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Boise National Forest
Idaho City Ranger District
Boise County, Idaho

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Appendix K—Response to Comments

List of Acronyms

ACS	Aquatic Conservation Strategy
AOP	Aquatic Organism Passage
APE	area of potential effect
ASD	aquatics survey database
ASQ	Allowable Sale Quantity
ATV	All-Terrain Vehicle
BA	Biological Assessment
BE	Biological Evaluation
BMP	Best Management Practices
BURP	Beneficial Use Reconnaissance Program
CAA	Clean Air Act
CBH	Canopy base height
CCC	Civilian Conservation Corps
CEQ	Council on Environmental Quality
CME	Certified Mineral Examiner
CSE	Common Stand Examination
CWA	Clean Water Act
CWD	Coarse Woody Debris
CWMA	Cooperative Weed Management Area
dbh	Diameter at Breast Height
DC	Desired Condition
DD	Detrimental Disturbance
DEIS	Draft Environmental Impact Statement
DFB	Douglas-fir beetle
DMR	Dwarf Mistletoe Rating
EA	Environmental Assessment
EC	Existing Condition
ECA	Equivalent Clearcut Area
eDNA	environmental DNA
EIS	Environmental Impact Statement
EO	Executive Order
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FA	Functioning Acceptably
FEIS	Final Environmental Impact Statement
FFE	Fire and Fuels Extension
FVS-FFE	Forest Vegetation Simulator to the Fire and Fuels Extension
Forest Plan	Boise National Forest Land and Resource Management Plan

Forest	Boise National Forest
FR	Functioning at Risk
FMO	foraging, migration, and overwintering
FSH	Forest Service Handbook
FSM	Forest Service Manual
FSVeg	Field Sampled Vegetation
FVS	Forest Service Vegetation Simulator
ft^2	Square Feet
ft^2/acre	Square feet per acre
FUR	Functioning at Unacceptable Risk
GIS	Geographic Information System
GMU	Game Management Unit
GRAIP	Geomorphic Road Analysis and Inventory Package
HRV	Historic Range of Variability
HUC	Hydrologic Unit Code
Idaho CWCS	Idaho Comprehensive Wildlife Conservation Strategy
IDEQ	Idaho Department of Environmental Quality
IDPR	Idaho Department of Parks and Recreation
IDT	Interdisciplinary Team
IFPA	Idaho Forest Practices Act
IRA	Inventoried Roadless Area
LAU	Lynx Analysis Unit
LWD	Large Woody Debris
MA	Management Area
MBTA	Migratory Bird Treaty Act
mi/mi^2	Miles per square mile
MIS	Management Indicator Species
ML	Maintenance Level
MM	Maximum Modification
MMBF	Million Board Feet
MOU	Memorandum of Understanding
MPB	Mountain pine beetle
MPC	Management Prescription Category
MRS	Minimum Road System
MT	Mixed Treatment
MT/ID	Montana/Idaho
MVUM	Motor Vehicle Use Map
MWMT	maximum weekly maximum temperatures
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NFMA	National Forest Management Act
NFS	National Forest System
NHPA	National Historic Preservation Act
NOA	Notice of Availability
NOI	Notice of Intent

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Chapter 3 continued from Volume 1

3.6 TRANSPORTATION SYSTEM

The following changes were made between the DEIS and FEIS:

General edits were completed to improve clarity and readability of the section.

3.6.1 Analysis Scale, Data Sources, and Methodology

A Transportation Analysis Process (TAP) report was completed for the project area in 2014 to recommend roads likely and unlikely needed for Forest management and travel access management (USDA Forest Service 2014b). The transportation specialist used the TAP recommendations, the environmental and Forest management reasons identified for these recommendations, input from the IDT, and comments received during scoping to identify the Minimum Road System (MRS) and to compare the alternatives.

The analysis area for direct, indirect, and cumulative effects to the transportation system is the 19,371-acre project area.

3.6.2 Analysis Indicators

Effects to the transportation system were measured using the following analysis indicators:

- Changes to the transportation system, including miles of road construction, reconstruction, realignment, decommissioning, conversion of unneeded roads to trails, and reduction in annual road maintenance costs associated with progressing toward the MRS
- Changes to miles of unauthorized road within the project area
- Temporary road construction to support forest product removal operations
- Miles of authorized trails co-located on closed NFS roads

3.6.3 Transportation System

3.6.3.1 Affected Environment

The environmental assessment (EA) for the Idaho City Ranger District Motorized Wheeled Vehicle Travel Management Plan was completed in 2009 to implement the Forest Service's 2007 Travel Management Rule (36 CFR 261.13), which required the designation of routes for motorized vehicle use. Motorized travel is only permitted along these designated routes and off-road within 300 feet to access dispersed campsites, where indicated on the MVUM.

Within the project area, 51.7 miles of NFS roads are currently open to all vehicles, yearlong. Another 26.9 miles of NFS roads are designated as seasonally open from June 16 through September 14. All routes open for public motorized use are identified on the Idaho City Ranger District MVUM and displayed on Map 2 in Appendix J.

The existing transportation system in the project area has 3 operational MLs: ML 1, ML 2, and ML 3 (Table 3-86). ML 1 is assigned to intermittent service roads during the time they are closed to vehicular traffic. Basic custodial maintenance is performed as needed to keep

damage to adjacent resources to an acceptable level and to perpetuate the road to facilitate future management activities. ML 2 is assigned to roads open for public or permitted use by high-clearance vehicles. Passenger car traffic is not a consideration on ML 2 roads. The ML 3 category is assigned to roads that are open and maintained for travel by a prudent driver in a standard passenger car; however, user comfort and convenience are not considered priorities. Map 1 in Appendix J displays the existing NFS roads within the project area.

Table 3-86. Existing National Forest System road miles by Maintenance Level (ML) within the project area

Maintenance Level	Miles
ML 1	73.7
ML 2	72.5
ML 3	6.1
Total Miles	152.3

Annual road maintenance activities such as surface blading, culvert and ditch cleaning, and roadside brushing occur on NFS roads within the project area. Primary routes, including NFS roads 312, 362, and 384, receive annual maintenance, while other routes receive maintenance when funding is available or when critical work must be completed.

The IDPR grooms approximately 29.2 miles of ski trail on existing roads/routes as part of the Park N' Ski trails system. During the winter, snowmobile trail grooming within the project area is performed by Boise County on about 10 miles of NFS roads 351 and 384.

Approximately 8.4 miles of State Highway 21 lie within the project area, under the jurisdiction of the Idaho Department of Transportation. Idaho Department of Transportation maintenance crews perform recurring tasks such as snow plowing, pavement repair, sign maintenance, ditch cleaning, waste disposal of cutbank slough material removed from drainage ditch lines, and other drainage improvements.

3.6.3.2 Environmental Effects

Direct and Indirect Effects

The existing transportation system within the project area was developed over time to provide access routes for Forest management activities. The Becker TAP analyzed the road system with respect to risks and benefits in order to recommend changes that would achieve the MRS. Recommendations suggested reducing the number of open system road miles to address undesirable effects to big game habitat, water quality, and other resources. In addition, the TAP recommended opportunities to convert unneeded roads to other uses, such as trails, to enhance the recreational experience.

The proposed changes to the transportation system listed within the action alternatives below are based on recommendations from the TAP and from public comments received during scoping. See Figure 3-88 below for the locations of roads recommended by the Becker TAP as likely or unlikely needed for future Forest management.

The analysis area for direct and indirect effects to the transportation system is the 19,371-acre project area.

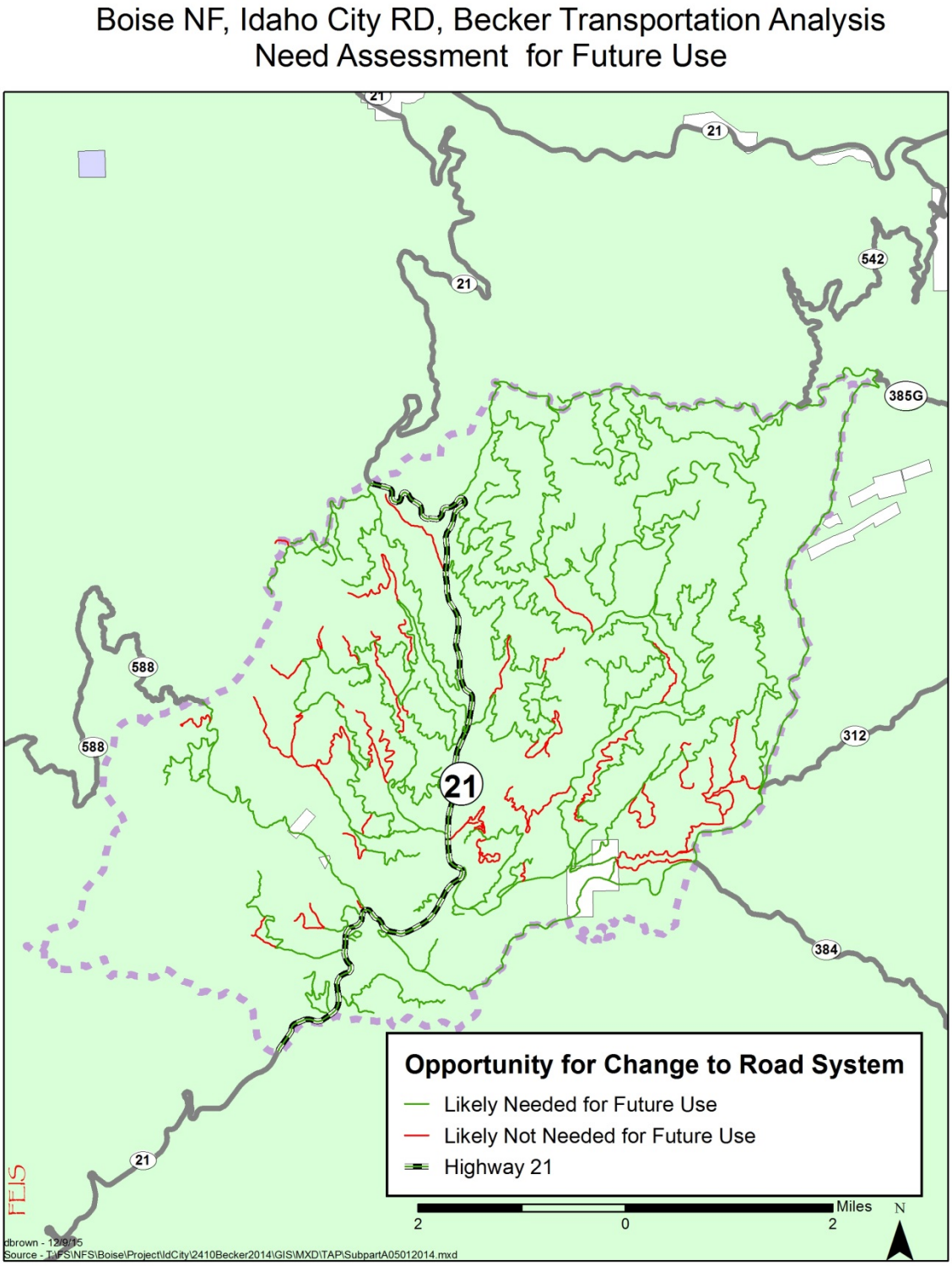

Figure 3-88. Needs assessment for the National Forest System roads from the Becker Transportation Analysis Process

Alternative A

This alternative does not propose any changes to the existing transportation system within the project area; therefore, it would not progress toward the recommended MRS by implementing recommendations from the Becker TAP, nor would this alternative reduce road mileage open to public motorized use as recommended by the TAP to reduce the negative effects to big game habitat, water quality, and other resources. Because this alternative does not propose decommissioning any roads, Alternative A would not meet Purpose 2, which states the need to improve watershed conditions by reducing motorized route-related impacts to water resources, fish, soil, and wildlife (and associated habitats) while providing for a safe and efficient transportation system to meet long-term management needs. This alternative would not reduce annual road maintenance costs; maintenance costs would remain at $133,776, annually. Because NFS road 393 would not be relocated under this alternative, road miles within the RCA would not be reduced. Finally, no miles of NFS roads would be decommissioned or converted to trail under this alternative. Thus, environmental effects from undesirable road locations in RCAs and unauthorized motorized use would not be reduced and recreational opportunities would not be enhanced.

All Action Alternatives

All of the action alternatives would reduce the total miles of NFS roads in the project area as a way to achieve the MRS; reduce the number of miles of NFS roads open to all motorized vehicles in order to decrease road-related impacts to big game habitat, sediment delivery to streams, and the spread of noxious weeds; and decrease the annual road maintenance costs. The sections below describe the differences between the action alternatives.

New construction of 1.2 miles of NFS roads (Table 3-87) would occur under all action alternatives to facilitate the relocation of NFS road 393 to ultimately reduce road miles within the RCA along China Fork Creek. With the relocation, 1.1 miles of NFS road 393 would be decommissioned, 0.9 miles of which is located in the RCA directly adjacent to China Fork Creek (Table 3-87). The decommissioning would occur only after the relocation had been completed, reducing the mileage within the RCA by 0.3 miles while still providing needed connectivity for the transportation system.

Table 3-87. Relocation of National Forest System (NFS) road 393, new road construction, and decommissioning actions common to all action alternatives

Road Segment	Length (miles)	General Location/Description
New construction 1	0.6	Connects NFS road 393 to NFS road 393C
New construction 2	0.6	Connects NFS road 393B to NFS road 393I
NFS road 393	1.1	Decommissions 1.1 miles of NFS road 393 along China Fork Creek, which includes 0.9 miles in the Riparian Conservation Area

All action alternatives would include reconstructing approximately 1.8 miles of closed ML 1 road to ML 2 road to facilitate the relocation of NFS road 393 (Table 3-88). The action alternatives would change the designation of these roads from “closed to all motorized use” to “open to all motorized use, yearlong.” The reconstruction work would include removing earthen barriers and waterbars, removing vegetation, reshaping the road surface, installing

culverts where necessary, and constructing drivable dips. These road segments have been kept in storage and closed to all motorized use for years.

