at this scale of analysis, beyond the effects to landscape-level fire resilience, stand-level fire resistance, and stand-level fire hazard (USDI BLM 2015, p. 212). The commenter does not address this explanation.

The Oregon Department of Forestry currently provides fire protection and prevention services on Western Oregon BLM-administered lands under the Western Oregon Fire Protection Services contract. All alternatives and the Proposed RMP would continue to manage wildfire response consistent with current Federal wildland fire policy (USDA and USDI 2009, USDI BLM *et al.* 2015).

137. Comment Summary: The BLM should create a land use allocation designating all areas that are wildland-urban interfaces and 'ownership perimeter zones' (within 1 mile of BLM forest boundaries) as 'fuels management emphasis areas.' Priority action should be taken to reduce the risk of fire by treating forests in this 'Fuels Management Emphasis Area.' This area would be managed to address the forest protection values of adjacent non-federal landowners (e.g., roads, wildfire, pests, etc.), and the impact of lacking BLM management on these neighboring non-federal lands.

Response: The BLM has not established a land use allocation designation specifically emphasizing fuels management. Across all land use allocations, the BLM has identified management direction to "create fuel beds or fuel breaks that reduce the potential for high-intensity fire spread within the wildland urban interface and in close proximity to other highly valued resources (**Appendix B** – Management Objectives and Direction.) This management direction applies to all alternatives. The alternatives did not create a separate land use allocation for fuels management because this management direction would be included in all land use allocations in the alternatives. In addition to this management direction, the analytic extents of Issues 3 and 4 in the Fire and Fuels section both emphasize BLM-administered lands within one mile from Wildland Developed Areas. The Proposed RMP/Final EIS expanded the discussion of ownership patterns within the Community Wildfire Protection Plan defined Wildland Urban Interface in the Proposed RMP/Final EIS.

138. Comment Summary: The Draft EIS failed to address a strategy to reduce the number of large fires or how the agency intends to reduce the number of acres burned.

Response: None of the alternatives in the Draft RMP/EIS specifically included a strategy to reduce the number of large fires or reduce the number of acres burned. As stated in the Draft RMP/EIS, there is no accurate way to predict the exact location and timing of wildfires, and there is no reasonable basis upon which the BLM could analyze how land management at this scale could affect the number of large fires or the number of acres burned (USDI BLM 2015, pp. 211–212). Instead, the purpose of the action includes improving the resilience and resistance of frequent fire systems, so that if, and when, fires do occur, there would be a lower likelihood that fire would substantially alter forest structure, composition, or function. The commenter does not suggest a specific strategy that they believe that the BLM did not analyze in the Draft RMP/EIS.

139. Comment Summary: Since no alternative has substantial decreases in high-severity fire risks, the RMP should include information regarding what additional actions are needed to substantially reduce high-severity fire risk.

Response: The Draft RMP/EIS analyzed in detail the effects of the alternatives on fire resiliency, fire resistance, wildfire hazard, and risk from activity fuels. The Draft RMP/EIS did not specifically

analyze the risk of high-severity fire directly, because such an analysis would require fine-scale, stand-specific data, particularly related to surface fuels and canopy base height changes over time by alternative, which is impractical at this scale of analysis. The Draft RMP/EIS concluded that all alternatives would increase stand-level fire resistance and reduce wildfire hazard on BLM-administered lands compared to current conditions. The commenter does not identify any additional alternatives that they believe that the BLM should have analyzed in the Draft RMP/EIS.

140. Comment Summary: BLM needs to work with USFS to implement a cohesive wildland fire management strategy that allows more fires to burn unimpeded in the back country to reduce widespread damage to ecosystems from extensive and often ineffective fire suppression (see Ingalsbee and Roja 2015).

Response: Currently, the Oregon Department of Forestry provides wildfire protection services on BLM-administered lands, and operates in an inter-agency capacity with the U.S. Forest Service for border fires, via the Southwest Oregon Interagency Fire Management Plan (USDA FS, USDI BLM, ODF, and USDI NPS 2014). None of the alternatives would alter the inter-agency working relationships with State or Federal agencies in wildfire response coordination. For management on BLM-administered lands, the alternatives include management direction that would allow the use of natural fire to meet resource objectives (**Appendix B** – Management Objectives and Direction).

141. Comment Summary: The RMP addresses fire issues using fundamentally flawed forestry management science. The RMP/DEIS fire and fuels treatments are based on faulty premises, instead of evolutionary fire science and understanding of natural fire regimes from which native plants and animals evolved and of their importance to sustain natural community ecosystems. The approach to fire in all alternatives perpetuates unsustainable and destructive timber industry driven forestry management paradigm. BLM's RMP shows inherent biases reflected in the partial treatment of fire as a threat that needs suppression via mechanical treatments.

Response: The alternatives considered in the Draft RMP/EIS would allow that all natural ignitions can be managed with the full suite of fire management options (**Appendix B** – Management Objectives and Direction), including using fire to meet resource and land use objectives, when and where conditions might allow. Nevertheless, all alternatives also provide for a continuing need for wildfire suppression and fire risk mitigation, given the checkerboard land ownership pattern and that large portions of the decision area lie within 1 mile of human developed areas (USDI BLM 2015, pp. 197–200). The commenter does not specifically identify what forestry management science used in the Draft RMP/EIS that they believe is flawed.

142. Comment Summary: The EIS needs to include a more comprehensive literature review that includes the ecosystem benefits of mixed-severity fires, studies relevant to the region's fire regimes or forest types, the importance of complex early seral forests and their association with future late-successional stand development. BLM's fire science synthesis and Draft RMP/EIS do not provide a comprehensive literature review on the ecological importance of mixed-severity fires in maintaining fire-dependent biodiversity and complex early seral forests (Swanson *et al.* 2011, DellaSala and Hanson 2015); the complex pattern of fire-vegetation mosaics in this region is associated with high biodiversity (Odion *et al.* 2010, Donato *et al.* 2012, DellaSala and Hanson 2015) and complex early seral forests (Swanson *et al.* 2011); heterogeneity in fire behavior is an inherent and resilient property of mixed evergreen forests undervalued by BLM. This critically important natural heterogeneity

needs to be recognized in the Proposed RMP/Final EIS for its biodiversity benefits and not just risks to ecosystems.

Response: A literature review of heterogeneity in fire behavior in mixed evergreen forests is not necessary to understand the potential impacts of the alternatives on fire resiliency, fire resistance, wildfire hazard, and risk from activity fuels. The BLM has not included such a literature review in keeping with CEQ direction that environmental analyses should not be encyclopedic in nature but should focus on the information relevant to the decisions to be made (40 CFR 1500.4). The BLM has reviewed the materials referenced. One reference (Donato *et al.* 2012) had been included in the Draft RMP/EIS (USDI BLM 2015, p. 175), and the Proposed RMP/Final EIS has included several of the additional referenced citations where applicable to the planning area and issues being analyzed.

143. Comment Summary: BLM's fire synthesis lacks a discussion of uncertainty related to thinning efficacy in mixed-severity systems (see Odion *et al.* 2014a, DellaSala and Hanson 2015) and the EIS should recognize that fuel reduction efforts have limits including: the probability that a treated area will intersect a fire is very small (5–8 percent, Rhodes and Baker 2008); thinning is ineffective during extreme fire behavior, which may increase over time due to climate change (Littell *et al.* 2009); extensive thinning can contribute to fire spread by opening forest stands to increase wind penetration, increased light levels and associated plant growth, and increases in fuel loadings left by thinning slash. BLM creates the expectation (without quantifying uncertainty or at least reporting on model biases) that thinning will reduce fire intensity in mixed-severity fire regimes that are mainly climate driven fire events. The lack of a uncertainty discussion in the fire section of the Draft RMP/EIS and supporting appendix, and BLM's treatment of thinning as fire remediation, runs counter to several studies in the region that were not discussed (e.g., Odion *et al*. 2004, Thompson and Spies 2007, Hanson *et al*. 2009, Odion *et al*. 2010, Odion *et al*. 2014a).

Response: The Draft RMP/EIS acknowledged that extreme weather, drought, and prevailing climatic conditions have the ability to result in unexpected and extreme fire behavior, regardless of forest structure (USDI BLM 2015, p. 188). The Draft RMP/EIS also discussed the potential effects of open stands on fuels and fire behavior, including increased drying and surface winds (USDI BLM 2015, pp. Appendix H). Issue 4 of the Fire and Fuels section analyzed the increased wildfire risk that activity fuels can potentially pose, if they go untreated. The BLM has incorporated additional discussions of uncertainty regarding effectiveness of thinning and fuels treatments in the Proposed RMP/Final EIS in the Current Fire Climate Environment and Future Trends section of Chapter 3**.**

The BLM reviewed the materials referenced. While several of the references are regionally relevant, the literature referenced largely refers to the effects of even-aged management (plantations and salvage harvest and rapid reforestation) on resulting fire severity, thus providing information related to certain types of treatments and forest structure and resulting fire interactions. The BLM has incorporated several of these citations in reference to these types of treatments and forest structure. Unfortunately, the planning area does not have any regionally specific studies that specifically examine the effectiveness of fuels reduction treatments, including uneven-aged management or non-commercial thinning and prescribed burning, on resulting fire severity and fire behavior. As stated, a wildfire intersecting a fuels treatment is a relatively rare occurrence. However, over the past few years, there have been several opportunities, locally (Douglas Fire Complex, Twincheria Fire, Worthington Road Fire, Stratton Fire, Speaker Road Fire, Reeves Creek Fire, and several more), to observe compelling anecdotal evidence of these types of treatments moderating the fire behavior and fire effects when intersected by wildfires. The Proposed RMP/Final EIS has added expanded discussions of the effects of stand treatments on fire behavior and fire effects.

144. Comment Summary: For the Klamath-Siskiyou ecoregion, plantations burned in twice as much high severity area compared to natural forests (Odion *et al.* 2004). The influence of plantation management on fuel structure and fire severity needs to be included to present a more complete and regionally specific review of the pertinent literature. BLM needs to include the relevant regionally specific study (Odion *et al.* 2004) that documented greater high severity acres in plantations and contrast complex early seral with early seral produced by forestry for this table to be based on best science. Additionally, long-unburned areas with closed forest canopies in mixed evergreen forests of this region support more low severity fire than recently burned areas (Odion *et al.* 2004).

Response: The Draft RMP/EIS did reference Odion *et al.* (2004) and incorporated the findings of plantations burning at high fire severity and multi-layered closed canopy forest burning at low fire severity in the analytical assumptions (USDI BLM 2015, pp. 193, 197, 1127–1128).

145. Comment Summary: The Draft RMP/EIS does not include relevant peer-reviewed studies that have shown no recent (since 1984) increases in acres burned or fire severity in this region (see Hanson *et al.* 2009, Odion *et al.* 2014 a, b). The discussion of presumed recent increases in fire extent/severity (p. 176) is based on a citation to an industry document (OFRI) and BLM's prior WOPR and to an analysis by Westerling *et al.* (2006) that did not show an increase in fire severity nor is it appropriate to this region. Industry citations are not peer reviewed documents and neither is the BLM's prior WOPR – BLM needs to rectify the omission of regionally-specific peer-reviewed literature that runs contrary to BLM's assumptions.

Response: It is not clear how the commenter believes the cited literature "runs contrary to BLM's assumptions." The commenter cites studies to support the assertion that there has been no recent increase in acres burned or fire severity since 1984. While the Draft RMP/EIS acknowledged studies that the frequency of large fires and the acre burned have increased across the West and in Oregon, the Draft RMP/EIS modeled future wildfires based on the regional wildfire history from 1970 to 2013 (USDI BLM 2015, pp. 1045–1056). That is, the Draft RMP/EIS did not project forward any increase in acres burned or fire severity compared to the past four decades. The Draft RMP/EIS specifically acknowledged the uncertainty around trends related to fire severity and made no attempt to incorporate predictions of increased future fire severity (USDI BLM 2015, pp. 1050–1051). The BLM has reviewed the references identified and did not cite Hanson *et al*. (2009) or Odion *et al*. (2014 a/b), because they do not add any relevant information, given that the BLM has already concluded that there is no statistically significant trend in fire severity to incorporate into the wildfire modeling.

146. Comment Summary: The Fuels and Fire section's "Affected Environment" section for Issue 1 (p. 182) states there is a slight overabundance of early seral without contrasting early seral produced by industrial forestry vs. that produced by natural disturbances. There are documented differences in habitat quality between the two that need discussion (see Swanson *et al.* 2011, DellaSala *et al.* 2014). Additionally, Figure 3-33 lacks acreage value for early seral.

Response: The BLM has added discussion to the Proposed RMP/Final EIS that clarifies the seral-stage classification is based on structure and does not necessarily represent a functioning ecological state. The BLM has carried this acknowledgement into Issue 1 in the Fire and Fuels section of Chapter 3. The Proposed RMP/Final EIS corrected an error in the early seral acreage in **Figure 3-33** in the Draft RMP/EIS.

147. Comment Summary: The Draft RMP/EIS (p. 186) only mentions fire exclusion as resulting in departure from reference condition. The BLM needs to discuss how timber management has increased departure from reference conditions as well. BLM's lack of discussion on timber impacts in this section is not based on best science.

Response: The Draft RMP/EIS acknowledged that land management practices, such as timber management, combined with fire exclusion, have resulted in stands that are overly dense and missing large, fire-resistant trees (USDI BLM 2015, p. 175).

Fisheries

148. Comment Summary: Unexplained in the DEIS is the scientific basis for concluding that the proposed, substantially smaller Riparian Reserve and the proposed increased timber harvest activities within the smaller Reserves are sufficient for the needs of salmon and other riparian-dependent species.

Response: The Draft RMP/EIS does not make any comprehensive conclusion about whether the Riparian Reserve designs in the action alternatives are "sufficient for the needs of salmon and other riparian-dependent species." The Draft RMP/EIS provides analytical conclusions regarding the comparative effect of the alternatives related to specific issues. A conclusion about whether such effects constitute a management approach that is "sufficient for the needs" of ESA-listed fish is appropriately addressed through the ESA consultation process.

The commenter incorrectly states that the Draft RMP/EIS is making a conclusion about the sufficiency of the management approach for "other riparian-dependent species." As explained in the Draft RMP/EIS, none of the action alternatives in the Draft RMP/EIS includes the Aquatic Conservation Strategy in its entirety, as found in the No Action alternative, which included an objective of supporting well-distributing populations of riparian-dependent species, based on the U.S. Forest Service organic statute and implementing regulations (USDI BLM 2015, pp. 22–23). The BLM has not included a management objective for the Riparian Reserve based on the needs of all "riparian-dependent species," but has included objectives consistent with BLM laws, regulations, and policy.

Effects analysis in NEPA documents must demonstrate that the BLM took a 'hard look' at the effects of the action. A 'hard look' is a reasoned analysis containing quantitative or detailed qualitative information (USDI BLM 2008, p. 55). The Draft RMP/EIS includes a detailed and quantified analysis of the effect of the alternatives on wood supply to streams, sediment delivery to streams, stream temperatures, and peak water flows (USDI BLM 2015, pp. 219–233, 286–318). That analysis demonstrates that, for each of these issues, some or all of the action alternatives would result in effects that are equally protective of ESA-listed fish and water quality as the No Action alternative. The analysis in the Draft RMP/EIS contains quantitative information on the significant effects on ESA-listed fish at issue and interprets that information to form analytical conclusions about the comparative effects of the alternatives. That analysis constitutes a 'hard look' and provides the scientific basis for evaluating the effects of the alternatives on ESA-listed fish and water quality.

In a December 18, 2015 letter from NMFS to the BLM, NMFS acknowledged that these comments misinterpreted the Draft RMP/EIS and asked that the comments be ignored. NMFS clarified that they believe that the approach in the Northwest Forest Plan is not the only approach that would ensure the

protection and recovery of threatened and endangered fish, and that the best available science also supports an approach modified from Alternative A or D that includes a one site-potential tree height Riparian Reserve on fish-bearing streams and perennial streams.

149. Comment Summary: The DEIS should disclose the potential consequences of reducing aquatic resource protections for other agencies and conservation and land management efforts.

Response: The commenter's assertion that all action alternatives would reduce aquatic resource protection is without foundation and contrary to the analytical conclusions in the Draft RMP/EIS. The reduction in Riparian Reserve buffer size on some streams in the action alternatives does not directly equate to adverse effects on ESA-listed fish or water quality. The analysis in the Draft RMP/EIS demonstrates that, for each of the significant issues affecting ESA-listed fish and water quality, some or all of the action alternatives would result in effects that are as equally protective of ESA-listed fish and water quality as the No Action alternative (USDI BLM 2015, pp. 217–235, 286–320). Therefore, all of the alternatives have the ability to fulfill the BLM's present role in coordinating conservation and land management efforts with other agencies. The commenter provides no basis for the assertion that other agencies' efforts would be less effective under any of the action alternatives.

150. Comment Summary: The DEIS asserts (p. 225) that there will be no difference in large wood production among the alternatives. This assertion is clearly in error, for reasons discussed below, but it is also problematic because the basis for this statement was based on the obscure and poorly described wood modeling exercise performed as part of the 2008 WOPR FEIS (which was subsequently withdrawn, in part due to extensive criticism as to its technical merits).

Response: The commenter mischaracterizes the assertion in the Draft RMP/EIS, which states, "There is no meaningful difference <u>discernible at this scale of analysis</u> among the alternatives in their effect on potential wood contribution" (USDI BLM 2015, p. 225; emphasis added). The Draft RMP/EIS further acknowledges, "There are differences in the design of the alternatives that may have differential effects on potential wood contribution that the BLM cannot quantitatively evaluate at this scale of analysis." The Draft RMP/EIS proceeds to address qualitatively the specific differential effects that the alternatives could have on potential wood contribution based on Riparian Reserve widths, inner zone widths, and management direction for Riparian Reserve thinning (USDI BLM 2015, pp. 228–230). The commenter does not acknowledge or address this discussion of the specific differential effects that the alternatives could have on potential wood contribution. In a December 18, 2015 letter from NMFS to the BLM, NMFS acknowledged that these comments misinterpreted the Draft RMP/EIS and asked that the comments be ignored.

The commenter mistakenly asserts that the "2008 WOPR FEIS" was withdrawn because of "extensive criticism as to its technical merits." The Secretary of the Interior withdrew the Records of Decision for the 2008 FEISs in July 2009, because the approval of the Records of Decision was in 'legal error' because the BLM had not conducted Section 7 consultation under the ESA. In withdrawing the Records of Decision, the Secretary raised no question about the technical merits of the EIS on which the 2008 FEIS Records of Decision were based, and the Secretary did not withdraw the EIS. Subsequent to the withdrawal by the Secretary, the Court in *DTO v. Salazar* found that the Secretary's decision to withdraw the Records of Decision was arbitrary, capricious, and an abuse of discretion. In *Pacific Rivers Council et al. v. Shepard*, the Court vacated the 2008 FEIS Records of Decision, again because the BLM had not completed Section 7 consultation under the ESA, without mention of the technical merits of the EIS on which the 2008 FEIS Records of Decision were based.

Thus, neither the Secretary nor the Court raised any question about the technical merits of the EIS on which the 2008 FEIS Records of Decision were based.

Furthermore, the commenter suggests that the BLM cannot use analytical information from the 2008 FEIS. It is appropriate for the BLM to rely on information in the 2008 FEIS to the extent it provides high quality information relevant to the analysis for this RMP revision. The CEQ regulations direct agencies to incorporate such information by reference (40 CFR 1502.21). The BLM NEPA Handbook explains that the BLM can incorporate any such information by reference if the information is reasonably available for public inspection (USDI BLM 2008, p. 26). The analysis in the 2008 FEIS does provide high quality information relevant to this analysis and is available for public inspection. Thus, it is appropriate for the Draft RMP/EIS to incorporate that information from the 2008 FEIS by reference.

151. Comment Summary: Assertions that thinning will improve habitat conditions should be viewed cautiously and with skepticism. The burden of proof should remain on thinning proponents that thinning is likely to accelerate attainment of conservation goals.

Response: RMPs establish management direction to accomplish the management objectives, as directed in the BLM planning handbook (USDI BLM 2005, pp. 11–13). Actions implementing the RMP must be in conformance with the RMP; this means that the action is specifically provided for in the RMP, or if not specifically mentioned, shall be clearly consistent with the terms, conditions, and decisions of the approved plan (43 CFR 1601.0–5(b)). That is, the BLM may take actions if the actions are specifically directed in the management direction or clearly consistent with the management direction of the approved RMP.

The 1995 RMPs directed the implementation of those silvicultural activities (such as thinning) "...needed to attain Aquatic Conservation Strategy objectives." This required a test of any such management actions as thinning against broad-based ecological goals. This approach of testing implementation actions against management objectives was generally inconsistent with the BLM planning process. As a result, the requirements in the 1995 RMPs unnecessarily confused decision-making for thinning in Riparian Reserve by requiring testing site-specific projects against broad and aspirational goals at multiple spatial scales.

In contrast, the Proposed RMP and all action alternatives provide specific management direction regarding where and under what circumstances to thin stands in the Riparian Reserve (**Appendix B** – Management Objectives and Direction). The evaluation of proposed thinning in the Riparian Reserve under the Proposed RMP or any action alternative would be solely a test of conformance with the applicable management direction. Under the Proposed RMP and all action alternatives, there would be no "burden of proof" related to thinning in the Riparian Reserve beyond evaluating whether the action would be consistent with the management direction (as with all implementation actions), and there would be no test of such thinning against "attainment of conservation goals." The BLM would evaluate whether implementation actions would be successfully accomplishing management objectives in effectiveness monitoring of the RMP (**Appendix V** – Monitoring Plan for the Proposed RMPs).

152. Comment Summary: The RMP needs to include a complete evaluation of how artificial fertilizer will influence water resources, anadromous fish, and critical habitat.

Response: Under all alternatives, the BLM would not apply fertilizer in the Riparian Reserve. The Proposed RMP has added specific management direction that would preclude aerial application of fertilizer (**Appendix B** – Management Objectives and Direction). The Riparian Reserve would provide sufficient nutrient filtering to ensure that any fertilizer application in the Harvest Land Base would not have any significant effect on water resources, anadromous fish, or designated critical habitat for fish as discussed in the Fisheries and Hydrology sections of Chapter 3.

153. Comment Summary: Analysis is needed to address the special needs of streams and cold water fish in the Medford BLM District where the dry forest classification dominates.

Response: The potential effects of the alternatives on fish in the dry forest do not differ from the other portions of the decision area. The relevant issues for analysis of effects on fish relate to wood supply to streams, sediment delivery to streams, and stream temperature. The Draft RMP/EIS analyzed these effects similarly in the dry forest as in the rest of the decision area. The commenter does not identify any error in that analysis or any significant effect on fish not addressed in that analysis.

154. Comment Summary: There is very little information regarding the shortnose and Lost River suckers in the DEIS.

Response: The Proposed RMP/Final EIS has added information on the Lost River and shortnose suckers within the planning area (see the Fisheries section in Chapter 3). There is no Lost River sucker critical habitat on or adjacent to BLM-administered lands in the planning area. Approximately 9 miles (7 percent) of shortnose sucker critical habitat is adjacent to BLM-administered lands in the planning area and 1,076 acres adjacent to BLM-administered lands, primarily around the Gerber Reservoir in the Klamath Falls Field Office.

155. Comment Summary: The RMP/DEIS inadequately mapped the linear extent of critical habitat for federally listed fishes. Critical habitat helps focus Federal, tribal, state, and private conservation and management efforts in such areas. Management efforts may address special considerations needed in critical habitat areas—including conservation regulations that restrict both private and Federal activities.

Response: In conducting the analysis and in designing the alternatives, the BLM used datasets provided by the NMFS and BLM datasets on fish presence to map fish-bearing streams and streams with critical habitat for ESA-listed fish. The BLM used the NMFS data on critical habitat specifically in the design of the subwatershed classes in the Proposed RMP (see Chapter 2). The Proposed RMP/Final EIS has included maps of critical habitat in **Appendix I** – Fisheries.

156. Comment Summary: The RMP/DEIS fails to disclose that supposedly 'fishless' stream channels actually provide an important habitat. This could allow more intensive logging practices in areas that do not contain fish. The RMP/DEIS fails to identify the need to map these critical habitats as 'fish' streams.

Response: The BLM acknowledges that streams that appear to be non-fish-bearing streams can provide important habitat under some circumstances, and that non-fish-bearing streams are important components of the stream network, affecting downstream fish habitat. Under all action alternatives

and the Proposed RMP, the Riparian Reserve is the same for fish-bearing perennial streams, fish-bearing intermittent streams, and non-fish-bearing perennial streams. Therefore, all streams that could provide habitat for fish would receive the same level of protection under all action alternatives and the Proposed RMP.

157. Comment Summary: The RMP/DEIS failed to analyze migration barriers to federally listed fishes. The RMP/DEIS has no plan for the removal of coho passage barriers. The RMP/DEIS fails to provide a schedule for removing priority coho passage barriers within the decision area and fails to provide coordinated actions with 'partners' to remove coho passage barriers within the planning area.

Response: The Analysis of the Management Situation specifically described the fish passage barriers in the planning area, their effect on fish populations, and the effect of removal of these barriers on fish populations (USDI BLM 2013, p. 36). The Draft RMP/EIS incorporated that discussion by reference (USDI BLM 2015, p. 219). There is no reasonable basis on which the BLM could forecast a difference among the alternatives or the Proposed RMP in the future removal of fish passage barriers.

All alternatives include management direction to remove or replace culverts that currently block fish passage with culverts that pass fish and aquatic organisms at a range of flows. Removal of passage barriers is an important component of watershed restoration. The Proposed RMP/Final EIS has added discussion of how the BLM would implement watershed restoration under the Proposed RMP (**Appendix X** – Guidance for the Use of the Completed RMPs). Specifically, the BLM will use the BLM Western Oregon Aquatic Restoration Strategy in determining priorities for watershed restoration. The BLM Western Oregon Aquatic Restoration Strategy presents a restoration strategy that uses a combination of habitat based intrinsic potential modeling and professional field knowledge to focus restoration efforts in areas deemed likely to have the highest production potential for fish species of interest.

Although the BLM can coordinate with adjacent landowners in implementing restoration strategies, directing the removal of passage barriers on other land ownerships is not within the BLM's authority and not within the scope of the RMP.

158. Comment Summary: The DEIS/RMP failed to identify locally relevant management direction, specific management objectives for critical habitat, and site specific interagency coordination needed to recover bull trout.

Response: The Proposed RMP/Final EIS has expanded the discussion of bull trout in the decision area (see the Fisheries section of Chapter 3). A total of 3.6 miles of bull trout critical habitat occur within the decision area, comprising less than 0.1 percent of bull trout critical habitat. Bull trout are affected by the same key ecological processes as the ESA-listed anadromous salmonids in the decision area, allowing them to be analyzed together at this scale of analysis.

159. Comment Summary: Beaver activity increases coho production and needs to be addressed.

Response: The BLM agrees that beaver activity can improve habitat conditions for coho salmon. Riparian restoration treatments adjacent to coho salmon streams would promote forage and building material by enhancing streamside hardwoods and vegetation diversity. The Proposed RMP has added management direction to promote beaver habitat restoration in the Riparian Reserve (**Appendix B** – Management Objectives and Direction).

160. Comment Summary: The RMP alternatives failed to analyze impacts to the green sturgeon in their analysis.

Response: Because of the very limited distribution of the southern DPS of green sturgeon in the decision area, the BLM would have very limited ability to affect these fish through land management actions. The Proposed RMP/Final EIS has added information regarding the distribution of the southern DPS of green sturgeon and its critical habitat relative to BLM-administered lands and potential effects in the Background of the Fisheries section in Chapter 3.

161. Comment Summary: The DEIS/RMP fails to adequately describe how the cumulative effects of logging, roads, and other disturbances caused by timber operations have depleted large wood in streams and depleted future sources of large wood for 100 years or more.

Response: The Draft RMP/EIS summarized the effect of past actions on large wood in streams and the future sources of large wood (BM 2015, pp. 222–223). The Proposed RMP/Final EIS has expanded the discussion of the effects of past actions on large wood in streams and the future sources of large wood by incorporating by reference background information from the Analysis of the Management Situation (USDI BLM 2013, pp. 32–36) and the 2008 FEIS (USDI BLM 2008, pp. 372–390) regarding key ecological processes affecting fish population and aquatic ecosystems.

162. Comment Summary: The RMP/DEIS does not provide for streambed stability monitoring.

Response: The Proposed RMP/Final EIS includes a monitoring plan for the Proposed RMP in **Appendix V** – Monitoring Plan for the Proposed RMPs, which specifically states that the BLM would continue to rely on the existing interagency effectiveness monitoring modules to address key questions about whether the RMP is effectively meeting the objectives. The aquatic and riparian effectiveness monitoring program measures in-channel attributes, which provides a basis for evaluating streambed stability (**Appendix V** – Monitoring Plan for the Proposed RMPs).

163. Comment Summary: The RMP/DEIS fails to assess the cumulative effects of decreased summer flows in coho critical habitat.

Response: The Proposed RMP/Final EIS has added discussion explaining that the effects on low water flows are an issue that the BLM considered but did not analyze in detail. Given the no-harvest Riparian Reserve along streams and the limited extent of the Harvest Land Base under all alternatives, there is no reasonably foreseeable effect of harvesting outside of Riparian Reserve on low water flows (see the Hydrology section of Chapter 3). Given that none of the alternatives would have a reasonably foreseeable effect on low water flows, there is no need for an analysis of the cumulative effects of other action on low water flows.

164. Comment Summary: The RMP/DEIS does not address the cumulative effects of mining on coho habitat.

Response: The Proposed RMP/Final EIS has added discussion of the potential effects of mining on fisheries (see the Fisheries section of Chapter 3).

Forest Management

165. Comment Summary: The BLM should revise the EIS because it applies the wrong definition of 'sustain' to timber harvest calculations. The EIS applies the definition as "supply, support, or nourish." The intended meaning of 'sustain' in the O&C Act is to "preserve, maintain, and prolong in a conservation context."

Response: The Draft RMP/EIS appropriately applied the definition of "sustain" in the context of forest management for a sustained yield of timber as directed under the O&C Act (**Glossary**). Sustained yield is a forestry term that defines the level of timber harvesting that can take place on a forested area in perpetuity, at a given intensity of management; in other words, the level of timber harvest that can be maintained over time.

Therefore, complying with the principles of sustained yield requires the BLM to verify mathematically that timber harvest levels will not decline over time due to overcutting practices. For the Proposed RMP and alternatives, the BLM has modeled a repeated cycle of harvest and regrowth that does not decrease over time (**Appendix C** – Vegetation Modeling, for more details on methodology). The BLM has applied the definition of sustained yield as intended under the O&C Act: to provide for a maintainable level of harvest, guarding against the overcutting that the O&C Act sought to end.

166. Comment Summary: The BLM should revise the EIS to distribute harvest levels and annual sale quantities (ASQs) evenly throughout the entire decision area.

Response: In accordance with the O&C Act, the BLM calculated a sustained-yield level for each of the six designated sustained-yield units, which currently correspond with the boundaries for Coos Bay, Eugene, Medford, Roseburg, and Salem Districts, and the area west of Highway 97 in the Klamath Falls Field Office. Inputs into this calculation include the inherent timber productivity of the land, current timber inventories, intensity of timber harvest, and areas reserved from timber harvest to help meet BLM's obligations under the Clean Water Act and the Endangered Species Act, among other laws, as well as meet the purpose and need for the action and the management objectives described in the alternatives. The annual sustained yield of timber calculation is an output of these various input factors and, because of differences in forest ecosystems and differences in approaches to meeting other laws, the result is different sustained-yield volumes in each sustained-yield unit.

167. Comment Summary: The BLM should revise the EIS to allow for on-site discretion when selecting modern harvesting methods rather than limiting them beforehand. The EIS should also allow road building where necessary for efficient operations, and reduce the reliance on more expensive helicopter logging.

Response: The BLM agrees that many harvesting decisions are best informed based on site-specific information. The action alternatives do provide management direction that directs and restricts harvesting methods, such as requiring a range of green tree retention levels or a suite of harvesting techniques. The BLM has developed these restrictions as necessary to comply with the guidance in the RMP revision, which directed that all action alternatives provide a high degree of predictability and consistency about implementing land management actions (USDI BLM 2015, p. 12).

Nevertheless, the BLM disagrees that management direction developed at this planning level would unreasonably restrict site-specific decisions to select harvest methods and logging methods prior to project implementation. The Proposed RMP allows wide discretion on harvest methods employed and includes a comprehensive set of Best Management Practices that BLM timber sale planners can use to customize contract stipulations to site-specific conditions. The Proposed RMP also directs the BLM to allow new road construction based on operational needs (**Appendix B** – Management Objectives and Direction, **Appendix J** – Best Management Practices). Helicopter (aerial) yarding will continue to be required in certain circumstances based on site-specific information, as the BLM implements the RMP; however, the BLM would identify yarding methods based on site-specific review during implementation project planning and not on determinations made at this larger-scale of analysis.

168. Comment Summary: The BLM should revise the EIS because the BLM uses subjective terms to describe logging intensity without providing data or literature to support classifications. Retaining 5–15 percent of the forest in a cut block is more extreme than moderate. The BLM provides no basis for quantifying how these intensities relate to wildlife impacts, soil, hydrology, cumulative effects, fire risks, etc. What the BLM classifies as low intensity in owl habitat has no basis in any literature on intensity of effects of logging on the northern spotted owl.

Response: The BLM chose to label Harvest Land Base sub-allocations in the Draft RMP/EIS conceptually, describing the management approaches in each relative to each other. The Harvest Land Base sub-allocation names listed in order of intensity from highest to lowest follow: High Intensity Timber Area (0 percent retention clearcuts), Moderate Intensity Timber Area (5–15 percent retention variable-retention regeneration harvest), Low Intensity Timber Area (15–30 percent retention variable-retention regeneration harvest), Uneven-aged Timber Area (fire resiliency uneven-aged management), and Owl Habitat Timber Area (owl habitat uneven-aged management). The BLM does not use these labels to inform analysis of environmental impacts, only to distinguish one sub-allocation from another.

169. Comment Summary: The BLM should revise the EIS because variable-retention or clearcutting on BLM lands is not necessary to create complex early successional habitat, since natural disturbances have been creating this sort of habitat in abundance. Leaving burned areas unsalvaged and unplanted would provide all of the complex early seral habitat necessary, and therefore clearcutting is not needed.

Response: The range of alternatives in an EIS for an RMP must present reasonable alternatives to accomplishing the stated purpose and need for action. The Draft RMP/EIS evaluated a variety of management intensities within the Harvest Land Base in the action alternatives in order to evaluate tradeoffs related to timber production and forest structural development, along with other environmental effects. As explained in the Forest Management section in Chapter 3, the higher intensity management practices tend to produce higher levels of sustained-yield timber production on a given acre of timberland.

All of the action alternatives include either variable-retention harvest or clearcutting on some portion of the decision area, to achieve a variety of purposes. All action alternatives would apply either variable-retention harvest or clearcutting to produce timber to contribute to the attainment of the Allowable Sale Quantity (USDI BLM 2015, pp. 276–280). Alternatives B and D include producing complex early successional ecosystems as one of several purposes for applying variable-retention harvest (USDI BLM 2015, pp. 949, 951, 978). Alternatives A and C, the only alternatives that would apply clearcutting, do not include producing complex early successional ecosystems as one of several

purposes for applying clearcut harvests. The Draft RMP/EIS did not contend that variable-retention harvest was necessary to create complex early successional habitat, only that it was one permissible purpose for implementing variable-retention harvest. That it is not the only means to create complex early successional habitat does not invalidate the use of variable-retention harvest for that purpose or for the several other purposes described in Alternatives B and D.

170. Comment Summary: The BLM should revise the EIS because the Forest Management section gives no information on how reforestation of logged areas would be achieved. The method of reforestation affects the quality and duration of the early seral stage that provides vital habitat for certain plants and wildlife. Early seral acreages are listed for the alternatives, but no clear definition is given of this stage.

Response: The BLM has added to the Proposed RMP/Final EIS additional information on how the BLM would achieve reforestation and additional information on the early seral stage of structural development (see the Forest Management section in Chapter 3). The definition of seral stage classes, including early seral, are included in the **Glossary**. The Proposed RMP includes management direction requiring reforestation within five years after regeneration harvest (**Appendix B** – Management Objectives and Direction). However, the Proposed RMP provides flexibility in specific reforestation methods based on site-specific conditions.

171. Comment Summary: The BLM should revise the EIS because Alternative B risks serious reforestation failures on the 282,445 acres on which low and moderate intensity practices would be applied because of vegetative competition in western Oregon forests. For these reasons, prohibiting tree planting seems inappropriate given statutory responsibilities to manage O&C lands for sustained-yield timber production.

Response: The Proposed RMP includes management direction requiring reforestation within five years of regeneration harvest in both the Moderate Intensity Timber Area and the Low Intensity Timber Area and would allow both natural and artificial reforestation (tree planting) (**Appendix B** – Management Objectives and Direction).

172. Comment Summary: The BLM should revise the EIS to increase the percent of a stand that may be left un-stocked after regeneration harvest from 10 percent under Alternative B to 25 percent. This would allow for rare situations where up to 25 percent of the stand may be desired to be left un-stocked. Page 952 states that up to 10 percent of the stockable stand may be left un-stocked. The Service encourages the BLM to consider a higher percentage available for natural regeneration for rare situations where up to 25% of the stockable stand may be desired to be left un-stocked.

Response: The Proposed RMP requires the BLM to reforest using natural or artificial regeneration within five years of harvest to a minimum stand level average density, which varies by Harvest Land Base sub-allocation. This direction in the Proposed RMP affords the BLM the discretion to vary planting densities across a harvest unit depending on site-specific information, and does not include the specific limitations on stocking in Alternative B.

173. Comment Summary: The BLM should revise the EIS to include silvicultural management, such as longer rotations to achieve a more diverse log supply, which would increase timber values to fulfill fiscal responsibility to counties.

Response: Both the Low Intensity Timber Area and the Moderate Intensity Timber Area in the Proposed RMP utilize long rotation management as a forest management strategy, resulting in a diverse log supply. Additionally, the uneven-aged management approach in the Uneven-aged Timber Area involves partial cutting of stands on an irregular re-entry cycle, which would also contribute to the variety of sizes and qualities of harvested timber. The BLM added additional information to the Forest Management section of the Proposed RMP/Final EIS that reports average regeneration harvest ages by alternative, and has provided an estimate of timber harvest volume by log size.

174. Comment Summary: The BLM should revise the EIS because direction in the LITA and MITA in the action alternatives contains direction for tree retention in regeneration harvest dependent on the amount of Riparian Reserve area in the stand. This will reduce the quality of habitat for northern spotted owls.

Response: The Proposed RMP does not include this management direction when determining retention levels for the Low Intensity Timber Area and Moderate Intensity Timber Area. Instead, the Proposed RMP requires tree retention based on retention of a portion of the pre-harvest tree basal area calculated solely on the timber harvest area. This change allows for clearer management direction and facilitates determination of retention levels based on site-specific information during project-level implementation planning.

175. Comment Summary: The BLM should revise the EIS to preclude management that would allow canopy closure to fall below 30 percent. Anything below this level leads to high densities of brush, increasing catastrophic fire risk.

Response: The BLM disagrees that reducing canopy closure below 30 percent necessarily increases catastrophic fire risk. The relationship of canopy closure to fire risk and its relative importance is site specific and depends on a number of factors, including ecological context and management objectives. Nevertheless, reducing canopy cover below 30 percent is necessary to achieve many forest management objectives. To achieve the BLM's stated purpose of producing a sustained yield of timber, creating forest openings large enough to grow new cohorts of trees is necessary. Many species in the planning area rely on shrubs, hardwoods, and other sun-loving forest plants for their survival. In order to develop multi-layered canopies to enhance ecological outcomes, it may be necessary to allow enough sunlight through the canopy to grow a new generation of trees. A thorough analysis of the environmental effects of forest management actions on fire and fuels is contained in Chapter 3. This analysis did not find that the BLM would implement timber management in a manner that would increase the risk of catastrophic fire under any of the alternatives.

176. Comment Summary: The BLM should revise the EIS to exclude timber salvage as a management option after wildfires. Many studies have shown (Beschta *et al.* 1995) the destructive nature of timber salvage and the negative effect it has on forest regeneration. Short-term financial gains should not outweigh best ecological practices.

Response: The Proposed RMP directs salvage harvest after disturbances in the Harvest Land Base to recover economic value and to minimize commercial loss or deterioration of damaged trees, but prohibits salvage harvest in the Late-Successional Reserve and Riparian Reserve except when necessary to protect public safety, or to keep roads and other infrastructure clear of debris (**Appendix B** – Management Objectives and Direction). The BLM is aware of studies on the environmental

impacts due to post-fire salvage logging, including the white paper produced by Beschta *et al.* (1995). That white paper focuses on the wisdom of salvage logging to meet ecological objectives. The BLM agrees that there is scientific controversy regarding the justification to salvage burned timber to enhance wildlife habitat outcomes. The same level of scientific controversy does not exist related to salvaging burned timber to recover economic value or removing dead trees for the purposes of protecting infrastructure and providing for public safety.

177. Comment Summary: The BLM should revise the EIS to include forest management that accelerates resilience treatments in the dry and very dry forest types.

Response: All action alternatives and the Proposed RMP would increase resilience treatments in dry and very dry forest types compared to current practices. **Appendix B** – Management Objectives and Direction includes management direction for the Proposed RMP relevant to the management of these forests in the Uneven-aged Timber Area, the Late Successional Reserve – Dry, and the Riparian Reserve – Dry. The management direction for Late Successional Reserve – Dry also includes target decadal acreage treatment targets to help meet the purpose of restoring fire-adapted ecosystems.

178. Comment Summary: The BLM should revise the EIS to retain legacy trees (>120 years) in all cases in harvest units, as these trees are the best habitat and most fire resistant.

Response: The Proposed RMP has incorporated management direction to protect large, older trees. The BLM disagrees that the best management approach to responding to the purpose and need for the RMP revision or meeting all objectives of the Harvest Land Base would be to apply a requirement to protect all trees above a 120-year age threshold. Coupled with regeneration harvest with retention or uneven-aged stand management, such a requirement would eventually reduce the timber production level of the stand, contrary to the purpose of the action to produce a sustained yield of timber. It is intuitively clear that if the BLM retains 15–30 percent of the stand basal area (or 5–15 percent in the Moderate Intensity Timber Area) and retains all trees over 120 year old, the abundance of trees over 120 years old will increase through successive harvesting rotations, so that eventually more than 15–30 percent of the stand basal area will be comprised of trees over 120 years old. Instead, the Proposed RMP would protect trees that are old *and* large in certain land use allocations, while allowing for necessary exceptions related to safety and operations. The Proposed RMP also includes management direction for the Uneven-aged Timber Area and the Late Successional Reserve – Dry directing the BLM to reduce competition around these trees and reduce adjacent fuels to increase tree vigor and reduce the risk of tree mortality (**Appendix B** – Management Objectives and Direction). These management directions would protect the majority of legacy trees within harvest units with characteristics contributing the most to complex habitat and would provide for forest resiliency.

179. Comment Summary: The BLM should revise the EIS because cutting timber stands within the Deer Creek Watershed contradicts the Medford District BLM's Water Quality Restoration Plan and is environmentally detrimental.

Response: The Water Quality Restoration Plan for the Deer Creek Watershed (USDI BLM 2011b) is not an existing decision supported by an EIS that the BLM is carrying forward into the RMPs under this revision (see Chapter 1, Existing Decisions). As such, there is no requirement for any of the action alternatives or the Proposed RMP to adhere to the goals and objectives established under the Water Quality Restoration Plan for the Deer Creek Watershed. The Draft RMP/EIS did not find any detrimental environmental impacts to water quality in the decision area, including the Deer Creek

watershed, under any of the alternatives (USDI BLM 2015, pp. 286–318). The commenter does not identify any errors in that analysis.

180. Comment Summary: The EIS should not include pre-decisional approval for BLM to conduct falling of trees in proposed logging units as a timber cruising mechanism as is shown in Chapter 2 (p. 39). The impacts of this proposed practice are not disclosed or analyzed in this document, and implementation without analysis would violate the NEPA.

Response: This listing of administrative actions is not a "pre-decisional approval" of these actions. Land use plans are designed to guide and control future uses, including describing allowable uses (40 CFR 1601). The Draft RMP/EIS provided a list of administrative activities that would be allowable and that the BLM anticipates would occur under all alternatives (USDI BLM 2015, p. 39). The BLM would conduct the appropriate NEPA compliance to support decision-making prior to implementation of sample tree falling and other administrative actions.

181. Comment Summary: The BLM should revise the EIS because it fails to describe the connection between logging road density and timber harvest density with Port-Orford-cedar root disease occurrence. Studies have found that both road networks and timber harvest patchworks were significantly related to cedar root rot heterogeneity (Clark 2011).

Response: As explained in the Draft RMP/EIS, the BLM would continue to apply management of Port-Orford-Cedar in accordance with the Record of Decision and Resource Management Plan Amendment of Management of Port-Orford-Cedar in Southwest Oregon, Coos Bay, Medford, and Roseburg District (USDI BLM 2004), and the Draft RMP/EIS incorporated the analysis conducted for the 2004 Port-Orford-cedar ROD by reference (USDI BLM 2015, p. 23).

The implementation of the Proposed RMP is well within the bounds of outcomes considered in the 2004 ROD for Port-Orford-cedar management. The road construction projected under the Proposed RMP would be less than road construction projected under the No Action alternative (see the Trails and Travel Management section in Chapter 3), and is within the range of effects considered in analysis for the 2004 Port-Orford-cedar ROD.

The Standards and Guidelines in the 2004 Port-Orford-cedar ROD describe all currently available disease-control practices, dividing them between those that should be applied generally (e.g., community outreach and restoration) and those that may, depending on site conditions, be applied to specific management activities (e.g., road construction and timber sales). For the latter group, the 2004 Port-Orford-cedar ROD includes a risk key to clarify the environmental conditions that require implementation of one or more of the listed disease-controlling management practices (USDI BLM 2004, pp. 32–37). Under all alternatives and the Proposed RMP, the BLM would apply the risk key during site-specific project planning. This approach precludes the need for additional project-specific analysis of mid-and large-geographic and temporal-scale effects, because the risk key describes conditions where the BLM would apply risk reduction management practices.

Hydrology

182. Comment Summary: Given the impaired nature of so many of our rivers, no increase in temperature originating with deliberate BLM actions can be tolerated, let alone the predicted 5 percent the DEIS identifies as a result of adopting either of the Alternatives B or C.

Response: The Proposed RMP includes a Riparian Reserve design for fish-bearing streams and perennial streams that is substantially similar to Alternative D.

The Draft RMP/EIS analyzed stream shading using two different methodologies. Method A concluded that all streams would retain sufficient stream shading to avoid any measurable increase in stream temperatures. Method B identified that approximately 5 percent of fish-bearing and perennial stream miles under Alternatives B and C and approximately 0.5 percent of fish-bearing and perennial streams under the No Action alternative, Alternative A, and Alternative D would be susceptible to shade loss that could result in stream temperature increases (USDI BLM 2015, pp. 294–297). The analysis in the Proposed RMP/Final EIS concludes that the Proposed RMP would have similar effects on stream shade to the No Action alternative, Alternative A, and Alternative D (see the Hydrology section of Chapter 3). Under Method B, the analysis concluded that this shade loss would occur if the outer zones of the Riparian Reserve were to be treated. Such conditions occur most frequently, where the riparian stand nearest the stream has widely spaced trees with a low canopy density. There would be no change in stream shading if the BLM were to not thin stands in the outer portions of the Riparian Reserve in these susceptible areas. Given that the riparian stands in these susceptible areas typically have low tree density and low canopy density, thinning the Riparian Reserve under such stand conditions would be unnecessary to comply with the management direction and meet the management objectives in any of the alternatives. Under such circumstances, the BLM would either defer forest management in the outer zones of these stream segments until the riparian stand nearest the stream increased in density or leave the Riparian Reserve un-thinned along these stream segments. In either case, it is unlikely that any of these areas susceptible to shade loss that could potentially result in stream temperature increases would, in fact, experience stream temperature increases.

183. Comment Summary: Raising stream temperatures directly inhibits BLM watershed management goals and may result in violations of the Clean Water Act associated with TMDL-listed waterbodies.

Response: The Draft RMP/EIS analyzed the effects of the alternatives on stream temperatures through two methodologies that assessed stream shading. The first methodology concluded that all alternatives would avoid any measurable increases in stream temperature at this scale of analysis. The second methodology found that a small percentage of streams would be susceptible to an increase in stream temperatures under all alternatives, including the No Action alternative. The Draft RMP/EIS explained that this result does not reflect an actual reduction in stream shading, but a susceptibility to such a reduction in stream shading if the BLM thins the outer zone along these streams. If the BLM does not thin the stand in the outer zone, no reduction in stream shading would occur (USDI BLM 2015, pp. 286–297). Thus, the analysis in the Draft RMP/EIS identified a susceptibility to a reduction in stream shading that would occur under all alternatives; any actual increase in stream temperature is speculative and would depend on project-specific and site-specific conditions. The Proposed RMP/Final EIS specifically identifies the stream segments that would be susceptible to a reduction in stream shading.

184. Comment Summary: The Hydrology section (DEIS:286–297) and Fisheries section (DEIS:232–233) are inadequate because they focused almost entirely on shade models with respect to impacts of timber harvest and failed to consider stream temperature change in the context of climate change.

Response: The Draft RMP/EIS acknowledged the potential future effect of climate change on stream temperatures (USDI BLM 2015, pp. 149–150). However, it is not possible to incorporate predictions of climate change into the modeling of stream shading and subsequent effects on stream temperature. There is much uncertainty regarding climate change and effect upon stream temperature response, especially in the next 10–20 years. Despite increased average annual and seasonal air temperatures in the planning area, the analysis in the Draft RMP/EIS noted the decreasing stream temperatures at long-term monitoring sites within the planning area (USDI BLM 2015, pp. 143, 293–294). Riparian forest stand development with corresponding increasing shade has apparently had a countervailing effect on warming air temperatures. It is not possible to forecast quantitatively how future riparian forest stand development would interact with increasing annual and seasonal air temperatures to affect water temperature.

185. Comment Summary: The BLM is using hydrological analysis that is biased and incomplete throughout the entire RMP. The BLM limits the hydrologic analysis to "peak flows." The BLM must address the impacts of all alternatives on low flows not just peak flows. The BLM fails to mention that there can be significant impacts caused by even small increases in the 1–2 year peak flows. The BLM's model is biased in that it only considers peak flow impacts to be of concern in the Rain-on-Snow (ROS) transitional zone within watersheds.

Response: There is no substantive basis for the commenter's assertion that the BLM is using hydrological analysis that is biased and incomplete.

The BLM chose a hydrological analysis that could compare the alternatives and potentially detect a change based on the analytical assumptions within the current hydrological understanding on how watershed systems work.

The commenter asserts that the BLM misrepresents Grant *et al.* (2008) in the peak flow analytical procedure when interpreting the peak flow response for the rain hydroregion and the rain-on-snow hydroregion in Figures 8 and 10 of Grant *et al.* (2008). The threshold of response is not an inflection point, but is the point where the mean response line crosses into the level of detection. These response curves should be applied cautiously when scaling up to larger watersheds such as the subwatershed scale (HUC 12) used in this analysis (Grant *et al.* 2008). Most experimental watershed studies have been conducted at the site scale (< 4 mi^2). However, the magnitude of peak flow response by forest management declines as watershed area increases, for a variety of reasons: storm size and variability over a watershed, timing of tributary inputs, conveyance losses, flood-plain storage, and channel resistance (Grant *et al.* and references cited therein 2008). There is no known hydrologic mechanism to yield a higher percentage increase in peak streamflows in a larger watershed (Grant *et al.* 2008). Because of these scaling-up challenges, the BLM believes the peak flow analytical procedure is conservative in the estimation of effects.

The BLM has added text to the Proposed RMP/Final EIS to explain that the BLM did not analyze in detail the effects of timber harvest on flow attributes other than peak flows (see the Hydrology section of Chapter 3). Specifically, the BLM did not analyze in detail the effects on other flow attributes, such as timing, annual water yield and low flows because either: (1) an effect is negligible or not detectable, (2) climate variability cannot be separated from the effects of forest management, (3) no known practicable analysis procedures are available to compare alternatives at the planning area scale for contemporary forest practices, or (4) specific and plan-wide streamflow information is not available in order to conduct an analysis. The commenter does not provide any alternate methodologies to evaluate these hydrological attributes at the planning area scale.

186. Comment Summary: Overstocked forests will reduce water availability. Too many trees cause snow not to reach the ground.

Response: The BLM has added text to the Proposed RMP/Final EIS to explain that the BLM did not analyze in detail the effects of timber harvest on water yield (see the Hydrology section of Chapter 3).

The commenter is correct that dense forests can reduce water availability. Forest evapotranspiration is the primary process responsible for changes in water yield as a result of cutting trees or growing trees. Results from thirty-nine paired watershed studies referencing changes in water yield from changes in forest cover conclude: (1) reduction of forest cover increases water yield, (2) planting forests on bare land, meadows or understocked forests decreases water yield, and (3) the response is highly variable and at times unpredictable (Brown *et al.* 2005 and references therein). Snow accumulation in the forest depends upon forest structure and density. Nevertheless, none of the alternatives would have a significant effect on water availability. Therefore, this issue does not require detailed analysis.

187. Comment Summary: The RMP needs to assess how clearcutting may deplete ground water supplies because regenerating trees are vigorously growing and can absorb greater volumes of water.

Response: The BLM has added text to the Proposed RMP/Final EIS to explain that the BLM did not analyze in detail the effects of timber harvest on water yield (see the Hydrology section of Chapter 3).

Clearcutting or other timber harvest under any of the alternatives would not have a consequential effect on ground water supplies. Therefore, this issue does not require detailed analysis. There is little substantive basis for the commenter's conclusions. Paired watershed deforestation experiments (including clearcutting) and regrowth of vegetation in experimental studies worldwide, show that water yield increases and gradually returns to the control watershed yields in 8–20 years (Brown *et al.* 2005 and references cited therein). The BLM acknowledges that some studies suggest that young forests transpire water to a greater degree than older forests, and this may have something to do with leaf area or sapwood area (Moore *et al.* 2004). However, beyond the reasons why young trees may transpire water more efficiently than older trees of the same species in a similar environment, there is little information to separate the evapotranspiration demand in young trees from the evapotranspiration demand in mature forests. Further, precipitation and runoff processes mask influences on water yield from differing vegetation, where a measurable difference in groundwater flow or annual yield can be demonstrated. Thus, even if the alternatives could have a consequential effect on ground water supplies, it would not be possible to construct an analysis of the effect of different harvesting practices on ground water supplies that could show any difference among the alternatives.

188. Comment Summary: Factors such as winter base flows, summer low flows, total flow volumes and the timing and duration of flows should be considered within the watershed analysis for each alternative.

Response: The Proposed RMP/Final EIS has added explanation of these issues that the BLM considered, but did not analyze in detail (see Hydrology section of Chapter 3).

189. Comment Summary: Alternatives do not properly address all possible sources of water into forest hydrological systems.

Response: The analysis in the Draft RMP/EIS analyzed the effects of the alternatives on water quality and timing of flows, including effects on stream shade, peak flows, and sediment (USDI BLM 2015, pp. 286–320). The BLM has added text to the Proposed RMP/Final EIS to explain that the BLM did not analyze in detail the effects of timber harvest on water yield (see the Hydrology section of Chapter 3).

190. Comment Summary: The Affected Environment and Environmental Consequences should consider the studies and results of the research done by the Oregon State University Watersheds Research Cooperative.

Response: The BLM agrees that research done by the Oregon State University Watersheds Research Cooperative is relevant and pertinent information for contemporary forest management, but cautions that much of the information was developed for industrial forestland. Because of the substantial differences between industrial forestland management and the alternatives considered in this analysis, especially with regards to riparian stand management, the research from the Oregon State University Watersheds Research Cooperative is only of limited relevance. The BLM has included relevant information from the research from the Oregon State University Watersheds Research Cooperative in the Proposed RMP/Final EIS (see the Hydrology section of Chapter 3).

191. Comment Summary: The Draft RMP/EIS does not address public safety and conservation concerns impacted by shallow, rapidly moving landslides, and also do not address Best Management Practices for future harvest to reduce the potential for landslides in proximity to the State's highway system.

Response: The Proposed RMP has added management direction that directly addresses avoiding practices that could cause landslides that would damage infrastructure such as highways (see **Appendix B** – Management Objectives and Direction). In addition, the Proposed RMP includes unstable lands within the Riparian Reserve, limiting management actions that would occur on unstable lands.

192. Comment Summary: Although regeneration harvest has a higher likelihood of increasing landslide frequency, thinning can also increase the frequency of landslides, depending on the harvest intensity. Reduced shear strength, associated with increased saturation, results from decreased tree canopy interception and reduced transpiration (Swanston 1973, Harr and McCorison 1979, Keim and Skaugset 2003, Johnson *et al.* 2007). NOAA recommends that the BLM analyzes the potential effects of thinning on landslide risk, particularly in areas that will receive high intensity thinning prescriptions (> 80 trees per acre, post thinning).

Response: The analysis of landslide risk necessarily requires considerable analytical assumptions. The BLM analyzed the effect of regeneration harvests on landslide risk. This analysis of regeneration harvests would include variable retention harvests that would retain of up to 30 percent of the basal area of the stand (e.g., the Low Intensity Timber Area in Alternative B). (The BLM believes the commenter meant < 80 trees per acre, post thinning in their comment).

The Draft RMP/EIS explained the basis for the analytical assumption that commercial thinning would not affect landslide risk: residual live trees with intertwined roots promote slope stability and transpire water, which helps to lower soil water, a causative factor in slope failures, and many cut stumps are root-grafted and continue to contribute to slope stability (USDI BLM 2015, pp. 307–308). Landslide density for extreme storms in mixed forests of 10–80 years of age (which includes the ages at which stands are typically thinned) is 2.7 times lower than open areas (Miller and Burnett 2007). As the commenter acknowledges, thinning has less effect on landslide risk than regeneration harvest. The BLM does not contend that thinning has no effect on landslide risk, but only that the effect is small and speculative, such that it would not be possible to analyze that risk at the scale of the planning area and would not show any measurable effects among the alternatives.

193. Comment Summary: Best Management Practices are not a Management Direction; there is an element of uncertainty related to the location of road construction, therefore we recommend that the FEIS should include a comprehensive analysis of landslide risk from new road construction.

Response: It would not be possible to analyze the effects of new road construction on landslide risk at the scale of the planning area. Whether new road construction could contribute to landslide risk would depend on the specific road location and construction relative to areas of landslide susceptibility. The BLM cannot specifically forecast the spatial locations of new road construction under the alternatives and therefore cannot match road locations with topographic attributes to determine a relative landslide density.

New road construction is unlikely to contribute to landslide risk. All alternatives would construct little new road mileage compared to the existing road network (Draft RMP/EIS, pp. 648–650). New road construction would generally not be located in areas of landslide susceptibility. Most new construction would likely be short spurs off local roads, because the existing road infrastructure meets much of the needs for resources management, especially timber harvest. Under the alternatives considered in the Draft RMP/EIS, Best Management Practices would include locating roads on stable locations and minimizing construction on steep slopes and high landslide hazard locations (USDI BLM 2015, p. 1140).

It was appropriate for the Draft RMP/EIS to analyze effects incorporating the effect of Best Management Practices. As explained in the Draft RMP/EIS, monitoring has shown that the BLM has generally applied Best Management Practices appropriately and that Best Management Practices have generally been effective (Draft RMP/EIS, p. 1140). Thus, it is highly probable that the BLM will continue to apply Best Management Practices appropriately and that they will continue to be effective. The commenter does not address these monitoring results or explain how they believe the BLM should address what they perceive as "uncertainty" associated with Best Management Practices. Nevertheless, the Proposed RMP has added management direction that directly and specifically addresses road construction on unstable slopes (**Appendix B** – Management Objectives and Direction).

194. Comment Summary: The EIS needs to consider potential landslides and other effects from a catastrophic Cascadia Subduction Zone earthquake.

Response: A major earthquake on the Cascadia Subduction Zone is possible within the timeframe of the landslide analysis, but is not highly probable. The U.S. Geological Survey identifies that the last major earthquake on the Cascadia Subduction Zone was about 300 years ago and describes an average interval of 500–600 years between great earthquakes on the Cascadia subduction zone

(Personius and Nelson 2006). Thus, a major earthquake is not reasonably foreseeable for the purposes of this landslide analysis and should not be included in the analysis. Furthermore, the effects of a major earthquake would not differ among the alternatives. This is because, in the event of a magnitude 8–9 earthquake, the main trigger for landslides will be from the extreme shaking intensity interacting with susceptible landforms and the degree of soil saturation. Mountain road locations or harvest practices will be of inconsequential importance for initiating slope failures, because the earthquake will likely trigger all types of landslides from debris-flows to large deep-seated rock slides in roaded and unroaded areas alike.

195. Comment Summary: Best Management Practice 'R 094' (in Appendix I) should be re-designated as management direction and incorporated into Appendix B. Limiting sediment production associated with hauling is an important component of a successful watershed restoration strategy and, as such, should carry the weight of management direction.

Response: All action alternatives analyzed in the Draft RMP/EIS included Best Management Practice R 094: "Suspend commercial road use where the road surface is deteriorating due to vehicular rutting or standing water, or where turbid runoff may reach stream channels." The Proposed RMP has added this requirement as management direction, as the commenter suggests (**Appendix B** – Management Objectives and Direction).

196. Comment Summary: Increased logging in riparian areas will necessitate increased road density within sensitive riparian habitats including roads within 'sediment delivery distance' (DEIS p. 317). The BLM fails to quantify the amount of road to be constructed in Riparian Reserve or the amount of sediment that will be added to streams. The BLM neglects to disclose which streams in the planning area are currently TMDL listed for sediment and how the agency intends to meet the Clean Water Act obligations.

Response: The BLM did quantify and analyze anticipated new road construction within the sediment delivery distance of streams. The BLM determined road miles by harvest type and distributed by road type (paved, gravel and natural surface) and then quantified and analyzed the resultant sediment delivery (USDI BLM 2015, pp. 313–318). The Draft RMP/EIS explained that the existing road infrastructure is essentially in place, and relatively few new roads would be constructed in the future under any of the alternatives compared to the existing road system. The commenter does not identify any flaw or inaccuracy in that analysis.

The new road construction within the sediment delivery distance of streams almost entirely overlays the Riparian Reserve under all alternatives and Proposed RMP. In analyzing sediment delivery to streams, the amount of road construction within the sediment delivery distance provides relevant information, in contrast to the amount of road construction within the Riparian Reserve land use allocation, which differs by alternative. Adding quantification of the amount of road construction within the Riparian Reserve would not improve the analysis of effects and it is not relevant to a reasoned choice among alternatives.

The BLM meets the Clean Water Act obligations through the sum of the Riparian Reserve land use allocation, management direction, and Best Management Practices. Further, the BLM is an ODEQ-designated management agency to meet Clean Water Act obligations. This means that, in addition to the foregoing preventative controls and practices, BLM specialists decide the necessary steps to maintain water quality during activity planning and implement those preventative measures. The

BLM would maintain water quality at the highest practicable level to meet water quality standards and TMDL load allocations as set by the State of Oregon's Department of Environmental Quality.

There are roughly 340 miles of streams in the planning area that are water quality limited for sedimentation or turbidity, and approximately 13 percent (or 46 miles) are located in the decision area. The BLM does not disclose which streams in the planning area are currently Total Maximum Daily Load (TMDL) [303(d)] listed for sediment in the EIS because disclosing this information is not relevant to the analysis or making an informed choice among alternatives. Relatively few stream miles within the decision area are water quality limited for sediment, and a process exists to restore these stream miles (TMDL Implementation Plans). The BLM develops TMDL Implementation Plans to identify sources, necessary strategies, and appropriate BMPs to restore water quality limited waters and reduce pollution for surface waters on lands within BLM's jurisdiction.

The commenter mistakenly implies that there would be "increased logging in riparian areas" under the alternatives. All action alternatives would have less Riparian Reserve thinning than the No Action alternative and most alternatives would have less thinning than the BLM has been implementing in the past two decades.

197. Comment Summary: The FEIS should include specific standards for reducing Total Maximum Daily Load (TMDL) from logging roads, thinning, and other logging activities to minimize chronic sediment to Surface Water Source Areas.

Response: The Proposed RMP includes specific management direction (**Appendix B** – Management Objectives and Direction) and Best Management Practices (– Best Management Practices**)** to reduce or avoid sediment delivery to streams from timber harvest, road construction, and other management actions.

198. Comment Summary: Timing of sediment input to a stream is not always equal to timing of impact on salmonid fish, and sediment input timing cannot be considered a reasonable criterion for concluding that erosion has little effect on these fish. The majority of the suspended sediment analysis focuses on the effects from new road construction. Although the DEIS identifies the level of suspended sediment generated from existing roads, there is no analysis of effects to ESA-listed fish compared to natural, background levels of suspended sediment. We recommend that the FEIS include a modified sediment analysis that (1) avoids the assumption that the timing of sediment delivery is more important than the volume, (2) considers effects of both the existing road network and proposed roads, and (3) includes consideration of long-term sediment routing and effects.

Response: The commenter is mistaken: the BLM did not assume that the timing of sediment delivery is more important than the volume of sediment delivery. In evaluating the effects of sediment delivery to streams on both water quality and fisheries, the analysis in the Draft RMP/EIS provided a reasoned analysis based on the detailed, quantified information on the volume of sediment delivery (USDI BLM 2015, pp. 230–233, 313–318). The BLM acknowledges the importance of the timing of sediment delivery and maintains that the timing is relevant in the analysis of effects on both water quality and fisheries. The timing of sediment delivery is highly linked to sediment yields and water flow volume. The analysis did consider the effects of existing and proposed roads. Increasing sediment yield with stream discharge has been reported in numerous studies in western Oregon and the United States, varying by seasonal trends in precipitation and streamflow (Skaugset *et al*. 2013, Luce and Black 1999). The largest proportion of watershed sediment yield is restricted to a few days each year with the largest discharge. The BLM has observed that under normal precipitation and

runoff, many roadside ditches carry little to no water or sediment. The BLM expects this seasonal pattern of a few large storms in the annual series to produce higher runoff and to yield the majority of the sediment load. Nevertheless, the analysis in the Draft RMP/EIS directly addressed the volume of sediment delivery under the alternatives in the analysis of effects on water quality and fisheries.

The BLM modeled sediment yields for new road construction under the alternatives together with the sediment yields from existing roads to show long-term potential sediment delivery under the alternatives (USDI BLM 2015, pp. 313–318), as the commenter recommends.

It is not practical to quantify the natural, background levels of suspended sediment in streams at the scale of the planning area. Natural background sediment yields vary over a wide range by watershed characteristics, area, vegetative cover, land use, and precipitation patterns. Natural background sediment yields are difficult to disentangle from land use history including the effect of harvests and roads. Watershed-intrinsic factors in managed and unmanaged areas, including widely scattered and infrequent landsliding and streambank erosion, heavily influence the natural, background levels of suspended sediment in streams. There is no comprehensive data on the natural, background levels of suspended sediment in streams across the planning area, and the high variability, both spatially and temporally, makes approximation or extrapolation from the existing data inappropriate.

Although natural, background levels of suspended sediment in streams are highly variable; the sediment delivery from road construction under the alternatives is likely to be very small in comparison. For example, Zégre (2008) calculated annual sediment yields for small headwaters catchments in Hinkle Creek, on western Oregon industrial forestland, in a paired watershed study using contemporary forest harvesting. Basin-wide annual sediment yields for this 5-year study averaged 134 tons/mile^2/year. Comparatively, **Table 3-72** *Potential fine sediment delivery from existing roads* (USDI BLM 2015, p. 314) shows modeled potential sediment delivery from roads, including BLM-administered and other lands in the planning area, total 13.43 tons/mile^2/year. Comparing to the Hinkle Creek watershed study, as an example, shows that roads in the planning area on multiple ownerships comprise a small proportion of the annual sediment budget. New road construction under the alternatives would add less than 1 percent to the sediment yield from the existing road system. Thus, using the example of Hinkle Creek, new road construction under the alternatives would, on average, add less than 0.001 percent to the natural, background levels of suspended sediment in streams.

Finally, quantified data on the natural, background levels of suspended sediment in streams across the planning area is not essential to a reasoned choice among the alternatives. The natural, background levels of suspended sediment in streams would not change as a result of any of the alternatives. As explained in the Draft RMP/EIS, the relevant analytical threshold for analyzing the effects of sediment delivery on fish is the amount of increase in fine sediment over natural levels at the watershed scale (USDI BLM 2015, p. 230). The information available to the BLM at the scale of the planning area is sufficient to evaluate the increase in sediment delivery relevant to the analytical thresholds. More data on the natural, background levels of suspended sediment in streams would not improve the evaluation of the alternatives against that analytical threshold or the comparison of the relative effects of the alternatives on water quality or fisheries.

In a December 18, 2015 letter from NMFS to the BLM, NMFS acknowledged that these comments misinterpreted the Draft RMP/EIS and asked that the comments be ignored. NMFS clarified that they believe that the approach in the Northwest Forest Plan is not the only approach that would ensure the protection and recovery of threatened and endangered fish, and that the best available science also supports an approach modified from Alternative A or D that includes a one site-potential tree height Riparian Reserve on fish-bearing streams and perennial streams.

199. Comment Summary: The RMP/DEIS fails to establish temporal baseline water quality conditions from known data sets. Water quality data needed to compile baseline water quality condition is available from ODEQ.

Response: The BLM is unaware of any water quality data sets that can characterize baseline water quality conditions across the intermingled BLM-administered lands in the planning area. The BLM-administered lands are often upstream of other land uses and often meet anti-degradation criteria. The ODEQ water quality assessment database referred to by the commenter is inappropriate to analyze water quality constituents from BLM–administered lands for the following reasons:

- The ODEQ stream monitoring sites for the most part are downstream of BLM-administered lands
- The receiving streamflow at the ODEQ monitoring sites normally cross varying ownerships upstream, involving a mix of stream-adjoining (or runoff from) forestland owners with differing forest practices, and private landowners using agricultural practices
- The receiving streamflow at the ODEQ monitoring sites may be capturing return flow from upstream point sources (e.g., sewage treatment plants, animal feedlots, and log ponds)

Therefore, it would not be possible to attribute water quality changes from BLM management activities relative to this baseline information. Additionally, the ODEQ water quality assessment database has a variety of collection methods, making comparisons across this planning area difficult. Therefore, a meaningful assessment of BLM water quality conditions across the planning area cannot be determined from the ODEQ datasets.

200. Comment Summary: The BLM failed to address nutrient loading of streams due to logging. The DEIS does not disclose impacts to surface waters and fish habitat on and downstream of BLM lands from nutrient leaching associated with BLM forest treatments, nor does the DEIS consider possible management practices to mitigate harm to downstream waters from nutrient loading. More recent studies (e.g., Nieber *et al.* 2011 and Sweeney and Newbold 2014, and references cited therein) suggest that unlogged forest buffers in excess of about 150' slope distance from surface waters and stream channels, including headwater channels with intermittent or ephemeral flow, are needed to mitigate nutrient leaching associated with upslope logging the maximum degree practicable (that is, with 90% of mobilized nutrients recaptured and retained in soils and vegetation).

Response: The Draft RMP/EIS did not address the issue because timber harvest under the alternatives would not have a significant effect on nutrient loading to streams. The Proposed RMP/Final EIS added explanation that the BLM did not analyze this issue in detail (see the Hydrology section of Chapter 3).

The nutrients of potential concern for streams are nitrogen and phosphorus. Nitrate, dissolved inorganic nitrogen, can enter aquatic ecosystems via point sources (e.g., farm and aquaculture wastewater, municipal and industrial sewage) and nonpoint sources (e.g., cultivation of nitrogen-fixing crops, use of animal manure and inorganic nitrogen fertilizers, logging and fuels management treatments that remove vegetation and increase leaching from forest soils). Streamside areas can remove dissolved nitrogen from subsurface water by denitrification, plant uptake, and microbial uptake (Sweeney and Newbold 2014 and references therein). Phosphorous as phosphate can be lost through soil erosion and, to a lesser extent, to water running over or through soil. Because phosphate is relatively immobile in soils, erosion control practices minimize phosphate loading to streams.