Table 3-88. Relocation of National Forest System (NFS) road 393 and reconstruction of Maintenance Level (ML) 1 roads under all action alternatives

Road	Length (miles)
NFS road 393B	0.3
NFS road 393C	1.0
NFS road 393I	0.5
Total	1.8

Movement toward the Minimum Road System

All action alternatives implement recommendations from the Becker TAP to reduce the 152.3 miles of NFS roads within the project area. Reductions range from 24.2 miles under Alternatives B, C, and D, to 27.1 miles under Alternatives E and F, or from 15% to 18% (Table 3-89 through Table 3-93). Alternatives E and F reduce road mileage by about 3 miles more than do Alternatives B, C, and D. This reduction assumes that roads not used for helicopter logging in Alternatives E and F would not be needed in the future, as the same area could be feasibly helicopter logged again.

Implementing the MRS would be achieved by all action alternatives, which is an important project component with respect to attaining restoration objectives. The Becker TAP identified roads likely and unlikely needed for future use to meet long-term management needs and was used to inform this project analysis. Purpose 2 states the need to improve watershed conditions by reducing motorized route-related impacts to water resources, fish, soil, and wildlife (and associated habitats) while providing for a safe and efficient transportation system to meet long-term management needs. Reducing the total miles of NFS roads within the project area addresses the need to improve watershed conditions (sections 3.5, 3.8, 3.9, and 3.10) while also considering long-term needs for the transportation system to remain viable into the future.

Table 3-89. Alternative B—Change in National Forest System road miles by operational maintenance level (ML)

Operational Maintenance Level	Alternative A	Alternative B	Change
ML 1—Closed to all motorized use	73.7	53.4	–20.3
ML 2—High-clearance vehicles	72.5	43.8	–28.7
ML 2 Administrative—Closed to public motorized use	0	24.8	+24.8
ML 3—Suitable for passenger cars	6.1	6.1	0
Totals	152.3	128.1	–24.2

Table 3-90. Alternative C—Change in National Forest System road miles by operational maintenance level (ML)

Operational Maintenance Level	Alternative A	Alternative C	Change
ML 1—Closed to all motorized use	73.7	53.4	–20.3
ML 2—High-clearance vehicles	72.5	48.3	–24.2
ML 2 Administrative—Closed to public motorized use	0	20.3	+20.3
ML 3—Suitable for passenger cars	6.1	6.1	0
Totals	152.3	128.1	–24.2

Table 3-91. Alternative D—Change in National Forest System road miles by operational maintenance level (ML)

Operational Maintenance Level	Alternative A	Alternative D	Change
ML 1—Closed to all motorized use	73.7	53.4	–20.3
ML 2—High-clearance vehicles	72.5	48.3	–24.2
ML 2 Administrative—Closed to public motorized use	0	20.3	+20.3
ML 3—Suitable for passenger cars	6.1	6.1	0
Totals	152.3	128.1	–24.2

Table 3-92. Alternative E—Change in National Forest System road miles by operational maintenance level (ML)

Operational Maintenance Level	Alternative A	Alternative E	Change
ML 1—Closed to all motorized use	73.7	50.5	–23.2
ML 2—High-clearance vehicles	72.5	43.8	–28.7
ML 2 Administrative—Closed to public motorized use	0	24.8	+24.8
ML 3—Suitable for passenger cars	6.1	6.1	0
Totals	152.3	125.2	–27.1

Table 3-93. Alternative F—Change in National Forest System road miles by operational maintenance level (ML)

Operational Maintenance Level	Alternative A	Alternative F	Change
ML 1—Closed to all motorized use	73.7	50.5	–23.2
ML 2—High-clearance vehicles	72.5	48.3	–24.2
ML 2 Administrative—Closed to public motorized use	0	20.3	+20.3
ML 3—Suitable for passenger cars	6.1	6.1	0
Totals	152.3	125.2	–27.1

Changes in Public Motorized Access

The Becker TAP recommended reducing road miles open to public motorized use to reduce the negative effects to big game habitat, water quality, and other resources. Reducing the miles of road available for public motorized use is a tradeoff between the needs of the natural resources present and the public's desire for access. The reductions proposed were identified through a risk–benefit analysis where public motorized access was considered. Access to developed facilities (e.g., trailheads and campgrounds) and major arterial routes received a

high benefit rating. Public access for general activities (e.g., wood gathering, hunting, dispersed camping, and driving for pleasure) received a low benefit rating; however, those general use activities are still important and would continue to exist within the project area.

Currently, 78.6 miles of NFS roads are open to public motorized use. NFS roads open to public motorized use by highway-legal vehicles would be reduced by 24.2 miles under Alternatives C, D, and F and by 28.7 miles under Alternatives B and E, or from 31% to 36%, respectively (Table 3-94 through Table 3-98). Alternatives B and E would reduce open road mileage by about 4.5 miles more than Alternatives C, D, and F, because Alternatives B and E address big game disturbance concerns by prohibiting public motorized access yearlong on NFS roads 394B and 362F, which currently allow seasonal access to the Skyline Yurt through the summer use period and yearlong access to the Stargaze Yurt.

Alternatives C and F address concerns voiced by the IDPR about the yearlong access restriction in the proposed action (Alternative B) as scoped (section 2.4). These 2 alternatives propose implementing a seasonal restriction on those roads instead of closing them yearlong. The period of open public motorized access would be from June 16 through September14, to allow use through the summer months.

Alternative D would remove the seasonal use restriction on NFS road 362F and maintain the current yearlong public access on NFS road 394B (section 2.4). This alternative fully addresses the concern expressed by the IDPR that restrictions on motorized access to the yurts would reduce public demand for those yurts because hauling water, bedding, and food over 2 miles from the trailheads would be difficult. This decrease in demand would be especially true for families with small children or those individuals with limited mobility who would like to be able to enjoy a memorable stay at those yurts. The 4 other yurts in the system—Banner Ridge, Whispering Pines, Elkhorn, and Rocky Ridge—have public access routes that are acceptable to IDPR and would not be altered under any of the alternatives.

Table 3-94. Alternative B—Change in miles of public motorized use on National Forest System roads

Public Motorized Use	Alternative A	Alternative B	Change
Open yearlong to all motorized use	51.7	40.0	–11.7
Open seasonally to all motorized use	26.9	9.9	–17.0
Closed yearlong to public motorized use	73.7	78.2	+4.5
Totals	152.3	128.1	—

Table 3-95. Alternative C—Change in miles of public motorized use on National Forest System roads

Public Motorized Use	Alternative A	Alternative C	Change
Open yearlong to all motorized use	51.7	40.0	–11.7
Open seasonally to all motorized use	26.9	14.4	–12.5
Closed yearlong to public motorized use	73.7	73.7	0
Totals	152.3	128.1	—

Table 3-96. Alternative D—Change in miles of public motorized use on National Forest System roads

Public Motorized Use	Alternative A	Alternative D	Change
Open yearlong to all motorized use	51.7	44.5	–7.2
Open seasonally to all motorized use	26.9	9.9	–17.0
Closed yearlong to public motorized use	73.7	73.7	0
Totals	152.3	128.1	—

Table 3-97. Alternative E—Change in miles of public motorized use on National Forest System roads

Public Motorized Use	Alternative A	Alternative E	Change
Open yearlong to all motorized use	51.7	40.0	–11.7
Open seasonally to all motorized use	26.9	9.9	–17.0
Closed yearlong to public motorized use	73.7	75.3	+1.6
Totals	152.3	125.2	—

Table 3-98. Alternative F—Change in miles of public motorized use on National Forest System roads

Public Motorized Use	Alternative A	Alternative F	Change
Open yearlong to all motorized use	51.7	40.0	–11.7
Open seasonally to all motorized use	26.9	14.4	–12.5
Closed yearlong to public motorized use	73.7	70.8	–2.9
Totals	152.3	125.2	—

Reducing Annual Road Maintenance Costs

The Becker TAP recommended reducing the miles of road open to public motorized use to reduce annual road maintenance costs. A reduction in annual road maintenance costs is needed in light of the reality of less appropriated dollars being available to perform road maintenance on the National Forests. The reduction in costs is not the primary driver for a reduction in the overall road system miles, however, as the largest benefits realized are those related to the protection of natural resources.

Costs would be reduced by $19,780 under Alternatives C and D; $19,668 under Alternative F; $22,705 under Alternative B; and $22,893 under Alternative E (Table 3-99 through Table 3-103). Alternative E shows the largest reduction, while Alternatives C, D, and F are nearly equal and show the least reduction in annual costs; a maximum difference of about $3,100 annually exists between the alternatives.

Table 3-99. Alternative B—Reduction in annual road maintenance costs

Operational Maintenance Level	Current Mileage	Final Mileage	Annual Cost per Mile	Current Annual Maintenance Cost	Final Annual Maintenance Cost	Change in Annual Cost
ML 1	73.7	53.4	$65	$4,791	$3,471	–$1,320
ML 2	72.5	43.8	$1,350	$97,875	$59,130	–$38,745
ML 2 (Administrative Use Only)	0	24.8	$700	$0	$17,360	+$17,360
ML 3	6.1	6.1	$5,100	$31,110	$31,110	$0
	152.3	128.1	—	$133,776	$111,071	–$22,705

Table 3-100. Alternative C—Reduction in annual road maintenance costs

Operational Maintenance Level	Current Mileage	Final Mileage	Annual Cost per Mile	Current Annual Maintenance Cost	Final Annual Maintenance Cost	Change in Annual Cost
ML 1	73.7	53.4	$65	$4,791	$3,471	–$1,320
ML 2	72.5	48.3	$1,350	$97,875	$65,205	–$32,760
ML 2 (Administrative Use Only)	0	20.3	$700	$0	$14,210	+$14,210
ML 3	6.1	6.1	$5,100	$31,110	$31,110	$0
	152.3	128.1	—	$133,776	$113,996	–$19,780

Table 3-101. Alternative D—Reduction in annual road maintenance costs

Operational Maintenance Level	Current Mileage	Final Mileage	Annual Cost per Mile	Current Annual Maintenance Cost	Final Annual Maintenance Cost	Change in Annual Cost
ML 1	73.7	53.4	$65	$4,791	$3,471	–$1,320
ML 2	72.5	48.3	$1,350	$97,875	$65,205	–$32,760
ML 2 (Administrative Use Only)	0	20.3	$700	$0	$14,210	+$14,210
ML 3	6.1	6.1	$5,100	$31,110	$31,110	$0
	152.3	128.1	—	$133,776	$113,996	–$19,780

Table 3-102. Alternative E—Reduction in annual road maintenance costs

Operational Maintenance Level	Current Mileage	Final Mileage	Annual Cost per Mile	Current Annual Maintenance Cost	Final Annual Maintenance Cost	Change in Annual Cost
ML 1	73.7	50.5	$65	$4,791	$3,283	–$1,508
ML 2	72.5	43.8	$1,350	$97,875	$59,130	–$38,745
ML 2 (Administrative Use Only)	0	24.8	$700	$0	$17,360	+$17,360
ML 3	6.1	6.1	$5,100	$31,110	$31,110	$0
	152.3	125.2	—	$133,776	$110,883	–$22,893

Table 3-103. Alternative F—Reduction in annual road maintenance costs

Operational Maintenance Level	Current Mileage	Final Mileage	Annual Cost per Mile	Current Annual Maintenance Cost	Final Annual Maintenance Cost	Change in Annual Cost
ML 1	73.7	50.5	$65	$4,791	$3,283	–$1,508
ML 2	72.5	48.3	$1,350	$97,875	$65,205	–$32,670
ML 2 (Administrative Use Only)	0	20.3	$700	$0	$14,210	+$14,210
ML 3	6.1	6.1	$5,100	$31,110	$31,110	$0
	152.3	125.2	—	$133,776	$113,808	–$19,968

Relocating National Forest System Road 393

Construction of 1.2 miles of NFS road would occur to facilitate the relocation of NFS road 393, in order to reduce road miles within the RCA along China Fork Creek. The newly constructed sections would be designed and constructed as single-lane, outsloped road with turnouts, with slash filter windrows at the toe of fill, and grass seed mix and straw mulch applied to new slopes.

With the relocation, 1.1 miles of NFS road 393 would be decommissioned, 0.9 miles of which is located in the RCA directly adjacent to China Fork Creek. The decommissioning would take place only after the relocation has been completed.

The relocation of NFS road 393 would address Purpose 2, which states the need to improve watershed conditions by reducing motorized route-related impacts to water resources, fish, soil, and wildlife (and associated habitats) while providing for a safe and efficient transportation system to meet long-term management needs.

Decommissioning National Forest System Roads

The decommissioning of unneeded roads is an effective tool to reduce the environmental effects of undesirable road locations in RCAs and unauthorized motorized use. Decommissioning results in reduced sediment delivery to streams, improved wildlife habitat, decreased spread of noxious weeds, and a reduced negative effect on soil productivity. The need to decommission authorized NFS roads under Purpose 2 is addressed by all the action

alternatives, which propose road decommissioning based on recommendations from the Becker TAP.

Miles of NFS road decommissioned would differ slightly: 22.8 miles under Alternatives B, C, and D; 23.6 miles under Alternative F; and 24.8 miles under Alternative E (Table 3-104). Of these miles, 2.6 miles of road to be decommissioned are currently open to motorized use, with 1.5 miles of open road within RCAs.