Under all alternatives and the Proposed RMP, allocation and management of the Riparian Reserve would reduce or avoid nutrient loading of streams from upslope forest practices. Sweeney and Newbold (2014) compared the nitrate removal efficiency and buffer width from 30 studies worldwide, half with forest vegetation, and concluded that effective nitrogen removal at the watershed scale probably requires buffers at least 100 feet wide, and the likelihood of high removal efficiencies continues to increase in buffers wider than 100 feet. Nieber *et al*. (2011) suggest that average nitrogen and phosphorus retention is around 80 percent for 100-foot buffers. The authors calculated the percentage removal of nitrogen and phosphorus into wetlands based on two literature reviews that covered 55 nationwide research papers. The Riparian Reserve under all alternatives and the Proposed RMP for perennial and fish-bearing streams would range from 150 feet to one site-potential tree height, which compare favorably with effective buffer widths in these references, indicating that the Riparian Reserve under all alternatives would provide effective nutrient filters on these streams. In a December 18, 2015 letter from NMFS to the BLM, NMFS acknowledged that the best available science supports an approach modified from Alternative A or D that includes a one site-potential tree height Riparian Reserve on fish-bearing streams and perennial streams. As explained above, this buffer width would be sufficient to avoid any measurable increase in nutrient levels in streams.

Riparian Reserve widths of 50 feet on non-fish-bearing intermittent streams in Alternatives B and C and in Class III subwatersheds in the Proposed RMP may not, in and of themselves, be sufficient to prevent nutrient loading to streams on all sites. Several factors that control buffer effectiveness (e.g., vegetation characteristics, slope, soil compaction and texture, percent organic matter, subsurface water flux) are dependent on site-specific conditions (Nieber *et al.* 2011, Sweeney and Newbold 2014) that cannot be fully assessed at the scale of this analysis. However, the potential for nutrient loading in these streams is highly limited. Under the Proposed RMP, the majority of the acreage upslope of the Riparian Reserve would be allocated to other reserve land use allocations, limiting the extent and intensity of upslope timber harvest. Under the Proposed RMP, Class III subwatersheds would constitute a small percentage of the decision area (see Chapter 2). Timber harvest and manual application of fertilizer upslope of non-fish-bearing intermittent streams would be staggered in space and time, minimizing the potential for cumulative effects from nutrient loading within the analysis area. In addition, trees remaining in upland thinned stands and retention trees in regeneration and selection harvests would increase their growth rate and uptake of nutrients and water following harvest (Ruzicka *et al*. 2014, Chan *et al.* 2004, Reiter and Beschta 1995).

Maintenance of continuous forest cover and sources of large wood on all streams under all alternatives and the Proposed RMP, together with continued instream habitat restoration, would ensure effective nutrient processing in the decision area, which would further minimize any nutrient loading in streams. Peterson *et al.* 2001 studied nitrogen in headwater streams in North America and found that the most rapid uptake and transformation of inorganic nitrogen occurred in the smallest streams where large streambed to water volume ratios favor rapid nitrogen uptake and processing. Streams with greater complexity, including low-order streams with log and boulder steps and higher order streams enhanced with boulders and wood for fish habitat, are more effective at nitrogen uptake than those lacking obstructions and backwaters, because the complexity provides more opportunities for water to come into contact with stream organisms that process and remove nitrogen (Johnson 2009).

As a result on the Riparian Reserve providing an effective nutrient filter on most or all streams, the limited extent and intensity of timber harvest and fertilization upslope of the Riparian Reserve, and the effective nutrient processing in riparian and aquatic systems, none of the alternatives or the Proposed RMP would have a significant effect on nutrient loading in streams.

201. Comment Summary: BLM lands are crucial for providing clean drinking water to 1.5 million Oregonians, high quality water for listed salmon, habitat for threatened wildlife, and for preparing communities and ecosystems for the effects of climate change. Improved drinking water protection would entail added emphasis actions. For example, we recommend that Cave Junction and the Kerby Water District receive a higher degree of watershed protections and higher priority for restoration. Benefits of BLM watersheds are irreplaceable and will only be degraded by logging on LSRs and Riparian Reserve.

Response: The BLM's primary water quality protection strategy is composed of the Riparian Reserve land use allocation, especially the inner zone along streams, management direction for the Riparian Reserve and hydrology, and the Best Management Practices. These preventative measures have complementary goals with Oregon's drinking water protection program. The Proposed RMP/Final EIS has added discussion of the link between BLM's normal activities and potential water contaminants. The BLM has identified the public water systems for lands that BLM administers (USDI BLM 2008, Appendix J – Water). This summary includes public water system ID, name, source, population served, BLM-administered acres and other acres.

The drinking water protection program in Oregon is through a partnership between the Oregon Department of Environmental Quality (ODEQ) and Oregon Health Authority (OHA). The BLM disagrees that source water protection watershed within the East Fork Illinois River needs additional protections than what would be provided under the Proposed RMP. The City of Cave Junction's Public Water System (PWS) has a surface source on the East Fork Illinois River. The BLM is a minority landowner, with lands occupying 12 percent of the watershed. The OHA has determined that the Cave Junction PWS is an outstanding performer. The criteria for outstanding performance include, (1) No Maximum Contaminant Level (MCL), Action Level, or Treatment Technique violations in the last 5 years; (2) No more than one Monitoring and Reporting violation in the last 3 years, (3) No significant deficiencies or rule violations identified during the current water system survey; and (4) Has not had a waterborne disease outbreak attributable to the water system in the last 5 years (ODEQ). Thus, there is no evidence to support the argument that this watershed needs increased protection for water quality. In addition, the BLM has little ability to affect water quality in this watershed because of limited ownership. Nonetheless, the analysis in the Draft RMP/EIS concluded that the alternatives would provide for protection of water quality. The commenter does not identify any error in that analysis and does not support their claim that the logging proposed under the alternatives would result in degraded water quality.

202. Comment Summary: RMP fails to adequately discuss the importance of the Port-Orford-cedar to water quality and stream function. RMP fails to assess consequences of root disease risk and lack of shade from action alternatives.

Response: The BLM has already analyzed and considered the management of Port-Orford-cedar and Port-Orford-cedar root disease in the Final Supplemental EIS Management of Port-Orford-Cedar in Southwest Oregon (USDA FS and USDI BLM 2004). The Draft RMP/EIS identified the Record of Decision for Management of Port-Orford-Cedar in Southwest Oregon (USDI BLM 2004) as an existing decision that the BLM will incorporate into the RMPs (USDI BLM 2015, p. 23). The conceptual framework, vectors of disease spread and management practices in the Record of Decision for Management of Port-Orford-Cedar in Southwest Oregon are still relevant. There are no effects of management of Port-Orford-cedar or Port-Orford-cedar root disease that are substantially different than the effects analyzed in the Final Supplemental EIS Management of Port-Orford-Cedar in Southwest Oregon. Furthermore, the effects of management of Port-Orford-cedar or Port-Orford-

cedar root disease would not differ among alternatives. Therefore, there is no need for any specific additional analysis of management of Port-Orford-cedar or Port-Orford-cedar root disease in this RMP revision.

203. Comment Summary: Factors such as down-cutting, excessive lateral movement and stream bank erosion should be considered in alternatives that manage for increased OHV use.

Response: The BLM agrees that stream stability depends upon intrinsic watershed factors and management history. However, the commenter has not shown a causal linkage between OHV use and stream stability that the BLM could evaluate to show differences among the alternatives. The BLM has included Best Management Practices designed to protect water quality when constructing and maintaining OHV trails within Riparian Reserve, including stream crossings (USDI BLM 2015, p. 1165).

204. Comment Summary: The DEIS should explain plans to reduce watershed, water quality and fishery impacts from roads, inclusive of reduction of road extent through limits on new road construction, decommissioning of existing roads, and drainage improvements to 'stormproof' roads that would remain on the landscape permanently.

Response: The Proposed RMP/Final EIS has added discussion of how the BLM would implement watershed restoration (**Appendix X** – Guidance for Use of the Completed RMPs).

The Draft RMP/EIS included an estimate of 372 miles of permanent road decommissioning to year 2023 (USDI BLM 2015, p. 318). The BLM typically makes decisions on whether to make specific existing roads open or closed to public motorized access through implementation-level travel management planning (**Appendix X** – Guidance for Use of the Completed RMPs) and typically makes decision on whether to decommission specific existing roads through project-level planning and analysis. The Draft RMP/EIS included estimates of new road construction under the alternatives and analyzed the effect of this new road construction. All alternatives would construct little new road mileage compared to the existing road network and would make little contribution to existing sediment delivery to streams (USDI BLM 2015, pp. 230–233, 313–318, 648–650). The alternatives in the Draft RMP/EIS all included limitations on road construction through management direction and Best Management Practices. The Draft RMP/EIS included Best Management Practices for road stormproofing and road closure and decommissioning (USDI BLM 2015, pp. 1151–1153).

205. Comment Summary: The gross geomorphic effects of different hydrological features with dispersed increases in magnitude might be small due to resilience of channels (Grant *et al.* 2008); however, a variety of effects (fine sediment transport, reduced streambank stability, reduced large wood retention) may result in significant effects to ESA-listed fish habitat at the stream reach scale.

Response: It is not possible, given the scope and scale of the RMP revision, to analyze the effects of the alternatives at the stream reach scale. The Draft RMP/EIS discussed how each of these effects could affect fish habitat at finer scales. However, the BLM necessarily conducted the detailed, quantified analysis in the Draft RMP/EIS of the effects of the alternatives on sediment delivery, peak stream flows, and wood supply to streams at broad spatial scales. That analysis concluded that new road construction under all alternatives would add less than 1 percent to the sediment yield from the existing road system (USDI BLM 2015, p. 315–318). Less than 1 percent of the decision area would be susceptible to peak flow increases under any of the alternatives (USDI BLM 2015, pp. 298–306).

All alternatives would increase the wood supply to streams from the current conditions (USDI BLM 2015, pp. 219–230). The Draft RMP/EIS acknowledged the possibility of differences in effects at the stream reach scale. For example, the analysis of wood supply detailed there are differences in the design of the alternatives (specifically, Riparian Reserve widths, inner zone widths, and management direction for Riparian Reserve thinning) that may have differential effects on potential wood contribution that the BLM cannot quantitatively evaluate at this scale of analysis (USDI BLM 2015, pp. 228–230). The commenter does not provide any explanation of how the BLM could conduct such analyses for an RMP revision, given the information available and the nature of the proposed action, at the stream reach scale. The BLM has designed the Proposed RMP to reduce the risk of adverse effects to ESA-listed fish and water quality. Although there may be some variation in the effects from reach to reach, the Proposed RMP would result in only minor adverse effects or wholly beneficial effects on ESA-listed fish and water quality (see the Fisheries and Hydrology sections of Chapter 3).

206. Comment Summary: The DEIS does not address the likely effects of fire management on riparian and aquatic habitat, particularly in regards to sediment production, riparian forest condition, effects of post-fire salvage logging and increased road construction.

Response: It is not clear what aspects of fire management the commenter believes would have effects on riparian and aquatic habitat that the BLM did not analyze in the Draft RMP/EIS. The only management actions the commenter specifies are post-fire salvage logging and increased road construction.

The only alternative that would allow salvage logging within the Riparian Reserve is the No Action alternative. Under all of the action alternatives, there would be no salvage logging after fires in the Riparian Reserve, except when necessary to protect public safety, or to keep roads and other infrastructure clear of debris. Salvage logging outside of the Riparian Reserve would have the same effects on riparian and aquatic habitat as green tree harvest. The analysis did specifically include post-fire salvage harvest in the vegetation modeling (USDI BLM 2015, pp. 98–100). Under all alternatives, the inner zone of the Riparian Reserve would provide effective sediment filtration and ensure that upslope timber harvest would not result in sediment delivery to streams (USDI BLM 2015, p. 317).

The Draft RMP/EIS analyzed the effect of new road construction; all alternatives would construct little new road mileage compared to the existing road network and would make little contribution to existing sediment delivery to streams (Draft RMP/EIS, pp. 230–233, 313–318, 648–650). The road construction necessary to implement salvage logging under the alternatives is included in this analysis of new road construction.

The Draft RMP/EIS incorporated a quantified and spatially explicit prediction of wildfire and post-fire salvage harvest under the alternatives. This detailed information was included in the analysis of effects. The BLM has addressed all significant effects of salvage logging or attendant new road construction on riparian and aquatic habitat in the analysis.

207. Comment Summary: BLM cannot extend the questionable “improving trend” in AREMP monitoring results because these results represent only the first twenty years of ACS implementation. As all BLM action alternatives remove ACS protections, the BLM cannot claim that any improving trends in watershed conditions, even if real, will continue, as the improving trend depends on full ACS implementation moving forward.

Response: The commenter is mistaken in implying the analysis in the Draft RMP/EIS extended the AREMP monitoring results into the future. The AREMP monitoring program is ongoing and current results show increases in watershed condition scores as well as stream characteristics (e.g., stream substrate percent fines, substrate size, and macroinvertebrate assemblages that indicate improving watershed health). The Draft RMP/EIS summarized these monitoring reports in describing the current condition of watershed resources (USDI BLM 2015, p. 223). The Draft RMP/EIS analyzed the effects on future conditions, such as stream shading, sediment delivery, and wood delivery potential, through analytical methodologies and modeling described in detail in the Draft RMP/EIS (USDI BLM 2015, pp. 217–235, 286–320). The Draft RMP/EIS compares the effects of all alternatives, including the No Action alternative (which includes the Aquatic Conservation Strategy), on these watershed resources. There is no basis for the commenter's assertion that the BLM has extended the monitoring results into the future.

Invasive Species

208. Comment Summary: The EIS should include a complete evaluation of how artificial fertilizer application for increased tree growth might support the growth of exotic plants.

Response: The Proposed RMP/Final EIS includes a discussion about non-native invasive plant response to forest management fertilization treatments. This discussion is added to the summary of analytical methods for the Invasive Plants section of Chapter 3.

209. Comment Summary: The EIS should address threats to North American ash trees from the emerald ash borer and to chinkapin from newly introduced pathogens.

Response: There are many forest pests and pathogens within the planning area or within the State of Oregon, including the emerald ash borer and chinquapin disease mentioned. The BLM manages infested or infected forests through forest stand manipulation as appropriate to the pest or pathogen. Eradication is not always possible. For many of these forest pests and pathogens, forest stand manipulation is the only feasible management tool for control. As such, management for most forest pests and pathogens would not vary by alternative, and analysis of the effect of the alternatives on these forest pests and pathogens would not be informative. The Proposed RMP/Final EIS includes management direction to manage forested stands for infestations.

210. Comment Summary: The EIS should address management of Port-Orford-Cedar (POC) in forested stands within the planning area. The EIS should also conduct up to date relevant spatial analysis of spread and consequences of POC root disease.

Response: The Proposed RMP/Final EIS addresses Port-Orford-cedar (POC) management in Chapter 1. The Proposed RMP directs for management of Port-Orford-cedar in accordance with the Record of Decision and Resource Management Plan Amendment of Management of Port-Orford-Cedar in Southwest Oregon, Coos Bay, Medford, and Roseburg District (USDI BLM 2004). BLM acknowledges that some POC root disease has spread since 2004. However, this FEIS and ROD conceptual framework, vectors of disease spread and management practices are still relevant. The Port-Orford-cedar ROD includes a Risk Key for site-specific analysis to determine where to apply risk reduction practices (USDI BLM 2004, pp. 32–37). Management for POC root disease would not

vary by alternative and analysis of the influence of the alternatives on POC root disease would not be informative.

211. Comment Summary: The EIS undermines BLM policy objectives for the management of invasive species and riparian habitats as is evidenced by analysis (pp. 332–335) stating that disturbances associated with Riparian Reserve logging will make "riparian habitats more susceptible to the introduction and spread of invasive plants."

Response: The Draft RMP/EIS analyzes the relative risk of introducing and spreading invasive plant introductions from the differing alternatives. Risk is not synonymous to likelihood. Project design and mitigations applied at project-level implementation planning influence the likelihood of invasive plant introduction and spread. The Proposed RMP/Final EIS includes management direction to address prevention and management of invasive plant infestations in implementation project design (**Appendix B** – Management Objectives and Direction). The Proposed RMP/Final EIS also incorporates the analysis for the Vegetation Treatments Using Herbicides on BLM Lands in Oregon Record of Decision (USDI BLM 2010). This Record of Decision addresses mitigation and control methods available for use in the event of an introduction.

212. Comment Summary: The EIS fails to prioritize invasive plants adequately.

Response: The Draft RMP/EIS does not include a prioritization of invasive plant species for management because there are no BLM policies, State or Federal regulations directing for a prioritization of invasive plant species in land use plans. The BLM districts recognize the Oregon Department of Agriculture's Noxious Weed Control Policy and Classification System, which prioritizes listed noxious weed species at the statewide level. BLM Manual 9015 – Integrated Weed Management (USDI BLM 1992) provides guidance for setting management priorities by developing weed management plans and using a classification system to provide weed management emphasis priorities. The BLM most effectively prioritizes invasive plant species at the field office level and develops annual weed management plans. The Draft RMP/EIS intentionally does not include priorities for invasive plant species.

213. Comment Summary: The EIS fails to restrict herbicides adequately.

Response: The EIS addresses the parameters for application of herbicides in Chapter 1. The Draft RMP/EIS incorporates the analysis for the Vegetation Treatments Using Herbicides on BLM Lands in Oregon Record of Decision (USDI BLM 2010). The commenter does not allege or substantiate that the 2010 BLM Record of Decision is inadequate.

214. Comment Summary: The EIS fails to consider general recreational uses and OHV use, including illegal use, in its analysis of invasive species.

Response: The Draft RMP/EIS does consider recreation and OHV use in the analysis of invasive species. The Draft RMP/EIS incorporates invasive plant analytical assumptions from the Planning Criteria (USDI BLM 2014, pp. 90–98), into analysis for invasive plants in Chapter 3. These analytical assumptions include identification of locations and activities influencing invasive species introduction and spread, including several assumptions about recreation use and OHV use. In addition, Chapter 3 provides a discussion about illegal OHV use in the invasive plant analysis identifying that BLM lacks

a basis for characterizing current illegal OHV use or for forecasting illegal OHV use at the scale of the planning area.

215. Comment Summary: The EIS fails to include data or research to support analysis of grazing impacts on invasive species.

Response: The Draft RMP/EIS does incorporate extensive data and research to support the analysis of grazing impacts on invasive species. The EIS incorporates the analysis for the Vegetation Treatments Using Herbicides on BLM Lands in Oregon Record of Decision (USDI BLM 2010) in its analysis of invasive species. Changes included in the Invasive Plants section of Chapter 3 identify presence of invasive plant species in the areas available for livestock grazing, and provide citations supporting assumptions about the risk of invasive plant species introduction and spread associated with livestock grazing.

Lands and Realty

216. Comment Summary: It is not clear how valid existing water rights and irrigation ditch rights would be affected by designation of Right-of-Way avoidance areas and Right-of-Way exclusion areas under the alternatives.

Response: Considering the intermingled nature of the BLM-administered lands in the planning area, the BLM has granted many rights-of-way, leases, permits, and other established legal rights within the decision area over the years. Valid existing rights may pertain to timber sale contracts, mining claims, mineral or energy leases, leases, easements, permits, rights-of-way, and water rights. As explained in the Draft RMP/EIS, designation of right-of-way avoidance areas and right-of-way exclusion areas would guide BLM decisions on future right-of-way requests (USDI BLM 2015, p. 366). The decisions in the RMPs, including designation of right-of-way avoidance areas and right-of-way exclusion areas, would not alter or extinguish valid existing rights on BLM-administered lands. Valid existing rights take precedence over the decisions in the RMPs.

Lands with Wilderness Characteristics

217. Comment Summary: Kerby Peak possesses wilderness characteristics and should be protected as potential Wilderness Area.

Response: As required under the FLPMA and current BLM policy, the BLM updated the wilderness characteristics inventories for western Oregon as part of this plan revision. In conducting these inventories, western Oregon BLM districts followed the guidance provided in BLM Manual 6310 – Conducting Wilderness Characteristics Inventory on BLM Lands (USDI BLM 2012). This manual provides a process for identifying BLM lands that meet the following criteria: (1) encompass at least 5,000 acres of roadless, contiguous BLM lands, (2) appear to be in a natural condition; (3) provide outstanding opportunities for solitude or primitive and unconfined recreation.

To launch this inventory update, the BLM held a two-day workshop in Roseburg, Oregon, during August 2012. The workshop focused on an initial screening of the planning area to identify all areas that could potentially meet the minimum size criteria. Geographic

Information System (GIS) data were used to (1) identify BLM-administered lands that met the size criteria and (2) screen areas that met the size criteria for the absence of roads meeting wilderness inventory criteria as identified as part of the BLM's Ground Transportation Network. Based on the outcomes of this screening, western Oregon districts began inventories during the summer of 2012.

Kerby Peak does not encompass at least 5,000 acres of roadless, contiguous Federal lands and, as such, was not inventoried for wilderness characteristics during this update.

218. Comment Summary: The BLM should designate all lands that possess wilderness characteristics as Wilderness Study Areas (WSA), and protect the identified wilderness values from management activities that would impair them.

Response: The BLM's authority to designate additional lands as Wilderness Study Areas expired on October 21, 1993, as affirmed in the agreement that BLM affirmed in the *Utah v. Norton* wilderness settlement agreement (April 2003).

219. Comment Summary: The Thompson Cantrall Extensive Recreation Management Area (ERMA) overlaps with the Burton Ninemile Lands with Wilderness Characteristics unit and should be designated as a *closed* OHV Management Area.

Response: The Proposed RMP maintains 6,103 acres of lands with wilderness characteristics within the Burton Nine Mile unit. Management direction to protect lands with wilderness characteristics includes designating these areas as *closed* for public motorized access (**Appendix B** – Management Objectives and Direction). The Thompson Cantrall ERMA management framework under the Proposed RMP would also be designated as a *closed* for public motorized access where the ERMA overlaps with lands with wilderness characteristics within the Burton Ninemile unit.

220. Comment Summary: The Proposed RMP should protect the four lands with wilderness characteristics units that were identified in the Applegate Valley (Wellington Butte, Dakubetede, Burton Ninemile, and Round Mountain). Specifically, these four areas should be designated as *closed* OHV Management Areas. Additionally, China Gulch was identified as an area that possesses wilderness characteristics and should be designated as a *closed* OHV Management Area. China Gulch and Wellington lands with wilderness characteristics should be protected. Any future management activities that would diminish wilderness characteristics should be prohibited.

Response: Under the Proposed RMP, the BLM would manage all inventoried lands with wilderness characteristics that occur outside of the Harvest Land Base for their wilderness characteristics, including the Burton Ninemile (6,103 acres) and Roundtop Mountain (5,295 acres) units. Because of the incompatibility between managing for wilderness characteristics and sustained-yield timber harvest, removal of Harvest Land Base acres causes the Dakubetede and Wellington units to fall below the 5,000-acre minimum size threshold in the Proposed RMP.

221. Comment Summary: The Wellington Butte lands with wilderness characteristics unit should be expanded to include the entire headwaters of China Gulch.

Response: The BLM, Medford District Office, completed a wilderness characteristics inventory evaluation for Wellington Butte. The Wellington wilderness characteristics inventory identified a contiguous mostly un-entered block of public lands within the middle Applegate watershed. It encompasses Wellington Butte in the heart of the area; Sugarloaf, to the northwest of Wellington; the headwaters of Long Gulch draining into the Applegate River to the south; all of the headwaters of Balls Branch, which drains into Humbug Creek to the west; and the west slopes of Mt. Isabelle. The wilderness characteristics inventory examined the area including the headwaters of China Gulch and found that this additional landbase did not possess wilderness characteristics. See Wellington Mountain wilderness characteristics inventory (USDI BLM 2013) for additional inventory information.

Livestock Grazing

222. Comment Summary: Grazing acre reductions outlined in the RMP should be prioritized to Riparian Reserve and stream buffers. Key ecosystem attributes should be monitored in areas where grazing is continued to ascertain whether continued use is consistent with ecological recovery, particularly as the climate shifts (Beschta *et al*. 2012).

Response: For all alternatives except Alternative D, the BLM only considered livestock grazing acre reductions as correlated to allotment-scale decisions on availability for livestock grazing. These boundaries are set based on fences and topography, which keep livestock within an area. Topography, exclosures, and riparian pastures to manage livestock and promote ecological health buffer a large majority of streams within existing allotments from livestock use. The Standards for Rangeland Health and Guidelines for Livestock Grazing Management for Public Lands Administered by the Bureau of Land Management in the States of Oregon and Washington (USDI BLM 1997) rigorously assess key ecosystem attributes at the allotment scale to determine if the fundamentals of rangeland health including physical function and biological health with elements of law relating to water quality, and plant and animal populations and communities are making significant progress toward being met or are being met. The BLM establishes short-term and long-term monitoring sites throughout allotments to continue to provide updated information on rangeland health. The Draft RMP/EIS discussed permitted livestock grazing levels of use in the analysis of Climate Change under issue 2 (USDI BLM 2015, pp. 136–140).

Under Alternative D, the BLM would terminate existing livestock grazing authorizations and make all allotments unavailable for livestock grazing. In the analysis of Alternative D, the Draft RMP/EIS addressed the effects of no livestock grazing in the decision area (USDI BLM 2015, pp. 379–388).

223. Comment Summary: The EIS does not identify each stream critical habitat reach for federally listed fishes and failed to identify how grazing would be changed to protect and improve critical habitat.

Response: The EIS considered rangeland health within each livestock grazing allotment (**Appendix L** – Livestock Grazing), which takes into consideration effects of livestock grazing within critical habitat of native, threatened and endangered, and locally important species. Additionally, consultation with the U.S. Fish and Wildlife Service and National Marine Fisheries Service regulate livestock grazing and monitoring efforts of ESA-listed fish species within riparian areas to maintain critical habitat. Rangeland health assessments use all available science and monitoring data including

condition and trend analysis. The BLM makes specific changes in livestock grazing and AUMs at allotment-specific scales when necessary based upon extensive monitoring.

224. Comment Summary: Alternatives that eliminate livestock grazing by closing allotments to livestock grazing and terminating existing grazing authorizations are is in violation of several laws. Termination of grazing on BLM lands would render private lands as unavailable for livestock grazing.

Response: BLM Land Use Planning Handbook H-1610-1 states that the primary purpose of the land use plan is to make land use allocation decisions including identifying lands to be made available or unavailable for livestock grazing (USDI BLM 2008 pp. Appendix C, II-B). Making livestock grazing unavailable within an alternative of a land use plan is consistent with the FLPMA land use planning, taking into consideration the present and potential uses of public lands. Alternatives A, B, and C, and the Proposed RMP do not terminate any existing livestock grazing authorizations, as these allotments are currently vacant with no current parties proposing to graze. The NEPA process requires the BLM to provide an appropriate range of alternatives in the analysis. Alternative D provides a broad range of potential management options coinciding with a larger range for analysis purposes. The possibility of livestock grazing on allotments could occur through a special use permit, or special agreement with the BLM under any alternative. The BLM does recognize decisions to make allotments unavailable for livestock grazing may, in some situations, make private land livestock grazing difficult but does not make any decisions on private lands as unavailable. None of the alternatives would make a decision concerning private lands and do not prohibit fencing on private land.

225. Comment Summary: The EIS includes management of recreation that is detrimental to livestock grazing. Why was the Lost Lake ACEC not to be considered for open to grazing with stipulations?

Response: Additional considerations and analysis were included in the Livestock Grazing section with reference to potential effects of a proposed SRMA to acres of available livestock grazing. The Lost Creek ACEC/RNA represents an Oregon Natural Areas Plan (ONAP 2015) cell for a mid-montaine lake surrounded by mixed-conifer forest. It is an example of a landslide-damned lake. Long-term vegetation monitoring plots established in the RNA provide research value as a baseline for the Oregon Natural Areas Plan cells this ACEC/RNA represents. Livestock grazing, even with stipulations, would degrade the research value of the Lost Creek ACEC/RNA.

226. Comment Summary: The grazing section contains inaccuracies and fails to provide information in a manner that allow the public to understand current grazing management and proposed grazing changes. No alternative was considered to increase grazing use. The grazing background section cites regulations that are not correct.

Response: The Draft RMP/EIS reported AUMs based on available database information. The BLM corrected discrepancies in AUMs on permits and AUMs available within the range database system in the Proposed RMP/Final EIS (see the Livestock Grazing section of Chapter 3). The BLM also updated information on suspended use in the Proposed RMP/Final EIS. **Appendix L** – Livestock Grazing includes all AUMs, including active use and suspended use. Suspended use otherwise was not included in the analysis as these are AUMs not available for use until more site-specific NEPA shows forage capacity for them. The purpose of the land use planning process is only to identify allotments as available or unavailable to livestock grazing; site-specific NEPA analysis would be

required for the BLM to increase AUMs on individual allotments. The BLM revised the Proposed RMP/Final EIS with the appropriate livestock grazing regulations in the Background section.

227. Comment Summary: The EIS fails to identify that livestock grazing can also be used to control invasive species, reduce fire danger, and accomplish management objectives. The EIS fails to include BMPs to address upland water development for grazing.

Response: Although the RMP designates allotments as available or unavailable for livestock grazing, this does not limit the use of livestock grazing as a management tool to obtain other management objectives within tiered NEPA analysis. Typically, the BLM directs the use of livestock grazing as a tool to obtain specific management objectives through site-specific project planning and analysis. The invasive species program has a statewide EIS for managing invasive species with districts to complete specific EAs on the implementation of treatment options, which could include livestock grazing. Best Management Practices (**Appendix J** – Best Management Practices) provide compliance with the Clean Water Act of 1972 and set out goals and objectives to maintain water quality. Development of range improvements is more a management tool for livestock grazing. Conditions for range improvements are provided for in 43 CFR 4120.3. **Appendix B** – Management Objectives and Direction contains management direction specific to the design and maintenance of range watersource infrastructure. Any range improvement would require more site-specific project planning and analysis.

Minerals

228. Comment Summary: The BLM should complete the formal Mineral Potential Report and make the report available for public review as soon as possible. **Appendix L** was lacking in specific information about the locations of lands available for locatable mineral entry in the Medford District - specifically metals.

Response: The BLM did not complete reasonably foreseeable development scenarios and Mineral Potential Reports for this RMP revision. The BLM based all estimates on broad scaled "trends" review, which is an opinion as opposed to a methodological approach. As clearly stated in the Draft RMP/EIS, the RMP revision would only make recommendations for withdrawals, and the BLM would prepare mineral potential reports prior to each recommended withdrawal proposal (USDI BLM 2015, pp. 398–399).

229. Comment Summary: Will areas that are closed to mineral entry, such as Wilderness Areas, Wild and Scenic river segments, and some ACECs and RMAs, be protected from all mining operations?

Response: The RMP would close specific areas to salable mineral development (e.g., rock quarry development), as described in the Draft RMP/EIS (USDI BLM 2015, pp. 391–397). The RMP would make recommendations about withdrawal of specific areas to locatable mineral entry, but it is not within the authority of the BLM to make the withdrawals (USDI BLM 2015, pp. 398–403). The RMP would provide stipulations for leasable mineral development in specific areas, but would not close areas to leasing (USDI BLM 2015, pp. 403–404).

The decisions in the RMPs will not alter or extinguish valid existing rights on BLM-administered lands. Valid existing rights take precedence over the decisions in the RMPs. Authorization for

implementing an action that would affect these valid existing rights may be subject to approval by the holders of valid existing rights and may not be discretionary to BLM.

230. Comment Summary: The BLM should investigate the possibility of keeping records on material extracted from mining efforts. Something should be done to help pay for the environmental damage being done if it is not reclaimed. If it is reclaimed, the money could be refunded to the operator. I don't know if this would be possible under the 1872 mining law but it should be researched.

Response: Record-keeping requirements for individual mining operations would be beyond the scope of the RMP revision. The BLM surface regulations for mining require that operators submit to the BLM an adequate financial guarantee for all Notices or Plans of Operations until the site is reclaimed.

231. Comment Summary: Close and rehabilitate rock quarry sites that are close to depletion.

Response: The Proposed RMP includes management direction to reclaim quarries following the approved mining and reclamation plan. The BLM typically does not reclaim rock quarry sites that are close to depletion because of the potential for future use.

232. Comment Summary: Develop an inventory of rock quarry sites with current value and viability.

Response: The BLM does have an inventory of rock quarry sites, and the Draft RMP/EIS described the currently developed quarry sites (USDI BLM 2015, pp. 392–395). The Proposed RMP/Final EIS updated the inventory of currently developed rock quarry sites based on additional information (see the Minerals section of Chapter 3). Additionally, there are historical borrow sites throughout the decision area that have not been recorded. As noted in the Draft RMP/EIS, the BLM does not have an inventory of *potential* quarry sites, which would be exorbitantly expensive to develop for the decision area and would require substantial speculation, given the myriad factors that influence potential quarry development.

National Recreation Trails

233. Comment Summary: The BLM should consider management direction that protects the Pacific Crest Trail by limiting recreational and commercial uses only to those that would not adversely affect PCT values and resources. This would include prohibiting or allowing races, endurance events, and fundraising.

Response: The BLM established management direction in the Proposed RMP that protects the values and uses, recreation setting characteristics and the established recreation outcome objectives for the Pacific Crest National Scenic Trail Special Recreation Management Area. The BLM developed the Proposed RMP to include management direction that would prohibit Special Recreation Permits that could potentially affect Pacific Crest Trail values and resources (**Appendix B** – Management Objectives and Direction).

234. Comment Summary: The corridor width identified in Alternative B is insufficient to protect the Pacific Crest Trail and is inconsistent to managing for a foreground corridor. A 1-mile wide trail

management corridor would result in a 1/2 mile on each side of the trail and therefore capture the foreground as well as maintain a consistent management with adjoining land management agencies.

Response: The Proposed RMP includes a 1-mile wide corridor along the portions of the Pacific Crest National Scenic Trail in the decision area.

235. Comment Summary: The viewshed analysis done for the Pacific Crest National Scenic Trail is incomplete. The BLM should revise the viewshed analysis to include lands managed by the USFS. This will allow analysis to consider, in addition, the current percentage of lands within the viewshed managed by an agency also holding responsibility for management of the Pacific Crest National Scenic Trail.

Response: The Proposed RMP/Final EIS has added an updated viewshed analysis that includes all U.S. Forest Service lands (see the National Trails System section of Chapter 3).

Rare Plants and Fungi

236. Comment Summary: The section on the effects of timber harvest on rare species needs to identify, clearly, what criteria would be used to determine if Bureau Sensitive plant protection is consistent with timber production. Without clear definitions in the RMP, land managers and other entities can dismiss Bureau Special Status designations in the field.

Response: The Bureau Special Status Species policy directs that the BLM address Bureau Sensitive species and their habitats in the planning process, and, when appropriate, identify and resolve significant land use conflicts with Bureau Sensitive species. In implementing a new RMP, the BLM would ensure that actions affecting Bureau Sensitive species would be carried out in a way that is consistent with its objectives for managing those species and their habitats at the appropriate spatial scale. The application of the Bureau Special Status Species policy to provide specific protection to species that are listed as Bureau Sensitive on lands governed by the O&C Act must be consistent with timber production as the dominant use of those lands (USDI BLM 2008, BLM Manual 6840 – Special Status Species Management, sections 6840.06.2A – 6840.06.2E). The action alternatives and the Proposed RMP provide discretion for individual BLM implementation decisions regarding Bureau Sensitive species and their habitats. The determination of when specific protections to Bureau Sensitive species on O&C lands are not consistent with timber production as the dominant use of those lands is a determination best made at the project and site level. The Draft RMP/EIS analysis assumes that the BLM will implement the BLM Special Status Species policy for Bureau Sensitive species, and the commenter provides no foundation for their assertion that managers would "dismiss" Bureau Sensitive species.

237. Comment Summary: Population augmentation for threatened and endangered plants and oak stand management needs to be included in all alternatives in order to meet BLM policy.

Response: The Proposed RMP includes population augmentation for threatened and endangered plants and oak stand management.

238. Comment Summary: The USFWS recommends specific management activities to contribute to the conservation and recovery of the endangered western lily.

Response: Management direction common to all alternatives and the Proposed RMP would require the BLM to manage ESA-listed plant species consistent with recovery plans and designated critical habitat, including the protection and restoration of habitat; altering the type, timing, and intensity of actions, and other strategies designed to recover populations of species. The Proposed RMP includes additional management direction designed to contribute to the conservation and recovery of all ESA-listed plant species, including western lily. The proposed management direction would require the BLM to manage habitat to maintain populations of ESA-listed, proposed, and candidate plant species and to maintain or restore natural processes, native species composition, and vegetation structure in natural communities, consistent with the recommendations of the commenter.

239. Comment Summary: According to the EIS-volume I page 436-the impacts from grazing on Gentner's fritillary would be minimal, but other species were not discussed.