Alternative E would decommission the greatest number of miles because roads that would be otherwise converted to motorized trail in the other alternatives would be decommissioned in Alternative E, which has no motorized trail proposal.

Table 3-104. Miles of National Forest System road decommissioning for all alternatives

Operational Maintenance Level	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F
ML 1—Roads currently closed	0	20.2	20.2	20.2	22.2	21.0
ML 2—Roads currently open	0	2.6	2.6	2.6	2.6	2.6
Totals	0	22.8	22.8	22.8	24.8	23.6

Converting National Forest System Road to Trail

Converting NFS roads to trails is considered in all TAP assessments as an opportunity to use existing infrastructure to benefit other resources, primarily recreation. Purpose 3 cites the need to modify the transportation system to improve the quality and diversity of the recreational experience in the project area.

Miles of road converted to non-motorized trail would range from 5.1 miles under Alternatives B, C, and D to 8.0 miles under Alternatives E and F. Alternatives E and F would convert the greatest number of miles as an indirect result of helicopter logging (as mentioned above).

Miles of road converted to motorized trail would range from 0.0 miles under Alternative E, to 1.3 miles under Alternative F, to 2.1 miles under Alternatives B, C, and D (Table 3-105). Alternative E would have no motorized trail and Alternative F would have a reduced trail loop length to address motorized noise concerns voiced by IDPR.

Table 3-105. Miles of National Forest System road converted to trail for all alternatives

Trail Type	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F
Non-motorized trail	0	5.1	5.1	5.1	8.0	8.0
Motorized trail open to vehicles ≤50 inches in width	0	2.1	2.1	0	0	0
Motorized trail open to vehicles ≤60 inches in width	0	0	0	2.1	0	1.3
Totals		7.2	7.2	7.2	8.0	9.3

Cumulative Effects

The analysis area for cumulative effects to the transportation system is the 19,371-acre project area.

Alternative A

Past management actions have been considered in describing the existing condition and in disclosing direct and indirect effects. No present or foreseeable future activities would likely have any additional effect on the existing transportation system. As a result, no additional or cumulative effects would be indirectly or directly related to the planned management actions.

All Action Alternatives

Past management actions have been considered in describing the existing condition and in disclosing direct and indirect effects. No present or foreseeable future activities would have any additional effect on the existing transportation system. As a result, no additional or cumulative effects would be indirectly or directly related to the planned management actions.

3.6.4 Unauthorized Roads

3.6.4.1 Affected Environment

Approximately 45 miles of unauthorized roads have been identified within the project area. An unknown number of unauthorized roads undoubtedly exist within the project area but remain unidentified.

3.6.4.2 Environmental Effects

Direct and Indirect Effects

Alternative A

Under this alternative, the identified unauthorized roads would continue to exist on the landscape and the undesirable effects to water quality and other resources would not be mitigated. Unauthorized motorized use by the public would likely continue, as the routes currently being used would not be blocked or obliterated.

All Action Alternatives

Approximately 45 miles of unauthorized roads within the project area have been identified through on-ground surveys conducted in 2006 and from aerial photography. Of these unauthorized routes, 6.5 miles are part of the non-motorized trail system associated with the IDPR Park N' Ski program; 7.5 miles are overgrown with brush and trees and are in a stable condition; 0.6 miles near the Whoop-Um Up Equestrian Campground are used by the snowmobile groomer; 0.4 miles are coincident with temporary road (Temp 26) and would be obliterated following use under all the action alternatives; and 16.9 miles would be evaluated in the future.

A total of 4.6 miles of unauthorized roads needed for Forest management activities would be added to the NFS road inventory (Table 3-106). Of these, 1.3 miles would be added to provide motorized road access to the IDPR yurts for facilities maintenance, 0.3 miles would

provide access to an existing Idaho Department of Transportation disposal site, and 0.3 miles would provide access to an existing mining claim off NFS road 384. These added road segments would be closed yearlong to public motorized use. To facilitate the relocation of NFS road 393, 0.3 miles of unauthorized road would be added to the transportation system as ML 2 road, open yearlong to all motorized use (Table 3-106).

Three unauthorized roads identified in the Becker TAP as needed for this project and/or future vegetation management projects would be added as ML 1 roads, closed yearlong to all motorized use. Together, these road segments would total 2.4 miles (Table 3-106).

Table 3-106. Unauthorized roads added to the National Forest System in the Becker project area

Unauthorized Road Number	Length (miles)	Maintenance Level (ML)	Reason for Adding to Road System
X025M1	0.3	ML 2A	Provide authorized access to existing Idaho Department of Transportation disposal site
X025M2	0.1	ML 2A	Provide authorized access to Rocky Ridge Yurt
X362F2	0.1	ML 2A	Provide authorized access to Skyline Yurt
X362F3	0.1	ML 2A	Provide authorized access to Skyline Yurt
X384C	0.3	ML 2A	Provide authorized access to existing mining claim
X385	0.2	ML 2A	Provide authorized access to Banner Ridge Yurt
X385B6	0.1	ML 2A	Provide authorized access to Elkhorn Yurt
X393A4	0.2	ML 2A	Provide authorized access to Whispering Pines Yurt
X393A4-1	0.1	ML 2A	Provide authorized access to Whispering Pines Yurt
X393A5	0.3	ML 2A	Provide authorized access to Whispering Pines Yurt
X394B	0.1	ML 2A	Provide authorized access to Stargaze Yurt
X393B2	0.3	ML 2	Part of NFS road 393 relocation
X025Q1	0.6	ML 1	Haul route for this project
X393A1	1.5	ML 1	Haul route for this project
X394A1	0.3	ML 1	Needed for future Forest management
Total	4.6		

Road decommissioning of unnecessary unauthorized roads would occur to reduce negative environmental effects on water, soil, fish, and wildlife. Road decommissioning would include culvert removal and stream channel rehabilitation, roadbed outsloping or partial recontouring, seed and mulch application to the disturbed areas, and full recontouring of the entrance to prevent future motorized use.

Decommissioning of 16 unauthorized road segments (totaling 8.1 miles) would occur under all action alternatives to prevent unauthorized motorized use and reduce negative environmental effects on water, soil, fish, and wildlife (Table 3-107). These routes were identified because of their proximity to streams and current unauthorized motorized use. Road decommissioning would include removing culverts and rehabilitating stream channels, outsloping or partial recontouring of the roadbed, applying grass seed mix and straw mulch to the roadbed and disturbed areas, and fully recontouring access points to prevent future motorized use.

This treatment would be implemented in all action alternatives and addresses Purpose 2, which states the need to decommission authorized roads and unauthorized routes within the project area to reduce sediment to streams, improve wildlife habitat, and decrease noxious weed spread, thereby improving watershed, aquatic, and terrestrial resource conditions.

Of the 8.1 miles of unauthorized routes proposed for decommissioning, 3.5 miles, or 43%, lie within RCAs.

Table 3-107. Decommissioning of unauthorized roads for all action alternatives

Unauthorized Road Number	Length (miles)	General Location
X025N5	0.3	Off National Forest System road 025O1, near Edna Creek
X025P4	0.3	Off north side of State Highway 21, near Beaver Creek Summit
X025P5	0.4	Off north side of State Highway 21, near Beaver Creek Summit
X025P6	0.1	Off north side of State Highway 21, near Beaver Creek Summit
X351C1	0.6	Off National Forest System road 351, north of Edna Creek
X351C2	0.4	Off X351C1, north of Edna Creek
X362-1	0.3	Off XX362, near Little Beaver Creek
X362B	0.8	Off National Forest System road 362, near Little Beaver Creek
X362D1A	1.5	Off east side of State Highway 21, connects to 362D1
X362F	0.4	Off National Forest System road 362F
X362-M	0.4	Off X362-1, near Little Beaver Creek
X393-11	0.3	Off National Forest System road 393, near top of China Fork watershed
X393A3	0.4	Off National Forest System road 393, connects to road 025P
X393B	0.9	Off National Forest System road 393B, near 393B1
X392C1	0.5	Off National Forest System road 394, near Beaver Creek Summit
XX362	0.5	Off National Forest System road 362, near Little Beaver Creek
Total	8.1	

Cumulative Effects

Alternative A

Past management actions have been considered in describing the existing condition and in disclosing direct and indirect effects. No present or foreseeable future activities would have any additional effect on unauthorized roads. As a result, no additional or cumulative effects on unauthorized roads would be indirectly or directly related to the planned management actions.

All Action Alternatives

Past management actions have been considered in describing the existing condition and in disclosing direct and indirect effects. No present or foreseeable future activities would have any additional effect on unauthorized roads. As a result, no additional or cumulative effects on unauthorized roads would be indirectly or directly related to the planned management actions.

3.6.5 Temporary Road Construction

3.6.5.1 Affected Environment

No temporary roads currently exist within the project area, as no active forest product removal activities are occurring within the project area.

3.6.5.2 Environmental Effects

Direct and Indirect Effects

Constructing temporary roads for the removal of forest products from the project area would be accomplished under a timber sale contract. The roads would be constructed to the minimum standard necessary to permit the safe passage of loaded log trucks and associated equipment. Several of the proposed routes are located on unauthorized roads where an existing road template occurs. These temporary roads would need less work than the newly constructed segments to prepare them for use.

Following usage, the roads would be obliterated by recontouring them back to the original ground line, applying grass seed mix and straw mulch, and covering with logging slash to prevent further motorized use. Temporary roads coincident with non-motorized trail locations would be reduced to 24-inch-wide trail tread and then revegetated using grass seed mix and straw mulch.

All temporary roads would be closed to public motorized use during project implementation.

See the maps in Appendix C of the Transportation Specialist Report for a spatial display of action alternatives, which is summarized below.

Alternative A

This alternative does not propose construction of any temporary roads. Therefore, no direct or indirect effects would occur as a result of implementing Alternative A.

All Action Alternatives

Temporary roads would be constructed under all action alternatives to facilitate the removal of forest products without adding road mileage to the transportation system, the associated long-term maintenance costs and resource effects would be the same under all action alternatives. These roads would be constructed to the minimum standard required to accommodate hauling and the associated harvesting equipment. Following use, the temporary roads would be returned to a natural state or a single-track, non-motorized trail where their location is coincident with the IDPR Park N' Ski trail system.

All action alternatives would convert some unneeded NFS road mileage to non-motorized and/or motorized trail. If not converted to trail, these unneeded roads would be decommissioned and no longer part of the NFS road system.

Purpose 4 cites the need to provide wood products from vegetation restoration activities to local and regional economies. All action alternatives would provide wood products concurrent with some temporary road construction.

Alternative E proposes the least amount of temporary road construction (1.5 miles), as a result of the most acres of helicopter logging (Table 3-108). Alternative D proposes the most miles of temporary road construction (6.5 miles), as a result of harvesting the most acres and using solely ground-based logging systems (Table 3-108). Alternative F proposes constructing 4.3 miles of temporary road, and Alternatives B and C propose constructing 5.8 miles (Table 3-108).

Temporary roads are necessary to provide access to achieve restoration objectives and would be returned to a natural state or to a non-motorized trail setting to mitigate long-term environmental effects.

Table 3-108. Miles of temporary road construction by action alternative

Temporary Road Description	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F
New construction	3.2	3.2	3.2	0.9	3.0
On existing roadbed	1.4	1.4	1.8	0.5	1.2
On existing roadbed coincident with trail segment	1.2	1.2	1.5	0.1	0.1
Total	5.8	5.8	6.5	1.5	4.3

Cumulative Effects

Alternative A

Past management actions have been considered in describing the existing condition and in disclosing direct and indirect effects. No present or foreseeable future activities would have any additional effect on temporary roads. As a result, no additional or cumulative effects to temporary roads would be indirectly or directly related to the planned management actions.

All Action Alternatives

Past management actions have been considered in describing the existing condition and in disclosing direct and indirect effects. No present or foreseeable future activities would have any additional effect on temporary roads. As a result, no additional or cumulative effects to temporary roads would be indirectly or directly related to the planned management actions.

3.6.6 Trails Co-located on Closed National Forest System Roads

3.6.6.1 Affected Environment

No authorized or designated trails are currently co-located on closed NFS roads.

3.6.6.2 Environmental Effects

Direct and Indirect Effects

NFS roads closed to public motorized use provide opportunities to authorize trails for non-motorized use and to designate trails for motorized use by nonhighway-legal vehicles. Non-motorized uses include hiking, horseback riding, and mountain biking in the summer months,

and skiing and snowshoeing during the winter months. Motorized uses by nonhighway-legal vehicles include motorcycles, ATVs, and UTVs. This opportunity to enhance the trail system would improve the quality and diversity of the recreational experience.

Roads managed as ML 1 are closed to all motorized use unless they are assigned a special designation permitting use by nonhighway-legal vehicles. ML 2 Administrative Use Only roads are closed to all public motorized use, unless they are assigned a special designation permitting use by nonhighway-legal vehicles. These roads would be available for highway-legal vehicle use for Forest management activities and for IDPR personnel to perform maintenance on the yurts.

Alternative A

This alternative does not propose the authorization or designation of trails on closed NFS roads. Therefore, no direct or indirect effects would occur as a result of implementing Alternative A.

All Action Alternatives

Both non-motorized and motorized trail segments would be co-located on portions of NFS roads that are closed to other motorized use. The roads would still be part of the NFS road system and could be reopened in the future if needed for Forest management activities.

The number of miles of non-motorized trail to be co-located on closed NFS roads would range from 13.0 miles under Alternatives C, D, and F, to 16.4 miles under Alternative B, to 18.3 miles under Alternative E (Table 3-109).

Miles of motorized trails co-located on closed NFS roads would vary by alternative: 0.0 miles under Alternative E; 15.9 miles under Alternative F; 18.0 miles under Alternatives C and D; and 19.1 miles under Alternative B. Alternative E proposes no motorized trails and Alternative F proposes 3 fewer miles than Alternative B because of the reduced trail loop size included under this alternative. These segments would appear on the MVUM as trails, along with the special motorized designation and permitted season of use.

Because recreation is an important aspect of the multi-use concept for the management of National Forests, the co-location of trails along closed NFS roads would accommodate the need for a quality recreational experience and the need to preserve a ground transportation system that facilitates future restoration projects.

Table 3-109. Miles of non-motorized trail co-located on closed National Forest System roads by action alternative

Road Maintenance Level	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F
ML 1 Road	8.7	9.0	9.0	9.0	9.0
ML 2 Administrative	7.7	4.0	4.0	9.3	4.0
Totals	16.4	13.0	13.0	18.3	13.0

Table 3-110. Miles of motorized trail co-located on closed National Forest System roads by action alternative

Road Maintenance Level	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F
ML 1 Road	12.8	11.7	11.7	0.0	10.3
ML 2 Administrative	6.3	6.3	6.3	0.0	5.6
Totals	19.1	18.0	18.0	0.0	15.9

Cumulative Effects

Alternative A

Past management actions have been considered in describing the existing condition and in disclosing direct and indirect effects. No present or foreseeable future activities would have any additional effect on trails co-located on NFS roads. As a result, no additional or cumulative effects on trails co-located on NFS roads would be indirectly or directly related to the planned management actions.

All Action Alternatives

Past management actions have been considered in describing the existing condition and in disclosing direct and indirect effects. No present or foreseeable future activities would have any additional effect on trails co-located on NFS roads. As a result, no additional or cumulative effects on trails co-located on NFS roads would be indirectly or directly related to the planned management actions.

3.7 RECREATION

The following changes were made between the DEIS and FEIS:

General edits were completed to improve clarity and readability of the section.

Name of Stargaze Yurt was corrected.

Discussions of the effects of transportation management actions to the recreation indicators was updated to improve clarity.

3.7.1 Analysis Scale, Data Sources, and Methodology

This section incorporates the recreation technical report (available in the project record), which contains the detailed data, methodologies, conclusions, maps, references, and technical documentation.

3.7.1.1 Analysis Scale

The analysis area for direct, indirect, and cumulative effects to recreation resources is the 19,371-acre project area, because this is the maximum extent to which impacts from proposed activities to recreation resources could be measured.

3.7.1.2 Data Sources

The data used to complete the recreation analysis include Forest and project-level GIS data, National Visitor Use Monitoring (NVUM), the Idaho City Ranger District's MVUM, the Boise National Forest Winter Travel Map, transportation and visual technical reports, and field observations.

3.7.1.3 Analysis Methodology

The methodology used to complete the analysis included evaluating the project GIS data, including dispersed recreation campsites, the Recreation Opportunity Spectrum (ROS), roads, and trails; the MVUM; the transportation and visuals technical reports; and field observations to determine the impacts to the recreation indicators by proposed activities.

3.7.2 Analysis Indicators

The following indicators were used to evaluate the measure of change between the alternatives for recreational resources in the analysis.

3.7.2.1 Indicator: Recreation Experience

This indicator was used to capture the qualitative changes in a recreational user's experience in the project area. The following measures were used for this indicator:

- Recreation opportunities: This measure was used to evaluate changes in dispersed and developed opportunities in the project area as a result of the proposed activities.
- Disturbance and displacement of recreation users: This measure was used to qualitatively evaluate disruption and/or displacement of recreation users in the project area as a result of the proposed activities.
- Scenery: This measure was used to evaluate the change in the scenery, as viewed by recreationists, in the project area along trails, roads, and developed recreation sites as a result of the proposed activities.

3.7.2.2 Indicator: Recreation Access

This indicator is used to evaluate the effects of the alternatives on visitor access due to changes in road designation, restrictions, or closures, depending on seasonal use (summer or winter). The following measures were used for this indicator:

- Miles of road shown on the MVUM for summer use: This measure was used to determine the difference in roads open for public motorized use between the alternatives.
- Miles of motorized trails on the MVUM by vehicle class: This measure was used to determine the miles of trails designated as motorized trails open to public use by alternative.
- Non-motorized trail miles on the NFS trail system: This measure was used to determine the change in miles of authorized NFS non-motorized trails in the project area by alternative.
- Miles of oversnow non-motorized trails: This measure was used to compare the miles of authorized oversnow non-motorized trails between the No Action Alternative and action alternatives.
- Miles of oversnow motorized trails: This measure was used to compare the miles of authorized oversnow motorized trails between the No Action Alternative and action alternatives.
- Acres of winter motorized restrictions: This measure was used to compare acres of winter motorized restriction area by alternative.
- Type of access to IDPR yurts: This measure was used to describe the type of access proposed by each alternative.

3.7.2.3 Indicator: Public Safety

This indicator shows the effects of the proposed alternatives on relevant aspects of public safety within the project area. The following measures were used for this indicator:

- Miles of summer mixed-use: This measure was used to evaluate the miles of routes with mixed use during the summer season. Mixed use routes include routes designated for different types of motorized vehicle access.
- Miles of summer shared-use: This measure was used to evaluate the miles of routes with shared use during the summer season. Shared use routes include routes authorizing motorized and non-motorized uses.
- Miles of winter shared-use: This measure was used to evaluate the miles of routes with shared use during the winter season. Shared use routes include routes authorizing motorized and non-motorized uses.

3.7.2.4 Indicator: Recreation Opportunity Spectrum (ROS) Classification

This indicator was used to evaluate the consistency of activities proposed under each alternative to the current ROS classifications defined in the Forest Plan for MA 7, North Fork of the Boise River (USDA Forest Service 2010a).

3.7.3 Recreation Experience Indicator

3.7.3.1 Affected Environment

The project area is a popular year-round recreation destination for Boise County residents. Additionally, this area is a popular weekend destination for Treasure Valley residents.

Past projects in the project area were considered when developing the existing conditions for the recreation experience indicator. Specific projects considered for this analysis are identified in Table 1 in Appendix B. Past construction of developed recreation facilities (e.g., campgrounds, trailheads, yurts) has formed the types of recreational experiences and opportunities currently available in the project area. Additionally, past and ongoing SUPs and cost-share agreements in the project area have affected the variety of recreational opportunities and experiences. Road and landing construction associated with past vegetation management activities has impacted the amount of motorized access and opportunities for dispersed campsites. Past trail construction in the project area has also contributed to both motorized and non-motorized opportunities. Past activities have altered recreational opportunities and experiences in the project area.

NFS recreation sites in the project area include a rental cabin, 2 campgrounds, and a trailhead (Table 3-111). In addition, 4 Park N' Ski trailheads and 6 yurts are present that are managed by IDPR under agreement with the Forest Service (Table 3-111).

Beaver Creek Cabin is a furnished historic Forest Service guard station that sleeps up to 6 people. Public access in the summer is via NFS road 362A; winter access is weather dependent because the Beaver Creek road is not plowed. Public access in the winter may be by car when the road is snow free or by non-motorized oversnow methods such as cross-country skiing or snowshoeing. Recreation infrastructure at this site includes a historic cabin, a picnic table, a fire pit, and designated parking. The site also has a well, well house, multiple

water spigots, a small campground with picnic tables and fire rings, a septic system, bear proof trash cans, and a vault toilet.

Edna Creek Campground is located just off State Highway 21. This fee campground contains 9 campsites accommodating up to 6 people each. The campground is open annually May through September. Recreation infrastructure includes 9 campsites with a picnic table, lantern hook, and fire pit. The site also has a well and hand pump, a kiosk, designated parking, bear proof trash cans, and 2 vault toilets.

Whoop-Um Up Campground is located just off State Highway 21. This fee campground contains 6 campsites accommodating up to 6 people each. The campground is open annually May through September. Recreation infrastructure includes 6 campsites with a picnic table, lantern hook, and fire pit. The site also has a well and hand pump, a kiosk, designated parking, bear proof trash cans, and a vault toilet.

Crooked River Trailhead is located on NFS road 384 and primarily serves as a trailhead for NFS trail 158. Crooked River is one of the most popular trailheads on the Idaho City Ranger District. Spring, summer, and fall are the most popular seasons of use. In the winter, the site is used by hikers if snow free. Recreation infrastructure at this site includes designated parking and a kiosk.

Beaver Creek Summit Park and Ski Trailhead is located off State Highway 21 and provides access to the Nordic ski and snowshoe trails that access the Stargaze Yurt managed by IDPR. This existing trailhead is not currently an authorized NFS trailhead but is managed under agreement with IDPR in the winter. Summer use of the site is limited because no summer trails connect the trailhead to the non-motorized trail system, and NFS road 393B to the Stargaze Yurt is open to motorized use in the summer. An Idaho Park N' Ski Permit is required between November 15 and April 30. Recreation infrastructure at this site includes a kiosk.

Banner Ridge Park and Ski Trailhead is located on State Highway 21 and accesses the winter and summer non-motorized trail system. The trails are maintained by IDPR in agreement with the Forest Service. In the winter, this trailhead is used to access the Nordic trail system. Summer use of the site is low but mountain bike use is increasing. An Idaho Park N' Ski Permit is required between November 15 and April 30. Recreation infrastructure at the site includes a kiosk and vault toilet.

Gold Fork Park and Ski Trailhead is located on State Highway 21 and accesses the winter and summer non-motorized trail system. In the winter, this trailhead is used to access the Nordic trail system. Summer use of the site is low but mountain bike use is increasing. An Idaho Park N' Ski Permit is required between November 15 and April 30. Recreation infrastructure at the site includes a kiosk and vault toilet.

Whoop-Um Up Park and Ski Trailhead is located on State Highway 21 and accesses the winter and summer non-motorized trail system. The trails are maintained by IDPR in agreement with the Forest Service. In the winter, this trailhead is used to access the Nordic trail system. This trailhead can be used by snowmobilers to access the 8A snowmobile area. The snowmobile trails are maintained by the Boise County Snowmobile Grooming Program under a partnership agreement. Summer use of the site is low but use by recreationists is

increasing. An Idaho Park N' Ski Permit is required between November 15 and April 30. Recreation infrastructure at the site includes a kiosk and vault toilet.

IDPR yurts (6) are located in the project area. Each of the 6 yurts sleeps 6 people in a well-furnished atmosphere, with access to a wide variety of recreational opportunities such as hiking, mountain biking, horseback riding, Nordic and Telemark skiing, and snowshoeing. The yurt system is managed by IDPR under a Forest Service Cost Share Agreement (IDPR Park and Ski Agreement 13-CS-11040203-03 and IDPR Yurt Agreement 13-CS-11040203-07). Recreation infrastructure at the yurts typically includes a yurt with a deck and pit toilet. NFS roads providing access to the yurt system are closed by snow in the winter; therefore, winter access is by non-motorized means only.

Table 3-111. Summary of developed recreation facilities in the Becker project area

Recreation Site	Managed By	Primary Season of Use
Beaver Creek Cabin	Forest Service	Year round
Edna Creek Campground	Forest Service	Summer
Whoop-Um Up Campground	Forest Service	Summer
Crooked River Trailhead	Forest Service	Summer
Beaver Creek Summit Park and Ski Trailhead*	Forest Service (summer)/ Idaho Department of Parks and Recreation (winter)	Year round
Banner Ridge Summit Park and Ski Trailhead	Forest Service (summer)/ Idaho Department of Parks and Recreation (winter)	Year round
Gold Fork Park and Ski Trailhead	Forest Service (summer)/ Idaho Department of Parks and Recreation (winter)	Year round
Whoop-Um Up Park N' Ski and 8A Snowmobile Trailhead	Forest Service (summer)/ Idaho Department of Parks and Recreation (winter)	Year round
Elk Horn Yurt	Idaho Department of Parks and Recreation	Year round
Stargaze Yurt	Idaho Department of Parks and Recreation	Year round
Banner Ridge Yurt	Idaho Department of Parks and Recreation	Year round
Rocky Ridge Yurt	Idaho Department of Parks and Recreation	Year round
Skyline Yurt	Idaho Department of Parks and Recreation	Year round
Whispering Pines Yurt	Idaho Department of Parks and Recreation	Year round

Dispersed recreation, such as hunting, fishing, hiking, sightseeing, snowmobiling, cross-country skiing, trail riding, firewood gathering, and camping, occurs throughout the project area. These activities have increased over time due to available motorized access into the area and the proximity to local communities. Dispersed recreation use generally occur along road/trail corridors but may occur anywhere within the project area. On the 2015 Idaho City Ranger District MVUM (USDA Forest Service 2015i), about 60.1 miles of roads are open year round for full-sized vehicle motorized use and 26.9 miles are open seasonally (June 16–September 14) for motorized use. All of these roads allow motorized travel to access dispersed recreation sites within 300 feet from the centerline of open NFS roads when it is safe to do so and when it does not cause damage to NFS resources.

Dispersed campsites are any campsites located outside of a developed campground/campsite. In general, dispersed campsites are primitive in nature and are developed by recreation users. These sites do not have facilities such as garbage cans, toilets, and/or fire rings. Dispersed campsites in this area require the user to be self-sufficient. These dispersed sites are typically

used during hunting season and on weekends during the summer. Currently, 16 helicopter landings (1–2 acres in size) and 113 tractor landings (0.5–1 acre in size) are located in the project area. Commonly, the tractor landings are associated with the road system and located on turnouts or wide portions of road prism. Historically, landings have been used by recreationists for dispersed camping activities. Existing landings may be available to be used as dispersed camp sites.