Response: The Proposed RMP/Final EIS has added text to clarify that Gentner's fritillary is the only ESA-listed plant species present in any grazing allotment. The Proposed RMP/Final EIS has also added text to address potential grazing impacts to other Bureau Special Status plant and fungi species (see the Rare Plants and Fungi section of Chapter 3).

240. Comment Summary: The effects from invasive species on Endangered, Listed, and Bureau Sensitive plants caused by grazing in open allotments was not analyzed other than speculative statements on page 436-vol 1.

Response: The BLM addressed the effect of grazing on the introduction and spread of invasive species in the Invasive Species section of Chapter 3 in the DEIS. The Draft RMP/EIS stated that elimination of grazing would result in increased competition. The Proposed RMP/Final EIS has added text to clarify that competition refers to increased production of non-native plant species, including noxious weeds, which compete for resources with Bureau Special Status plants (see the Invasive Species section of Chapter 3).

241. Comment Summary: RMP needs to acknowledge that loss of host trees and changes in forest conditions has direct and indirect impacts on rare plants and fungi.

Response: The Proposed RMP/Final EIS has included text to address direct and indirect impacts of the loss of host trees on rare plants and fungi (see the Rare Plants and Fungi section of Chapter 3).

242. Comment Summary: RMP inaccurately states that prescribed burning rarely consumes duff, snags, or large logs, when in fact prescribed burning can consume all downed woody debris and burn 20 feet up logs.

Response: The Proposed RMP/Final EIS has revised this discussion to acknowledge that prescribed burning can and does sometimes result in the consumption of downed woody debris and impacts to soil (see the Rare Plants and Fungi section of Chapter 3).

243. Comment Summary: The BLM should remove the reference to Dahlberg and Stenlid on page 416 about sporocarps because it is misleading. The presence of fruiting bodies is very important because it demonstrates that a species exists in that location, regardless of the activity or location of underground mycelia. The purpose of these surveys is simply to ascertain whether certain species occur in the areas being surveyed.

Response: The BLM did not intend to imply that surveys for fungi are not useful in determining species presence. The Proposed RMP/Final EIS has revised this statement to clarify that visual observation cannot determine the extent of a fungal population, but the presence of sporocarps demonstrates that the species is present (see the Rare Plants and Fungi section of Chapter 3).

244. Comment Summary: "Opportunistic" fungal surveys need to be more clearly defined and the EIS should demonstrate that "opportunistic" surveys would be effective in finding rare fungal species. If such surveys are inadequate, the proposed timber harvest in all action alternatives could contribute to the need to list Sensitive fungi.

Response: The Draft RMP/EIS used the word "opportunistic" to refer to surveys for fungi that are incidental to surveys for Bureau Special Status plants (USDI BLM 2015, p. 423). The Proposed RMP/Final EIS has replaced this word with language to clarify how and when the BLM would survey for fungi and that the BLM Manual 6840 – Special Status Species Management (USDI BLM 2008) would apply to all alternatives (see the Rare Plants and Fungi section in Chapter 3). The Proposed RMP/Final EIS has added discussion to illustrate how surveys for most fungi, including Bureau Sensitive and Survey and Manage species, are considered impractical and acknowledge that impacts are likely to occur to undocumented sites of rare and Bureau Sensitive fungi. The discussion in the Proposed RMP/Final EIS details that the Proposed RMP would protect most existing habitat for rare and Bureau Sensitive fungi species, would protect most known sites within the reserve allocations, and would result in an increase in the amount of habitat for rare and Bureau Sensitive fungi species (see the Rare Plants and Fungi section in Chapter 3). The commenter's assertion that the proposed timber harvest in all action alternatives could lead to the "need to list Sensitive fungi" is contrary to the conclusions of the analysis in the Proposed RMP/Final EIS and is predicated on unsupported speculation.

245. Comment Summary: Surveys for rare and Sensitive fungi need to be carried out in forests younger than 180 years old as well as in older forests. The BLM assumed that timber activities would not affect Survey and Manage plant and fungi sites directly in the No Action alternative because of pre-disturbance surveys and site protection. This does not take into account the fact that only old stands are surveyed. Unless surveys are carried out, timber harvest activities will affect these species. This needs to be acknowledged and the effects analyzed in the EIS.

Response: Under the No Action alternative, the BLM would manage Survey and Manage species in accordance with the current Survey and Manage requirements. Most Survey and Manage fungi species are on the Category B list (i.e., pre-disturbance surveys not practical). Under the No Action alternative, the BLM would conduct 'equivalent effort' surveys for Survey and Manage fungi species for habitat disturbing activities within old-growth forests as defined by the 2000 Final Supplemental EIS for Amendment to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines (USDA FS and USDI BLM 2000). The Proposed RMP/Final EIS has added discussion to illustrate how surveys for most fungi, including Sensitive and Survey and Manage species, are considered impractical and acknowledge that impacts are likely to occur to undocumented sites of rare and Bureau Sensitive fungi.

Recreation and Visitor Services

246. Comment Summary: The Recreation Management Areas that are proposed in the preferred alternative (Alternative B) need to be adjusted to include additional Recreation Management Areas proposed in Alternatives C and/or D.

Response: The BLM identified Alternative B as the preferred alternative in the Draft RMP/EIS. However, Alternative B does not provide the best possible response to the purpose and need of providing recreation opportunities.

Recognizing this, the BLM has developed a Proposed RMP that increases protection of the unique recreation settings and increases recreation use. To increase protection of unique recreation settings and increase recreation use compared to Alternative B, the Proposed RMP includes an approach to the management of recreation resources modified from Alternative C.

Appendix O – Recreation provides a comprehensive list of recreation management areas that the BLM is designating under the Proposed RMP. Recreation Management Frameworks describe the important recreation values, recreation outcome objectives, supporting management actions and allowable use activities for each recreation management area evaluated. The Recreation Management Frameworks also describe the types of visitor use for which the BLM would be managing recreation in that recreation management area.

247. Comment Summary: Table 3-127 Activity Specific Recreation demand for western Oregon communities is inaccurate.

Response: The Draft RMP/EIS presented the activity-specific demand percentages generated from individuals who participated in the BLM's interactive mapping site during the winter of 2012 (USDI BLM 2015, p. 450). This percentage is specific to those participants that responded to the interactive mapping tool.

248. Comment Summary: Access categories should be clearly delineated in recreation analysis due to legal access and right-of-way implications.

Response: In all action alternatives, the BLM only proposed recreation management areas where the BLM has legal public access. The BLM identified this requirement in the Planning Criteria (USDI BLM 2014, p. 110). Since reciprocal right-of-way agreements and some gating on BLM and adjacent private lands can prevent visitors from accessing BLM-administered lands for recreation use, the BLM first conducted an inventory to determine which BLM-administered lands are legally accessible to the public.

249. Comment Summary: In the interest of public safety, the RMP should make a management commitment to significantly increase law enforcement efforts to enforce target shooting rules. RMP management guidelines for target shooting need to be more specific. Creation of no-shooting buffers at trail heads and along trail corridors, both motorized and non-motorized is essential for public safety. Given the nature of the terrain and vegetation in western Oregon, uncontrolled shooting on

public lands poses a serious threat to recreation users and residents of adjacent lands. Exploding targets such as Tannerite should be banned completely on all Western Oregon BLM lands.

Response: Recreation Management Area frameworks contained in **Appendix O** – Recreation identify and establish target-shooting restrictions for individual recreation areas. This includes areas identified for trail-based recreation, both motorized and non-motorized. The BLM has established these restrictions to protect recreation settings, achieve recreation specific outcome objectives, and account for public health- and safety-related concerns. The BLM has not established target shooting restrictions on BLM-administered lands outside of proposed recreation management areas. The BLM would evaluate additional target shooting restrictions, such as banning exploding targets, during implementation-level recreation management planning under all alternatives.

250. Comment Summary: Any Designation for OHV use in the Timber Mountain area is not appropriate. The existing conditions make the area unsuitable for development of OHV use.

Response: Under the Proposed RMP, the BLM has designated the Timber Mountain Recreation Management as *limited* for public motorized access in order to limit environmental impacts from OHV use. The BLM would determine the specific routes and trails that would be open to public motorized vehicle use through implementation-level travel management planning subsequent to the RMP revision (**Appendix X** – Guidance for Use of the Completed RMPs).

The designation of specific routes and trails in implementation-level travel management planning would be consistent with the criteria outlined under BLM's regulatory requirements in 43 CFR 8342.1. These designation criteria require that trails be located to—

a) Minimize damage to soil, watershed, vegetation, air, or other resources of the public lands;
b) Minimize harassment of wildlife or significant disruption of wildlife habitats. Special attention will be given to protect endangered or threatened species and their habitats; and
c) 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.

Socioeconomics

251. Comment Summary: The Draft RMP/Draft EIS failed to quantify many economic benefits of conservation.

Response: The Draft RMP/EIS analyzed the relationship between the alternatives and the value of ecosystem goods and services associated with BLM-administered lands in Issue 1 of the Socioeconomics section (USDI BLM 2015, pp. 478–526). The Proposed RMP/Final EIS includes more discussion of the economic importance of non-market benefits to Oregonians and the regional economy.

The analysis includes both market and non-market measures of value. Where reliable data are available, the analysis described values in monetary units. Where data are insufficient to allow for reliable estimation in monetary units, the analysis describes the value qualitatively, focusing on factors that would influence the direction, magnitude, and timing of change in value.

The BLM based the analysis of value on the underlying physical changes in ecosystems under each alternative, compared to current conditions, as described in the other resource sections of the Draft RMP/EIS. Thus, if a resource section did not identify variation among alternatives, such as water quality, for example, the analysis in the socioeconomic section of the value of the good or service associated with that resource also did not show variation. The affected environment described, and where data are available, quantified, the value of the resource under current conditions.

252. Comment Summary: The Draft RMP/Draft EIS failed to relate market and non-market economic values.

Response: The BLM has updated the presentation of the market and non-market values analysis in Issue 1 of the Socioeconomics section of the Proposed RMP/Final EIS to clarify how the BLM estimated the market and non-market values of ecosystem services, and what the values mean in the context of the alternatives and the Proposed RMP.

The Draft RMP/EIS presented the value of ecosystem goods and services in two broad categories: those traded in markets (market values), and those not traded in markets (non-market values) (USDI BLM 2015, pp. 478–526). The Draft RMP/EIS assessed the value of goods and services traded in markets using the market price people are willing to pay for them (e.g., stumpage prices). The Draft RMP/EIS assessed the value of goods and services not traded in markets using other measures of willingness to pay, derived using scientifically validated and professionally accepted techniques outlined in official BLM guidance for estimating non-market values (USDI BLM 2013a).

These non-market valuation techniques result in monetary estimates for non-market goods and services that are comparable to market-based prices. These values are comparable insofar as they both reflect changes in society's overall economic well-being. However, they are not comparable in how they contribute to the fiscal status of the economy. By definition, market values are associated with monetary transactions that have real financial impacts in communities. Non-market values reflect the importance people place on goods and services for which they do not have to pay real money, and estimate likely payments if market conditions did exist, such as if the BLM charged people what they were willing to pay to use outdoor recreation resources. People's interactions with these non-market goods and services (e.g., participating in a mountain biking trip) may produce financial impacts traceable in the economy, but these impacts likely do not reflect the entire value associated with the good or service.

The Draft RMP/EIS contains a reasoned analysis containing quantitative or detailed qualitative information on how the alternatives would affect market and non-market values. Thus, the Draft RMP/EIS took a 'hard look' at the effects on market and non-market values.

253. Comment Summary: The Draft RMP/Draft EIS inadequately differentiated the fiscal impacts of the dollar value estimates of goods and services by benefit type.

Response: The BLM has updated the presentation of the market and non-market values analysis in Issue 1 of the Socioeconomics section of the Proposed RMP/Final EIS to clarify how the BLM estimated the market and non-market values of ecosystem services, and what the values mean in the context of the alternatives and the Proposed RMP.

The analysis of the value of goods and services is an assessment of the economic value to society of

goods and services derived from BLM-administered lands, and how those values differ under the RMP alternatives. Following BLM guidance (USDI BLM 2013a), the analysis includes both market-based and non-market goods and services. The analysis estimates both market and non-market values using professionally accepted valuation techniques. The resulting market-based and non-market based monetary estimates are comparable in the context of determining society's overall economic well-being. However, market and non-market values result in different degrees of fiscal impact in economies.

Market-based values, by definition, show up as monetary transactions in an economy. Non-market values, in contrast, do not contribute directly to the fiscal status of an economy. However, they do have indirect effects. People routinely make decisions or take actions because of the value they place on non-market goods and services. These actions result in monetary transactions that do affect the economy, though these transactions typically reflect only a small portion of the total economic value of the good or service. In the context of the Proposed RMPs, the most relevant example of this relationship is recreation: people do not typically pay to participate in outdoor recreation, but they do purchase gear, fuel, and lodging as a result of their participation. These purchases, while economically important, are not part of the description of the non-market value of recreation as presented in Socioeconomics Issue 1, but are, to the extent data allow, included in the analysis of economic impacts, described in Socioeconomics Issue 2, economic activity in the planning area.

254. Comment Summary: The Draft RMP/Draft EIS failed to recognize the full value of water quality, especially variation across alternatives.

Response: The BLM based the analysis of economic value presented in Socioeconomics Issue 1 on the underlying physical changes in water quality arising from each alternative, as described in the Hydrology section of Chapter 3. In that section, the analysis did not identify variation across alternatives with respect to impacts to water quality parameters that contribute to people's use or enjoyment of the resource (e.g., drinking, swimming, fishing, supporting biodiversity, and diluting downstream pollution). Thus, the analysis of the value of the good or service associated with water quality also did not show variation across alternatives. The Draft RMP/EIS acknowledged the importance of water quality services provided by BLM-administered lands, but did not estimate specific monetary values because of the uniformity of benefits across alternatives.

255. Comment Summary: The Draft RMP/Draft EIS failed to estimate the socioeconomic value of biodiversity.

Response: The BLM has updated Issue 1 of the Socioeconomics section of the Proposed RMP/Final EIS to include more detail from the economic literature about the importance of biodiversity. The Draft RMP/EIS described in qualitative terms the value of biodiversity associated with BLM-administered lands and the effects of alternatives. Quantifying in monetary units the value of biodiversity of BLM-administered lands would require physical and economic data that is not available, and a level of analytical detail and precision that would be too speculative for a planning-level analysis over a large landscape.

256. Comment Summary: Loss of survey and manage will impact the local economy by removing numerous local survey jobs from the economy. These impacts were not disclosed or analyzed in the DEIS.

Response: The loss of survey jobs from the elimination of the Survey and Manage measures is speculative. The commenter provided no specific information on the present number of local, seasonal survey jobs that the Survey and Manage measures might provide at any point in time during a calendar year, or whether these are volunteer or paid positions with any available wage data or other economic data that could have been included in the Draft RMP/EIS analysis of socioeconomic effects. The BLM would continue to provide management for species listed under the ESA including pre-disturbance surveys and surveys to find new populations for plant species listed under the ESA. Surveys for Bureau Sensitive species would continue to be an available management tool, to be used at the discretion of the BLM. It is speculative to assert that survey jobs would decline under the action alternatives or the Proposed RMP, given the management direction to conduct surveys for listed species and the discretion to use surveys to manage Bureau Sensitive species.

257. Comment Summary: The Draft RMP/Draft EIS failed to estimate the value of views to private property owners.

Response: The BLM has updated Issue 1 of the Socioeconomics section of the Proposed RMP/Final EIS to include a more detailed description of the relationship between property values and scenic amenities on BLM-administered lands. The Proposed RMP/Final EIS also includes acknowledgement of the relevance of scenic amenities for property values as demonstrated by hedonic analyses (analyses of the characteristics or services related to a price of a marketed good). However, quantifying in monetary units the impacts of the alternatives on property values would require physical and economic data that is not available, and a level of analytical detail and precision that would be too speculative for a planning-level analysis over a large landscape.

258. Comment Summary: The EIS should clearly identify the relative social cost of each alternative, specifically with respect to the social cost of carbon.

Response: The BLM has updated Issue 1 of the Socioeconomics section of the Proposed RMP/Final EIS to clarify confusion surrounding the description of the effects of the alternatives on the value of net carbon storage. The BLM has incorporated into the analysis updated data from the Climate Change section and has updated social cost of carbon values from the Interagency Working Group (IWG 2015), but the analytical methodology is fundamentally the same as in the Draft RMP/EIS. Issue 1 quantifies the value of net carbon storage, relying on carbon storage data presented in the Climate Change section that take into account emissions resulting from the alternatives. The value reflects the latest Federal estimates of the social cost of carbon, using the guidance and methods outlined by the Council on Environmental Quality (IWG 2015).

259. Comment Summary: The Draft RMP/Draft EIS underestimated the social cost of carbon.

Response: The BLM has updated the social cost of carbon estimates presented in Issue 1 of the Socioeconomics section of the Proposed RMP/Final EIS. The estimates rely on the U.S. Interagency Working Group on Social Cost of Carbon's (IWG) latest estimates and methodology, from July of 2015 (IWG 2015). The IWG's estimates are the best available estimates of the social cost of carbon at the current time. The IWG identifies limitations to the analysis in the 2010, 2013, and 2015 technical support documents. These identified limitations include some of the same concerns raised through public comments on the Draft RMP/EIS. The IWG acknowledges that these limitations may lead to an underestimation of the actual social cost of carbon (IWG 2010, p. 31). The economists charged with developing the estimates say they plan to continue to refine their estimates and methods as

researchers produce better valuation data on a wider range of global damages from climate change. Specifically, the Office of Management and Budget states, in responding to the many public comments it received on the 2013 Technical Support Document:

> *[T]o ensure that the next SCC update keeps up with the latest available science and economics, we will seek independent expert advice on opportunities to improve the estimates, including many of the approaches suggested by commenters and summarized in the Response to Comments document. Specifically, we are asking the National Academies of Sciences, Engineering, and Medicine to provide advice on the pros and cons of potential approaches to future updates. Input from the Academies, informed by on-going public comment and the peer-reviewed literature, will help to ensure that the SCC estimates used by the Federal government continue to reflect the best available science and economics. Federal agencies will continue to use the current SCC estimates in regulatory impact analysis until further updates can be made to reflect the forthcoming guidance from the Academies.* (Shelanski and Obstfeld 2015)

Thus, the BLM believes using the current (2015) social cost of carbon estimates in the Proposed RMP/Final EIS is justified, because more comprehensive, peer-reviewed estimates are not available. The BLM has reviewed the studies presented by the commenters and the data limitations outlined by the IWG itself. To address the uncertainty that arises from these limitations, the BLM has incorporated discussion in the Proposed RMP/Final EIS to highlight the uncertainty and the implications for management decision-making (see the Socioeconomics section of Chapter 3).

260. Comment Summary: The Draft RMP/Draft EIS failed to account, properly, for all costs of the RMP alternatives, including social, external, and non-market costs.

Response: The Draft RMP/EIS accounted for all costs of the alternatives to the extent practicable. The analysis of the value of goods and services presented in Issue 1 of the Socioeconomics section captured both market and non-market values, including many values typically identified as 'external' to timber harvest calculations. For example, the analysis considered the effects of the alternatives on water quality, net carbon storage, and recreation, among many other goods and services. The values of these goods and services, described both qualitatively and quantitatively, are presented alongside the market values of timber and other traditional extractive uses of BLM-administered lands, so readers may compare how each alternative would affect the entire suite of goods and services. Neither the CEQ regulations for NEPA nor BLM guidance require a benefit-cost analysis of alternatives. Moreover, a benefit-cost analysis would not be appropriate or produce an accurate comparison of benefits and costs (external or otherwise) given the level of detail available for each good and service across the planning area.

261. Comment Summary: The EIS should discuss the impacts of differences in timber revenues on county services and community capacity not just on payments to counties.

Response: The Draft RMP/EIS did discuss the impacts of differences in timber revenues on county services and community capacity. In Issue 3 of the Socioeconomics section, the analysis focuses on the effects of the alternatives on amount of payments to counties from activities on BLM-administered lands. Issue 5 of the Socioeconomics section incorporates output from Issue 3 into its analysis of the impacts of the alternatives on community capacity (USDI BLM 2015, pp. 569–588). The Draft RMP/EIS provided a historical context for the analysis of how alternatives may affect county payments and may affect spending on services. This information includes the relative importance of county payments to total county budgets, the types of county services supported by

county payments, and the challenges counties have faced and currently face with declining county payments from 2003 through 2012 (USDI BLM 2015, pp. 558–559). The Analysis of the Management Situation provided additional information, including county payments as a percentage of county budgets and as a percentage of county general funds discretional revenue (USDI BLM 2013, pp. 96–104). This information also included a description of the Oregon Secretary of State's assessment of financial well-being, which found that all eight of the counties identified as having a higher rate of financial distress receive payments from activities on BLM-administered lands. The BLM incorporated this information into the Draft RMP/EIS by reference (USDI BLM 2015, p. 529).

Counties choose how to spend these payments. Counties also decide whether and how to change spending on county services in response to changes in payments from activities on BLM-administered lands. It is outside the purpose or scope of the analysis to speculate how counties might choose to change future spending on county services in response to future changes in payments from activities on BLM-administered lands.

262. Comment Summary: The Draft RMP/EIS used an inappropriate baseline year for analyzing payments to counties. The Draft RMP/EIS failed to adequately describe the historical conditions regarding county payments as a basis for understanding and providing context for the effects of the proposed alternatives on these payments.

Response: The BLM based its analysis of county payments on the results of the vegetation modeling, which included projected timber harvest. The Draft RMP/EIS explained that the analysis used 2012 as baseline, because 2012 was the most recent year for which all economic data were available (USDI BLM 2015, pp. 527–528, 545, 557). Using the most recent data available assures that the economic analysis reflects current conditions and provides readers with a common reference point and context for the impacts described in the analysis. The BLM disagrees that its use of 2012 as baseline year is inappropriate.

The Draft RMP/EIS included information on payments to counties for years 2003, 2007, 2010, and 2012, allowing readers to compare payments in different time periods (USDI BLM 2015, p. 560). The Analysis of the Management Situation discussed how county payments would have been significantly less in 2007 had they been based on the payment formula in the O&C Act, rather than on the payments through the Secure Rural Schools and Community Self-Determination Act (SRS) (USDI BLM 2013, p. 103). The BLM provides additional information on payments to counties from activities on BLM-administered lands for earlier years on BLM's website, http://www.blm.gov/or/rac/ctypaypayments.php.

263. Comment Summary: The EIS should be revised to remove bias in its presentation of payment mechanisms to counties. The Draft RMP/EIS appears to favor payments under the SRS program rather than payments calculated using the O&C Act formula.

Response: The BLM disagrees that its presentation of payment mechanisms is biased. The Draft RMP/EIS identified the uncertain future of SRS payments (USDI BLM 2015, p. 556). In light of this uncertainty of continued payments under the SRS formula, the Draft RMP/EIS analyzed the effects of the alternatives on county payments using the O&C Act formula. For comparison, the Draft RMP/EIS showed county payments in 2012 under both the SRS and the O&C Act formula (USDI BLM 2015, p. 561). Regardless, the BLM has no discretion over whether counties receive SRS payments or payments using the O&C Act formula.

264. Comment Summary: The EIS should acknowledge sources of funding (other than from County payments) are or could be available to offset county budget shortfalls.

Response: The analysis of county payments evaluates how alternatives would affect payments to counties from activities on BLM-administered lands. Counties decide how to change spending in response to changes in payments from activities on BLM-administered lands. County residents, through their elected officials and through votes on taxes or fees, choose how they collect revenues to fund county services. How counties could obtain sources of funding other than payments derived from activities on BLM-administered lands is beyond the scope of an RMP.

265. Comment Summary: The EIS fails to take into account the potential responses of other non-BLM timberland owners in analyzing market conditions. It also does not include an assessment of the rate of harvest on adjacent state and private forestlands and the implications this has for the relative value of goods and services from BLM lands.

Response: The Draft RMP/EIS did include assessments of both potential responses of non-BLM timberland owners in assessing market conditions and those owners' influences on markets in deriving values of goods and services on BLM-administered lands. Issue 1 of the Socioeconomics section in Chapter 3 discussed both these under the "Market Impacts of Changes in BLM Harvests" section. The analysis addressed the market (both price and harvest quantities) impacts of changes in BLM timber harvests under each alternative, specifically and quantitatively assessing the estimated change in private harvest under each alternative (USDI BLM 2015, pp. 515–516). The analysis incorporated these estimated responses to market conditions into the analysis of the values of BLM goods and services. The "Market Impacts of Changes in BLM Harvests" section, in part, served to help distinguish between gross harvest effects (the BLM Harvest Volumes in **Table 3-165)** and the net harvest effects, which was incorporated into the jobs and earnings analysis in Issue 2 of the Socioeconomics analysis. Thus, the BLM believes that the Draft RMP/EIS did take into account the potential responses of other non-BLM timberland owners in analyzing market conditions.

266. Comment Summary: The EIS should include a detailed assessment of externalities, subsidies, missing markets and other timber market failures in the planning area that distort normal market conditions. The Draft RMP/EIS was silent on the entire concept of normal markets, market failures, and how the proposed increase in logging was justified in the presence of them.

Response: The BLM used recent as well as historical market trends and levels of activity by timber suppliers and buyers to develop the stumpage price projections used in the vegetation modeling in the Draft RMP/EIS. The Draft RMP/ EIS presented the historical stumpage prices in western Oregon for BLM, U.S. Forest Service, and state and private timber sales (USDI BLM 2015, p. 484–486). For BLM timber sales, stumpage is appraised and sold (by auction) in competitive markets at the fair market value. For projecting stumpage prices into the future, the BLM generalized trends from the volatile nature of the market, as explained the Draft RMP/EIS (USDI BLM 2015, pp. 480–481).

Timber markets, like other commodity markets, are organic frameworks that operate with little structure other than to establish terms of trade. They seek to cover production costs of suppliers and to reduce factor costs of production. In the case of both public and private forest management, production costs include stand establishment costs, management costs, administrative costs, and harvesting costs. Externalities are often mitigated through regulation of forestry practices, such as stream buffers or limits on harvesting practices. There is little evidence of subsidies in western

Oregon timber markets, though Federal agencies may sell some timber at less than the production costs, typically as part of restoration strategies to reduce fire risks or to restore habitat. In such cases, the timber harvest represents a by-product of other achieving other management purposes.

Timber markets in western Oregon are both highly competitive and volatile, as underlying market determinants shift. Because the BLM sells timber by auction in competitive markets, which represents the highest standard for establishing prices, market failures in the western Oregon timber markets do not constitute a substantial issue that would alter the analysis of effects of the alternatives on timber supply and demand as analyzed in the Draft RMP/EIS. The BLM does not agree that a detailed assessment of "externalities, subsidies, missing markets and other timber market failures" is necessary to analyze the effects of the alternatives on timber supply and demand.

The commenter mischaracterizes the alternatives as constituting a "proposed increase in logging." As clearly described in the Draft RMP/EIS, only three of the four action alternatives would provide more sustained-yield timber harvest than the volume declared in the 1995 RMPs, and only one of the four action alternatives would provide more sustained-yield timber production than the No Action alternative (USDI BLM 2015, pp. 262–263). Thus, the alternatives in the Draft RMP/EIS present an array of timber harvest levels that range above and below current levels and cannot be characterized as a proposed increase in logging. Regardless, the analysis does not purport to justify any particular timber harvest level, but to analyze the effects of the alternatives of resources, including timber supply and demand.

267. Comment Summary: The EIS should explain the need for logs sourced from public lands, when hundreds of millions of board feet are harvested in Oregon and exported to our commercial competitors every year.

Response: The O&C Act requires that the O&C lands be managed "for permanent forest production, and the timber thereon shall be sold, cut, and removed in conformity with the principal of sustained yield for the purpose of providing a permanent source of timber supply, protecting watersheds, regulating stream flow, and contributing to the economic stability of local communities and industries, and providing recreational facilities" (43 U.S.C. 1181a). In Chapter 1 of the Draft RMP/EIS, the BLM stated, "Based on the language of the O&C Act, the O&C Act's legislative history, and case law, it is clear that sustained-yield timber production is the primary or dominant use of the O&C lands in western Oregon" (USDI BLM 2015, p. 15). The BLM based the purpose and need for this RMP revision on the laws that apply to the BLM, and one of the purposes for the RMP revision is to provide for a sustained yield of timber. Thus, the BLM has established that the BLM-administered lands in the planning area must provide for a sustained yield of timber, consistent with applicable statutes, regulations, and policies (USDI BLM 2015, pp. 5–10).

The Draft RMP/EIS explained that public lands have been a major supplier of timber to mills in western Oregon for decades (USDI BLM 2015, pp. 484–486). Once timber is harvested, it flows across the region to various processing centers. There are few restrictions on how Federal timber flows across western United States, with the exception of the ban on the export of timber from Federal lands and substituting timber from Federal lands for exported private timber. The amount of timber harvest on other lands and the movement of harvested timber do not alter the applicable statutes, regulations, and policies that direct that the BLM-administered lands in the planning area provide a sustained yield of timber.

268. Comment Summary: The EIS should include a market analysis that is driven by optimization of revenue from timber harvests on a per mmbf basis. The BLM might be able to avoid the market response that the Draft RMP/EIS says will occur (i.e., reductions in private harvests and at the same time increase revenues for Counties without increasing acres treated).

Response: One of the purposes for the RMP revision is to provide for a sustained yield of timber. The alternatives in the Draft RMP/EIS would result in an array of timber harvest levels and a consequent array of revenue from timber harvest and payments to counties (USDI BLM 2015, pp. 509–516, 562–565). However, optimizing revenue from timber harvests or maximizing payments to counties were not purposes for the RMP revision. As a result, the BLM did not develop an alternative specifically designed to optimize revenue from timber harvests or maximize payments to counties. As explained in the comment response above in the Range of Alternatives section, the Draft RMP/EIS assessed a reference analysis of "Manage most commercial lands for maximizing timber production," which would produce substantially more timber harvest (and consequently higher payments to counties) than the alternatives. However, the reference analysis of "Manage most commercial lands for maximizing timber production" would not be a reasonable alternative.

Additionally, the BLM did not develop the analysis of socioeconomic effects to derive a specific conclusion. According to CEQ regulations, the analysis in an EIS must provide a full and fair discussion of significant environmental issues and shall serve as a means of assessing environmental effects rather than justifying decisions already made (40 CFR 1502.1, 40 CFR 1502.2(g)). To design the analysis to reach the particular outcome of "optimization of revenue from timber harvest on a per mmbf basis" would not be consistent with the requirements for NEPA analysis.

269. Comment Summary: The EIS should provide a better explanation of recreation participation forecasts. The EIS should be revised to better explain the basis for the recreation demand forecasts. The Draft EIS was flawed in that it implied a similar value for recreation across alternatives.

Response: The BLM has revised the recreation participation forecasts to reflect different levels of recreation participation and value by alternative and the Proposed RMP in the Proposed RMP/Final EIS (see the Socioeconomics section of Chapter 3).

The recreation participation forecasts in the Proposed RMP/Final EIS are based on trends developed by the U.S Forest Service specific to each of 17 categories of outdoor recreation, and include not only trends in preferences, but also factor in the effects of population growth, income growth, land use change and climate change. The U.S. Forest Service developed the trends for ten-year increments through the year 2060 (Bowker *et. al.* 2012). The BLM aligned these activity-specific forecasts and participation trajectories with the outdoor recreation categories monitored and reported within the BLM Recreation Management Information System (RMIS) database. The BLM applied the trends to the baseline (2012) participation levels by activity type. The recreation demand forecasts in the Proposed RMP/Final EIS include all measured recreation on BLM-administered lands, not just those proximate to population centers. The BLM included only those recreation activities that are measured and included in the RMIS in the basis for future extrapolations.

In addition to forecasts for overall future participation levels, the Proposed RMP/Final EIS includes estimates of changes in outdoor recreation participation (visitor day and visit forecasts) by alternative and the Proposed RMP. The BLM based these estimates on different levels of outdoor recreation opportunities that would result from differences in Recreation Management Area total acreage by alternative and elasticity of demand estimates derived from data collected by the U.S. Census Bureau

as part of the American Time Use Survey. **Appendix P** – Socioeconomics provides detail on the methods for estimating and applying these demand elasticities.

270. Comment Summary: The EIS fails to describe how the increased timber harvesting will take away the forest resources needed for job growth in the economic sectors such as tourism with long term growth potential.

Response: The BLM does not agree with the commenter's assertion that timber harvesting necessarily would "take away the forest resources needed for job growth" in other sectors, such as recreation and tourism. As demonstrated by the analysis in the Draft RMP/EIS, the amount and type of recreation opportunities on BLM-administered lands would not be constrained by the level of timber harvest, but rather by prioritization of recreation activities and locations, considering the overall set of options available to participants in western Oregon. Notably, the amount of recreation opportunities and the jobs and revenue associated with recreation shows no clear or direct relationship with the amount of timber harvest under the alternatives (USDI BLM 2015, pp. 454–470, 516–520). It is possible that timber harvest activities under the alternatives or Proposed RMP would inhibit certain types of outdoor recreation in certain specific locations, such as dispersed backcountry activities that prioritize wilderness conditions (USDI BLM 2015, pp. 467–468). However, the alternatives and the Proposed RMP provide for different recreational values on different portions of the landscape, including backcountry and wilderness conditions, but cannot provide for all values on every acre. As explained in the Recreation section of Chapter 3, where the BLM would manage recreation management areas within the Harvest Land Base, the BLM has determined that recreation management can be compatible with sustained-yield timber production. Therefore, allocation of the Harvest Land Base would not degrade BLM's objectives for providing outdoor recreation opportunities and associated economic development conditions.

271. Comment Summary: The BLM should revise the EIS to identify underestimated or omitted jobs attributable to recreation and tourism activities, including hunting, fishing, and wildlife viewing.

Response: The BLM has revised the recreation participation forecasts in the Proposed RMP/Final EIS to reflect different levels of recreation participation and value by alternative and the Proposed RMP. These varying levels of recreation participation and value would result in varying levels of jobs and income attributable to recreation and tourism by alternative and the Proposed RMP in the Proposed RMP/Final EIS (see the Socioeconomics section of Chapter 3).

Tourism in western Oregon is an important and complex component of local and regional economies. In the Proposed RMP/Final EIS analysis, the BLM estimates recreation and tourism-based jobs and income where there are transactions in the economy expected as a result of BLM resource management activities and where data are available to make the estimates. The visitor use estimates in the analysis include all recreation activities, including fishing, hunting, and wildlife viewing, and both local and non-local visitors (tourists). The Proposed RMP/Final EIS describes the valuation methodologies for recreation and visitation (see the Socioeconomics section of Chapter 3).

272. Comment Summary: The BLM should revise the EIS to identify jobs attributable to all amenities, both market and non-market that were omitted from the Draft RMP/Draft EIS.

Response: The BLM believes that the analysis has identified the reasonably foreseeable effects of the alternatives on jobs. As noted in the comment response above, the BLM has revised the Proposed

RMP/Final EIS to reflect different levels of recreation participation and recreation-related jobs by alternative and the Proposed RMP. It is not the intent of this analysis to catalog all the ways in which BLM-administered lands contribute to life in western Oregon, however attenuated or speculative the connection with the alternatives. The BLM is required under the NEPA to provide analysis of significant issues (40 CFR 1501.7(a)(2), 40 CFR 1501.7(a)(3), 40 CFR 1502.1). The BLM also analyzes issues where their assessment is necessary to make a reasoned choice between alternatives considered (USDI BLM 2008, pp. 40–41).

Western Oregon is known for amenities that extend and interconnect across all types of public and private lands. Amenities include cultural, institutional, and natural features that interact to provide an array of benefits for business and residents alike. Economic development in western Oregon often draws upon such attributes to attract new businesses or cultivate new ones, resulting in jobs and income for residents and newcomers. The BLM-administered lands contribute to this vast array of amenities in western Oregon through natural features such as forests, meadows, wildlife habitat, streams, topography, and juxtaposition with private lands. The BLM does not dispute that cultural, institutional, or natural amenities could be associated with BLM-administered lands in the planning area. However, there is insufficient information on such amenities to—

- Identify the production of goods and services associated with these amenities;
- Forecast any changes in these amenities; and
- Link any changes in these amenities to the alternatives or the Proposed RMP.

Without such information, it is not possible to analyze any change in jobs associated with these amenities as a reasonably foreseeable effect of the alternatives or the Proposed RMP, beyond the effects on jobs analyzed in the Socioeconomics section of Chapter 3.