In the project area, a 7,491-acre winter motorized travel restriction area exists that prohibits motorized oversnow use to routes displayed on the Boise National Forest Winter Travel Map only (USDA Forest Service 2014f). Cross-country oversnow motorized use is currently allowed on about 11,836 acres in the project area. The areas with winter motorized travel restrictions typically provide recreation users with a more isolated experience, with less probability of experiencing the sights and sounds of humans than in areas allowing motorized uses. Separation of motorized and non-motorized winter recreation uses provides non-motorized users with greater opportunity for solitude.

The Forest's Special Use Program authorizes uses on NFS land that provide a benefit to the general public and protect public and natural resource values. Currently, 8 special use authorizations exist within the project area (Table 3-112).

Table 3-112. Summary of special use permittees in the project area

Name	Type of Special Use Permit
Allreds Adventures LLC	Outfitter Guide
Camp Ee Da How	Organization Camp
Escape Adventures	Outfitter Guide
Idaho Transportation Department Waste Sites (NFS road 025M and Lamar Creek)	Waste Site
Korell Outfitter and Guide	Outfitter Guide
Mountain Outfitters	Outfitter Guide
Pilot Peak Communication Site (Idaho Power Special Use Permit)	Communications Site
Youren Outfitter and Guide	Outfitter Guide

Occasional minor disruptions and/or displacement of recreation users by other uses, such as road/trail maintenance activities and livestock grazing, occur in the project area. Minor recreation use and/or access disruption may occur during scheduled maintenance of roads and trails. Recreational users may encounter livestock during their visits to the project area, depending on the time of year and the grazing rotation and routing patterns.

In general, the scenery as viewed by recreation users in the analysis is characterized as moderate to high-relief mountains covered with coniferous forests intermixed with aspen and brush/grass hillslopes. The rivers and streams are generally described as exhibiting clear, fast-moving, high-gradient water features. Recreation users on roads and trails generally have confined forest views with limited breaks in vegetation (section 2.4.2, Figure 3-89, Figure 3-90; scenery technical report [project record]).

Scenery from the developed recreation facilities in the project area depends on the type of site. The Forest Service developed campgrounds in the project area can be characterized as small, rustic campgrounds surrounded by mixed-species conifer forest (Figure 3-91). Beaver Creek Cabin is a historic Forest Service cabin built in the 1930s by the Civilian

Conservation Corps (CCC) and is surrounded by a mixed-species forest with several streams nearby (Figure 3-92). The IDPR yurts are typically located on ridgelines providing panoramic views of the surrounding mountains and conifer forests (Figure 3-93 and Figure 3-94). The Park N' Ski trailheads are located just off State Highway 21 and are generally surrounded by mixed-species conifer or ponderosa pine forests on at least one side (Figure 3-95).

Figure 3-89. Typical National Forest System road in the Becker project area

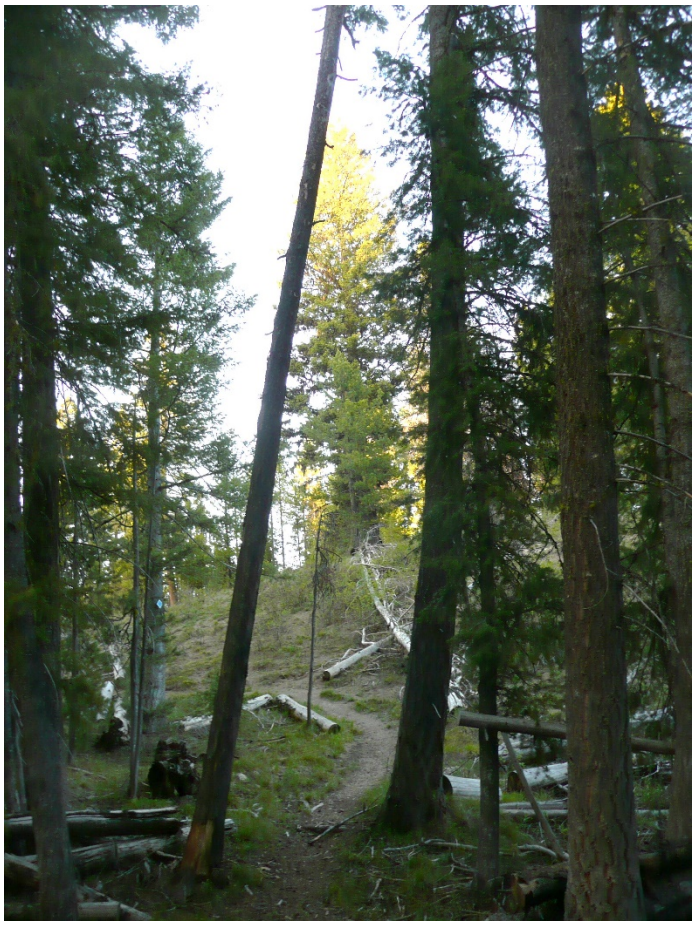

Figure 3-90. Typical non-motorized trail in the Becker project area

Figure 3-91. Edna Creek Campground

Figure 3-92. Beaver Creek Cabin

Figure 3-93. Stargaze Yurt

Figure 3-94. View from the deck of Stargaze Yurt

Figure 3-95. Gold Fork Park N' Ski Trailhead

3.7.3.2 Environmental Effects

Direct and Indirect Effects

Alternative A (No Action)

Implementing Alternative A (No Action) would have no direct or indirect effects on the current recreational experience in the project area, given that this alternative would maintain the existing recreational opportunities and scenery as viewed from travelways and recreational facilities. Present and ongoing activities, such as road and trail maintenance, livestock grazing, and fire suppression (Appendix B) are expected to continue in the project area. No new activities would be implemented under this alternative. Use of NFS and IDPR-managed developed recreational facilities in the analysis are expected to continue at or near current levels. Beaver Creek Summit Park N' Ski Trailhead would continue to be managed by IDPR under agreement in the winter but would not be authorized as a Forest Service facility. Existing dispersed recreation activities are expected to continue in the project area. No change is expected in the amount, duration, or frequency of minor disruptions of recreational activities by other uses in the project area under this alternative.

As viewed by recreation users, the scenery is expected to remain very similar to existing conditions with Alternative A. Under this No Action Alternative there is the potential for loss of vegetation due to insect and disease and/or wildfire which could change the recreation scenery in the project area.

Alternative B (Proposed Action)

Alternative B would increase the number of developed recreational facilities by adding a developed trailhead for the motorized trail system at the junction of NFS roads 312 and 385, as well as improve and authorize one developed recreational facility in the project area by relocating the Beaver Creek Summit Park N' Ski Trailhead to a better location. The conceptual designs of the trailheads are available in Appendix G. The motorized trailhead would provide parking for full-sized vehicles and OHV trailers, an information kiosk, and a vault toilet. In addition, development of this trailhead would close user-developed OHV trails and complete vegetation rehabilitation between the parking area and stream channel. The relocated Beaver Creek Summit Trailhead would provide a safer trailhead as users would be able to access the trail to the Stargaze Yurt without walking along the edge of State Highway 21 directly adjacent to traffic. As part of the relocation, the existing information kiosk would be moved to the new trailhead location, and approximately 200 feet of new trail for winter and summer use would be constructed to connect the trailhead to NFS road 394, which provides access to Stargaze Yurt. The Beaver Creek Park N' Ski Trailhead would be authorized as a Forest Service facility under this alternative. All of the other developed recreational facilities in the project area would be maintained under this alternative. Based on the population growths of local communities, the demand for developed recreation in the project area may increase over time.

Alternative B would reduce the dispersed recreation opportunities in the project area. However, dispersed recreation activities (e.g., hunting, camping, fuelwood gathering) currently occurring in the project area are expected to continue. Dispersed recreation uses generally occur along road/trail corridors but may occur anywhere within the project area.

Alternative B would reduce the miles of road open to the public year round and seasonally by 28.7 miles. This reduction would also reduce the miles of MVUM routes allowing motorized travel within 300 feet of the centerline of open roads to access dispersed recreation sites, as long as it is safe to do so and when it does not cause damage to NFS resources. This alternative would increase the miles of trail designated for motorized vehicles <50 inches wide in the project area by 23.3 miles (Table 3-113); however, the motorized trails in the project area would not allow motorized travel within 100 feet of the trail to access dispersed recreation sites. As a result, implementing this alternative would reduce the area accessible by motorized vehicles for the purpose of dispersed camping. In addition, Alternative B would construct 20 tractor landings (0.5–1 acre in size) to facilitate tractor logging operations. In general, the tractor/light cable landings are associated with the road system (e.g., turnouts or wide portions of road prism) but, under this alternative, 16 of these tractor landings are located off of temporary roads that would be constructed to facilitate timber harvest. These landings would be decommissioned, as part of the temporary road decommissioning activities as required by Design Feature TH-4 and and landing decommissioning as required by Design Feature FH-6, therefore would not be available as dispersed recreation campsites in the future. Based on the population growths of local communities, the demand for dispersed recreation in the project area may increase over time.

Alternative B would disrupt and displace recreational visitors in the project area during the snow-free season due to active timber harvest, prescribed burning, and road/trail activities. It is assumed that this project would be implemented in stages over the next 5 to 10 years: 4 timber sales, followed by noncommercial thinning and activity fuels treatments, in turn followed by prescribed fire activities (maps describing the timing of activities are available in the recreation technical report [project record]). Design Feature RE-2 requires that, for public safety, area closures be issued when logging operations occur; recreational uses would be restricted in the closure area. Project activities would also be expected to generate noise, dust, and/or smoke, which may displace recreational users; however, recreational users would likely shift their use to nearby areas within the project area that are open and away from project implementation to maintain their recreational experience. Timber sale contract provision C5.31 and the timber sale road maintenance plan would require dust abatement on all haul routes, which would reduce the impact to recreational visitors. In the project area, recreational visitors may be disrupted or displaced by log haul activities on NFS roads. However, Design Feature TH-3 prohibits log hauling from 6:00 p.m. Friday through midnight Sunday, on all major holidays, and on the opening day of general deer and elk seasons, which would mitigate potential conflicts between log haul and recreationists during times when recreation use in the area is expected to be highest. Design Feature RE-3 would require the timber sale administrator to coordinate the timber sale purchaser/contractor campsites with Forest Service recreation staff to avoid or minimize impacts to recreation users in the project area. Design Features FF-2 and RE-10 were applied to this alternative to provide a mechanism for informing the public of project activities and closures that may impact the availability of recreation opportunities in the project area. The design features have been applied to this alternative to minimize disruption and/or displacement of recreational users in the project area.

Winter recreational users may be disrupted during project implementation in the project area before December 15 and after April 15 if snow conditions allow for oversnow uses during these times. Design Feature RE-5 would prohibit snowplowing on established groomed ski

and snow machine trails within the project area and all haul routes from December 15 to April 15 during project implementation. Design Feature RE-6 indicates that all logging operations would cease by December 15 in areas with winter recreation facilities and trails, to allow for winter trail use by skiers and snowmobilers. Design Feature RE-7 would close non-motorized and motorized oversnow trails until December 15 for log haul during project implementation. These design features would reduce potential conflict between timber sale activities and winter recreation users, minimizing impacts from project activities to winter recreational users between December 15 and April 15.

This alternative would maintain the existing 7,491-acre winter motorized restriction areas in the project area; therefore, no change from the current winter recreation experience would be expected.

SUP holders in the project area may also experience disruption and displacement of their activities during project implementation. Design Feature SU-1 requires that the SUP Administrator be notified of project activities and timing of implementation, so the permittee can be informed of scheduled activities and allow for a short-term modification of special use activities, where necessary. This design feature would minimize the impact of project implementation on the special use permittees in the project area.

As viewed by recreation users, the scenery would be modified by implementing vegetation management, road/trail, and prescribed fire activities. These activities would modify the vegetation density and species composition, reduce fuels, and modify road/trail systems through timber harvest activities, temporary road location, road relocation, and stream crossing installation/replacement along travel routes and adjacent to developed recreational sites. The scenery associated with non-motorized trails co-located on NFS roads that would be used for timber sale activities, such as skid trails and/or haul routes, would be affected by the reopening of the roads. These routes would be widened back to road width, and vegetation would be cleared to facilitate use as roads and/or skid trails, which would change the scenery as viewed by recreational users on these routes. Implementing Design Features RE-4, RE-8, RE-9, SE-1, SE-2, SE-3, SE-4, SE-5, SE-6, SE-7, SE-8, SE-9, SE-10, and SE-11 (section 2.4.7) would minimize impacts of the activities to recreation scenery by reducing the visibility of the treatments to recreationists. The scenery changes would be expected to be more noticeable to recreation users in the area immediately (i.e., temporary timeframe, 0–3 years) following implementation and would be expected to become less noticeable over the short term (3–15 years). VQOs are expected to be maintained with implementation of this alternative (see section 3.15, Scenic Environment).

Alternative C

The effects of Alternative C would be the same as those described for Alternative B above, except for the changes to dispersed recreation opportunities in the project area. Alternative C would reduce the miles of road open to the public year round and seasonally by 24.2 miles, which would also reduce the miles of MVUM routes allowing motorized travel within 300 feet of the centerline of open roads to access dispersed recreation sites, as long as it is safe to do so and when it does not cause damage to NFS resources (USDA Forest Service 2015i). This alternative would increase the miles of trail designated for motorized vehicles <50 inches wide in the project area by 22.0 miles (Table 3-113); however, the motorized trails in the project area would not allow motorized travel within 100 feet of the trail to

access dispersed recreation sites. As a result, implementing this alternative would reduce the area accessible by motorized vehicles for dispersed camping.

Alternative C would add approximately 3,215 acres to the 7,491-acre winter motorized restriction area in the project area. Implementation of this alternative would increase the area with separation between motorized and non-motorized winter uses, providing increased opportunities for solitude and isolation from the sights and sounds of humans for non-motorized recreation users.