273. Comment Summary: The BLM should revise the EIS to correct the number of jobs attributable to timber harvest and processing. These were overstated in the Draft RMP/Draft EIS.

Response: The BLM disagrees that forest product industry jobs were overstated in the Draft RMP/EIS. Summaries of firm-level (individual business) data from Oregon Forest Resources Institute and from the University of Montana, Bureau of Business and Economic Research provided employment and income relationships to timber harvest by product type that are unique to Oregon. The BLM used the relationship data in conjunction with timber growth and harvest models to create and run seven customized IMPLAN® models of western Oregon (MIG, Inc. 2014) (see Issue 2 of the Socioeconomics section of Chapter 3). In addition, the BLM incorporated the effect of BLM harvest on other timberland ownerships to account for total market effects on jobs and income. The BLM believes that this analysis provides a reasoned analysis of jobs attributable to timber harvest and processing based on high quality, detailed, and quantitative information.

274. Comment Summary: The BLM should revise the EIS using an earlier base year, not 2012, as a reference point for comparing jobs by alternative.

Response: The BLM disagrees that the use of 2012 as baseline year is inappropriate. As explained in the comment response above, the BLM used 2012 as the base year for comparing jobs by employment because it was the most recent year for which all economic data were available (USDI BLM 2015, pp. 527–528, 545, 557). Using the most recent data available assures that the economic analysis reflects current conditions and provides readers with a common reference point and context for the impacts described in the analysis. In addition, using the most recent year as a benchmark assures that production, employment, and payrolls for all industries in the area reflect current business conditions. Production processes and relationships, whether in retail, service, or manufacturing

industries, change over time. Using old benchmarks could easily compromise the analyses, and mislead or cloud analysis results. Economic effects that are triggered by changes in BLM management start with and move forward from current economic and business conditions as described in the Affected Environment sections of the Socioeconomics section in Chapter 3.

Additionally, the BLM has provided earlier base year information for employment within the planning area in the Analysis of the Management Situation (USDI BLM 2013, p. 105), and the BLM incorporated this information into the Draft RMP/EIS by reference (USDI BLM 2015, p. 529).

275. Comment Summary: The BLM should revise the EIS to use best available data in conducting jobs analysis, including publications by the Oregon Forest Resources Institute.

Response: The BLM used detailed data from multiple sources in the various employment analyses presented in the Draft RMP/EIS, including data from the Oregon Forest Resources Institute and from the University of Montana, Bureau of Business and Economic Research. The analysis cites the data sources (including the Oregon Forest Resources Institute's "2012 Forest Report: An economic assessment of Oregon's forest and wood products manufacturing sector") throughout the analysis of the effects of the alternatives and the Proposed RMP on jobs (see the Socioeconomics section of the Chapter 3).

276. Comment Summary: The BLM should revise the EIS to fully consider industry trends when analyzing and presenting timber industry jobs by alternative.

Response: The BLM fully considered historical and trend data as an aggregated description of the Affected Environment for the analysis of the alternatives on jobs. The BLM considered and has presented historical and trend data for employment, unemployment, and earnings in the planning area briefly in the Affected Environment portions of the Socioeconomics section in the Draft RMP/EIS (USDI BLM 2015, pp. 484–508, 529–545, 559–561, 576–584), and more fully in the Analysis of the Management Situation (USDI BLM 2013, pp. 98–108, 121–127).

277. Comment Summary: The BLM should revise the EIS to recognize differing log sizes and their distribution across BLM districts as well as variations in manufacturing/processing capacity when estimating economic effects to the timber industry.

Response: The Draft RMP/EIS included analysis of differing log sizes that would be harvested under each alternative (USDI BLM 2015, pp. 274–275). The jobs and income analysis for Issue 2 in the Socioeconomics section recognized three distinct grades of log products harvested from BLM-administered lands: veneer logs, sawlogs, and roundwood/pulpwood. As explained in the Draft RMP/EIS, the analysis considered each product using unique job and income relationships per unit volume harvested and processed (USDI BLM 2015, p, 548).

The analysis used data on current log flows between district model areas, so that logs harvested from each district were distributed to processing centers according to current product transportation patterns. Based on these data, some logs harvested on BLM-administered lands are transported outside of western Oregon for processing. This is especially true for harvest from the Klamath Falls model area, where data show that 11 percent of logs are processed in California.

For this analysis, the BLM customized the economic models for the jobs and income analysis to represent current industry production (2012), but did not constrain the models to the current processing capacity. As such, the models allow production expansion as part of the analysis, if needed, to process harvest increases.

Therefore, the BLM believes that the socioeconomic analysis in the Draft RMP/EIS did recognize differing log sizes and their distribution across BLM districts as well as variations in manufacturing/processing capacity.

278. Comment Summary: The BLM should revise the EIS to correct or clarify the application of the stability/volatility analysis to avoid erroneous conclusions. The BLM should revise the EIS to re-analyze stability/volatility at a regional or local geographic scale instead of a national scale.

Response: The BLM disagrees that it has incorrectly applied analysis of stability and volatility in analysis in the Draft RMP/EIS. The volatility analysis presented in the Draft RMP/EIS is one way to examine the historical pattern of economic growth rates and how BLM management might affect jobs and income in western Oregon.

The timber industry has a long history in western Oregon, but it is not a stagnant one. Like most industries, timber-based firms have responded to changing product demands, fluctuating input availability, and U.S. business cycles by upgrading production processes to capabilities not seen or technologically available in decades past. The volatility analysis of growth rates does suggest that industries tied to commodity markets—like wood products —can be vulnerable to highs and lows not experienced by some industries. Steady timber harvests may eliminate one factor of industry volatility, but it cannot fully offset the volatility of commodity markets that are central to these timber-based firms.

The jobs and income analysis in the Draft RMP/EIS showed how changes in timber harvest are likely to translate into an increase (growth) or decrease (contraction) of the timber industry and the local economy in the first decade of implementation of the alternatives, while the volatility analysis shows how steady such growth could be over many decades given historic patterns. As explained in the Draft RMP/EIS, the timber industry contributes high, year-round salaries to western Oregon, especially southwestern Oregon, that seasonal recreation-based industries do not, but it also brings a level of volatility that recreation-based industries do not (USDI BLM 2015, pp. 529–555).

The BLM analyzed volatility at a local, district model area scale for portions of the analysis. This analysis encompassed all industries in each local area, and provided a local reference point for the historic national characteristics of both the timber-related and recreation-related industries. However, these data are limited in accounting for influences to the industry that national level data can present. The BLM conducted volatility analysis of growth rates for both timber-related and recreation-related sectors at the national level primarily to disclose the inherent characteristics of these industries and the markets they serve. A common data set at the national level made possible the long-term analysis, which better reveals growth patterns characterizing each industry. A national scale is especially necessary for timber-related sectors, as industries and harvests in western Oregon are strongly influenced by Federal timber management programs that are often driven by Federal Government interests rather than by markets. For this reason, national patterns are likely to represent a lower bound of growth-rate volatility for timber sectors in western Oregon.

279. Comment Summary: The BLM should revise the EIS to use cost relationships that vary by program size when estimating agency costs to implement the timber program under each alternative.

Response: The Proposed RMP/Final EIS has revised the cost estimates by using a variety of timber program costs per Mbf that better reflect the variation in harvest volume yield per acre and relative timber program costs by district and alternative and the Proposed RMP (see Issue 7 in the Socioeconomics section of Chapter 3, which reflects this updated information).

280. Comment Summary: The EIS should be revised to adequately describe and capture the relationship between the BLM's management and social conditions in the Counties including public safety, schools, and discretionary spending. The EIS's capacity and resiliency analysis is flawed because it did not address some of issues which are paramount to social well-being: i) impacts to school enrollment, which ultimately affects future workforce availability, school funding, and ability to offer services; ii) labor force size trends; and iii) employment participation numbers relative to unemployment, which is reflected in the related social consequences of unemployment such as domestic violence, and drug and alcohol addiction.

Response: The Draft RMP/EIS analyzed the relationship between BLM's management and social conditions in the counties in several different ways throughout the Socioeconomics section. The analysis of socioeconomic resources has two broad emphases: economic growth and stability; and social capacity and resiliency (USDI BLM 2015, pp. 473, 570). Issues 3 and 5 addressed public safety, schools, and discretionary spending most directly. Issue 3 noted that counties use payments in various ways including for public safety, county roads, and education. Issue 3 also described the declines in payments to counties since 2003, the financial hardships and challenges that some of the counties face, and the different efforts by counties to deal with declines in payments (USDI BLM 2015, pp. 558–565).

While the capacity and resiliency analysis did not address every factor contributing to social well-being, it included a broad representation of factors. The Affected Environment for Issue 5 provides data on 13 metrics including education, unemployment, and health insurance (see **Table 3-2**, Capacity and Resiliency Metrics, in the Draft RMP/EIS). Further, these issues featured frequently in interviews with community representatives (see the interview summaries in **Appendix P** – Socioeconomics).

For the analysis in Issue 5, the BLM worked closely with the Cooperating Agencies Advisory Group's Socioeconomics Working Group, as documented in the Planning Criteria (USDI BLM 2014) (see the Formal Cooperators section of Chapter 4). Members of that group urged the BLM to explore the relationship between the BLM's management and specific social conditions such as public safety, child, family, and community health, school budgets and programs, unemployment, and drug and alcohol abuse. The BLM reviewed data on these conditions provided by group members and explored the potential, for example, to analyze quantitatively the relationship between an increase or decrease in a timber harvest and a change in a social condition, such as a sheriff's office staffing levels. This proved to be not meaningfully possible because of the myriad of other factors that influence social conditions and the practical inability to isolate timber harvest volume as a factor affecting such social conditions.

Instead, the BLM opted to explore the relationship qualitatively through interviews with city and Tribal representatives capturing personal experiences, perspectives, perceptions, and insights, to help tell each community's "story" in relation to the RMP revision. The Issue 5 of the Socioeconomics section of Chapter 3 includes a brief summary of the interviews. **Appendix P** – Socioeconomics

provides detailed summaries of each interview. The BLM incorporated the conclusions from the interviews into a quantitative analysis to describe how the alternatives and the Proposed RMP would affect communities.

Through the rounded, comprehensive analyses described above, the BLM believes it has adequately described the reasonably foreseeable effects of the alternatives and the Proposed RMP on social conditions in the counties.

281. Comment Summary: The EIS's capacity and resiliency analysis is flawed because it focused on cities and ignored the population living in unincorporated areas; these residents have been most impacted by changes in federal land management. The selection of cities for inclusion in the analysis seems to have been biased towards a desired result. The BLM chose 13 metrics of community capacity and resiliency, but they were chosen among a larger set of metrics. The subset of metrics chosen failed to accurately reflect the community benefits of forest conservation, leading to the conclusion that more logging will provide greater benefits

Response: Much of the socioeconomic analysis in the Draft RMP/EIS presented effects at the county level and, as such, included the effects of the alternatives and the Proposed RMP on the populations of both incorporated and unincorporated areas. Therefore, the Draft RMP/EIS did not ignore either population.

The Draft RMP/EIS noted that there are practical difficulties in comprehensively identifying some types of communities and in analyzing how the alternatives would affect them. With respect to the population living in unincorporated areas, this is largely due to the geographically dispersed nature of the residents that make up this population. The Draft RMP/EIS also explained that because much of the socioeconomic analysis is at the county level, the BLM opted to gain a different perspective on the potential impacts of the alternatives and the Proposed RMP by analyzing communities at the sub-county level (i.e., cities). The Draft RMP/EIS noted that incorporated cities comprise approximately 70 percent of the population of the planning area, justifying special consideration in the socioeconomic analysis (USDI BLM 2015, pp. 569–576). Due to this high percentage of population in incorporated cities, the large number of cities, and their wide geographic distribution, and without evidence to the contrary, the BLM does not agree that the alternatives or the Proposed RMP would have greater effects on community capacity and resiliency for the population in living in unincorporated areas than the population in incorporated cities.

The Draft RMP/EIS disclosed that analyzing all 134 (small and mid-size) cities, including conducting personal interviews, would have been impractical, and that the BLM decided that a 10 percent sample plus the Tribes would be sufficiently representative of the entire group. The BLM stratified (weighted) the sample of cities, so that it would be representative of the diverse geography of the planning area, and, within the stratification rules, selected 13 cities at random from the group of 134 cities. The Draft RMP/EIS clearly described the methodology for stratifying and selecting the cities for inclusion, and the random selection ensured that the BLM did not bias the selection towards any particular outcome. The BLM developed this methodology in consultation with the Cooperating Agencies Advisory Group's Socioeconomics Working Group (see the Formal Cooperators section of Chapter 4).

The Draft RMP/EIS explained the selection of the capacity and resiliency metrics. The BLM selected these metrics to create a data baseline for assessing potential impacts from the alternatives and Proposed RMP, not with the intent of reflecting or favoring one type of benefit over another. The BLM selected the metrics in consultation with the RMP's for Western Oregon Cooperating Agencies

Advisory Group's Socioeconomics Working Group. The group considered a larger set of potential metrics, but, as described in the methods section, selected the final list based on each metric's relevance to the capacity/resiliency question, availability of data across the communities, and analytic efficiency (USDI BLM 2015, p. 574). None of the selected metrics are directly related to timber harvest or logging, but are generally reflective of broad social or economic conditions, such as unemployment rate and median household income. Only one metric is directly related to a resource managed by the BLM: acres of outdoor recreation land (USDI BLM 2015, p. 578). Therefore, the BLM does not believe that the selection of the metrics failed to reflect benefits of forest conservation or was biased towards timber harvest.

282. Comment Summary: The EIS should be revised to address the issue of the increased cost to county governments to provide services such as roads, sheriff patrols, and search and rescue as a result of increasing levels of activities on BLM lands.

Response: The BLM has revised Proposed RMP/Final EIS to include a description of payments for services from BLM districts to local jurisdictions and other organizations (see Issue 3 in the Socioeconomics section of Chapter 3). The Cooperating Agencies Advisory Group's Socioeconomics Working Group discussed this issue, and the City of Sublimity representative described the issue in his interview for Issue 5 (see the interview summaries in **Appendix P** – Socioeconomics).

The BLM districts contract with local jurisdictions (counties and cities) to provide services such noxious weed control, refuse removal, road maintenance and decommissioning, campground maintenance, habitat restoration, trail maintenance, law enforcement patrol, and emergency services. Payments for such services are highly variable from year to year depending on funding or special project needs. It is possible that unreimbursed county government expenses occur in specific locations under specific circumstances, but comprehensive data of the cost to county governments of providing services on BLM-administered lands is lacking. Therefore, it is not possible to project such expenses into the future or to analyze future change in such expenses as an effect of the alternatives or the Proposed RMP.

283. Comment Summary: The EIS should revise its conclusion (p. 472 of the DEIS) that alternatives with more logging (i.e., Alternatives B and C) will provide greater benefits in terms of community capacity and resiliency in light of the EISs other conclusions that the timber industry is inherently volatile, that increased timber harvest may have an adverse effect on community stability, and that the social cost of carbon is high.

Response: The conclusion that Alternatives B and C would make the strongest overall contributions to community capacity and resiliency is supported by the analysis of the capacity and resiliency metrics in the Draft RMP/EIS (USDI BLM 2015, pp. 472, 584–588). The Draft RMP/EIS discloses the volatility of the timber industry and analyzes in detail the social cost of carbon of the alternatives. While the analysis of timber industry volatility and the social cost of carbon provided information relevant to the discussion of the social and economic effects of the alternatives, it did not alter the analysis of the community capacity and resiliency metrics. The Interview Summary and Conclusions section of Issue 5 (Capacity and Resiliency) noted that, "With respect to the BLM's impacts, the way the BLM manages timber is by far the number one issue of concern among the communities. The primary concern is economic" (USDI BLM 2015, p. 582). Therefore, the BLM has not revised its conclusion that Alternatives B and C would make the strongest overall contributions to community capacity and resiliency, as demonstrated by the analysis of the capacity and resiliency metrics.

284. Comment Summary: The EIS should address whether the Proposed RMP will change the State of Oregon's distressed status of any of the counties and its communities to a non-distressed status or will the status remain the same or get worse.

Response: The Draft RMP/EIS discussed distressed areas, which the State defines based on indicators that take into account unemployment rates, per capita personal income, change in average covered payroll per worker over 3 years, and change in the county's weighted average employment change over 2 years (USDI BLM 2015, pp. 477–478). However, this analysis cannot project how the alternatives or the Proposed RMP would change which areas the State identifies as distressed, because the BLM cannot project precisely and accurately how the alternatives or the Proposed RMP would alter the specific indicators that the State uses to define distressed areas. Nevertheless, the Proposed RMP/Final EIS notes in Issues 2, 5, and 6 of the Socioeconomics section of Chapter 3 where different alternatives or the Proposed RMP could adversely affect different geographic areas with respect to employment and earnings and capacity and resiliency. The Proposed RMP/Final EIS also notes which of these geographic areas are in distressed areas.

285. Comment Summary: The EIS's analysis of environmental justice should include the full geographic scope of the impacts of climate change, many of which will occur elsewhere in the U.S. and the world, and the fact that the cost of climate change will fall disproportionately on the poor and disadvantaged communities.

Response: The BLM NEPA Handbook explains that the geographic scope of the effects analysis does not extend beyond the scope of the direct and indirect effects of the action (BUSDI BLM 2008, pp. 58–59). The BLM appropriately limited the geographic scope of the environmental justice analysis to the counties within the planning area, because these areas reflect the scope of the direct and indirect social and economic effects of the alternatives (USDI BLM 2015, pp. 589–591). Climate change, in and of itself, is not an effect of the BLM action. The Draft RMP/EIS analyzed the effects of the alternatives on carbon storage and greenhouse gas emissions, and described how climate change would interact with BLM management actions to alter the potential outcomes for key natural resources. As detailed in that analysis, all alternatives would result in a net increase in carbon storage over time (USDI BLM 2015, pp. 132–164). Nevertheless, the BLM cannot equate any specific greenhouse gas emissions or any specific change in net carbon storage with specific climate change effects. Therefore, the BLM does not consider the "the full geographic scope of the impacts of climate change" as an effect of the BLM action, and the effects of climate change on poor and disadvantaged communities outside of the planning area is beyond the scope of this analysis.

286. Comment Summary: The EIS should acknowledge that the shift in harvest volume from the BLM's Coos Bay, Roseburg, and Medford Districts to the northern districts will have negative impacts on the Coquille Indian Tribe's ability to harvest and market timber from the Coquille Forest and result in decreased timber revenue to the Tribe.

Response: The Proposed RMP/Final EIS acknowledges that there would be a shift in harvest volume generally from southern to northern BLM districts under the Proposed RMP. However, it is not reasonably foreseeable that this shift in BLM management of timber would affect the Coquille Tribe's ability to harvest and market timber from the Coquille Forest.

As explained in the Tribal Interests section of Chapter 3, the Coquille Tribe manages the Coquille Forest "subject to the standards and guidelines of Federal forest plans on adjacent or nearby Federal

lands, now and in the future" per Title V of the Oregon Resource Conservation Act of 1996 (Pub. L. 104-208). This means that the adopted BLM RMP that applies to the Coos Bay District will also apply to the Coquille Forest in that it will establish the suite of possible management approaches available for the Coquille Forest. However, the BLM RMP will not determine which specific land use allocations apply to which specific portions of the Coquille Forest or the rate or extent of timber harvest on the Coquille Forest. Absent such information, the BLM cannot ascribe any particular effect of the BLM RMP on the Coquille Tribe as a result of the BLM RMP establishing potential management approaches available for the Coquille Forest.

287. Comment Summary: The RMPs have no provisions for and the EIS does not discuss how the BLM intends to go about offsetting both the federal financial costs and negative externalities of an increased timber sale program.

Response: The Draft RMP/EIS presented a detailed analysis of the "federal financial costs" and the "negative externalities" associated with timber harvest.

The commenter mischaracterizes the alternatives as constituting "an increased timber sale program." As clearly described in the Draft RMP/EIS, only three of the four action alternatives would provide more sustained-yield timber harvest than the volume declared in the 1995 RMPs, and only one of the four action alternatives would provide more sustained-yield timber production than the No Action alternative (USDI BLM 2015, pp. 262–263). Thus, the alternatives in the Draft RMP/EIS present an array of timber harvest levels that range above and below current levels and cannot be characterized as an increased timber sale program.

The Draft RMP/EIS provided a detailed and quantified analysis of the costs of the alternatives, specifically breaking out the costs of the timber sale program (USDI BLM 2015, pp. 599–602). For the Proposed RMP/Final EIS, the BLM has revised its cost estimates by using a variety of timber program costs per Mbf that better reflect the variation in harvest volume yield per acre and relative timber program costs by district and alternative (see the Socioeconomics section of Chapter 3). Nevertheless, as stated in the Draft RMP/EIS, "the BLM's selection of an alternative does not authorize funding to any specific project or activity nor does it directly tie into the agency's budget as appropriated annually through the Federal budget process" (USDI BLM 2015, p. 600). Identifying funding levels or funding mechanisms for the timber program or any other resource program is beyond the scope of an RMP. Thus, the Proposed RMP/Final EIS appropriately does not attempt to address whether or how the BLM "intends to go about offsetting … the federal financial costs … of an increased timber sale program" for the alternatives or the Proposed RMP.

The commenter does not specify which "negative externalities" they believe result from timber harvest. Nevertheless, the Draft RMP/EIS analyzed in detail all significant effects that would be caused directly or indirectly by timber harvest under the alternatives (USDI BLM 2015, pp. 105–862). The specific analyses are too numerous to itemize here, but include analyzing the effects of timber harvest on habitat for plants, fish, and wildlife, water quality, soil productivity, particulate emissions, greenhouse gas emissions, recreation opportunities, visual quality, jobs, earnings, and payments to counties. These analyses describe in detail the externalities, both positive and negative, associated with the array of timber harvest levels that would result under the alternatives. Where significant adverse effects would occur from timber harvest or other resource management, the alternatives in the Draft RMP/EIS vary in their design and consequently vary in the adverse effects that would occur. Where adverse effects would occur from timber harvest or other resource management under all alternatives, the Draft RMP/EIS considered how to mitigate such adverse effects. The Records of Decision for the RMP revision will address mitigation measures that the BLM

will adopt and mitigation measures that the BLM will not adopt. The BLM will address the extent to which it will be "offsetting" negative externalities of timber harvest in the Records of Decision, which will explain how the BLM balances the beneficial and adverse effects of timber harvest against other resource objectives in selecting an RMP.

288. Comment Summary: The EIS should expand the economic measures of success to include other values such as those achieved by the requirements of the Clean Water and Air Acts, enhancement of fisheries, recreation, and other forest resources.

Response: The Proposed RMP/Final EIS includes a Monitoring Plan with three socioeconomic reporting items. The Monitoring Plan notes that such items involve activities that are related to certain analytical assumptions that are pertinent to non-specific management actions, or analytical assumptions pertinent to the analysis of environmental consequences in the Proposed RMP/Final EIS (**Appendix V** – Monitoring Plan for the Proposed RMPs). The items suggested in the comment are not related directly to the analysis of socioeconomic consequences. Instead, the Proposed RMP/Final EIS has addressed the analysis of effects on these resources in the sections of Chapter 3 on Air Quality, Hydrology, Fisheries, Recreation, and Forest Management, respectively. Furthermore, the BLM has included management objectives for Air Quality, Hydrology, Fisheries, Recreation, and Forest Management (**Appendix B** – Management Objectives and Direction). Finally, the BLM has addressed monitoring of these resources in both effectiveness and implementation monitoring (**Appendix V** – Monitoring Plan for the Proposed RMPs)

Soil Resources

289. Comment Summary: The BLM should have developed a reasonable action alternative that would have reduced, as opposed to increased, the amount of detrimental soil disturbance associated with intensive harvest activities and road construction that are emphasized in the action alternatives.

Response: The Draft RMP/EIS analyzed the amount of detrimental soil disturbance that would occur under the alternatives, in addition to the detrimental soil disturbance that has already occurred. The alternatives would result in differing amounts of additional detrimental soil disturbance, based on actions such as timber harvest, road construction, and fuels reduction treatments (USDI BLM 2015, pp. 608–628). Some amount of additional detrimental soil disturbance is necessarily incidental to implementing the management actions necessary to meet the purposes of the action. That is, it would not be possible to develop a reasonable alternative that would not result in some amount of additional detrimental soil disturbance. To reduce the amount of total detrimental soil disturbance to less than the current amount of detrimental soil disturbance would require that the BLM ameliorate more total detrimental soil disturbance than any additional detrimental soil disturbance. Such an alternative is not feasible, given the economic and technical challenges of ameliorating existing detrimental soil disturbance. Amelioration of detrimental soil disturbance, through practices such as tillage, is typically only feasible during forest management operations in a stand, such as timber harvest, when the necessary machinery is on-site. Identification of specific locations of detrimental soil disturbance from past management actions and possible amelioration is typically only feasible with site inspections, which typically occur when the BLM is contemplating a new management action, such as a timber sale. It is not practical to conduct amelioration of detrimental soil disturbance over a substantial acreage in the absence of other forest management actions because of the cost. Implementation of such forest management actions would entail additional detrimental soil

disturbance, further frustrating any attempt to reach a net decrease in total detrimental soil disturbance.

The cost for measures to ameliorate detrimental soil disturbance are highly dependent on site- and project-specific factors. Furthermore, implementing such measures during forest management operations typically provides efficiencies associated with bringing machinery to the site, which the BLM cannot account for in this estimate. Any attempt to estimate average costs for ameliorating detrimental soil disturbance in the absence of other forest management actions is highly approximate and variable. Nevertheless, based on past project experiences, the BLM estimates an approximate cost of $1,000 per acre to ameliorate detrimental soil disturbance. The Draft RMP/EIS identified that there are139,299 acres of existing detrimental soil disturbance from past management action, and that the alternatives would result in additional detrimental soil disturbance ranging from 18,138 acres under Alternative A to 41,506 acres for Alternative C (USDI BLM 2015, pp. 611–612). Thus, an alternative that would result in a net decrease in the overall acreage of detrimental soil disturbance would require additional funding ranging from more than $18 million under Alternative A to more than $41 million under Alternative C, which would represent approximately a quarter to a third of the entire annual BLM budget for the decision area.

290. Comment Summary: The EIS should be revised to include more detailed information on soils, including maps of soil regions and more information on soil types.

Response: The Draft RMP/EIS included the appropriate level of information on soils to inform decision-making. The planning area covers an extensive area, and tables displaying details on each soil type present would be cumbersome, and not provide information necessary to understanding the analysis presented. The level of detail desired by the respondent is more informative to project-level planning. However, soil-mapping information is publicly available through the Natural Resources Conservation Service (NRCS). The NRCS is the Federal agency responsible for soil typing and mapping, and information on soils within the planning area can be found using their Web Soil Survey application (http://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm). In the implementation of the RMP, site-specific analysis prior to management actions will identify soil types, and apply appropriate management recommendations for fragile soils found on site. The BLM will identify soils unsuitable for sustained-yield timber production and add such areas to those areas reserved through updates to the Timber Production Capability Classification system (**Appendix V** – Monitoring Plan for the Proposed RMPs). The BLM can identify more effectively and accurately these specific soil types and conditions through site-specific analysis than the coarse and low accuracy mapping that would be possible at the scale of the RMP revision.

291. Comment Summary: The EIS should be revised to include Best Management Practices to protect from potential landslides from future harvest near existing State highways and considerations for public safety from landslide dangers.

Response: The Proposed RMP includes several Best Management Practices to protect from potential landslides in harvest units (**Appendix J** – Best Management Practices). The BLM designed these Best Management Practices to reduce the risk from potential landsliding because of the dangers landslides can present to human safety and infrastructure. The BLM does not design Best Management Practices differently when they are adjacent to highways—all units and roads are afforded equal measures for protection. The management direction contains the operational practices for avoiding road construction and future harvests that reduce the high potential areas for landslides during management actions. Avoiding unstable slopes and not creating unstable slopes with tillage

should protect all lands downslope, including State highways, which would also provide for public safety protections.

292. Comment Summary: The EIS should be revised to clearly disclose the locations and analyze the impacts of machine piling on soil resources. Machine piling in harvest units can cause soil compaction, reduce microbial activity, and affect tree growth.

Response: The Draft RMP/EIS analyzed the effects of machine piling on soil resources, including effects on forest productivity, and acknowledged the potential effects of machine piling (USDI BLM 2015, pp. 608–611, 617–621). The Draft RMP/EIS identified that machine piling would produce detrimental soil conditions on between 1,674 to 4,307 acres, depending on alternative. The Draft RMP/EIS identified that the effects of machine piling may bring reduced seedling growth or vegetative cover of native plants. The discussion describes the impacts from soil compaction, the reduction of microbial activity, and the potential reduction of soil processes from accumulated ground materials from mastication practices. Because machine-piling locations would be largely dependent upon timber harvest locations, it would be speculative to forecast specific machine piling locations at this scale of analysis.

293. Comment Summary: The EIS should be revised because it relies on false assumptions that OHV users will operate vehicles consistent with BLM decisions and by deferring analysis until future implementation planning. Impacts to soil from OHV use are well-documented, and the EIS fails to incorporate analysis on illegal use for this topic.

Response: The Draft RMP/EIS identified that data is unavailable at this scale of analysis to predict location or effects of any widespread or systematic illegal OHV use (USDI BLM 2015, p. 623). Across the scale of the decision area, the BLM is unable to characterize the current illegal use or forecast impacts under any of the alternatives. The BLM assumed for analytical purposes that OHV users would operate vehicles in a legal manner consistent with BLM decisions about OHV use.

Decisions about OHV use in land use planning classify lands as *open*, *limited*, or *closed*. The BLM has differed designation of individual routes for OHV use to implementation-level travel management planning (**Appendix X** – Guidance for Use of the Completed RMPs). Where the BLM has site-specific information about illegal OHV use, such as OHV users creating new trails in areas designated as *limited* to existing roads and trails, the BLM would be able to address management through implementation-level travel management planning.

294. Comment Summary: The EIS should be revised because literature citations used to determine the presumed detrimental disturbance to soil from timber harvest activities are outdated, and studies used outdated forest practices. The EIS misinterprets the study conclusions cited and applies inaccurate measures for analysis.

Response: The Draft RMP/EIS used relevant science for determining analytical methods and anticipated effects of harvest activities on soil quality. The BLM determined detrimental disturbance percentages from harvest types based upon multiple scientific sources. The commenter did not present any alternate studies for the BLM to consider and did not specifically identify misinterpreted scientific conclusions.

295. Comment Summary: The EIS should be revised because the presumed detrimental disturbance levels for timber harvest activities and road construction misrepresent modern forest practices and overstate the amount of damage. These blanket assumptions are misleading and wrong because detrimental disturbance can be and often is avoided.

Response: The Draft RMP/EIS clearly identified that analytical estimates used for both harvest actions and road construction have several limitations, and overestimate the amount of detrimental soil disturbance that would occur (USDI BLM 2015, pp. 609–611, 615–621, 625–626). Limitations identified include an inability to account for amelioration of detrimental disturbance due to the site-specific and project-specific elements that effect extent and effectiveness of the actual reductions, the inability to determine at this scale of analysis the number of temporary roads that would receive decommissioning, and constraints within modeling parameters necessitating fixed-widths for road construction. However, at this scale of analysis, the BLM cannot provide more accurate assumptions about the effects of actions on soils, and the commenter does not provide more accurate assumptions. The BLM generated the acreages of detrimental soil disturbance in the Draft RMP/EIS using the same assumptions for all alternatives. Therefore, the analysis provides an effective comparison of the relative differences in resource effects.

Trails and Travel Management

296. Comment Summary: The Proposed RMP should contain a clear schedule showing the list of Travel Management Plans needed for each BLM district with their completion dates over the next five years.

Response: The Proposed RMP/Final EIS contains the criteria for managers to apply in determining a district-level prioritized implementation travel management planning schedule in **Appendix Q** – Public Motorized Access Designation Guidelines.

297. Comment Summary: The decision to allow unauthorized user-created trails to remain in use until a Travel Management Plan is developed rewards illegal and resource-damaging behavior. 'Grandfathering' user-created OHV trails should not be allowed.

Response: The BLM is deferring implementation-level travel management planning in accordance with current BLM policy (see the Trails and Travel Management section of Chapter 3). The BLM is making area designations of *open*, *limited*, or *closed* for public motorized access through this RMP revision. Implementation-level travel management planning will evaluate each route, applying the minimization criteria contained in 43 CFR 8342 and the direction in BLM Manual 1626 – Travel and Transportation (USDI BLM 2011a) and BLM Handbook 8342 – Travel and Transportation Handbook (USDI BLM 2012), which provides policy guidance for incorporating the BLMs Travel and Transportation Management (TTM) planning decisions into the land use planning process. Under this policy, the area designation of *limited* to existing roads and trails is an appropriate use of the allocation until the BLM completes an implementation-level travel management plan.

Vegetation Modeling

298. Comment Summary: The BLM should revise the EIS because the analysis inflated the productivity estimates. The Southern Oregon Forest Restoration Collaborative (SOFRC) provides a better estimate of productivity.

Response: As explained in the Draft RMP/EIS, the BLM used the Current Vegetation Survey (CVS) permanent inventory plots, and the stand-level information found in the Microstorms database to estimate productivity on BLM-administered lands (USDI BLM 2015, pp. 98–102, 987–1043). The productivity estimates used by the SOFRC in their Rogue Basin Cohesive Forest Restoration Strategy is based upon Gradient Nearest Neighbor (GNN) analysis. This does not provide a better estimate of productivity on BLM-administered lands than what the BLM used in the Draft RMP/EIS. The CVS inventory data provides a non-biased, impartial estimate of current inventory volume and growth on BLM-administered lands. The Microstorms database also provides the best available information on forested stands on BLM-administered lands. This database is maintained by the BLM and includes descriptions of the forest vegetation, forest treatments, and forest surveys through time. The GNN analysis is based on remotely sensed, Landsat data, which is not specific to BLM-administered lands, and provides much less detail. The BLM did make use of GNN analysis in innumerable analyses in the Draft RMP/EIS, but only on non-BLM-administered lands, where the BLM lacked data comparable to the CVS plots and Microstorms database (e.g., USDI BLM 2015, pp. 100, 673, 1453).

Appendix C – Vegetation Modeling describes how the BLM used CVS and Microstorms data to model the forested vegetation. The BLM used many aspects of both data sets in the vegetation modeling. The tree lists for each modeling strata came directly from the CVS sub-plot tree lists. The BLM compared the growth on the first and second measurement of the permanent plots, with the projections from the ORGANON growth model, and found that ORGANON was adequately projecting growth. The productivity estimates in the harvest land base in the Draft RMP/EIS are similar to what the BLM has measured on the CVS plots. The BLM based the distribution of site productivity classes within each modeling unit (district) on the distribution of site productivity classes measured on the CVS plots. The productivity has not been "inflated," as the commenter contends; it provides the best representation of the actual measured conditions of forests on BLM-administered lands.

299. Comment Summary: AOCC is concerned about the BLM's modeling of the alternatives to estimate harvest acreage and volume by different harvest types.

Response: As explained in the Draft RMP/EIS, the BLM constrained the modeling of timber harvest to the volume of timber that could be produced continuously for 200 years with the management practices described in the alternatives from those lands allocated to the Harvest Land Base (USDI BLM 2015, p. 102). The BLM did not constrain the modeling of timber harvest to require consistent acreages of particular harvest types or consistent timber volumes produced by particular harvest types. As a result, the amounts of thinning and regeneration harvest does change throughout the 200-year modeling horizon. This was intentional, and there are no requirements associated with calculating a sustained yield that prohibit a change in the percentage of harvest type in different modeling periods. The fewer constraints placed on the timber harvest model, the better the model is able to achieve a higher estimate of volume. Placing arbitrary constraints within the Woodstock model to achieve even levels of thinning and regeneration harvest for the 200-year modeling horizon would have resulted in lower harvest volumes.

300. Comment Summary: The DEIS fails to disclose maps of the modeled harvest.

Response: The Draft RMP/EIS did not include maps of the modeled harvest, because the modeled harvest locations only represent a scenario of where the future harvest would actually occur. The modeled harvest is one of many different scenarios of where the harvest could occur, and does not represent any decision in principle about the specific locations of future harvest. Although the BLM used spatially explicit data from modeling outputs for several analyses in the Draft RMP/EIS, spatial display of the modeled timber harvest locations would not improve the quality of the analysis and is not necessary for a reasoned choice among alternatives.

301. Comment Summary: The Draft RMP/EIS failed to disclose the hierarchical accounting methods for reporting the acreage of the allocations under the alternatives.