Alternative D

The effects of Alternative D would be the same as those described for Alternative B above, except for the changes to dispersed recreation opportunities in the project area. Alternative D would reduce the miles of road open to the public year round and seasonally by 24.2 miles, which would also reduce the miles of MVUM routes allowing motorized travel within 300 feet of the centerline of open roads to access dispersed recreation sites, as long as it is safe to do so and when it does not cause damage to NFS resources (USDA Forest Service 2015i). This alternative would increase the miles of trail designated for motorized vehicles <60 inches wide in the project area by 22.0 miles (Table 3-113); however, motorized trails in the project area would not allow motorized travel within 100 feet of the trail to access dispersed recreation sites. As a result, implementing this alternative would reduce the area accessible by motorized vehicles for dispersed camping. This alternative would provide recreation users with a motorized trail opportunity for larger OHVs by designating the trail for motorized vehicles <60 inches wide instead of <50 inches wide.

Alternative E

The effects of Alternative E would be the same as those described for Alternative B above, except for the following changes to developed and dispersed recreation opportunities and scenery in the project area.

Alternative E does not propose constructing the trailhead at the junction of NFS roads 385 and 312, nor does it propose designating the associated motorized trail system.

Alternative E would reduce the miles of road open to the public year round and seasonally by 28.7 miles, which would also reduce the miles of MVUM routes allowing motorized travel within 300 feet of the centerline of open roads to access dispersed recreation sites, as long as it is safe to do so and when it does not cause damage to NFS resources (USDA Forest Service 2015i) (Table 3-113). As a result, implementing this alternative would reduce the area accessible by motorized vehicles for dispersed camping. Additionally, Alternative E would implement tractor, light cable, and helicopter logging. This alternative would construct 4 new helicopter landings and 5 new tractor landings. In general, the tractor/light cable landings would be associated with the road system (e.g., turnouts or wide portions of road prism) but, under this alternative, 2 of the tractor landings would be located off the road prism. These landings would be decommissioned as required by Design Feature FH-6 and therefore would not be available in the future for dispersed recreation activities.

When compared with Alternatives B, C, and D, Alternative E is expected to have less of an impact upon scenery as viewed by the project area's recreation users because this alternative would implement helicopter logging, which is expected to reduce the number of NFS roads

used to facilitate timber harvest activities. More specifically, this decrease in NFS road usage would reduce the number of NFS roads with co-located non-motorized trails to be widened, along with the amount of vegetation cleared to facilitate road use associated with timber harvest activities, thereby maintaining the non-motorized trails closer to their existing conditions. In other words, he non-motorized trail experience following project implementation in areas with helicopter logging would likely be maintained closer to existing conditions because less trail damage would occur during timber harvest activities.

Alternative E would add approximately 3,215 acres to the 7,491-acre winter motorized restriction area in the project area. Implementation of this alternative would increase the area with separation between motorized and non-motorized winter uses, providing increased opportunities for solitude and isolation from the sights and sounds of humans for non-motorized recreation users.

Alternative F

The effects of Alternative F would be the same as those described for Alternative B above, except for the changes to dispersed recreation opportunities in the project area. Alternative F would reduce the miles of road open to the public year round and seasonally by 24.2 miles, which would also reduce the miles of MVUM routes allowing motorized travel within 300 feet of the centerline of open roads to access dispersed recreation sites, as long as it is safe to do so and when it does not cause damage to NFS resources (USDA Forest Service 2015i). This alternative would increase the miles of trail designated for motorized vehicles <60 inches wide by 18.8 miles (Table 3-113); however, the motorized trails in the project area would not allow motorized travel within 100 feet of the trail to access dispersed recreation sites. As a result, implementing this alternative would reduce the area accessible by motorized vehicles for dispersed camping. This alternative would provide recreation users with a motorized trail opportunity for larger OHVs by designating the trail for motorized vehicles <60 inches wide instead of <50 inches wide. Additionally, Alternative F would implement tractor, light cable, and helicopter logging. This alternative would construct 2 new helicopter landings and 13 new tractor landings. In general, the tractor/light cable landings are associated with the road system (e.g., turnouts or wide portions of road prism) but, under this alternative, 4 of the tractor landings are located off the road prism. These landings would be decommissioned as required by Design Feature FH-6 and therefore would not be available in the future for dispersed recreation activities.

When compared with Alternatives B, C, and D, Alternative F is expected to have less of an impact upon scenery as viewed by the project area's recreation users because this alternative would implement helicopter logging, which is expected to reduce the number of NFS roads used to facilitate timber harvest activities. More specifically, this decrease in NFS road usage would reduce the number of NFS roads with co-located non-motorized trails to be widened, along with the amount of vegetation cleared to facilitate road use associated with timber harvest activities, thereby maintaining the non-motorized trails closer to their existing conditions. In other words, the non-motorized trail experience following project implementation in areas with helicopter logging would likely be maintained closer to existing conditions because less trail damage would occur during timber harvest activities.

Alternative F would add approximately 3,215 acres to the 7,491-acre winter motorized restriction area in the project area. Implementation of this alternative would increase the area

with separation between motorized and non-motorized winter uses, providing increased opportunities for solitude and isolation from the sights and sounds of humans for non-motorized recreation users.

Table 3-113. Summary of Motor Vehicle Use Map (MVUM) routes in the project area by alternative

MVUM Route Description	Alt. A (No Action)	Alt. B (Proposed Action)	Alt. C	Alt. D	Alt. E	Alt. F
Miles of National Forest System (NFS) roads open to full-sized vehicles year round[a]	60.1	48.4	48.4	52.9	48.4	48.4
Miles of NFS roads open to full-sized vehicles seasonally (June 16–September 14)	26.9	9.9	14.4	9.9	9.9	14.4
Miles of motorized trail designated for vehicles ≤50 inches wide	0	23.3	22.0	0	0	0
Miles of motorized trail designated for vehicles ≤60 inches wide	0	0	0	22.0	0	18.8
Total Miles	**87**	**81.6**	**84.8**	**84.8**	**58.3**	**81.6**

[a]These MVUM roads allow motorized travel for the purposes of dispersed camping for up to 300 feet from the centerline of the road when it is safe to do so and when this use does not cause damage to NFS resources (USDA Forest Service 2015i).

Cumulative Effects

Alternative A

Under Alternative A, cumulative effects for the recreation experience indicator would not exist because no direct or indirect effects occur under this alternative.

Action Alternatives

Table 1 in Appendix B of the document identifies which past activities were considered for this cumulative effects analysis. The impacts of past activities have contributed to the existing conditions for the recreation experience indicator in the project area and, therefore, are included in the affected environment discussed in section 3.7.3.1.

Table 1 in Appendix B identifies which present/ongoing activities were considered for this cumulative effects analysis. Ongoing activities, such as road use and maintenance, trail use and maintenance, livestock grazing, IDPR cost-share agreement activities, snow grooming, noxious weed treatment, minerals activities, and fire suppression, would likely continue. Recreational users may encounter livestock during their visits to the project area, depending on the time of year and the grazing rotation and routing patterns. In addition, areas could be temporarily closed to visitors during fire suppression activities, to mitigate public health and safety hazards. Although proposed alternatives would incrementally add to the effects of present and ongoing activities, implementing the design features discussed above should prevent the proposed and present activities from substantially altering recreational experiences for visitors, particularly during the high-use periods.

Table 1 in Appendix B identifies which reasonably foreseeable activities were considered for this cumulative effects analysis. No cumulative effects activities would incrementally add to

the effects of this indicator; therefore, no cumulative effects would be expected with implementation of these alternatives.

3.7.4 Recreation Access Indicator

3.7.4.1 Affected Environment

Recreational access in the project area is available by motorized and non-motorized means. An extensive NFS transportation system is located within the project area, with State Highway 21 providing primary access (Appendix J, Map 1). The existing motorized transportation system in the project area can be attributed to past vegetation and motorized route designation activities (Appendix B). Road construction associated with past vegetation management activities has impacted the transportation system in the project area. Additionally, travel management decisions on the Idaho City Ranger District have affected motorized access in the project area by designating the roads open to motorized use, as well as the types of authorized vehicles. Past trail construction activities in the project area have contributed to the non-motorized access. Agreements with the State of Idaho, Boise County, and 8A Snowmobile Club have provided winter access in the project area via groomed snowmobile trails and non-motorized groomed and ungroomed trails. Past activities have altered the miles of roads/trails providing motorized access for recreation users, as well as the non-motorized trail access, in the project area. Additionally, minor disruption of recreational access in the project area by other uses—such as timber harvest, road/trail activities, and livestock grazing—has occurred. Minor recreation access disruption may occur during scheduled maintenance of roads and trails, along with livestock rotation, throughout the project area.

The Idaho City Ranger District MVUM identifies the motorized access and types of vehicles authorized, with the exception of oversnow use, on NFS roads and trails in the project area. Currently, no NFS trails are designated for motorized use in the project area. About 87 miles[31] of NFS roads have been designated as open to full-sized vehicles, with about 26.9 miles closed seasonally (September 15 to June 15) to motorized use. No designated motorized NFS trails are available for summer use in the project area (Appendix J, Map 2).

The project area features about 10 miles of NFS roads groomed and maintained as snowmobile routes during the winter (Table 3-3). Groomed snowmobile routes in the project area consist of NFS roads 312, 384, and 351 (Appendix J, Map 4). These snowmobile routes are used extensively during the snow season and are groomed through an agreement between IDPR, the Forest Service, Boise County, and the Boise County 8A Snowmobile Club (Agreement 11-CD-017). Snowmobilers park at Whoop-Um Up Park N' Ski Trailhead to access these trails. These routes are part of a larger system of groomed snowmobile trails in Boise and Elmore counties. In the project area, a 7,491-acre winter motorized travel restriction area exists that prohibits motorized oversnow use to routes displayed on the Boise National Forest Winter Travel Map only (USDA Forest Service 2014f). Cross-country oversnow motorized use is currently allowed on about 11,836 acres in the project area.

[31] The 87 miles of NFS roads designated for motorized use in the project area include 72.5 miles of Maintenance Level (ML) 2 roads, 6.1 miles of ML 3 roads, and 8.4 miles of ML 5 roads. The ML 5 road in the analysis area is State Highway 21, which is under the jurisdiction of the Idaho Transportation Department.

About 2.9 miles of existing authorized NFS non-motorized trails exist in the project area (Table 3-114). In addition, 32.4 miles of existing summer non-motorized trails are located on NFS roads that are closed to all motorized use (ML 1) (Table 3-114 and Appendix J, Map 3). These trails are not authorized on the NFS trail system but are managed by IDPR under agreement and in conjunction with the yurt rental system. Under this agreement, IDPR also manages 60.2 miles of winter non-motorized trails, of which 29.2 miles are groomed and 31 miles are ungroomed (Table 3-114). The trail system supports the IDPR yurt rental program and allows for year round, non-motorized use opportunities including hiking, mountain biking, horseback riding, Nordic and Telemark skiing, and snowshoeing.

The means by which each yurt is accessed depends on the transportation and trail system and the season. In winter, backcountry yurts are accessed by a 2–3 mile ski or snowshoe trek on either groomed or ungroomed non-motorized trails; in the summer, the yurts can be accessed by car and/or hiking, depending on the yurt (Table 3-115).

Table 3-114. Summary of existing trails in the Becker project area, including National Forest System (NFS) trails and those managed by the Idaho Department of Parks and Recreation (IDPR)

Trail Description	Miles
NFS Designated Motorized Trails (Summer)	0.0
NFS Non-motorized Trails: NFS Trail 267 (0.9 miles), NFS Trail 158 (0.5 miles), and NFS Trail 275 (1.4 miles)	2.9
Summer Non-motorized Trail under Agreement with IDPR	32.4
Winter Groomed Non-motorized Trail under Agreement with IDPR	29.2
Winter Ungroomed Non-motorized Trail under Agreement with IDPR	31.0
Groomed Snowmobile Routes	10
Total Miles of Trail	**105.5**

Table 3-115. Summary of summer and winter access, including National Forest System (NFS) routes, to the Idaho Department of Parks and Recreation yurts

Yurt	Summer Access	Winter Access
Elk Horn	Non-motorized Trail	Non-motorized groomed trail (ski/snowshoe)
Stargaze	Motorized—NFS road 394B	Non-motorized ungroomed trail (ski/snowshoe)
Banner Ridge	Motorized—NFS road 385	Non-motorized groomed trail (ski/snowshoe)
Rocky Ridge	Motorized—NFS road 025M	Non-motorized ungroomed trail (ski/snowshoe)
Skyline	Motorized—NFS road 362F, seasonally open June 16–September 14	Non-motorized groomed trail (ski/snowshoe)
Whispering Pines	Motorized—NFS road 393	Non-motorized groomed trail (ski/snowshoe)

3.7.4.2 Environmental Effects

Direct and Indirect Effects

Alternative A

Implementing Alternative A (No Action) would have no direct or indirect effects on recreation access in the project area, given that all recreation access indicator measures

would be maintained at current levels (Table 3-113, Table 3-116, Table 3-117, Table 3-118). In the analysis, present and ongoing activities would be expected to continue, but none of the proposed activities under the action alternatives would be implemented under Alternative A. Alternative A would not add the summer and winter trails currently under agreement with IDPR to the authorized NFS trail system and, therefore, the Forest Service could not expend funds on these trails, and the trail system would continue to be maintained by IDPR.