Response: The Draft RMP/EIS described the vegetation modeling at length and in extensive detail in the Draft RMP/EIS, and that description summarized the information used to account for the acreage of the allocations under the alternatives (USDI BLM 2015, pp. 98–102, 987–1043). The Draft RMP/EIS did not include the specific and detailed hierarchies used in the vegetation modeling, because this is highly technical information that is not essential for the reader to understand the effects of the alternatives analyzed and is difficult to understand and interpret correctly without the context of all of the technical workings of the vegetation modeling. It is neither necessary nor practical to describe in an EIS all of the technical details for the complex vegetation modeling that the BLM conducted beyond the summary of that information provided in the Draft RMP/EIS. The BLM will provide this technical information upon request.

Wildlife

302. Comment Summary: The scope of analysis for all wildlife species should be consistent in only including BLM-administered lands.

Response: The BLM generally analyzed the effects of the alternatives on wildlife habitat and wildlife species at both the decision area scale (BLM-administered lands only) and at the planning area scale (all ownerships). The BLM analyzed the effects at both the decision area and planning area scales to evaluate the cumulative effects on wildlife species within the geographic scope of the effects of the alternatives and the Proposed RMP. For some wildlife species, data was not available across the entire planning area, so the analysis in the Proposed RMP/Final was limited to the decision area.

303. Comment Summary: The State recommends the BLM use the Oregon Conservation Strategy as part of its planning effort, and requests the BLM address in the RMP how it will address these statewide key conservation issues on BLM-administered lands consistent with the goals and actions described in the OCS.

Response: The BLM reviewed the conservation actions recommended in the Oregon Conservation Strategy against the alternatives, particularly the Proposed RMP, for consistency. The Proposed RMP/Final EIS has added specific discussion of consistency with the Oregon Conservation Strategy (see the Wildlife section of Chapter 3).

304. Comment Summary: Alternatives should address how wildlife corridors would be managed. The Middle Applegate region is the last mid-elevation wildlife corridor in the Medford District, yet little discussion of migratory corridors is contained in this analysis.

Response: The Draft RMP/EIS analyzed the effects of the alternatives using the availability of habitat within species-specific ranges and addressed dispersal for species for which there is sufficient information to support analysis. Dispersal and migration of species are dependent upon species-specific factors, and generic wildlife corridors do not provide any basis for comparative analysis of the effects of the alternatives. The commenter does not identify which species' dispersal they believe that the BLM did not adequately analyze in the Draft RMP/EIS. Without identifying the species, it is not possible to analyze the effects of the alternatives on a generic wildlife corridor.

305. Comment Summary: The DEIS does not reflect some new species listed since 1994-5.

Response: The Draft RMP/EIS identified all species that are listed under the Endangered Species Act as of the preparation of the Draft RMP/EIS. The commenter does not identify which "new species" that they believe the BLM did not reflect in the Draft RMP/EIS.

Bald Eagle

306. Comment Summary: The BLM analyzes impacts to bald eagles at the entire planning level scale, and concludes that there will be "indistinguishable" differences between the action alternatives at this scale. Given that there are only approximately 250 thousand acres of nesting habitat on BLM lands, the BLM should be looking specifically at the impacts to these various habitat patches (older forest in close proximity to large waterbodies).

Response: The BLM analyzed the effects to bald eagles at both the decision area and planning area scales and for some of the alternatives there were only minor differences in the results. As stated in the Draft RMP/EIS and Proposed RMP/Final EIS, the bald eagle habitat analysis indicates that Alternatives A, B, and D would have less than a 5 percent difference at the decision area scale and less than a 1 percent difference at the planning area scale (the gross acreage difference is < 16,080 acres). The BLM did note and discuss more meaningful differences in regards to the No Action alternative and Alternative C, which the commenter did not acknowledge.

Bureau Sensitive, Bureau Strategic, Survey and Manage Species, and Landbird Focal Species

307. Comment Summary: The Average Historic Condition (AHC) used as a comparison for habitat levels of Bureau Sensitive, Bureau Strategic, or Survey and Manage wildlife species and landbird focal species is based on one paper published by Nonaka and Spies in 2005. This paper's findings rely completely on the results of a computer model simulation exercise that is disproven by extensive research done on the subject using actual historical records. The model's outputs are essentially fabrications, based entirely on arbitrary modeling formulas and not actual observation. If depicting an AHC is necessary to the analysis in the Draft RMP/EIS, research that includes actual historic data should be used, rather than relying on a computer model of questionable rigor and usefulness.

Response: The BLM used peer-reviewed, published scientific literature to provide a context for the habitat development in the analyses. The purpose of the analysis is to inform the BLM decision-makers as to the relative differences in effects among the action alternatives, the No Action alternative, and the No Timber Harvest reference analysis. The BLM provided representations of average historical condition of the forest structural stage composition (e.g., Nonaka and Spies 2005, Wimberly 2002) to provide further context of the effects. The modeling in both Nonaka and Spies 2005 and Wimberley 2002 provide reliable depictions across broad geographic and temporal scales of the range of historic forest structural conditions. These two peer-reviewed published papers rely on high-quality scientific information as the foundation for their modeling and provide analytical conclusions that are generally consistent. It is not possible to rely instead on "actual historical records," as urged by the commenter, because such records are not sufficient to characterize the entire landscape of the decision area or planning area over broad temporal scales, which is the necessary analytical context that the BLM has used these papers to provide.

308. Comment Summary: The RMP should look to integrate timber harvest objectives with conservation objectives, particularly for complex early seral habitat. In the Wildlife & Wildlife Habitat section (p. 157), relevant studies need to be included (e.g., Swanson *et al.* 2011; Olson *et al.* 2012; DellaSala *et al.* 2014) and the distinction between complex early seral (created by natural disturbances and impacted by logging) and early seral (created by forestry and in abundance due to logging) needs to be made clear in order to represent the best science omitted from the RMP.

Response: All alternatives and the Proposed RMP would increase the amount of early successional forest habitat in 50 years and the BLM recognizes the distinction between complex and simple early seral forest habitats. The structural stages used throughout the analyses in the Proposed RMP/Final EIS have two categories of early seral habitat: Early Successional Forests *with* Structural Legacies and Early Successional Forest *without* Structural Legacy. The BLM regards Early Successional Forest with Structural Legacies as analogous to complex early successional habitat as described by DellaSala *et al.* (2014) and Swanson *et al.* (2011). In addition, management direction regarding green tree retention, snag retention (or creation), and down woody material retention would add to the complexity of that early successional habitat. The BLM has reviewed the suggested literature and added these citations and discussion of the differences in complex early successional habitat development in terms of young stands that do (or do not) have structural legacies to the Proposed RMP/Final EIS (see Wildlife section of Chapter 3). The BLM has integrated timber harvest objectives with conservation objectives in the design of the action alternatives and the Proposed RMP with varying approaches. Specifically, the BLM has incorporated regeneration harvest with varying levels and patterns of retention and uneven-aged management approaches into several action alternatives and into the Proposed RMP, which would create complex early seral habitats.

309. Comment Summary: Stream restoration can destroy or prevent the development of open habitats that provide turtle nesting habitat as well as sunny areas within the stream environment to allow for foraging and basking. The western pond turtle requires aquatic habitat for feeding/basking and open upland habitat for nesting/overwintering.

Response: Under all alternatives, the BLM would manage naturally occurring special habitats, such as wetlands and natural ponds, to maintain their ecological function. Additionally, stream restoration would benefit pond turtle habitat. Stream restoration actions, such as log and boulder placement and fish passage improvements that are beneficial to fish habitat, would also result in short-term increases in sediment delivery to stream channels. Removal of culverts and other instream structures like

blockages would cause stream channel disturbance during summer instream operating periods. The addition of structure to stream channels would create additional pools and slow-flowing, shallow areas that would be favorable for pond turtles.

310. Comment Summary: Page 680 of the DEIS indicates that the BLM intends to rely upon projected increases in hypothetical habitat for Bureau Sensitive Species (BSS) and (former) Survey and Manage species rather than protecting the actual known sites where these species occur. Trading occupied actual habitat for hypothetical future habitat is arbitrary and capricious.

Response: The action alternatives would remove Survey and Manage measures, which require pre-disturbance surveys and protection of known sites. Even in the absence of such measures, habitat and sites of Survey and Manage species that fall within the reserve system would generally be protected by the management direction of the reserve land use allocations, which would generally protect existing Mature and Structurally-complex Forest habitat and foster the development of additional Mature and Structurally-complex Forest habitat. Under the No Action alternative, 36 percent of known sites of Survey and Manage wildlife species would fall within the reserve system. Under the action alternatives and the Proposed RMP, the proportion of sites that would fall within the reserve systems would increase substantially: 86 percent under Alternative A, 68 percent under Alternative B, 66 percent under Alternative C, 70 percent under Alternative D, and 73 percent under the Proposed RMP. Thus, the majority of "actual known sites" for Survey and Manage wildlife species would continue to be protected under the action alternatives and the Proposed RMP, even without the Survey and Manage measures. Even in the absence of the Survey and Manage measure, habitat and sites of species that fall within the reserve system would receive some protection. Not all sites within reserve land use allocations would necessarily be protected by buffers comparable to the No Action alternative. However, management actions in reserves could occur within these sites, but there would be a minimal effect to the species based on the type and intensity of allowable treatments. Under all action alternatives and the Proposed RMP, management direction in reserves would largely limit stand treatments to thinning to improve habitat conditions and fuels treatments to reduce the risk of uncharacteristic wildfire, and would generally preclude stand treatments that would remove or degrade Mature and Structurally-complex habitat (**Appendix B** – Management Objectives and Direction).

Under the action alternatives, the amount of existing Mature or Structurally-complex Forest habitat within the reserve network would increase (from 65 percent under the No Action Alternative to at least 72 percent). The Proposed RMP would reserve 83 percent of existing Mature or Structurally-complex Forest habitat, while only 65 percent is reserved under the No Action alternation. Therefore, despite the absence of Survey and Manage measures, more habitat for species associated with older forests would be reserved and protected under the Proposed RMP than under the No Action alternative.

In addition to reserving existing older and more structurally-complex, multi-layered conifer forests, the acreage of Mature and Structurally-complex Forest (which is a broader category than older and more structurally-complex multi-layered conifer forests) in the decision area would increase over time under all alternatives. Therefore, the amount of habitat for Survey and Manage wildlife species would also increase under all alternatives.

The BLM does not agree that omitting the Survey and Manage measures from the Proposed RMP is arbitrary and capricious. The BLM considers the increased habitat protection and habitat development under the Proposed RMP to be a sound management approach for these species. The Proposed RMP would protect the majority of the "actual known sites" of Survey and Manage wildlife species, would

reserve more of the potential habitat for Survey and Manage species than the No Action alternative, and would provide a greater increase in the amount of potential habitat for Survey and Manage species over time than the No Action alternative. Finally, under the Proposed RMP, the BLM would continue to provide management for many of the Survey and Manage species as Bureau Sensitive species. The Draft RMP/EIS analyzed the effects of the alternatives on Survey and Manage species, and the BLM used that analysis in the development of the Proposed RMP (see the Rare Plants and Fungi and Wildlife sections of Chapter 3).

311. Comment Summary: The RMP must provide more detail and clarification of a monitoring and evaluation strategy to determine if protection objectives for Survey and Manage species are being achieved during implementation.

Response: Monitoring provides information to determine whether the BLM is following the RMP management direction (implementation monitoring) and to verify if the implementation of the RMP is achieving plan-level desired results (effectiveness monitoring). The monitoring plan included in the Proposed RMP/Final EIS include implementation monitoring questions related to Bureau Special Status Species, and the BLM would continue to rely on the existing interagency effectiveness monitoring modules to address key questions about whether the RMP is effectively meeting its objectives, including the module for late-successional and old growth ecosystems (**Appendix V** – Monitoring Plan for the Proposed RMPs).

The BLM does not agree that the monitoring plan should directly address Survey and Manage species, because the Proposed RMP does not have "protection objectives" for Survey and Manage species. Given that there is no management direction for Survey and Manage species in the Proposed RMP, there is no need to address Survey and Manage species in implementation monitoring. Given that there are no management objectives for Survey and Manage species in the Proposed RMP, there is no need to address Survey and Manage species in effectiveness monitoring.

312. Comment Summary: The BLM's draft RMP for Western Oregon does away with a biologically-driven snag retention standard, replacing it with draft standards that treat existing and newly created snags as interchangeable, and averages the snag density standards across the "scale of the harvest unit" which could be hundreds, if not thousands, of acres.

Response: The alternatives in the Draft RMP/EIS explored a variety of snag retention and creation requirements. Alternative A did not include any snag retention or creation targets. Alternative C included targets for snag retention or creation in the reserve network similar to those used in the 2008 FEIS. Alternatives B and D included snag retention and creation targets based on the desired conditions for wildlife species as interpreted from the Decayed Wood Advisor (DecAID) (Mellen-McLean *et al*. 2012) in conjunction with estimates of the current abundance of snags and down wood from the CVS inventory plots (see the Snags and Down Woody Material section of **Appendix S** – Other Wildlife). The BLM maintains that the information from DecAID and CVS inventory plots provides information that better reflects the needs of snag-dependent species than the snag retention requirements in the 1995 RMPs. The Proposed RMP includes the snag retention and creation targets similar to Alternatives B and D.

The action alternatives do not "treat existing and newly created snags as interchangeable," contrary to the commenter's assertion. The management direction for Alternatives B and D clearly requires the retention of existing snags and separately requires the creation of new snags, independent of the

amount of existing snags (USDI BLM 2015, pp. 962, 984). The Proposed RMP includes the snag retention and creation targets similar to Alternatives B and D.

In addition, while the management direction for the Proposed RMP directs snag densities at the scale of the harvest unit, the commenter's assertion that harvest units could be "hundreds, if not thousands, of acres" is erroneous. Given the typical checkerboard of BLM-administered lands, much of the BLM-administered lands occur in square mile sections (640 acres), which are themselves composed of a myriad of stand types further intertwined with the Riparian Reserve and other land-use allocations. Such practical considerations of land ownership and land use allocations necessarily limit timber harvest unit sizes. The output form vegetation modeling for the analysis in this Proposed RMP/Final EIS (**Appendix C** – Vegetation Modeling) indicated that more than 99 percent of regeneration harvest units in the first decade of implementation would be less than 100 acres in size, and all regeneration harvest units would be less than 250 acres in size. Therefore, there is little prospect of BLM implementing extremely large harvest units under any alternative or the Proposed RMP. Regardless, the commenter does not explain how providing snags at densities averaged over entire harvest units would adversely affect any resources in a manner not addressed in the Draft RMP/EIS.

Deer and Elk

313. Comment Summary: The DEIS attributes reductions in deer and elk populations to reductions in timber harvest levels without considering other factors which may be causing the population declines.

Response: As stated in the Draft RMP/EIS, the Oregon Department of Fish and Wildlife identifies availability of early successional forest stages as a potential limiting factor (USDI BLM 2015, p. 676). The Proposed RMP/Final EIS has added additional discussion regarding potential sources of deer and elk population declines.

Fisher

314. Comment Summary: Landscape scale spatially explicit analysis is needed in this RMP process to identify critical habitat for fishers for protection and enhancement of key elements.

Response: The Draft RMP/EIS included management direction common to all action alternatives that would provide some protection for key elements of fisher habitat (denning structures). The Proposed RMP has included additional management direction that would provide protection and enhancement of key elements for fisher as well (denning structures and canopy cover) and would avoid disruption of normal denning behaviors (**Appendix B** – Management Objectives and Direction).

315. Comment Summary: The Pacific fisher will be impacted by increased regeneration harvesting, increased commercial thinning, decreased riparian buffers, abandonment of the ACS, and increased road building proposed in the DEIS. This impact was not adequately analyzed in the DEIS document. A detailed analysis of the Pacific fisher, its population, viability, and conservation status under different alternatives is needed in the FEIS.

Response: The Draft RMP/EIS conducted a detailed and quantified analysis of the effects of the alternatives on fisher habitat. The Proposed RMP/Final EIS has added quantified forecasts of impacts to the fisher population in southwestern Oregon. The fisher habitat modeling used the vegetation modeling output, which incorporated changes in vegetation over time under the alternatives from integrating the effects of timber harvest, wildfire, and forest growth. Therefore, the BLM reflected changes in harvest or buffer regimes in the habitat modeling results presented in Chapter 3.

316. Comment Summary: The State recommends that the BLM identify barriers to dispersal, and plan habitat restoration to ensure connectivity and terrestrial corridors for fisher in the RMP.

Response: The Draft RMP/EIS did not identify barriers to fisher dispersal, because the BLM does not regard dispersal as a limiting factor for fisher. Fishers have a large home range size (males 13,329 acres; females 4,692 acres) and the ability to disperse long distances (males disperse an average of 18.0 miles; females disperse an average of 3.7 miles). Dispersing juvenile fisher are capable of moving long distances (up to 84 miles) and navigating across or around various landscape features, including rivers, highways, and rural communities. The BLM contends that availability of denning habitat and denning structures are more limited and have a more important influence on fisher than dispersal.

317. Comment Summary: The RMP fails to restrict OHV use in areas of denning fishers.

Response: The commenter is mistaken. The action alternatives and the Proposed RMP would restrict all management actions that would disturb denning fishers. All action alternatives included management direction that would restrict activities that create noise or visual disturbance(s) above ambient conditions within 0.5 miles of known fisher natal and maternal den sites from February 1 to June 30 (USDI BLM 2015, p. 937). The Proposed RMP includes management direction that the BLM would not approve, fund, or carry out actions that would disrupt normal fisher behaviors (e.g., foraging, resting, or denning) associated with known natal or maternal denning sites except when done in accordance with an approved recovery plan, conservation agreement, species management plan, survey and monitoring protocol, or critical habitat rule and the action is necessary for the conservation of the species (**Appendix B** – Management Objectives and Direction). In areas allocated as *limited* for public motorized access, the BLM would consider specific restrictions on OHV use near fisher den sites during implementation-level travel management planning (**Appendix Q** – Public Motorized Access Designation Guidelines).

Golden Eagle

318. Comment Summary: Every action alternative includes more acres designated for ORV use while no analysis or data is provided regarding actual impacts to golden eagle populations and behavior.

Response: The commenter is mistaken. All action alternatives and the Proposed RMP would eliminate areas *open* to public motorized vehicle use and increase the areas *closed* to public motorized vehicle use (USDI BLM 2015, p. 639). In addition, all action alternatives and the Proposed RMP include management direction that would prohibit activities that will disrupt nesting where bald eagles or golden eagles are actively nesting common to all alternatives (**Appendix B** – Management Objectives and Direction). All action alternatives and the Proposed RMP would also prohibit

operation of off-road vehicles within 330 feet of bald eagle or golden eagle nests during the breeding season under the action alternatives. Finally, all action alternatives and the Proposed RMP would prohibit operation of off-road vehicles within 660 feet of bald eagle or golden eagle nests during the breeding season in areas without forest cover or topographic relief to provide visual and auditory screening (USDI BLM 2015, p. 936; **Appendix B** – Management Objectives and Direction). The commenter does not explain how public motorized vehicle use could affect golden eagle populations in light of these prohibitions.

Greater Sage-Grouse

319. Comment Summary: The RMP needs to identify conservation measures in greater sage-grouse habitat.

Response: All action alternatives included the conservation measure to manage unoccupied or historic sage grouse habitat consistent with the Oregon Sage-Grouse Action Plan (USDI BLM 2015, p. 913). The Proposed RMP has also included conservation measures to cut junipers encroaching on unoccupied or historic sage-grouse habitat and to plant native species to improve unoccupied or historic sage-grouse habitat (**Appendix B** – Management Objectives and Direction).

Gray Wolf

320. Comment Summary: In an effort to most effectively contribute to the conservation and recovery of the gray wolf (*Canis lupus*), the Service would like the BLM to begin its seasonal restriction within one mile of an active den on April 1st instead of April 30th. The Service believes that extending this restriction to July 15 (as opposed to August 31) would be sufficient to protect the young of the year as they are likely to have left their den sites by then.

Response: The Proposed RMP has added management direction restricting activities that create noise or visual disturbance(s) above ambient conditions within one mile of known active gray wolf dens from April 1 to July 15, consistent with the commenter's suggestion (**Appendix B** – Management Objectives and Direction).

321. Comment Summary: The DEIS fails to analyze impacts to wolf from road densities and road construction, grazing, and project activities associated with timber harvest. The BLM needs to develop standards to ensure that road densities in the forests it manages remain below road densities over 1 mile per square mile or manage areas over this road density to prevent any new temporary or permanent road construction.

Response: The Proposed RMP/Final EIS includes additional discussion and analysis regarding road density and gray wolves (see the Wildlife section in Chapter 3).

The BLM does not agree that a road-density threshold of 1 mile per square mile is needed for wolf conservation. Increased land development (e.g., road development) has the potential to make some areas less suitable for wolf occupancy. However, it is unlikely that increased land development in the planning area would, in fact, adversely affect wolves. Wolves are habitat generalists and one of the most adaptable large predators in the world. They were extirpated in the southern portion of the

subspecies' range only because of sustained, deliberate, human-targeted elimination. Land-use restrictions on land development are not necessary to ensure the continued conservation of the subspecies; even active wolf dens can be quite resilient to nonlethal disturbance by humans. Vast areas of suitable wolf habitat and the current wolf population are secure in the subspecies' range (e.g., national parks, wilderness, road-less areas) and are not available for intensive levels of land development (78 FR 35681).

In addition, current road densities on BLM-administered lands are 3.70 miles per square mile (see the Trails and Travel Management section of Chapter 3). Given that wolves are actively colonizing and establishing packs in areas with an existing road density of 3.70 miles/sq. mile (as evidenced by the Rogue pack and Keno pair), the BLM concludes that wolves in the planning area are resilient to road densities at current levels.

Marbled Murrelet

322. Comment Summary: The State recommends the BLM analyze the number of known or historic occupied marbled murrelet sites within 0.25 miles of adjoining private lands to determine the potential impact to occupied marbled murrelet sites that span property boundaries and the potential impact to timber volume output.

Response: The Draft RMP/EIS identified known and historic marbled murrelet sites (USDI BLM 2015, pp. 732–733). Segregating these sites by proximity to private lands would not improve the quality of the analysis or provide for a reasoned choice among the alternatives. The BLM has no reasonable way to predict the management actions private landowners would take in response to marbled murrelet sites on BLM-administered lands or estimate whether there would be any effects of marbled murrelet sites on BLM-administered lands on the timber volume production of adjacent landowners.

323. Comment Summary: The conservation strategy for marbled murrelets should include protecting remaining large patches of older-aged forests with minimal edge, buffering nest sites from windthrow and predators, and maintaining habitat connectivity. The system of LSRs on BLM lands continues to be critical to murrelet conservation. The watershed, juxtaposition of occupied murrelet habitat, and ownership should all be considered in thinning operations within LSRs or adjacent to older-aged forest.

Response: The BLM would protect all older, more structurally-complex forest through the designation of such stands as Late-Successional Reserve, which would benefit marbled murrelets. The BLM analyzed the effects of the alternatives on patch size of marbled murrelet nesting habitat and discussed the effects of smaller or larger patches on marbled murrelets in Chapter 3.

324. Comment Summary: Does BLM have data to support its claim on p. 150 that when sufficient habitat is present the marbled murrelet population still declines? How can BLM conclude this when nearly all habitat (80%) was eliminated on public lands prior to the NWFP?

Response: The commenter mischaracterizes the statement in the Draft RMP/EIS. The Draft RMP/EIS did not claim that when sufficient habitat is present, the marbled murrelet population still declines. The Draft RMP/EIS stated that even when sufficient high-quality nesting habitat is available, other

factors (i.e., climate events and climate change) can influence murrelet populations (either positively or negatively) by affecting conditions important for prey species (USDI BLM 2015, p. 150). The Draft RMP/EIS detailed the variety of the factors affecting marbled murrelet populations, which include loss of nesting habitat, but also non-habitat factors. Specifically citing the U.S. Fish and Wildlife Service 2009 review, the Draft RMP/EIS identified that changes in prey abundance and availability and climate change are among the threats to the marbled murrelet population (USDI BLM 2015, pp. 720–721). The Draft RMP/EIS acknowledged that there is a strong association between total marbled murrelet populations and the total amount of suitable habitat. Nevertheless, there are other factors besides habitat affecting marbled murrelet populations. Thus, the BLM maintains that even when sufficient high-quality nesting habitat is available, other factors can influence murrelet populations. The commenter offers no evidence to dispute this point.

325. Comment Summary: Alternatives fail to include all of the conservation measures necessary to provide for the survival and recovery of Marbled Murrelet populations (e.g., protect all current occupied sites on Federal land, protect habitat within 55 miles of the coast, survey habitat within 55 miles of the coast, and maintain NWFP LSRs).

Response: The Draft RMP/EIS analyzed a range of strategies to contribute to the conservation and recovery of marbled murrelets.

Under the No Action alternative, Alternatives A, B, and D, and the Proposed RMP, the BLM would protect all current occupied marbled murrelet sites (USDI BLM 2015, pp. 733–737; see the Wildlife section of Chapter 3).

The BLM does not agree that surveying and protecting all habitat within 55 miles of the coast is necessary for the survival and recovery of the marbled murrelet. As explained in the Draft RMP/EIS, the BLM describes the inland range of the marbled murrelet based on the two management zones for the marbled murrelet established in the Northwest Forest Plan: Zone 1 from the coast to approximately 35 miles inland, and Zone 2 from the eastern boundary of Zone 1 to approximately 50 miles inland from the coast. Marbled murrelet nesting has been documented only up to 47 miles from the coast in Oregon. Therefore, the BLM considers the effects to marbled murrelets and their habitat within 50 miles of the coast as the appropriate geographic scope. The commenter does not provide any evidence that habitat beyond 50 miles from the coast is used by marbled murrelets in the planning area.

The No Action alternative and Alternative D would require surveys and protection of occupied sites throughout the marbled murrelet range. Alternative B would require surveys and protection of occupied sites in Zone 1, but not in Zone 2. Alternatives A and C would not require surveys and protection of occupied sites. The Draft RMP/EIS analyzed the effects of these different approaches and projected the potential loss of future occupied sites under each alternative. That analysis concluded that the approach in Alternative B would result in the loss of relatively few marbled murrelet sites (USDI BLM 2015, pp. 730–736). The BLM developed the Proposed RMP approach to marbled murrelet management similar to the approach of Alternative B based on the results of that analysis. The commenter does not dispute the accuracy of this analysis. The BLM has updated that analysis in the Proposed RMP/Final EIS based on additional information, but the basic analytical conclusions about the effects of different marbled murrelet survey and site protection measures remain unchanged (see the Wildlife section of Chapter 3).

The BLM does not agree that maintaining the Northwest Forest Plan Late-Successional Reserve is necessary for the survival and recovery of the marbled murrelet. Under all action alternatives,

including the Proposed RMP, the Late-Successional Reserve is larger than under the No Action alternative (i.e., the Northwest Forest Plan), providing increased benefits to the marbled murrelets. The commenter does not explain how maintaining the smaller Late-Successional Reserve under the No Action alternative would better contribute to the conservation and recovery of the marbled murrelet. Under all action alternatives and the Proposed RMP, more of the current marbled murrelet nesting habitat would be within reserve land use allocations than under the No Action alternative. Under Alternatives A, B, and D, and the Proposed RMP, the amount of high-quality marbled murrelet nesting habitat would increase more than under the No Action alternative (USDI BLM 2015, pp. 726, 734; see the Wildlife section of Chapter 3).

The BLM contends that the Proposed RMP would better contribute to the conservation and recovery of the marbled murrelet than the No Action alternative, because the Proposed RMP would provide a larger Late-Successional Reserve, would reserve more marbled murrelet nesting habitat, and would result in a larger increase in high-quality marbled murrelet nesting habitat over time.

326. Comment Summary: The Preferred Alternative states there will be no disruption to murrelets. FWS would like to see it state that no disruption would apply to both known and predicted murrelet sites.

Response: The Proposed RMP and Alternative B would restrict activities that disrupt marbled murrelet nesting during the nesting period where marbled murrelets are currently nesting. This restriction would apply to all sites where marbled murrelets are nesting, including both currently known sites and sites that the BLM identifies in the future, consistent with the commenter's suggestion.

327. Comment Summary: Increased clearcutting within Riparian Reserve is in direct conflict with FWS' 1997 Recovery Plan for the Marbled Murrelet, which recommends that mature forests within "secured areas" (such as Riparian Reserve) be protected so they can serve as future nesting habitat for the marbled murrelet.

Response: The commenter is mistaken: none of the alternatives would include clearcutting within Riparian Reserve. Under all alternatives and the Proposed RMP, the only timber harvest within the Riparian Reserve would be thinning in some portions of the Riparian Reserve for some specific restoration purposes. Clearcutting is a component of the Harvest Land Base under Alternatives A and C; all other alternatives, including the Proposed RMP, would employ regeneration harvest with varying levels of stand retention (see the Forest Management section of Chapter 3). Furthermore, more of the current marbled murrelet nesting habitat would be within reserve land use allocations under the action alternatives and the Proposed RMP compared to the No Action alternative. As a result, regardless of the distinction between clearcutting and regeneration harvest with retention, several of the action alternatives and the Proposed RMP would result in less timber harvest of marbled murrelet nesting habitat across the landscape compared to the No Action alternative (see the Wildlife section of Chapter 3).

North Oregon Coast Distinct Population Segment of the Red Tree Vole

328. Comment Summary: Pages 738 and 744 of the DEIS indicate that Alternatives A and C would negatively affect the red tree vole by logging 136 of 383 known sites. Given the acknowledgment that "every RTV site in the NOCDPS is critical for persistence" of the species, the contention on page 744 that the BLM is unsure if such logging would contribute to the need to list the species under the ESA is in error.

Response: The statement "Since every red tree vole site in the North Oregon Coast DPS is critical for persistence …" in the Draft RMP/EIS was in error. The BLM could not support that statement given the uncertainties around population numbers, trend, and distribution of the North Oregon Coast DPS of the red tree vole. The Proposed RMP/Final EIS has deleted this statement. The Proposed RMP/Final EIS has updated the discussion of the effects for the North Oregon Coast DPS of the red tree vole. Because the population status or population trend of red tree voles in the North Oregon Coast DPS is unknown, it is also unknown the extent to which loss of occupied stands would negatively affect the population of red tree voles in the North Oregon Coast DPS. In any event, the Proposed RMP would include direction to conduct pre-disturbance surveys and known site management (habitat areas) for red tree voles in the North Oregon Coast DPS north of Highway 20 and known site management south of Highway 20 within the reserves.

329. Comment Summary: Analysis of effects to red tree vole does not consider number of sites affected or genetic connectedness.

Response: The commenter is mistaken; the Draft RMP/EIS did address the number of sites affected and population connectivity. The Draft RMP/EIS considered observations (one measure of the number of sites) of red tree voles within the North Oregon Coast DPS. The Draft RMP/EIS included a tabulation of the number of observations by land use allocation and forecast the number of future red tree vole sites that would be identified and protected under the alternatives. Finally, the Draft RMP/EIS included a discussion of the effects of different management approaches on the North Oregon Coast DPS of the red tree vole, including how the loss of sites under some alternatives would affect population interaction and connectivity in the North Oregon Coast DPS (USDI BLM 2015, pp. 738–745).

330. Comment Summary: FWS strongly recommends that, within the North Oregon Coast Distinct Population Segment of the red tree vole, BLM carry forward into their RMP the existing management that they are doing for the red tree vole under the Survey and Manage standards and guidelines of the NWFP.

Response: The No Action alternative and Alternatives B and D would include direction to conduct pre-disturbance surveys and known site management (habitat areas) for red tree voles in the North Oregon Coast DPS. The Proposed RMP would include direction to conduct pre-disturbance surveys and known site management (habitat areas) for red tree voles in the North Oregon Coast DPS north of Highway 20 and known site management south of Highway 20 within the reserves. Surveys and known site management are some of the primary components of the Survey and Manage measures (**Appendix B** – Management Objectives and Direction).

Northern Spotted Owl

331. Comment Summary: The BLM should include the 2014 northern spotted owl demographic meta-analysis and individual demographic study area annual reports in its analysis.

Response: The commenter appears to confuse the northern spotted owl portion of the Northwest Forest Plan 20-year monitoring report (Davis *et al*. 2015), which was released in draft form, with the newest northern spotted owl meta-analysis, which has not yet been released at the time of the preparation of the Proposed RMP/Final EIS. The lead author of the new meta-analysis, Dr. Katie Dugger, Oregon State University, provided the BLM with meta-analytical results pertaining to northern spotted owl populations in the eight Federal demographic study areas, northern spotted owl survival and fecundity rates, and barred owl encounter rates. The Proposed RMP/Final EIS has updated its northern spotted owl models using those results, as appropriate. The BLM does not use the annual results from individual demographic study areas, because they are not analytically credible due to their sample sizes; hence, the need for a meta-analysis about every 5 years.

332. Comment Summary: It makes no sense to manage for northern spotted owl habitat when there are other factors affecting northern spotted owl survival. Establishment of large, contiguous blocks of late-successional forest has been shown to not provide any benefit to the conservation of the spotted owl due to the overwhelming presence and competition from the barred owl.

Response: Complex problems, such as northern spotted owl recovery, commonly require multiple, collaborative solutions. The Draft RMP/EIS demonstrated that habitat management alone would not be sufficient for conservation and recovery of the northern spotted owl, but habitat management remains a necessary component of northern spotted owl conservation and recovery (USDI BLM 2015, pp. 746–826). As detailed in the Draft RMP/EIS, the U.S. Fish and Wildlife Service identified in the revised recovery plan for the northern spotted owl the continuing need for habitat management and also acknowledged the effects of competitive interactions between northern spotted owls and barred owls and outlined a strategy to address the barred owl. Thus, the BLM, as recommended by the Service's recovery plan, is addressing the habitat component of northern spotted owl recovery. In addition, the Draft RMP/EIS identified a potential mitigation measure of BLM participation in a future barred owl management program and analyzed the effectiveness of such a mitigation measure (USDI BLM 2015, pp. 40, 778–780). The Proposed RMP has incorporated this mitigation measure and has added management direction related to "take" of northern spotted owls (see Chapter 2). Therefore, the Proposed RMP includes management of northern spotted owl habitat, management of northern spotted owls, and future management of barred owls, all of which are necessary components of northern spotted owl conservation and recovery.

333. Comment Summary: "The RMP ignores the checkerboard character of the majority of the O&C lands" and managing for contiguous northern spotted owl habitat is futile because of the checkerboard BLM ownership.

Response: The Draft RMP/EIS evaluated northern spotted owl habitat conditions on all land ownerships, and the results of that analysis clearly demonstrate that the commenter's claims are incorrect. The Draft RMP/EIS forecasted habitat changes on all land ownerships within the United States' portion of the northern spotted owl's range and determined that BLM-administered lands in the checkerboard ownership are capable of contributing to large habitat blocks of northern spotted owl nesting-roosting habitat and to northern spotted owl movement and survival between and through the large blocks (USDI BLM 2015, pp. 746–774). The commenter identifies no error in that analysis.

334. Comment Summary: The northern spotted owl analyses are missing important information such as northern spotted owl migratory habits, the effects of reduced harvest levels under the Northwest Forest Plan on barred owl abundance and competition with northern spotted owls, and interbreeding by the two species.

Response: The BLM presumes that the commenter confused east-west connectivity between the Oregon Cascades and Coast Range with northern spotted owl migration. The BLM correctly characterized east-west connectivity as pertaining to northern spotted owl dispersal across the landscape by individual owls looking for mates and available nesting habitat (USDI BLM 2015, pp. 764–774). Northern spotted owls are not migratory, in that the range of the species does not vary by season.

The BLM is unaware of credible data on how past timber harvest levels on BLM-administered lands have affected, if at all, competitive interactions between northern spotted owls and barred owls. Thus, there is no basis for a credible analysis. The BLM does not address interbreeding between northern spotted owls and barred owls, as there is no evidence that interbreeding is having a measurable effect on the northern spotted owl population or that the BLM could affect interbreeding through land use planning. The commenter does not present any information, evidence, or data that would provide a basis for the BLM to analyze the effect of reduced harvest levels on barred owl abundance and competition with northern spotted owls, or the effect of interbreeding by the two species.

335. Comment Summary: The BLM should increase the barred owl encounter rate over time to reflect the true growth rate of this population and its effect on northern spotted owls.