Alternative B (Proposed Action)

Alternative B (Proposed Action) would decrease motorized recreation access and increase non-motorized access in the project area. Proposed transportation management activities, such as road decommissioning, road closures, road relocation, conversion of road to trail, new trail construction, and designation of motorized trail, would change the miles of routes available for public motorized use. Alternative B would reduce the miles of NFS road open to full-sized vehicle use by about 28.7 miles and increase the miles of motorized trail designated for vehicles 50 inches wide or less by about 23.3 miles. Designation of the motorized trail system would provide increased authorized motorized recreation access and opportunities for OHVs away from the NFS road system in the project area. The Idaho City Ranger District MVUM (Appendix J, Map 8) would have approximately 5.4 fewer miles available for public motorized use under this alternative (Table 3-113). Design Feature TS-3 would require installing closure devices or other access modifications on ML 1 NFS roads. In addition, closure devices such as gates would be installed on all NFS roads and trails with seasonal closures. These design features would discourage unauthorized use of closed routes during closure periods.

Recreational access in the project area would be impacted during implementation of project activities including timber harvest, prescribed fire, road maintenance, road relocation, and culvert replacements. This project was assumed to be divided into 4 timber sales so the entire project area would not be impacted by timber harvest disruptions simultaneously. Noncommercial thinning activities would be expected to occur following timber harvest activities. Activity fuels treatments are assumed to occur 1–3 years following each timber sale, and 5 prescribed fire treatments are assumed to occur following activity fuels treatments. Closure orders would be issued for public safety during logging and prescribed fire operations, as required by Design Feature RE-2. Design Features FF-2 and RE-10 have been applied to this alternative to provide a mechanism for informing the public of project activities and closures that may impact the availability of recreational opportunities in the project area.

A potential exists for the non-motorized trails in the project area to be damaged by timber harvest activities. Design Feature RE-1 outlines the timber sale contract provisions to be included to maintain access or use and address public safety to protect and/or minimize impacts to trail surfaces, trailheads, and recreational opportunities. Design Feature RE-1 states that the timber sale administrator shall designate all skid trails crossing authorized trails and shall consult with Forest Service recreation staff to determine the appropriate repair or reconstruction needs in order to return the trail to a condition similar to pre-project implementation. This design feature would minimize negative impacts to the non-motorized NFS trail and meet Forest Plan Guideline REGU22.

Alternative B (Proposed Action) would add about 41.3 miles of summer non-motorized trails to the authorized NFS trail system (Table 3-116). Currently, about 2.9 miles of NFS non-motorized trail and 32.4 miles of trail under agreement with IDPR exist, but these trails are not on the authorized NFS trail system. This alternative would increase the miles of non-motorized trails available for summer recreational use by approximately 8.9 miles to 44.2 miles (Table 3-116). Approximately 19.8 miles of unauthorized routes and 5.1 miles of NFS road would be converted to trail (Table 3-116) to meet standard trail construction/maintenance specifications, signage requirements, and drainage provisions as required by Design Features RE-11, RE-12, and RE-13. NFS roads converted to trails would serve as winter non-motorized trails and mountain bike trails. Ungroomed winter trails would have a minimum width of 24 inches and meet the requirements described in Design Feature RE-14. NFS roads converted to trail that would be used as winter non-motorized groomed trails would be maintained at 14–16 feet wide to allow for double-track snow grooming and to meet the requirements described in Design Feature RE-15. IDPR would continue to manage the summer non-motorized trail system under an agreement.

Table 3-116. Summary of summer non-motorized trails in the project area by alternative

Non-motorized Trail Actions	Alt. A (No Action)	Alt. B (Proposed Action)	Alt. C	Alt. D[a]	Alt. E	Alt. F[a]
Existing National Forest System (NFS) non-motorized trail	2.9	2.9	2.9	2.9	2.9	2.9
Non-motorized trail under agreement with Idaho Department of Parks and Recreation and not on NFS trail system	32.4	0	0	0	0	0
Authorized trail currently on unauthorized routes	0	19.8	19.8	19.8	19.8	19.8
Authorized trail on existing NFS road, Maintenance Level (ML) 1	0	8.7	9.0	9.0	9.0	9.0
Authorized trail on existing NFS road, ML 2—Administrative Use Only	0	7.7	4.0	4.0	9.3	4.0
Conversion of NFS roads (ML 1) to non-motorized trail	0	3.9	3.9	3.9	6.5	6.5
Conversion of NFS roads (ML 2) to non-motorized trail	0	1.2	1.2	1.2	1.5	1.5
Total Miles (all trails/routes)	**35.3**	**44.2**	**40.8**	**40.8**	**49.0**	**43.7**

[a]Alternatives D and F would designate motorized trail for motorized vehicles 60 inches wide or less.

Alternative B would add about 60.2 miles of winter non-motorized trail to the NFS trail system (Table 2-19). These trails are under agreement with IDPR but are not on the authorized NFS trail system. Approximately 29.2 miles of this trail system is groomed by IDPR and 31.0 miles is ungroomed in the winter (Table 2-19). IDPR would continue to manage this winter non-motorized trail system under an agreement. Alternative B does not

propose any changes to the groomed snowmobile routes in the project area. The existing about10 miles of groomed snowmobile routes on NFS roads 312, 351, and 384 would be maintained under this alternative. The existing winter motorized restriction area of 7,491 acres in the project area would be maintained under this alternative (Table 3-117). Thinning treatments along Nordic trails would be designed to provide shade for snow retention, as required by Design Feature RE-4, in order to minimize the impact of these activities to the winter non-motorized trails. Winter trail access would be reduced in years with snow conditions allowing use prior to December 15 and after April 15 because logging operations may still occur until December 15 (as defined by Design Feature RE-6). Design Feature RE-7 would close ski and snowmobile routes used for log haul until December 15 during project implementation; however, Design Feature RE-5 would prohibit snowplowing on established groomed ski and snow machine trails in the project area between December 15 and April 15, allowing winter recreation access on these routes.

Alternative B would maintain existing access to the Elk Horn, Banner Ridge, Rocky Ridge, and Whispering Pine Yurts in both the summer and winter (Table 3-118). This alternative would maintain the existing winter season access to the Stargaze and Skyline Yurts but change the summer season access to the yurts to non-motorized trails (Table 3-118 and Appendix J, Map 10). The Stargaze and Skyline Yurts would not be accessible by motorized vehicles in the summer season under this alternative, possibly reducing use for those wishing to drive to these yurts.

Table 3-117. Winter motorized restriction areas by alternative

Winter Motorized Restriction	Alt. A (No Action)	Alt. B (Proposed Action)	Alt. C	Alt. D	Alt. E	Alt. F
Existing winter motorized restriction area (acres)	7,491	7,491	7,491	7,491	7,491	7,491
Proposed winter motorized restriction area (acres)	0	0	3,215	0	3,215	3,215
Total Acres	**7,491**	**7,491**	**10,706**	**7,491**	**10,706**	**10,706**

Table 3-118. Summer access to Idaho Department of Parks and Recreation yurts by alternative

Yurt	Alternative A (No Action)	Alternative B (Proposed Action)	Alternative C	Alternative D	Alternative E	Alternative F
Elk Horn	Non-motorized trail	Non-motorized Trail	Non-motorized Trail	Non-motorized Trail	Non-motorized, mechanized equipment closure May 1–June 15	Non-motorized trail
Stargaze	Motorized—National Forest System (NFS) road 394B	Non-motorized Trail	Motorized—NFS road 394B, seasonally open June 16–September 14	Motorized—NFS road 394B	Non-motorized trail	Motorized—NFS road 394B. seasonally open June 16–September 14
Banner Ridge	Motorized—NFS road 385	Motorized—NFS road 385	Motorized—NFS road 385	Motorized—NFS road 385	Motorized—NFS road 385	Motorized—NFS road 385
Rocky Ridge	Motorized—NFS road 025M	Motorized—NFS road 025M	Motorized—NFS road 025M	Motorized—NFS road 025M	Motorized—NFS road 025M	Motorized—NFS road 025M
Skyline	Motorized—NFS road 362F, seasonally open June 16–September 14	Non-motorized trail	Motorized—NFS road 362F, seasonally open June 16–September 14	Motorized	Non-motorized, mechanized equipment closure May 1–June 15	Motorized—NFS road 362F, seasonally open June 16–September 14
Whispering Pines	Motorized—NFS road 393	Motorized—NFS road 393	Motorized—NFS road 393	Motorized—NFS road 393	Motorized—NFS road 393	Motorized—NFS road 393

Alternative C

Alternative C would reduce the motorized recreation access and increase the non-motorized access in the project area. The effects of Alternative C would be the same as those described for Alternative B, except for the measures described below.

Alternative C would reduce the miles of NFS road open to full-sized vehicles by about 24.2 miles and increase the miles of motorized trail designated for vehicles ≤50 inches wide by about 22 miles. The Idaho City Ranger District MVUM would have approximately 2.2 fewer miles available for public motorized use under this alternative (Table 3-113 and Appendix J, Map 13).

Alternative C would increase the miles of non-motorized trail in the project area by about 5.5 miles. Alternative C would add about 37.9 miles of summer non-motorized trails to the existing 2.9 miles on the authorized NFS trail system (Table 3-116). Approximately 19.8 miles of unauthorized routes and 5.1 miles of NFS road would be converted to trail, to meet standard trail construction/maintenance specifications, signage requirements, and drainage provisions as required by Design Features RE-11, RE-12, and RE-13.

Under Alternative C, approximately 3,215 acres of winter motorized restriction area would be added to the existing 7,491-acre winter motorized restriction area in the project area (Table 3-117 and Map 15 in Appendix J). This addition would increase the area restricting motorized oversnow use to routes displayed on the Boise National Forest Winter Travel Map (USDA Forest Service 2014f) to 10,706 acres, thus reducing the area where motorized oversnow use may occur. This addition would decrease the potential for damage from snowmobile use on the non-motorized winter trail system in the project area and meet MA 7 Objective 0773, as described in the Forest Plan errata in Appendix I of this document.

Alternative C would maintain existing access to the Elk Horn, Banner Ridge, Rocky Ridge, Skyline and Whispering Pine Yurts in both the summer and winter. This alternative would maintain the existing winter season access to the Stargaze Yurt but only allow motorized summer season access to this yurt from June 16 to September 14 (Table 3-118 and Appendix J, Map 14). NFS road 394B would be seasonally closed from September 15 to June 15 annually; therefore, access to the Stargaze Yurt would be non-motorized during this time period (Table 3-118). Much of the closure period is during the winter season when the roads cannot be accessed by motorized wheeled vehicles due to snow. Therefore, the seasonal closure would only impact motorized wheeled vehicle access during the shoulder seasons of spring and fall. Summer season motorized wheeled vehicle access would be allowed on NFS roads 362F and 394B after June 15. Shoulder season use of the Stargaze Yurt may be reduced under this alternative due to the season closure to motorized wheeled vehicles.

Alternative D

Overall, Alternative D would reduce motorized recreational access and increase non-motorized access in the project area; however, Alternative D would increase motorized access to the IDPR yurts by removing a seasonal closure on the road accessing the Skyline Yurt (Table 3-118). The effects of Alternative D would be the same as those described for Alternative B (section 3.7.4.2), except for the measures described below.

Alternative D would reduce the miles of NFS road open to full-sized vehicles by about 24.2 miles and increase the miles of motorized trail designated for vehicles ≤60 inches wide by about 22 miles. This alternative provides motorized trail access for larger OHVs by designating the motorized trail for vehicles <60 inches wide instead of <50 inches wide. The Idaho City Ranger District MVUM would have approximately 2.2 fewer miles available for public motorized use under this alternative (Table 3-113 and Appendix J, Map 19). However, designation of the motorized trail system would provide increased authorized motorized recreation access and opportunities for OHVs away from the NFS road system in the project area. Additionally, recreation accress and opportunities under this alternative would increase for recreation users with OHVs wider than 50 inches but less than 60 inches in width.

Alternative D would increase the miles of non-motorized trail in the project area by about 5.5 miles and add about 37.9 miles of summer non-motorized trails to the existing 2.9 miles on the authorized NFS trail system (Table 3-116).

Alternative D would maintain the existing access to the Elk Horn, Stargaze, Banner Ridge, Rocky Ridge, and Whispering Pine Yurts in both the summer and winter. This alternative would maintain the existing winter season access to the Skyline Yurt and remove the seasonal closure on NFS road 362F to allow motorized access to this yurt between September 15 and June 16 during the snow-free periods (Table 3-118). This alternative may increase the use of the Skyline Yurt during the shoulder seasons of spring and fall whenever the road is snow free, based on increased motor vehicle access.

Alternative E

Alternative E would reduce motorized recreation access and increase non-motorized access in the project area. The effects of Alternative E would be the same as those described for Alternative B in section 3.7.4.2, except for the measures described below.

Alternative E would reduce the miles of NFS road open to full-sized vehicles by about 28.7 miles and would not add motorized trails. The Idaho City Ranger District MVUM would have approximately 28.7 fewer miles available for public motorized use under this alternative (Table 3-113 and Appendix J, Map 25).

Alternative E would increase the miles of non-motorized trail in the project area by about 13.7 miles. Alternative E would add about 46.1 miles of summer non-motorized trails to the existing 2.9 miles on the authorized NFS trail system (Table 3-116). Approximately 19.8 miles of unauthorized routes and 8.0 miles of NFS road would be converted to trail to meet standard trail construction/maintenance specifications, signage requirements, and drainage provisions as required by Design Features RE-11, RE-12, and RE-13. Alternative E adds a mechanized equipment (e.g., wagons, carts, bicycles) closure north of Beaver Creek Cabin and east of State Highway 21 from May 1 to June 15, annually. This closure would eliminate mountain bike trail users from this area during the closure period.