Response: The Draft RMP/EIS used observed estimated barred owl encounter rates from the most recent northern spotted owl meta-analysis available at that time (USDI BLM 2015, pp. 778–780). The Proposed RMP/Final EIS has updated the barred owl encounter rates used in the analysis based on the newest northern spotted owl meta-analysis, which had not yet been released at the time of the preparation of the Proposed RMP/Final EIS. The commenter's suggestion that the BLM increase the encounter rate over time to reflect "the true growth rate" of the barred owl cannot be done, because, as the meta-analyses indicate, barred owl encounter rates change over time differently—and, thus, not predictably—in each demographic study area. In addition, the barred owl will reach carrying capacity in some areas at some time, and there exists no information that would allow the BLM to predict, reasonably, when, where, and at what levels barred owl populations will stabilize.

The BLM did expanded the analyses of Alternative C and the No Timber Harvest reference analysis by using modified barred owl encounter rates developed by the U.S. Fish and Wildlife Service. The BLM ran these analyses for Alternative C and the No Timber Harvest reference analysis because these would bracket the outcomes of all alternatives using the modified encounter rates (USDI BLM 2015, p. 779). However, the BLM did this only to determine the range of northern spotted owl population responses to a potential future barred owl management program.

336. Comment Summary: By withdrawing from the Northwest Forest Plan, the BLM puts existing habitat conservation plans, the northern spotted owl recovery plan and the basis for northern spotted owl critical habitat designations at immediate risk.

Response: The Draft RMP/EIS explained that the BLM needs to revise existing plans to replace the 1995 RMPs' land use allocations and management direction because of new scientific information and policies related to the northern spotted owl. Since the approval of the 1995 RMPs, there have

been analyses on the effects of land management on northern spotted owl habitat, demographic studies, and analyses of the effects of barred owls on northern spotted owls. In addition, since that time, the U.S. Fish and Wildlife Service has developed new policies for northern spotted owls, including a revised recovery plan and a new designation of critical habitat (USDI BLM 2015, p. 5).

The Draft RMP/EIS provides a reasoned analysis based on detailed and quantified information on the effects of the alternatives on northern spotted owls and northern spotted owl habitat, including designated critical habitat (USDI BLM 2015, pp. 746–826). Therefore, the Draft RMP/EIS took a 'hard look' at the effects of the alternatives on northern spotted owls and northern spotted owl habitat.

The BLM is unaware of, and the commenter does not identify, any habitat conservation plan that would be 'at risk' from any of the alternatives.

As verified by the northern spotted owl analysis in the Draft RMP/EIS, which specifically examined the consistency of the various alternatives with the northern spotted owl revised recovery plan and final rule on northern spotted owl critical habitat, all alternatives would be consistent with the recovery plan and final rule, and none would place these strategies 'at risk.'

Regardless, the CEQ regulations require that an EIS analyze the environmental effects of the alternatives and explains that effects include "ecological (such as the effects on natural resources and on the components, structures, and functioning of affected ecosystems), aesthetic, historic, cultural, economic, social, or health" (40 CFR 1502.16, 1508.8). Habitat conservation plans, recovery plans, and critical habitat rules—in contrast to the resources to which they pertain—do not constitute an ecological, aesthetic, historic, cultural, economic, social, or health resource that could be affected by the BLM action. If a harm does not have a sufficiently close connection to the physical environment, NEPA does not apply (*Metropolitan Edison Co. v. People Against Nuclear Energy*, 460 U.S. 766 (1983)). The Draft RMP/EIS analyzed the effect of the RMP revision on northern spotted owl and on northern spotted owl habitat, including designated critical habitat. Beyond that, the continued validity of any habitat conservation plan, recovery plan, or critical habitat rule itself lacks a sufficiently close connection to the physical environment to be analyzed in an EIS.

337. Comment Summary: The documents cited in the Draft RMP justifying the need to maintain "large, contiguous blocks of late-successional forest" are outdated and have since been proven false or have been superseded by future decisions.

Response: The Draft RMP/EIS identified that maintaining large, contiguous blocks of late-successional forest is a part of the purpose for the action, based on scientific information, the results of previous analyses, and the recommendations in the northern spotted owl revised recovery plan (USDI BLM 2015, pp. 7–8).

Although scientists first identified large blocks of older forest as a conservation need of the northern spotted owl in 1990, the importance of such large blocks has been reaffirmed by ongoing science. The Draft RMP/EIS cited the most recent research in this area, which validates the importance of older forest conditions and managing for large blocks of unfragmented older forest (USDI BLM 2015, p. 774).

Contrary to the commenter's claim, the U.S. Fish and Wildlife Service did not dismiss the need for large blocks of older forest in the 2011, revised recovery plan for the northern spotted owl or the 2012 final rule on northern spotted owl critical habitat. Instead, the U.S. Fish and Wildlife Service identified management needs *in addition to* large blocks of older, contiguous forest specifically to

help compensate for the loss of such blocks fragmented by past management actions. As the U.S. Fish and Wildlife Service stated in the 2012 final rule on critical habitat (77 FR 71908):

> *"The natural ecological processes and landscape that once provided large areas of relatively contiguous northern spotted owl habitat (especially on the west side of the Cascade Range) have been altered by a history of anthropogenic activities, such as timber harvest, road construction, development, agricultural conversion, and fire suppression. The resilience of these systems is now additionally challenged by the effects of climate change. As recommended in the Revised Recovery Plan for the Northern Spotted Owl, active forest management may be required throughout the range of the owl with the goal of maintaining or restoring forest ecosystem structure, composition, and processes so they are sustainable and resilient under current and future climate conditions, to provide for the long-term conservation of the species* (USFWS 2011, p. III–13)*."*

The commenter does not offer any evidence that including large, contiguous blocks of late-successional forest among the purposes of the action was arbitrary or unreasonably narrow.

338. Comment Summary: Competition between the northern spotted owl and the barred owl will increase as late seral and structurally-complex forest is influenced by increased logging. The BLM northern spotted owl analysis "is severely flawed and biased towards timber interests." "An issue of particular concern is the proposal of the BLM to increase logging in scope, scale, and intensity throughout dry forests in western Oregon."

Response: The BLM disagrees with the basic claims by this commenter. As the BLM stated in the Draft RMP/EIS, "Current research provides no evidence that the BLM can manage individual forest stands to provide northern spotted owls with a competitive advantage over barred owls (Dugger *et al*. 2011 and Wiens *et al*. 2014)" (USDI BLM 2015, p. 774). Since that determination is so fundamental to the BLM analytical methods, the BLM specifically verified that statement with the subject matter experts, the U.S. Fish and Wildlife Service, and multiple northern spotted owl scientists.

The BLM also disagrees that the northern spotted owl analysis "is severely flawed and biased towards timber interests." The BLM evaluated northern spotted owl habitat and population responses to different land management strategies in terms of BLM contributions to the science-based conservation needs of the northern spotted owl, and consistency with the 2011 northern spotted owl revised recovery plan and 2012 final rule on northern spotted owl critical habitat, and evaluated and presented the results. The BLM developed the northern spotted analyses in collaboration with the U.S. Fish and Wildlife Service and Federal scientists with expertise in northern spotted owl research, analysis, and management. At the request of the BLM, three northern spotted owl scientists who work for the U.S. Forest Service, and are outside the BLM planning process, reviewed the BLM's methods, analyses, and conclusions. The BLM went to exceptional lengths to ensure that the northern spotted owl analyses were both analytically and scientifically credible, and that the BLM correctly interpreted and presented the results of those analyses.

The science on dry forest management has progressed since approval of the 1994 Northwest Forest Plan. The northern spotted owl analyses indicate that, during the next 50 years, dry forests treated with low intensity or uneven-age management prescriptions support northern spotted owl habitat development and populations almost as well as leaving these lands untreated, and better than under the Northwest Forest Plan.

339. Comment Summary: The BLM appears committed to eliminating the leave tree and wood retention standards and guidelines that provide at least some structural complexity in Northwest Forest Plan regeneration harvest units. The U.S. Fish and Wildlife Service relied upon the retention of structural legacies in harvest units over time in development of the Northern Spotted Owl Recovery Plan and in the designation of northern spotted owl critical habitat.

Response: The alternatives in the Draft RMP/EIS considered a range of approaches to "leave tree and wood retention" in regeneration harvests. The Proposed RMP includes requirements for retention of green trees, snags, and woody debris in regeneration harvests (**Appendix B** – Management Objectives and Direction).

340. Comment Summary: The State of Oregon recommends a requirement for northern spotted owl surveys in the Harvest Land Base, and those protections, at a minimum, for northern spotted owl known and historic sites within the Harvest Land Base, meet Oregon Forest Practices Act standards.

Response: Congress enacted legislation pertaining to the management of the BLM timberlands pursuant to the O&C Act which preempts state law purporting to govern administration of the O&C lands, including the Oregon Forest Practices Act. The commenter equates the Harvest Land Base allocated under the alternatives with state and private industrial forest lands managed under the Forest Practices Act. This ignores the fact that the Harvest Land Base is only one of several proposed land use allocations under each alternative, and that the reserve network under each alternative would be substantially larger than the Harvest Land Base. Specifically, the Proposed RMP would provide substantial support to northern spotted owl conservation and recovery, and continue to exceed the protections afforded to the northern spotted owl by the Forest Practices Act.

341. Comment Summary: The BLM must analyze and disclose the impacts of their activities on northern spotted owl survival and recovery, including increases in fire risk.

Response: As explained in the Draft RMP/EIS, the BLM modeled wildfire and included the effects of future wildfires in the northern spotted owl habitat modeling on all lands within the range of the northern spotted owl (USDI BLM 2015, pp. 748, 811–814, 1045–1056). The commenter identifies no error in that analysis.

342. Comment Summary: Northern spotted owl population trends continue to decline at alarming rates (Davis *et al*. 2015). Decline was steepest on study areas not managed under the Northwest Forest Plan (Anthony *et al*. 2006); thus, the downward trajectory might have been much worse without the Forest Plan. BLM needs to include this in the Final EIS.

Response: The Proposed RMP/Final EIS has included the most current information on northern spotted owl populations. Speculation about how a different management plan might have affected northern spotted owls in the past is neither possible nor relevant to this analysis. The analysis considers the cumulative effect of past actions in producing the current baseline condition for resources (USDI BLM 2015, p. 94), including northern spotted owl populations. The northern spotted owl analyses evaluated northern spotted owl future population responses under each alternative, including the No Action alternative, which assumes the continued implementation of the Northwest Forest Plan on BLM-administered lands.

343. Comment Summary: On BLM-administered lands in Oregon, the rate of old forest losses reflected by spotted owl habitat loss was more than 2 times that of U.S. Forest Service lands over a ten-year period (Table 4 of Davis *et al*. 2015). This relatively higher rate of loss on BLM lands needs to be acknowledged in the Final EIS.

Response: The commenter misread Table 4 of Davis *et al*. (2015), which does not distinguish between BLM-administered lands and U.S. Forest Service lands. In fact, Davis *et al*. (2015) provides no results specific to BLM-administered lands.

344. Comment Summary: Federal agencies assume that fire is a leading cause of habitat loss to northern spotted owls, yet few empirical studies have actually investigated spotted owl response to fire absent post-fire logging in or around owl territories. The tradeoff between fire risk reduction and owl habitat maintenance has seldom, if ever, been systematically evaluated by Federal agencies. Such simulation and empirical based studies on impacts of widespread thinning on spotted owls need to be included in the RMP. Forest treatments intended to reduce the threat of fire are more likely to cause more harm to the northern spotted owl than fire itself.

Response: The Draft RMP/EIS included the effects of wildfire and timber harvest treatments in all of the northern spotted owl analyses. The vegetation modeling incorporated the effects of wildfire and timber harvest and fuel treatments on forest stand conditions over time (USDI BLM 2015, pp. 98–102). The northern spotted owl analysis used the results of the vegetation modeling in evaluating changes in northern spotted owl habitat over time (USDI BLM 2015, pp. 1453–1455). In this analysis, the BLM did model the effects of timber harvest and fuel treatments within the alternatives, among other forest management actions, on northern spotted owl habitat over time based on empirical information on current stand conditions, the effects of timber harvest and fuel treatments on stand conditions, and habitat suitability of different stand conditions. The commenter identifies no error in this analysis.

The treatment of a stand to improve its fire resiliency commonly reduces the immediate value of the stand for northern spotted owls. However, the effects of these treatments are temporary, they typically occur in younger forest stands that are of less value to northern spotted owls, and they are intended to protect adjacent older forest stands from fire ignition in the treated stand. The Draft RMP/EIS acknowledged that hazardous fuels treatments can affect wildfire risk, but the BLM has no method to translate these changes in risk into meaningful differences in wildfire occurrence and wildfire effects for the alternatives (USDI BLM 2015, p. 212). The commenter offers no information that would allow such analysis.

Finally, the goal of fuels management under the alternatives is not limited to northern spotted owl habitat management. One of the purposes of the RMP is to restore fire-adapted ecosystems to increase fire resiliency (USDI BLM 2015, p. 10). Under all action alternatives, the management objectives for fuels management include managing fuels to reduce wildfire hazard, risk, and negative impacts to communities and infrastructure, landscapes, ecosystems, and highly valued resources (**Appendix B** – Management Objectives and Direction). Therefore, while beneficial and adverse effects to northern spotted owls are relevant in the analysis, such effects are not the only consideration in including fuel treatments in the action alternatives.

345. Comment Summary: The Final EIS should provide protections for all suitable spotted owl nesting and roosting habitat and not just the high quality habitat areas given owls will use mature forests and not just the oldest age classes (Carroll and Johnson 2008).

Response: The Draft RMP/EIS explained why an alternative that would protect all northern spotted owl habitat would be substantially similar to Sub-alternative C, which the Draft RMP/EIS analyzed in the northern spotted owl analysis (USDI BLM 2015, p. 80). Under Sub-alternative C the BLM evaluated the effects of protecting all northern spotted owl nesting-roosting habitat on BLM-administered lands and determined that it would contribute negligible added benefits to northern spotted owl conservation when compared to some other alternatives and actually performed less well with respect to owl conservation than did some other alternatives (USDI BLM 2015, pp. 746–826).

346. Comment Summary: The Final EIS should recognize that mixed-severity fires are not a threat to spotted owls in its southern range and manage for heterogeneity produced by these fires. Mixed-severity fires provide nesting and roosting habitat in low to moderate burn patches and foraging habitat in high-severity burn complexes (DellaSala *et al*. 2015). This needs to be recognized by BLM as the spotted owl appendix is out-of-step with new fire science on owl habitat.

Response: The Draft RMP/EIS modeled the *observed* effects of high-, moderate- and low-intensity wildfires in mixed severity patches on northern spotted owl habitat (USDI BLM 2015, pp. 1045–1056). The BLM has reviewed DellaSala *et al*. 2015, which presents literature reviews and policy critiques and does not include any scientific information that would alter the empirical information used in the wildfire modeling.

347. Comment Summary: We assert that Federal land spotted owl habitat modeling are not adequately incorporating the rapid loss of nesting-roosting-foraging habitat from private land clear cutting at scales relevant to existing northern spotted owls.

Response: The Draft RMP/EIS modeled habitat changes on all land ownerships within the northern spotted owl range based on observed rates specific to land classification/ownership (USDI BLM 2015, pp. 1480–1485). The commenter does not identify what habitat loss on private land they believe has not be "adequately incorporated" in this modeling.

348. Comment Summary: Impact of sudden oak death on spotted owl habitat not disclosed.

Response: The Draft RMP/EIS modeled habitat changes based on observed rates of change on all land ownerships (USDI BLM 2015, pp. 1453–1485). Although the BLM did not specifically breakout the impacts of sudden oak death, the effects of sudden oak death are incorporated among the change elements identified in the GNN data. It would not improve the quality of the analysis or provide for a reasoned choice among the alternatives to break out specifically the effects of sudden oak death on northern spotted owl habitat in the modeling.

349. Comment Summary: It is unlikely any of the BLM's alternatives will provide the harvest levels projected for them given the spotted owl recovery plan and critical habitat designation, which are likely to result in restrictions greater than disclosed in the Draft RMP. It is unknown what level of constraint will result at project level consultation in terms of avoidance, reduced acreage for harvest, or harvesting at lower intensities than stated in RMP.

Response: The northern spotted owl revised recovery plan is advisory. That said, the Draft RMP/EIS analyzed the effects of the alternatives in the context of the recommendations in the northern spotted

owl revised recovery plan (USDI BLM 2015, pp. 746–818). Consistent with Section 7(a)(2) of the ESA, the BLM will ensure, in consultation with the U.S. Fish and Wildlife Service, that any action by the BLM will not result in the destruction or adverse modification of designated critical habitat for the northern spotted owl. The Draft RMP/EIS specifically evaluated the effects of the alternatives on designated critical habitat for the northern spotted owl (USDI BLM 2015, pp. 819–826).

The BLM will also consult with the U.S. Fish and Wildlife Service on individual projects implemented under the approved RMP that may affect northern spotted owls or their critical habitat. Unless the Service finds jeopardy or adverse modification and offers a reasonable and prudent alternative, the BLM would not be constrained from implementing actions under the RMP.

The commenter provides no information or evidence to support their speculation that there will be some unspecified future restrictions on timber harvest. Furthermore, the commenter does not identify any change the BLM should make to the analysis in response to their asserted uncertainty.

350. Comment Summary: If BLM were to adopt a management plan that merely conformed to the existing regulatory policies of the spotted owl recovery plan and critical habitat, the levels of sustainable harvest would be lower than any alternative BLM has analyzed. The BLM analysis has established that the RMP, if fully adhered to, will have a substantial impact on sustained-yield management on O&C lands that was not previously revealed publicly.

Response: The commenter does not specify what alternative they believe would conform to the "existing regulatory policies of the spotted owl recovery plan and critical habitat" or how such an alternative would differ from the alternatives analyzed in the Draft RMP/EIS. By implication, the commenter is asserting that the alternatives analyzed in the Draft RMP/EIS would not conform to the northern spotted owl revised recovery plan or the critical habitat rule. Based on the analysis in the Draft RMP/EIS of the effects of the alternatives on northern spotted owls (USDI BLM 2015, pp. 746–826), the BLM does not agree with this implied assertion. The commenter does not explain the basis for their supposition that such an alternative would have a lower level of "sustainable harvest" than the alternatives analyzed in the Draft RMP/EIS. The alternatives analyzed in the Draft RMP/EIS would result in sustained-yield harvest levels that would range from 120 MMbf to 486MMbf per year. These alternatives cover the full spectrum of reasonable alternatives to accomplishing the stated purpose and need for action.

351. Comment Summary: The BLM did not disclose the extent of spotted owl critical habitat and the degree it overlays the Harvest Land Base.

Response: The Proposed RMP/Final EIS has added the acreage of designated critical habitat within the Harvest Land Base under each alternative (see the Wildlife section of Chapter 3).

352. Comment Summary: All the action alternatives analyzed in the RMP DEIS will eliminate reserves or allow logging within the reserves that currently serve as habitat for the Northern Spotted Owl. The No Action Alternative – compliance with the Northwest Forest Plan – would result in the greatest increase in large blocks of suitable habitat by 2050. The RMP EIS fails to discuss or consider any of the scientific studies finding that further loss of owl habitat may drive the northern spotted owl to extinction. Sustainable Ecosystem Institute, Scientific Evaluation of the Status of the Northern Spotted Owl (2004).

Response: The commenter mischaracterizes the action alternatives in the Draft RMP/EIS. None of the action alternatives would "eliminate reserves." In fact, all of the action alternatives would allocate more acres to the Late-Successional Reserve than the No Action alternative. The action alternatives include a range of approaches to management within reserves, but most, including the Proposed RMP, would allow silvicultural treatments within the Late-Successional Reserve comparable to the approach in the No Action alternative. The commenter is mistaken about the effects of the No Action alternative; the Draft RMP/EIS analysis verified that the No Action alternative would support the development of large habitat blocks no better than any other alternative and, in the dry forest, would support northern spotted owl conservation less well than several other alternatives (USDI BLM 2015, pp. 746–764). The commenter does not identify any error in that analysis. The Draft RMP/EIS cited relevant studies and scientific information related to the effects of habitat changes on northern spotted owl populations (USDI BLM 2015, p. 774). The only specific study that the commenter suggests is cited throughout the Draft RMP/EIS analysis of the northern spotted owl (e.g., BLM 2015, pp. 747, 749, 751, 764).

353. Comment Summary: A large block strategy will not protect owls and aid in the recovery of owls in Southern Oregon. A finer scale approach to recovery and protection is needed instead of a large block reserve for the dry forest. It appears that the RMP analysis of habitat, includes private lands as contributing to NSO habitat. You cannot count on private land to meet the obligation of habitat for spotted owls. This is a flaw in the analysis assumptions. On the Medford District an owl-by-owl strategy is needed rather than a large block design.

Response: The Draft RMP/EIS identified that maintaining large, contiguous blocks of late-successional forest is a part of the purpose for the action, based on scientific information, the results of previous analyses, and the recommendations in the northern spotted owl revised recovery plan (USDI BLM 2015, pp. 7–8). Although scientists first identified large blocks of older forest as a conservation need of the northern spotted owl in 1990, ongoing science has reaffirmed the importance of such large blocks. The Draft RMP/EIS cited the most recent research in this area, which validates the importance of older forest conditions and managing for large blocks of unfragmented older forest (USDI BLM 2015, p. 774). The commenter does not offer any evidence that including large, contiguous blocks of late-successional forest among the purposes of the action was arbitrary or unreasonably narrow. Regarding private land contributions to northern spotted owl conservation, the Draft RMP/EIS stated that the analysis would evaluate the BLM's contribution to a western Oregon landscape that supports northern spotted owl conservation (USDI BLM 2015, p. 749). The BLM evaluated the contribution of private lands to northern spotted owl recovery because they affect all management outcomes. As the BLM analyses verify, the private lands contribute relatively little to northern spotted owl conservation, and that affects how the cumulative effect of how the alternatives would contribute to northern spotted owl conservation and recovery.

The commenter asserts "an owl-by-owl strategy is needed rather than a large block design." Such as strategy would not be a reasonable alternative; the purpose and need for the RMP revision specifically identified the purpose of maintaining large, contiguous blocks of late-successional forest (USDI BLM 2015, pp. 7–8). Furthermore, the Background section of the Northern Spotted Owl section in Chapter 3 details the continuing conservation need of large blocks of nesting, roosting, and foraging habitat. An alternative that would not include "a large block design" would not respond to the purpose and need for action and would not address the conservation needs of the northern spotted owl.

354. Comment Summary: It is unclear from the DEIS, but is NRF habitat now being defined as only multilayered, multi-species canopy, diameter over 30 inches DBH and canopy cover over 60% and

decadence components? Spotted owls can and do nest in forests over 80 years old, even if they have not yet developed full decadence components present in unique old-growth forests like RA 32 habitat.

Response: The BLM is not redefining northern spotted owl NRF (nesting-roosting-foraging) habitat. The Draft RMP/EIS cited the description of nesting-roosting-foraging habitat in Thomas *et al*. (1990) and subsequent research that confirmed that this description remains valid (USDI BLM 2015, p. 749). This definition does not use an age criterion nor does the analysis in the Draft RMP/EIS, and is broader than the description of 'high-quality' habitat in Recovery Action 32. For the purposes of modeling changes in northern spotted owl habitat over time, the BLM modeled northern spotted owl relative habitat suitability over time (USDI BLM 2015, pp. 1453–1485). This modeling did not classify stands as simply habitat or non-habitat, but modeled relative habitat suitability from 0 to 100, with higher numbers signifying better habitat value. The commenter does not identify any error in this analysis.

355. Comment Summary: Spotted owl habitat suitability is rated on a 0 to 100 scale (higher numbers indicating better habitat) and the scale is based upon canopy cover, mean tree diameter, and slope. This new metric raises many questions. Exactly what variables were included, and how are they weighted? Were legacy trees accounted for or secondary older cohorts accounted for and how? Additionally, the BLM divided owl habitat into four categories 'strongly selected for', 'selected for', 'selected against', and 'strongly selected against.' I believe this means that a 'strongly selected for' area had a high proportion of northern spotted owl nest locations based on the relative habitat suitability value. It would be beneficial to the public and our organization to see how this new metric rates against the more simple analysis of stand age.

Response: The Proposed RMP/Final EIS has added information to explain further the habitat suitability modeling (**Appendix T** – Northern Spotted Owl).

356. Comment Summary: The BLM is claiming in the RMP that northern spotted owl declines have little to do with loss of available late seral and structurally-complex forest habitat. This assumption is simply not validated by the best available science.

Response: The commenter appears to be confusing the threats that have caused past population declines for the northern spotted owl with the results of the analysis of the future effects of the alternatives. The revised recovery plan clearly stated that the northern spotted owl was listed under the ESA due to loss of spotted owl habitat because of timber harvesting and was exacerbated by other events. In the Draft RMP/EIS, the analysis of northern spotted owl habitat incorporated the aggregate effect of past timber harvest into the baseline description of current habitat conditions. The analysis in the Draft RMP/EIS evaluated the effects of the alternatives on future amounts and configuration of habitat. The analysis in the Draft RMP/EIS also modeled the effect of these future changes in habitat and other factors, such as barred owl interactions, on northern spotted owl population responses. The Draft RMP/EIS concluded that habitat changes on BLM-administered lands, under the different alternatives, had little discernable effect on northern spotted owl population responses due to the effects of competitive interactions between northern spotted owls and barred owls (USDI BLM 2015, pp. 746–826). That determination is consistent with scientific observation and modeling by other subject matter experts throughout the northern spotted owl's range. The commenter does not identify any error in that analysis and does not cite any scientific information that is inconsistent with the information in the Draft RMP/EIS.

357. Comment Summary: A reference analysis should be performed to illustrate the extent to which the encounter rate of barred owl and northern spotted owl affects management strategy outcomes.

Response: The Draft RMP/EIS did provide an analysis of the effects of the alternatives at different barred owl encounter rates. Based on that analysis, the Draft RMP/EIS concluded that habitat changes on BLM-administered lands, under the different alternatives, had little discernable effect on northern spotted owl population responses due to the effects of competitive interactions between northern spotted owls and barred owls (USDI BLM 2015, pp. 774–804).

358. Comment Summary: Mark it well: historic, ongoing, and widespread habitat destruction is the root cause of the endangerment of the NSO. This premise is as inarguable as it is certain. For the authors of the DEIS to throw up their hands, so to speak, and declare that '…the BLM has no opportunity through habitat management in the Coast Range to reduce risks to the northern spotted owl during the next 50 years…' goes beyond cavalier and enters the realm of the outrageous! The BLM must assume the NSO's ultimate recovery across the decision area, if not the entire planning area.

Response: The analytical conclusions in the Draft RMP/EIS are supported by scientifically and analytically credible modeling, and are consistent with empirical evidence and multiple, independent expert conclusions. The analysis in the Draft RMP/EIS evaluated the effects of the alternatives on future amounts and configuration of habitat. The analysis in the Draft RMP/EIS also modeled the effect of these future changes in habitat and other factors, such as barred owl interactions, on northern spotted owl population responses. The Draft RMP/EIS concluded that habitat changes on BLM-administered lands, under the different alternatives, had little discernable effect on northern spotted owl population responses due to the effects of competitive interactions between northern spotted owls and barred owls (USDI BLM 2015, pp. 746–826). The commenter observes this analytical conclusion, but identifies no error in the analysis.

Analysis of effects in an EIS must address those effects that are reasonably foreseeable (40 CFR 1508.8). While the "ultimate recovery" of the northern spotted owl is desirable from both a legal and policy standpoint, it is by no means reasonably foreseeable, as evidenced by the discussion of the current population condition in the Draft RMP/EIS. The commenter's assertion that the BLM must "assume the NSO's ultimate recovery" disregards the current condition and trend of the northern spotted owl population and the results of the analysis in the Draft RMP/EIS. As noted in the analysis in the Draft RMP/EIS, the outcomes for the northern spotted owl population under the No Timber Harvest reference analysis at current barred owl encounter rates would be substantially the same as the alternatives (USDI BLM 2015, pp. 783–804). In that context, it is unclear how the commenter intends that the BLM must "assume the NSO's ultimate recovery."

359. Comment Summary: The BLM must manage habitat to allow for northern spotted owl and barred owl co-existence and in doing so must protect all habitats. Competition between the spotted owl and the barred owl will increase as late seral and structurally-complex forest is influenced by increased logging. Further fragmentation and late seral habitat degradation will provide an advantage to the barred owl, who can utilize slightly more altered forest habitat.

Response: Currently there is no substantive empirical evidence that northern spotted owls would be able to coexist with barred owls in the future as the effects of competitive interactions on the northern spotted owl are continuing to increase, and the commenter offers no such evidence.

The Draft RMP/EIS analyzed the effects of a No Timber Harvest reference analysis, in which the BLM forecast northern spotted owl habitat and population responses to a hypothetical management scenario in which the BLM conducted no timber harvest. That analysis concluded that protecting all habitats, in the absence of barred owl control, would not substantively curb the continued northern spotted owl population decline (USDI BLM 2015, pp. 746–826). The commenter identifies no error in that analysis.

360. Comment Summary: Effects to northern spotted owl foraging habitat have not been specifically addressed.

Response: The BLM did not specifically address foraging habitat because, unlike nesting-roosting and dispersal habitats: (1) there is no accepted description of foraging habitat in terms of stand age, stand structure, canopy cover or other metrics the BLM can model, and (2) there is no quantitative definition of the necessary amount of foraging habitat in terms of patch size, patch spacing, density on the landscape, where it needs to be and when it needs to be there. With no credible metric of how much is enough or other benchmarks, the BLM could not state that the contribution of any one alternative would be adequate or would not be adequate to contribute to the conservation and recovery of the northern spotted owl. Therefore, an analysis specifically evaluating the amount of foraging habitat would not improve the quality of the analysis or provide for a reasoned choice among the alternatives. This is in sharp contrast to nesting-roosting and dispersal habitats, which have clear, science-based thresholds of adequacy.

361. Comment Summary: In displaying the results of its HexSim model, the BLM provides no estimates of variance for any of the modeled northern spotted owl population numbers. It's important to provide some measure of variation in these estimates from HexSim models.

Response: The variance associated with the HexSim model results does not alter the basic analytical conclusions in the Draft RMP/EIS. Including variance measures for the results on the HexSim model would not improve the quality of the analysis or provide for a reasoned choice among the alternatives.

362. Comment Summary: How did the BLM come to the conclusion that northern spotted owl populations in the western Cascades would be stable? Stability is a description of the trend, not total numbers.

Response: The commenter mischaracterizes the analytical conclusions in the Draft RMP/EIS. The Draft RMP/EIS stated that the modeling indicated that the northern spotted owl population likely would persist in the western Cascades during the next 50 years; the Draft RMP/EIS clearly showed that the population is not stable and is not expected to stabilize without a reduction in the barred owl encounter rate (USDI BLM 2015, pp. 787, 792).

Oregon Spotted Frog

363. Comment Summary: Analysis and survey data are needed for the Oregon spotted frog because it has been proposed for Federal listing and proposed critical habitat identified.

Response: The Draft RMP/EIS analyzed the effects of the alternatives on the amount of habitat for Oregon spotted frog and its proposed critical habitat. The Proposed RMP/Final EIS has included additional information on the current conditions and analyzed effects of the alternatives on the Oregon spotted frog and its proposed critical habitat (see the Wildlife section of Chapter 3).

Western Snowy Plover

364. Comment Summary: The State recommends changes in OHV use and Recreation Management Area (RMA) designations in the RMP that would not increase activities in snowy plover habitat.

Response: The BLM would allocate snowy plover habitat and critical habitat as *limited* to public motorized access under the Proposed RMP. However, the Proposed RMP would specifically direct the BLM to not authorize or construct additional roads or trails in within snowy plover habitat or designated critical habitat. Furthermore, ACEC management direction under the Proposed RMP would preclude additional impacts to snowy plovers resulting from public motorized vehicle use (see the Wildlife section of Chapter 3 and **Appendix B** – Management Objectives and Direction).

365. Comment Summary: To protect snowy plovers adequately at the two sites where BLM lands support the species (the New River ACEC and the Coos Bay North Spit [CBNS]), the Service recommends the BLM include a set of conservation measures in its RMP.

Response: The Proposed RMP includes management direction intended to conserve snowy plovers. The Proposed RMP would provide direction to continue activities that restore or maintain snowy plover nesting habitat, as the Coos Bay District has been implementing (e.g., mechanical treatment of plowing of European beach grass and augmenting nesting grounds with oyster shells). The Proposed RMP also includes direction to avoid disruption of plover nesting behaviors through restricting the timing and location of beach access or activities (see the Wildlife section of Chapter 3 and **Appendix B** – Management Objectives and Direction).

Issues Considered but not Analyzed in Detail

366. Comment Summary: The Siskiyou Mountain Salamander conservation agreement, to which the BLM is a party to, indicates that "significant changes in Forest Service or BLM land-use allocation within the area of the conservation strategy" must trigger "immediate review of the Conservation Agreement." This threshold would be triggered by implementation of the RMP as outlined in the DEIS and the conservation agreement must be revisited and amended to either reduce logging and ground disturbance impacts or proceed towards listing of the SMS due to new threats from BLM logging that far exceeds the standards of the NWFP and therefore the assumptions built into the Conservation Agreement and Conservation Strategy.

Response: The Proposed RMP would include management direction to manage the Siskiyou Mountains salamander consistent with the Conservation Agreement for the Siskiyou Mountains Salamander *(Plethodon stormi)* in Jackson and Josephine Counties of Southwest Oregon; and in Siskiyou County of Northern California (August 17, 2007), as amended and as long as that agreement is in effect. The option to review and potentially amend this conservation agreement is an independent process that is outside of the scope of the RMP revision.

Wild and Scenic Rivers

367. Comment Summary: Rough and Ready Creek should be found eligible for potential inclusion into the National Wild and Scenic Rivers System.

Response: The BLM has determined that Rough and Ready Creek is not eligible for potential inclusion in the National Wild and Scenic Rivers System based on the lack of outstandingly remarkable values present within the river corridor. The BLM completed the eligibility determinations and subsequent suitability studies for all potential Wild and Scenic Rivers in the decision area as part of the 1995 RMPs. As part of this RMP revision, each BLM district re-validated all river segments that the BLM had previously found eligible or non-eligible for potential inclusion into the National Wild and Scenic Rivers System. The eligibility determination that was performed by the Medford District in 1992 for Rough and Ready Creek was re-validated and determined as non-eligible based on the lack of outstandingly remarkable values present within the river corridor being studied.

368. Comment Summary: The BLM should not designate the Rogue River as a Wild and Scenic River. Designation of this river and the private lands along the river corridor would violate private landowners' rights.

Response: The BLM has not proposed to recommend any non-BLM-administered lands, including privately owned lands, for inclusion into the National Wild and Scenic River System anywhere in the decision area. The land acres considered under this analysis comprising the Wild and Scenic River corridor along the 63 miles of the Rogue River total 754 acres, all of which are BLM-administered lands. The 63-mile stretch of the Rogue River and the associated 754 acres of BLM-administered lands underwent eligibility and suitability reviews as part of this RMP revision. The details of the eligibility and suitability study process for the Rogue River is documented in Section 2, pp. 7–9 of the Wild and Scenic Rivers Suitability Report for Southwest Oregon (BLM USDI 2015). The BLM followed the methodology to determine whether this eligible river would meet the 13 suitability criteria to be appropriate to recommend for inclusion in the National System and found the Rogue River to be suitable to recommend for potential inclusion. The Rogue River suitability factor assessment is contained in the Wild and Scenic Rivers Suitability Report (pp. 121–139).

The alternatives consider a range of requisite protections and recommendations for inclusion into the National Wild and Scenic River System. Under the No Action alternative, the Rogue River would receive protections of the outstandingly remarkable values and tentative classification identified until the next land use planning process assessed the suitability of Wild and Scenic Rivers. Under Alternatives B, C, and D, and the Proposed RMP, the BLM would recommend the Rogue River for inclusion into the National Wild and Scenic River System. Under these alternatives and the Proposed RMP, the 63 miles and 754 acres of BLM-administered lands would receive interim management for the outstanding remarkable values and tentative classification until Congress either designates the river or releases it for other uses. This interim management would apply only to BLM-administered lands and would have no bearing on private land management.

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Appendix X – Guidance for Use of the Completed RMPs

This appendix describes on how the BLM will implement, evaluate, and change the RMPs after approval of the RMP revisions. These descriptions, which provide background information and explanations of how the BLM will use the completed RMPs, do not constitute additional requirements beyond the management direction described in **Appendix B**. The BLM may make changes to the processes described in this background information through plan maintenance, as explained below, in that changes to processes, in and of themselves, would not expand the scope of resource uses or restrictions or change the terms, conditions, and decisions of the approved plan.

Implementation of the Completed RMPs

At this time, the BLM anticipates issuing two Records of Decision/Resource Management Plans (RODs/RMPs): one ROD/RMP that would apply to the Coos Bay District, Eugene District, Salem District, and the Swiftwater Field Office of the Roseburg District; and another ROD/RMP that would apply to the Klamath Falls Field Office of the Lakeview District, the Medford District, and the South River Field Office of the Roseburg District.

The Records of Decision will only make decisions on lands that fall under BLM jurisdiction (including mineral estate). The major provisions of the RMPs will include the following land use plan decisions—

- Objectives for the management of BLM-administered lands and resources;
- Land use allocations relative to future uses for the purposes of achieving the various objectives; and
- Management direction that identifies where future actions may or may not be allowed and what restrictions or requirements may be placed on those future actions to achieve the objectives set for the BLM-administered lands and resources.

Management objectives are descriptions of desired outcomes for BLM-administered lands and resources in an RMP; the resource conditions that the BLM envisions or desires would eventually result from implementation of the RMP. As such, management objectives are not rules, restrictions, or requirements by which the BLM determines which implementation actions to conduct or how to design specific implementation actions.

For some land use allocation decisions, such as the location of the Late-Successional Reserve, Harvest Land Base, and District-Designated Reserve – Lands Managed for their Wilderness Characteristics, the maps accompanying the approved RMP of these allocations represent the decision. For other land use allocation decisions, such as the location of the Riparian Reserve, the decision requires identification of features on the ground (e.g., a perennial stream) and the allocation of a corresponding width of Riparian Reserve.

Although the location of the Riparian Reserve will require the identification of specific features on the ground, the maps accompanying the approved RMP of the three subwatershed classes for the purpose of defining Riparian Reserve widths and management direction (**Appendix B**) represent the decision. In identifying subwatershed classes, the BLM considered the information in critical habitat designations and data on high intrinsic potential streams to indicate the importance of subwatersheds to the conservation and recovery of ESA-listed fish. However, future changes in designated critical habitat or data on high intrinsic potential streams would not alter the identification of subwatershed classes for the purpose of

Riparian Reserve design and management direction. Any change to the subwatershed classes would constitute a change to the approved RMP and such changes would only be made consistent with the discussion below in the section on Changes to the Approved RMP. As noted above, the Records of Decision will only make decisions on lands that fall under BLM jurisdiction; as such, the identification of subwatershed classes within the planning area is only relevant to defining Riparian Reserve widths and management direction for streams and water features on BLM-administered lands within the subwatershed.

The decision requires the future allocation of marbled murrelet occupied stands[61] to the Late-Successional Reserve for occupied sites identified[62] after March 26, 2015 as a result of BLM marbled murrelet surveys in (1) all land use allocations within 35 miles of the Pacific Coast, and (2) Late-Successional Reserve and Riparian Reserve between 35–50 miles from the Pacific Coast and outside of exclusion Areas C and D (shown in **Figure 3-166**). In addition, this decision requires the future allocation of red tree vole "habitat areas"[63] to the Late-Successional Reserve for occupied sites identified as a result of BLM red tree vole surveys within the range of the North Oregon Coast Distinct Population Segment of the red tree vole north of Highway 20.

Through the RMPs, the BLM will determine and declare the annual productive capacity for sustained-yield timber production. In the Records of Decision for the approved RMPs, the BLM will declare the annual productive capacity for sustained-yield timber production and describe the level of allowable variation in the amount of timber offered for sale in a given time period. In addition, the Records of Decision for the approved RMPs will define any necessary transition period from the declarations of the annual productive capacity in the 1995 RMPs to the declarations of the annual productive capacity in the approved RMPs. The BLM will make the determination and declaration of the annual productive capacity for each of the six sustained yield units, which match the five western Oregon BLM district boundaries and the western portion of the Klamath Falls Field Office of the Lakeview District.

Land use plan decisions (land use allocations, management objectives, and management direction) do not directly authorize implementation of on-the-ground projects. Land use plan decisions guide and control future implementation decisions, which the BLM can carry out only after completion of further NEPA compliance and decision-making processes and consultation as appropriate.

Implementation decisions authorize implementation of on-the-ground projects. Examples of implementation decisions include but are not limited to the following: offering a specific tract of timber for sale, applying a vegetation treatment, approving or denying an application for a permit, issuing an individual grazing lease, designating specific roads and trails as *open* or *closed* to motorized travel, or completing a specific land exchange. The Proposed RMP does not include any implementation decisions to be included in the eventual Records of Decision/Approved RMPs.

Implementation Planning

Implementation planning is a process the BLM uses to develop a coordinated strategy to facilitate implementation of new land use plans. Consistent with the 2005 BLM Land Use Planning Handbook (H-1601-1), the BLM will complete implementation planning within one year of approval of the RMPs. The

[61] Marbled murrelet occupied stand refers to all forest stands, regardless of age or structure, within 1/4 mile (1,320 feet) of the location of marbled murrelet behavior indicating occupancy and not separated from the location of marbled murrelet behavior indicating occupancy by more than 328 feet of non-forest.
[62] In this context, "identified after March 26, 2015," means that survey data for occupied marbled murrelet sites was entered into the BLM corporate database after March 26, 2015.
[63] Red tree vole "habitat areas" are described in the management direction (**Appendix B**).

implementation planning process is a three-step process by which the BLM identifies and outlines work tasks to achieve the desired outcomes of one the land use plans. The product of this effort will be a worksheet, which outlines implementation actions in correlation to management objectives and direction described in the RMPs for 5–10 years. The implementation plan will prioritize work tasks for funding and implementation based upon direction provided and given the existing or anticipated resources. Implementation planning enables the BLM to prioritize the preparation of implementation decisions.

Project-level Planning and Analysis

The BLM will make decisions on specific projects to implement, including on-the-ground locations and timing of projects, subsequent to the approval of the RMPs. All implementation decisions must conform to the approved RMP, consistent with 43 CFR 1610.5–3.

Revision of an RMP necessarily involves a transition from the application of the old RMP to the application of the new RMP. The planning and analysis of implementation projects typically requires several years of preparation before the BLM can reach a decision. Allowing for a transition from the old RMP to the new RMP avoids disruption of the management of the BLM-administered lands and allows the BLM to utilize work already begun on the planning and analysis of projects. The Records of Decision for the approved RMPs will address the application of the RMP to new and ongoing projects.

The analysis in the Proposed RMP/Final EIS describes the cumulative effect of anticipated implementation actions under the RMPs, based on the information available to the BLM at this time and forecasting of reasonably foreseeable implementation actions under the RMPs. The analysis in the Proposed RMP/Final EIS will provide useful analysis, including cumulative effects analysis, to which most implementation-level analyses will tier, consistent with 40 CFR 1502.20. As the BLM plans and analyzes implementation actions, the BLM will have better and more specific information on the location, scope, and timing of proposed implementation actions, and site-specific conditions for project-level NEPA compliance.

Implementation-level Travel Management Planning

In accordance with 43 CFR 8342 and current BLM policy, the BLM is deferring implementation-level Travel Management Planning during the current RMPs for Western Oregon planning effort. Implementation-level TMP is the process of establishing a final travel and transportation network that includes route-specific designations within the broader land use planning level designations for public motorized access. In the future, implementation-level travel planning will follow a site-specific process for selecting a final public road and trail network. The BLM may delineate Travel Management Areas within these broader land use planning level designations for public motorized access to address particular concerns and prescribe specific management actions for a defined geographic area. The BLM will make final route designations within the decision area in comprehensive, interdisciplinary Travel and Transportation Management Plans, scheduled to be completed within five years after the completion of the western Oregon RMPs. Until implementation-level Travel Management Planning is complete, routes and trails would be managed in accordance with their designation of *closed* or *limited* to existing routes for public motorized travel activities, as described in **Appendix Q**. Implementation-level Travel Management Planning would be conducted within the decision area generally prioritizing planning to occur first where the BLM has legal public access and where implementation-level planning is needed to reduce threats to resources or to protect public safety. Specific prioritization criteria are listed in **Appendix Q**, and would be applied by each district and field office based upon local knowledge of their administrative areas.

BLM Participation in Barred Owl Management

The U.S. Fish and Wildlife Service is currently authorizing the removal of barred owls from four study areas in California, Oregon, and Washington to evaluate the feasibility, cost, and effectiveness of barred owl removal and the resulting effects to northern spotted owl populations (USDI FWS 2013). In the Revised Recovery Plan for the Northern Spotted Owl, Recovery Action 29 describes the design and implementation of large-scale barred owl control experiments to assess the effects on spotted owl site occupancy, reproduction, and survival (USDI FWS, 2011, p. III-65). Recovery Action 30 calls for management to reduce the negative effects of barred owls on spotted owls so that the recovery criterion for a stable population trend can be achieved. In the Revised Recovery Plan for the Northern Spotted Owl, the U.S. Fish and Wildlife Service acknowledges the need for aggressive strategies to address the threat from barred owls in the face of scientific uncertainty, and will employ an active program of adaptive management in order to deal with uncertainty and risk (USDI FWS 2011, p. II-6 – II-10).

Based on information in the Revised Recovery Plan for the Northern Spotted Owl (USDI FWS 2011), the analysis in the U.S. Fish and Wildlife Service EIS for Experimental Removal of Barred Owls to Benefit Threatened Northern Spotted Owls (USDI FWS 2013), and preliminary results from experimental removals (Diller 2013, Diller *et al*. 2014), barred owl management may result in decreased competition between barred owls and northern spotted owls, increased site occupancy by northern spotted owls, and increased northern spotted owl survival and reproduction. These outcomes may increase the likelihood of recovery of the northern spotted owl. As such, the experimental removals represent an inquiry into the best manner in which barred owl management can contribute to the recovery of the northern spotted owl.

The BLM is cooperating with the U.S. Fish and Wildlife Service and providing financial support for this experimental removal of barred owls. Further, when the U.S. Fish and Wildlife Service determines the best manner in which barred owl management can contribute to the recovery of the northern spotted owl, the BLM would participate in, cooperate with, and provide support for an interagency program for barred owl management to implement Recovery Action 30. Barred owl management actions on BLM-administered lands within the range of the northern spotted owl could include BLM participation in scheduling, funding, and implementing such actions. These actions would be implemented pursuant to appropriate NEPA analysis and decision-making. To the extent the BLM funds implementation of the Experimental Removal of Barred Owls to Benefit Threatened Northern Spotted Owls (USDI FWS 2013), the NEPA analysis for that action is already completed. The EIS prepared by the U.S. Fish and Wildlife Service describes and evaluates nine alternatives for an experimental removal of barred owls on a scale sufficient to determine if the removal would increase northern spotted owl site occupancy and improve northern spotted owl population trends. Results from these experiments would be used by the U.S. Fish and Wildlife Service to inform future decisions on potential, long-term management strategies for barred owls (USDI FWS 2013). That analysis is hereby incorporated by reference.

The BLM and U.S. Fish and Wildlife Service would develop a monitoring program that would evaluate whether such a barred owl management program is having the biological benefits to the northern spotted owl assumed by the Biological Opinion on the RMP. The BLM and U.S. Fish and Wildlife Service would meet as necessary, at least annually, to review the results of the monitoring program.

Incidental Take of Northern Spotted Owls

As described under the Proposed RMP in Chapter 2 and **Appendix B**, upon signing of the ROD/RMP, the BLM would not authorize timber sales that would cause the incidental take[64] of northern spotted owl

[64] The ESA defines 'take' as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct" 16 U.S.C. 1532(19). The definition of harm is "an act which actually kills or injures wildlife. Such an act may include significant habitat modification or degradation where it actually kills or injures

territorial pairs or resident singles from timber harvest until implementation of a barred owl management program consistent with the assumptions contained in the Biological Opinion on the RMP has begun. Implementation of a barred owl management program includes the existence of a monitoring program that would evaluate whether a barred owl program is having the biological benefits to the northern spotted owl assumed by the Biological Opinion on the RMP.

Whether a specific timber harvest would result in incidental take would be determined on a case-by-case basis. Until implementation of a barred owl management program has begun, the BLM would not authorize any timber harvest after the signing of the ROD/RMP that it determines would cause incidental take of northern spotted owls or is determined to cause incidental take through a Section 7 consultation process. The BLM would be authorizing timber harvest that does not result in incidental take of northern spotted owls (e.g., harvest in unoccupied home ranges or harvest within occupied home ranges that does not constitute incidental take), provided that such harvest otherwise meets BLM's obligations under ESA section 7.

As part of the process to determine whether a planned timber harvest would result in take of northern spotted owls, the BLM would establish whether the northern spotted owl is actually present in the area that would be affected by the timber harvest using the best available science at that time, such as through pre-project northern spotted owl surveys consistent with USDI Fish and Wildlife Service. 2012. Protocol for Surveying Proposed Management Activities That May Impact Northern Spotted Owls. (February 2, 2011; revised January 9, 2012). The U.S. Fish and Wildlife Service has updated the northern spotted owl survey protocol to account for the influence of barred owl and may update it in the future.

If the BLM and the U.S. Fish and Wildlife Service jointly determine that implementation of a barred owl management program has begun, the BLM may proceed with implementation of timber harvest consistent with the ROD/RMP that may include incidental take of northern spotted owl territorial pairs or resident singles. Any proposed timber harvest that may include such incidental take would be implemented only after and consistent with appropriate project-level Section 7 consultation and incidental take statement.

After implementation of a barred owl management program has begun, the BLM and U.S. Fish and Wildlife Service would meet as necessary, at least annually, to review the results of the monitoring program. If the BLM or the U.S. Fish and Wildlife Service conclude that the monitoring program shows that the results of such a barred owl management program are not consistent with the assumptions in the Biological Opinion, the BLM would reinitiate Section 7 consultation on the RMP.

If the BLM or the U.S. Fish and Wildlife Service concludes that implementation of a barred owl management program consistent with the assumptions contained in the Biological Opinion has not begun after five years from the effective date of the ROD/RMP, the agencies would meet as necessary, at least annually, and evaluate whether implementation of a barred owl management program consistent with the assumptions of the Biological Opinion is reasonably certain to occur. If both the BLM and the U.S. Fish and Wildlife Service agree that such a barred owl management program is still reasonably certain to occur, the BLM would continue to not authorize timber sales that would cause the incidental take of northern spotted owl territorial pairs or resident singles from timber harvest. If the BLM or the U.S. Fish and Wildlife Service concludes that such a barred owl management program is not reasonably certain to occur, the BLM would reinitiate Section 7 consultation on the RMP.

If implementation of a barred owl management program has not begun after 8 years of the effective date of the ROD/RMP, the BLM would reinitiate Section 7 consultation on the RMP.

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wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering" (50 CFR 17.3); *Babbitt v. Sweet Home Chapter of Cmtys. for a Greater Or.*, 515 U.S. 687, 696-700 (1995).

If reinitiation of Section 7 consultation on the RMP is triggered for any of the reasons above, the BLM would comply with ESA section 7(d) and would not authorize timber harvest that is likely to adversely affect the northern spotted owl or likely to adversely affect its critical habitat until consultation is complete.

After implementation of a barred owl management program has begun, the BLM would continue to seek to avoid or reduce negative impacts to northern spotted owl sites, to the extent consistent with the management objectives and management direction for the Harvest Land Base, as detailed below.

Management of Northern Spotted Owl Known Sites Associated with the Harvest Land Base[65]

In 2013, an estimated 175 known sites occurred in what would be the Harvest Land Base under the Proposed RMP. In addition, the Harvest Land Base under the Proposed RMP would contribute to the 500-acre core use areas of an additional estimated 660 known sites located in other land use allocations, and to the median provincial home range areas of another estimated 250 known sites. Thus, an estimated 1,085 known sites, or 44 percent of the known sites associated with BLM-administered lands, potentially would be affected by BLM management actions in the Harvest Land Base under the Proposed RMP. Given the severe biological stressors currently affecting the northern spotted owl, when designing, locating and implementing actions in the Harvest Land Base, BLM managers would[66] reduce, avoid, or delay negative impacts to northern spotted owl known sites located in the Harvest Land Base, and avoid causing the abandonment of northern spotted owl known sites located in other land use allocations, to the extent consistent with the management objectives and management direction for the Harvest Land Base.

This guidance is not intended to prevent all negative effects to known sites associated with the Harvest Land Base or the eventual loss of known sites in the Harvest Land Base. Instead, this guidance is intended to avoid or delay, to the extent consistent with the management objectives and management direction for the Harvest Land Base, near-term negative effects to known sites as northern spotted owl habitat continues to develop in the reserved land use allocations and the U.S. Fish and Wildlife Service evaluates options for barred owl management.

The following information is intended to help BLM managers implement this guidance.

[65] As stated in the beginning of this appendix, this description, which provides background information and explanations of how the BLM will use the completed RMPs, does not constitute additional requirements beyond the management direction described in **Appendix B**. This description provides guidance for the timing or order of timber harvest in the Harvest Land Base but does not alter which lands are available for timber harvest. Guidance in this section for avoiding harvest or prioritizing harvest is in the context of those actions that are allowable consistent with the management objectives and management direction for the Harvest Land Base.

[66] As stated above, guidance in this section for avoiding harvest or prioritizing harvest is in the context of those actions that are allowable consistent with the management objectives and management direction for the Harvest Land Base. Thus, statements throughout this section about actions that the BLM would or would not take are solely explanations of how the BLM would use the completed RMPs and do not constitute additional requirements beyond the management direction described in **Appendix B**.

Known Sites Located in the Harvest Land Base

With respect to sites currently[67] occupied by a northern spotted owl territorial pair or resident single, to the extent consistent with the management objectives and management direction for the Harvest Land Base, BLM managers would–

- Avoid management actions that would cause the abandonment of more than 10 percent of such sites during the first decade of plan implementation, more than 15 percent of such sites during the second decade of plan implementation, and more than 20 percent of such sites per decade thereafter. These thresholds are intended to reflect site abandonment caused by a BLM action; they are not intended to reflect site abandonment from other causes such as displacement by barred owls or habitat losses on adjacent lands. If the BLM determines that an action would not cause the incidental taking of a territorial pair or resident single, and the U.S. Fish and Wildlife Service concurs with that determination, subsequent abandonment of a site associated with the action would not be considered as resulting from the action.
- Give priority to maintaining existing habitat conditions in the associated nest patch, 500-acre core use area and median provincial home range area, in that order of priority, to support continued site occupancy.

With respect to sites not currently occupied but known to have been occupied by a territorial pair or resident single within the past 5 years, BLM managers would give priority to maintaining existing habitat conditions in the nest patch and 500-acre core use area, and maintaining existing nesting-roosting-foraging habitat in the associated median provincial home range area, to the extent consistent with the management objectives and management direction for the Harvest Land Base. If the BLM cannot maintain all existing nesting-roosting habitat in the median provincial home range area, BLM managers would give priority to maintaining nesting-roosting habitat closest to the 500-acre core use area and maintaining at least 50 percent of the median provincial home range area as nesting-roosting-foraging habitat when all lands are considered.

With respect to sites not currently occupied, but known to have been occupied by a territorial pair or resident single within the past 10 years, BLM managers would give priority to maintaining existing habitat conditions in the nest patch and maintaining existing nesting-roosting habitat in the 500-acre core use area, or promoting the protection and development of nesting-roosting habitat in the nest patch and 500-acre core use area, to the extent consistent with the management objectives and management direction for the Harvest Land Base.

BLM managers would give priority to implementing management actions that are located outside the median provincial home range area of a site, or would affect sites not known to have been occupied by a territorial pair or resident single within the past 10 years, over actions that would affect sites that have been occupied within the past ten years.

Known Sites Located Outside the Harvest Land Base

In 2013, approximately 590 known sites in other BLM land use allocations under the Proposed RMP were occupied by a territorial pair or resident single within the past 5 years. In addition, if the U.S. Fish and Wildlife Service implements a barred owl management program, the BLM anticipates that northern spotted owls would reoccupy currently unoccupied habitat.

[67] For the purpose of this guidance, "sites currently occupied" means northern spotted owl sites that the BLM has determined are occupied at the time of implementation of the management action. The BLM will determine occupancy using the best science available at that time, such as through pre-project northern spotted owl surveys.

As stated above, when designing, locating and implementing actions in the Harvest Land Base, BLM managers would avoid causing the abandonment of northern spotted owl known sites located in other land use allocations, to the extent consistent with the management objectives and management direction for the Harvest Land Base.

BLM managers would give priority to actions that affect sites–

- That are not known to have been occupied by a territorial pair or resident single within the past 10 years. The longer a site has been unoccupied, the less likely it is to be re-occupied by northern spotted owls.
- That have less than 50 percent nesting-roosting-foraging habitat within the associated median provincial home range area when all land ownerships are considered. Sites with median provincial home range areas supporting less than 50 percent nesting-roosting-foraging habitat are less likely to be re-occupied by northern spotted owls until habitat conditions recover.
- With less than 50 percent of the associated median provincial home range area occurring in the Late-Successional Reserve, when all land ownerships and U.S. Forest Service reserves are considered. Sites associated with more reserved lands are more likely to be re-occupied by northern spotted owls, resist displacement by barred owls and contribute to species recovery.

BLM managers would avoid actions that—

- Occur in the nest patch of a site. Habitat modification in the nest patch will negatively affect re-occupancy of the site by northern spotted owls until habitat conditions recover.
- Cause the loss of nesting-roosting-foraging habitat in the 500-acre core use area surrounding a site. Sites with core use areas supporting less than 50 percent nesting-roosting-foraging habitat, when all land ownerships are considered, are less likely to be re-occupied by northern spotted owls until habitat conditions recover.
- Cause the amount of nesting-roosting-foraging habitat in the median provincial home range area surrounding a site to decline below 50 percent, when all land ownerships are considered.

Best Management Practices

Best Management Practices (BMPs) are practices that have been determined to be the most effective and practicable in preventing or reducing the amount of pollution generated by diffuse sources to a level compatible with water quality goals (40 CFR 130.2 [m]). **Appendix J** – Best Management Practices lists these practices and provides a detailed discussion of the role and application of BMPs. Project-level planning and analysis will identify the appropriate and applicable BMPs needed to achieve management objectives.

Watershed-Scale Information for Implementation Actions

The BLM will compile watershed-scale information on aquatic and riparian resources, including identifying resource conditions, watershed processes, risks to resources, and restoration opportunities, as needed for planning and analysis of implementation actions under the approved RMP. The BLM will compile watershed-scale information with the purpose of developing and documenting a scientifically-based understanding of the ecological structures, functions, processes, and interactions occurring within a watershed. The number and detail of the aspects considered will depend on the issues pertaining to a given watershed and the scope of proposed implementation actions.

This compilation of watershed-scale information does not constitute a separate or additional analysis beyond what the BLM would provide for NEPA or Endangered Species Act compliance for implementation actions. The BLM will focus on collecting and compiling information within the

watershed that is essential for making sound management decisions. This watershed-scale information will be relevant to analyzing the effects of implementation actions, determining monitoring and restoration needs for a watershed, and developing priorities for funding and implementing actions.

The BLM will use such watershed-scale information, where appropriate, to facilitate NEPA and Endangered Species Act compliance for specific projects. For example, such watershed-scale information will typically be relevant in the preparation of biological assessments for consultation with the National Marine Fisheries Service and U.S. Fish and Wildlife Service under Section 7(a)(2) of the ESA on the effects of implementation actions that may affect ESA-listed fish species or their critical habitat.

Watershed Restoration

Watershed restoration will be an integral part of a program to contribute to the conservation and recovery of ESA-listed fish and protect water quality. Important components of a watershed restoration program include control and prevention of road-related runoff and sediment production, restoration of access to stream channels, restoration of instream habitat complexity, and restoration of the condition of riparian vegetation.

Watershed restoration will include road treatments, such as obliteration, decommissioning, closure, or upgrading. Upgrading may involve practices such as removing soil from locations where there is a high potential of triggering landslides, modifying road drainage systems to reduce the extent to which the road functions as an extension of the stream network, and reconstructing stream crossings to reduce the risk and consequences of road failures or wash outs.

Watershed restoration will include maintaining and restoring access to stream channels for all life stages of aquatic species. Specific actions will include replacing stream crossings that currently or potentially block or hinder fish passage with crossings that allow aquatic species to pass at each life stage and at a range of flows.

Watershed restoration will include instream restoration to create desired levels of channel complexity and improve fish habitat. Specific actions may include log and boulder placement in stream channels, tree tipping, and gravel enhancement to create spawning, rearing, and holding habitat for fish.

Watershed restoration will include silvicultural treatments of riparian forest stands, as needed to ensure that stands are able to provide trees that would function as stable wood in the stream, to increase diversity of riparian species, and develop structurally-complex stands. Watershed restoration will also include fuels reduction treatments in riparian forest stands, as needed to reduce the risk of stand-replacing, crown fires.

The BLM will evaluate restoration opportunities based on watershed-scale information on aquatic and riparian resources, considering ecological processes and limiting factors. The BLM will use the BLM Western Oregon Aquatic Restoration Strategy in determining priorities for watershed restoration. The BLM Western Oregon Aquatic Restoration Strategy presents a restoration strategy that uses a combination of habitat based intrinsic potential modeling and professional field knowledge to focus restoration efforts in areas deemed likely to have the highest production potential for fish species of interest and is incorporated here by reference (BLM 2015b). The BLM may update the Western Oregon Aquatic Restoration Strategy periodically, and the BLM will continue to use the updated strategy to guide watershed restoration priorities.

Funding

Implementation of actions in conformance with the approved RMP will be subject to sufficient funding and staffing to complete the necessary analysis and compliance steps and to carry out the actions. The RMP sets management objectives and the Proposed RMP/Final EIS analyzes effects based on assumptions about implementation of future actions. If the BLM does not implement future actions as anticipated in the Proposed RMP/Final EIS, the BLM will consider through plan evaluation whether the plan objectives are being met or are likely to be met, as discussed below.

Timber Production Capability Classification

The Timber Production Capability Classification is a process of partitioning forestland within the sustained yield unit into major classes based on the biological and physical capability of the site to support and produce forest products on a sustained yield basis using operational management practices. Through the Timber Production Capability Classification, the BLM identifies some sites as unsuitable for sustained-yield timber production because of their biological and physical capabilities. Over time, the BLM will add additional areas to those areas reserved through updates to the Timber Production Capability Classification system, when examinations indicate that an area meets the criteria for reservation. The BLM will also delete areas from those areas reserved and return the area to the Harvest Land Base through updates to the Timber Production Capability Classification system, when examinations indicate that an area does not meet the criteria for reservation. The BLM will implement these additions and deletions to the Timber Production Capability Classification through plan maintenance, as discussed below, because such changes will represent minor changes based on further refining the decision in the RMP.

Management of Newly Acquired Lands

Lands may come under BLM administration after approval of the RMPs through exchange, donation, purchase, revocation of withdrawals to other Federal agencies, or relinquishment of Recreation and Public Purpose leases. Discretionary acquisitions (such as exchanges) would be guided by the acquisition criteria described in **Appendix K** – Lands and Realty.

The BLM would manage newly acquired or administered lands or interests in lands for the purpose for which they were acquired or in a manner that is consistent with management objectives for adjacent BLM-administered lands or other BLM-administered lands having similar resource values. For example, the BLM would typically manage acquired lands consistent with the land use allocations, management objectives, and management direction of comparable or adjacent BLM-administered lands. Newly acquired lands, regardless of status, would be subject to non-discretionary access rights provided for under the terms and conditions of most reciprocal right-of-way agreements and permits.

In accordance with Section 205 (e) of the FLPMA (Pub. L. 99-632), lands acquired by the BLM in exchange for O&C or Coos Bay Wagon Road (CBWR) lands would have the same status and be administered in accordance with the same provisions of law applicable to those lands disposed of; and those newly acquired lands would be designated as O&C or CBWR lands, as appropriate, and managed under the sustained yield principles as prescribed in the Act of August 28, 1937 and other laws applicable to the O&C or CBWR lands. Additionally, lands acquired using proceeds generated from the disposal of O&C or CBWR lands under the authority of the Federal Land Transaction Facilitation Act (Pub. L. 106-248) would also take on the same status as the lands from which the funds were generated (O&C or CBWR) and would likewise be managed in accordance with the Act of August 28, 1937 and other applicable laws.

Lands acquired by the BLM that take on the status of either O&C or CBWR lands would require classification in accordance with the Act of June 9, 1916, as to power-site, timberlands, or agricultural lands. Lands classified as timberland or agriculture would be open to exploration, location, entry, and disposition under the general mining laws in accordance with the Act of April 8, 1948. Lands acquired by the BLM under Section 205 or 206 of the FLPMA take on the status of 'acquired lands,' and therefore would not be available for location, lease, or sale until the BLM formally opened the lands to such entry.

Land acquisitions resulting in net adjustments in the Harvest Land Base may be made without adjusting the declaration of the annual productive capacity for sustained-yield timber production or amending the RMP, unless the cumulative effects of all changes to the Harvest Land Base indicate that the decadal amount of sustained-yield timber production would be modified by more than 10 percent of the declared annual productive capacity for sustained-yield timber production.

Management of Future Proposed Special Areas

After approval of the RMPs, the BLM could receive recommendations, nominations, or identification of new special areas, such as Areas of Critical Environmental Concern or Wild and Scenic Rivers, requiring study or evaluation for special management. The BLM would conduct reviews and evaluations of these newly proposed or identified areas under the guidance of the national programs and BLM policies applicable to their management. Where the BLM determines that values are present, the BLM would provide management to protect the values while awaiting further evaluations or designations to the extent possible under existing legal authorities. The BLM would consider the protection of any identified values through due consideration in site-specific NEPA analysis and decisions in conformance with the applicable and current agency policies, BLM manuals, and law.

Valid Existing Rights

Other Federal, State, or local government agencies, Tribes, private individuals, or companies may hold valid existing rights within the decision area. Considering the intermingled nature of the BLM-administered lands in the planning area, the BLM has granted many rights-of-way, leases, permits, and other established legal rights within the decision area over the years. Valid existing rights may pertain to timber sale contracts, mining claims, mineral or energy leases, leases, easements, permits, rights-of-way, and water rights. Perhaps the most extensive and unique rights are the reciprocal rights-of-way agreements with dozens of adjacent landowners established to provide for the logical, effective, and efficient development of access on the intermingled lands.

The decisions in the RMPs will not alter or extinguish valid existing rights on BLM-administered lands. Valid existing rights take precedence over the decisions in the RMPs. Authorization for implementing an action that would affect these valid existing rights may be subject to approval by the holders of valid existing rights and may not be discretionary to BLM.

Adaptive Management

In some instances, management direction in the Proposed RMP provides for a range of activities or resource uses. In these cases, levels of activities or resource uses would vary within the range prescribed by the management direction, without the need for additional planning steps such as plan amendment. The BLM would adapt the level of activities within the range given by management direction, depending on variation in resource needs or organizational capability.

In addition to the constraints or latitude provided by management direction, the ability to adapt or change management without the use of planning steps or NEPA analyses would be restricted by how much of a departure would be from analytical assumptions in the Proposed RMP/Final EIS. This is because the BLM derived conclusions regarding environmental consequences from analytical assumptions. Analytical assumptions include such things as levels or methods of activities, number of acres treated, and miles of roads maintained.

If the need for adaptive management changes would so alter the implementation of the RMP that the environmental consequences would be substantially different than those anticipated in the Proposed RMP/Final EIS, then the BLM would engage in additional planning steps and NEPA procedures. The BLM would make the determination as to when additional planning steps and NEPA procedures would be required through the plan evaluation process, as discussed below.

The BLM may also apply adaptive management by acting on information found through the monitoring questions (**Appendix V**). Adaptive management associated with monitoring could include corrective actions precipitated by findings of non-compliance. Corrective action precipitated by monitoring could range from simple changes in administrative procedures, refinements of the plan through plan maintenance, or more substantive changes through plan amendment or revision, as discussed below.

Plan Evaluation

Evaluation is the process of reviewing the RMPs to determine whether the BLM is implementing the plan decisions as expected and the associated NEPA analyses are still valid. The BLM will conduct plan evaluations at five-year intervals. In addition to the monitoring results (**Appendix V**), the BLM will examine many of the underlying assumptions regarding levels of activities and anticipated environmental consequences at the time of the five-year plan evaluation to determine if the plan objectives are being met or are likely to be met. The evaluation will also assess whether changed circumstances or new information have created a situation in which the expected impacts or environmental consequences of the plan are significantly different from those anticipated in the Proposed RMP/Final EIS. Through the plan evaluation, the BLM will make a finding of whether or not a plan amendment or plan revision is warranted.

The BLM could conduct unscheduled plan evaluations to address certain unanticipated events or new information that would call into question the underlying analysis and decisions of the plan.

Changes to the Approved RMPs

Subsequent to approval of the RMPs, the BLM can make changes to the RMPs through plan maintenance, amendment, or revision, consistent with 43 CFR 1610.5. The appropriate mechanism for making changes to the RMPs depends on the scope of the changes.

The approved RMPs may contain data, typographical, mapping, or tabular errors not apparent at the time of approval. Many of the decisions in the approved RMPs, such as mapping of land use allocations, are based on the BLM data available at the time of RMP approval. As noted above, the map of land use allocations accompanying the approved RMPs represents the decision on the mapped allocations. Given the extent and detail of the data on resource conditions that the BLM used to determine the location of the land use allocations, it is inevitable that there are some errors in that underlying data that, if corrected prior to approval of the RMPs, would have resulted in a change in mapped land use allocations. Regardless of any such errors in underlying data, the map of land use allocations accompanying the approved RMPs represents the decision on those allocations, and changes to those allocations would

require changes to the approved RMPs. That is, changes to the data that the BLM used to determine the location of a mapped land use allocation in the approved RMPs would not automatically result in changes to the location of the mapped land use allocation.

For example, the BLM used existing, district-specific information on structurally-complex forests in part to determine the location of the Late-Successional Reserve. Future identification of patches of structurally-complex forest not included in the Late-Successional Reserve, in and of itself, would not alter the land use allocation. If the BLM identifies substantial areas of errors in the underlying data used to determine land use allocation locations, such that the environmental consequences would be substantially different than those anticipated in the Proposed RMP/Final EIS, then the BLM would engage in additional planning steps and NEPA procedures to make changes to land use allocations.

For some land use allocation decisions, such as the location of the Riparian Reserve, the decision requires identification of features on the ground (e.g., a perennial stream) and the allocation of a corresponding width of Riparian Reserve. The BLM would make this identification of features and allocation of a corresponding width of Riparian Reserve as needed, generally through project implementation. The future identification of features and the allocation of a corresponding width of Riparian Reserve would represent implementation of the approved RMP and would not constitute a change to the approved RMP.

The decision also requires the future allocation of some marbled murrelet occupied stands and red tree vole "habitat areas" to the Late-Successional Reserve, as described earlier in this section. The future identification of marbled murrelet occupied stands and red tree vole "habitat areas" and allocation to the Late-Successional Reserve would represent implementation of the approved RMP and would not constitute a change to the approved RMP.

Plan Maintenance

The BLM may maintain RMP decisions as necessary to reflect minor changes in data, consistent with 43 CFR 1610.5-4. Plan maintenance is limited to further refining, documenting, or clarifying a previously approved decision. Plan maintenance would not expand the scope of resource uses or restrictions or change the terms, conditions, and decisions of the approved plan. The BLM may use plan maintenance to adjust the declaration of the annual productive capacity for sustained-yield timber production based on minor changes, such as updated operations inventory data. Plan maintenance does not require formal public involvement, interagency coordination, or the NEPA analysis required for making new RMP decisions.

Plan Amendments and Revisions

New information, updated analyses, or new resource use or protection proposals may require amending or revising RMPs.

Plan amendments change one or more of the terms, conditions, or decisions of an approved RMP. Plan amendments are most often prompted by the need to—

- Consider a proposal or action that does not conform to the plan;
- Implement new or revised policy that changes RMP decisions;
- Respond to new, intensified, or changed uses on public land in the decision area; and
- Consider significant new information from resource assessments, plan evaluations, monitoring, or scientific studies relevant to the effects of the RMP.

Plan amendments would be accompanied by either an environmental assessment or EIS, depending on the scope and environmental effects of the amendment.

Plan revisions involve preparation of a new plan to replace an existing one. An RMP revision would be necessary if monitoring and evaluation findings, new data, new or revised policy, or changes in circumstances indicate that decisions for an entire plan or a major portion of the plan would no longer serve as a useful guide for resource management. Plan revisions would be accompanied by an EIS.

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