Alternative E proposes 1,166 acres of helicopter logging, which may reduce the potential for existing non-motorized trails co-located on NFS roads to be reopened as roads facilitating harvest activities. Alternative E would likely have less damage and require fewer repairs to trails in areas with helicopter logging, and trail access may be restored more quickly than under Alternatives B, C, and D.

Under Alternative E, approximately 3,215 acres of winter motorized restriction area would be added to the existing 7,491-acre winter motorized restriction area in the project area (Table 3-117 and Map 27 in Appendix J). This addition would increase the area restricting motorized oversnow use to routes displayed on the Boise National Forest Winter Travel Map (USDA Forest Service 2014f) to 10,706 acres, thus reducing the area where motorized oversnow use may occur. The addition would decrease the potential for damage from snowmobile use on the non-motorized winter trail system and meet MA 7 Objective 0773, as described in the Forest Plan errata in Appendix I of this document.

Alternative E would have the greatest change in access to the IDPR yurts, as compared to the existing conditions. Alternative E would maintain existing access to the Banner Ridge, Rocky Ridge, and Whispering Pine Yurts in both the summer and winter. This alternative would maintain existing winter season access to the Stargaze Yurt but would only allow non-motorized access during the summer. This alternative would maintain winter access to the Elk Horn and Skyline Yurts but modify summer access. Alternative E adds a mechanized equipment (e.g., wagons, carts, bicycles) closure north of Beaver Creek Cabin and east of State Highway 21 from May 1 to June 15, annually (Table 3-118 and Appendix J, Map 26). Alternative E would maintain existing winter access to the Skyline Yurt and change summer access for non-motorized equipment with the mechanized equipment closure. For the Elkhorn Yurt, the existing winter access and non-motorized summer access would be maintained, except for the mechanized equipment closure from May 1 to June 15. The mechanized equipment closure would eliminate the ability for recreation users to use carts, bicycles, etc. to transport supplies from the trailhead to the yurt during the closure period.

Alternative F

Alternative F would reduce motorized recreation access and increase non-motorized access in the project area. The effects of Alternative F would be the same as those described for Alternative B (section 3.7.4.2), except for the measures described below.

Alternative F would reduce the miles of NFS road open to full-sized vehicles by about 24.2 miles and increase the miles of motorized trail designated for vehicles ≤60 inches wide by about 18.8 miles. This alternative provides motorized trail access for larger OHVs by designating the motorized trail for vehicles <60 inches wide instead of <50 inches wide. The Idaho City Ranger District MVUM would have approximately 5.4 fewer miles available for public motorized use under this alternative (Table 3-113 and Appendix J, Map 31). However, designation of the motorized trail system would provide increased authorized motorized recreation access and opportunities for OHVs away from the NFS road system in the project area. Additionally, recreation accress and opportunities under this alternative would increase for recreation users with OHVs wider than 50 inches but less than 60 inches in width.

Alternative F would increase the miles of non-motorized trail in the project area by about 8 miles and add about 40.8 miles of summer non-motorized trails to the existing 2.9 miles on the authorized NFS trail system (Table 3-116). Approximately 19.8 miles of unauthorized routes and 8 miles of NFS road would be converted to trail to meet standard trail construction/maintenance specifications, signage requirements, and drainage provisions as required by Design Features RE-11, RE-12, and RE-13.

Alternative F proposes 377 acres of helicopter logging, which may reduce the potential for existing non-motorized trails co-located on NFS roads to be reopened as roads facilitating

harvest activities. Alternative F would likely cause less damage and require fewer repairs to trails in areas with helicopter logging, and trail access may be restored more quickly than under Alternatives B, C, and D.

Under Alternative F, approximately 3,215 acres of winter motorized restriction area would be added to the existing 7,491-acre winter motorized restriction area in the project area (Table 3-117 and Map 33 in Appendix J). This addition would increase the area restricting motorized oversnow use to routes displayed on the Boise National Forest Winter Travel Map (USDA Forest Service 2014f) to 10,706 acres, thus reducing the area where motorized oversnow use may occur. The addition would decrease the potential for damage from snowmobile use on the non-motorized winter trail system in the project area and meet MA 7 Objective 0773, as described in the Forest Plan errata in Appendix I of this document.

Alternative F would maintain existing access to the Elk Horn, Banner Ridge, Rocky Ridge, Skyline, and Whispering Pine Yurts in both the summer and winter (Table 3-118). This alternative would maintain the existing winter season access to the Stargaze Yurt but only allow motorized summer access to this yurt from June 16 to September 14. NFS road 394B would be seasonally closed from September 15 to June 15, annually; therefore, access to Stargaze Yurt would be non-motorized during that time period (Table 3-118 and Appendix J, Map 32). Much of the closure period is during the winter season when the roads cannot be accessed by motorized wheeled vehicles due to snow. Therefore, the seasonal closure would only impact motorized wheeled vehicle access during the shoulder seasons of spring and fall. Summer season motorized wheeled vehicle access would be allowed on NFS roads 362F and 394B after June 15. Shoulder season use of the Stargaze Yurt may be reduced under this alternative due to the season closure to motorized wheeled vehicles.

Cumulative Effects

Alternative A

Under Alternative A, cumulative effects for the recreation access indicator would not exist because there are no direct or indirect effects under this alternative.

Action Alternatives

Table 1 in Appendix B identifies which past activities were considered for this cumulative effects analysis. The impacts of past activities have contributed to the existing conditions for recreational access and opportunities in the project area and, therefore, are included in the affected environment discussed in section 3.7.4.1.

Table 1 in Appendix B identifies which present/ongoing activities were considered for this cumulative effects analysis. Ongoing activities such as road use and maintenance, trail use and maintenance, livestock grazing, IDPR cost-share agreement activities, snow grooming, noxious weed treatment, minerals activities, and fire suppression would be expected to continue within the project area. Minor recreational access disruptions have occurred and may continue to occur during scheduled maintenance of NFS roads and trails in the project area. Recreational users may encounter livestock during their visits to the project area, depending on the time of year and the grazing rotation and routing patterns. In addition, areas could be temporarily closed to visitors during fire suppression activities to mitigate public

health and safety hazards. Although proposed alternatives could incrementally add to the effects of present and ongoing activities, implementing the design features discussed above should prevent the proposed and present activities from substantially altering recreational access for visitors, particularly during the high-use periods.

Table 1 in Appendix B identifies which reasonably foreseeable activities were considered for this cumulative effects analysis. No cumulative effects activities would incrementally add to the effects of these alternatives; therefore, no cumulative effects to this indicator would be expected with implementing the action alternatives.

3.7.5 Public Safety Indicator

3.7.5.1 Noxious Weed Treatment

Herbicide use to treat noxious weeds in the project area does occur as part of the Boise National Forest Noxious Weed Treatment program. Appendix E of this document describes the biological controls, mechanical treatments, and herbicide use that may have been used in the project area.

Using pesticides, including herbicides, on NFS lands is based on the effectiveness of the pesticide but also on an understanding of the risks associated with its use. For the pesticides commonly used by the Forest Service in its management activities, Human Health and Ecological Risk Assessments have been prepared. In these documents, the process of risk assessment is used to quantitatively evaluate the probability (i.e., risk) that a pesticide use might pose harm to humans or other species in the environment. It is the same assessment process used for regulation of allowable residues of pesticides in food, as well as for safety evaluations of medicines, cosmetics, and other chemicals. The Forest Service Forest Health web site[32] for Pesticide-Use Risk Assessments states that existing Human Health and Ecological Risk Assessments for pesticide treatments completed by the Forest Service may be used in lieu of project-specific risk assessments (USDA Forest Service 2015d). All herbicides currently used in the Boise National Forest and in the project area (Appendix E) have had a risk assessment completed (available in the project record). The risk of noxious weed treatment to the human environment as part of this project will not be discussed further.

3.7.5.2 Affected Environment

Motorized mixed use is defined as the use of a road by both highway-legal and nonhighway-legal vehicles. In 2009, Idaho Senate Bill 1098 modified the Idaho Code with respect to OHV licensing requirements. Although responsible OHV recreation is welcome on NFS roads, this new law changed OHV operator licensing requirements by allowing any person under the age of 16 to operate an OHV on all federal lands open to such use. Motorized use designations on national forests in Idaho were formed by the previous Idaho law prohibiting OHV use by unlicensed drivers on roads open to passenger vehicles. Trails designated for OHV use were unaffected by Senate Bill 1098. The National Travel Management Rule (36 CFR 212) requires that mixed-use safety be considered in designating roads/trails for motorized use. In late 2010, Idaho forests initiated motorized mixed-use safety reviews of the primary transportation system with unlicensed OHV operators in mind, identifying roads that might require additional safety measures in order to allow continued OHV and passenger

[32] http://www.fs.fed.us/foresthealth/pesticide/risk.shtml

vehicle mixed use. In 2011, the Idaho legislature passed Senate Bill 1001, which requires underage operators on NFS roads to complete an OHV safety course. This legislation is an important factor in completing the final risk analysis and will be one component of the Forest Service's plan to mitigate mixed-use risk while allowing continued OHV recreation on the vast majority of NFS roads.

The existing motorized transportation and trail systems in the project area can be attributed to past vegetation; motorized route designation; and IDPR, Boise County, and 8A Snowmobile Club cost-share agreement activities (Table 1 in Appendix B). Road construction associated with past vegetation management activities has contributed to the transportation system in the project area. Additionally, travel management decisions on the Idaho City Ranger District have affected motorized access in the project area by designating the roads open to motorized use, as well as the types of authorized vehicles. Past trail construction activities have contributed to the non-motorized trail system. IDPR developed a non-motorized trail system in conjunction with their yurt rental system. Agreements with the State of Idaho, Boise County, and 8A Snowmobile Club have historically provided winter access in the analysis via groomed snowmobile trails and non-motorized groomed and ungroomed trails. Past activities have altered the miles of roads/trails providing motorized access for recreation users, as well as the non-motorized trail access in the project area.

Currently, mixed use between full-sized vehicles and OHVs in the summer season may occur on 78.6 miles of NFS ML 2 and ML 3 roads in the project area (Table 3-119). Summer season shared-use routes in the project area are routes authorized for non-motorized and motorized uses. Although non-motorized recreation users may use open NFS roads in the project area, no routes are specifically authorized for shared use.

Winter season shared use may occur where non-motorized oversnow trails interact with groomed snowmobile trails in the vicinity of the Whoop-Um Up Trailhead and Edna Creek Campground. The IDPR agreement requires trail intersections be signed with warning signs and/or stop signs where right-a-way is not apparent to provide for trail user safety (Trail Sign Guide available in the project record). Currently, 11,836 acres of the project area are open for motorized cross-country oversnow travel from November 1 to May 15, as snow conditions allow (USDA Forest Service 2014f). This area overlaps with portions of the existing non-motorized winter trail system, which increases the potential for non-motorized and motorized winter recreation user conflicts in this area (Appendix J, Map 4).

3.7.5.3 Environmental Effects

Direct and Indirect Effects

Alternative A

Alternative A would have no direct or indirect effects on mixed use or shared use in the project area because no modifications to the transportation and/or trail system would be implemented. Alternative A would not change the miles or mixed use or shared use in the project area from existing conditions (Table 3-119 and Table 3-120).

Table 3-119. Summary of summer season mixed use by alternative

Summer Mixed Use	Alt. A (No Action)	Alt. B (Proposed Action)	Alt. C	Alt. D	Alt. E	Alt. F
Miles of National Forest System (NFS) Maintenance Level 2 (ML 2) and ML 3 roads with full-sized vehicles and OHV mixed use	78.6	49.9	54.4	54.4	49.9	54.4
Miles of mixed use on designated NFS motorized trail co-located on NFS ML 2 roads (Administrative Use Only)	0	6.3	6.3	6.3	0	5.6
Total Miles	**78.6**	**56.2**	**60.7**	**60.7**	**49.9**	**60.0**

Alternative B (Proposed Action)

Alternative B would decrease mixed use in the project area through transportation system actions such as road decommissioning, road closures, conversion to trail, and motorized trail designation. This alternative would reduce routes with mixed use by about 22.4 miles, thus reducing the potential for conflict between highway-legal and nonhighway-legal vehicles in the project area. Approximately 49.9 miles of NFS ML 2 and ML 3 roads have the potential for mixed use with implementation of this alternative (Table 3-119). Under Alternative B, a potential exists for mixed use on NFS ML 2 roads closed to the public but open for administrative use only and co-located with 6.3 miles of designated motorized trails (Table 3-119). Mixed use on these roads would only occur when the road is used by full-sized vehicles for administrative purposes, such as IDPR access to yurts for cleaning and/or maintenance.

The miles of routes with shared use between motorized and non-motorized uses would increase by about 9.6 miles under this alternative (Table 3-120). Alternative B would have 7.7 miles of NFS ML-2 roads closed to the public but open for administrative use only, along with co-located non-motorized trail. Shared use on these roads would only occur in the event that the road is used by motorized vehicles for administrative purposes. Alternative B would also have about 1.9 miles of non-motorized trails co-located with designated motorized trails, increasing the potential for non-motorized and motorized conflict on those trail segments (Table 3-120). Alternative B would continue to have the potential for winter non-motorized and motorized recreation user conflicts in the 11,836-acre portion of the project area allowing for motorized oversnow use and overlapping the winter non-motorized trail system (Appendix J, Map 11). The potential for winter season shared use would be expected to continue where non-motorized oversnow trails interact with groomed snowmobile trails in the vicinity of the Whoop-Um Up Trailhead and Edna Creek Campground. The IDPR agreement requires trail intersections be signed with warning signs and/or stop signs where right-a-way is not apparent to provide for trail user safety (Trail Sign Guide available in the project record).

Table 3-120. Summary of summer season shared use by alternative

Summer Shared Use	Alt. A (No Action)	Alt. B (Proposed Action)	Alt. C	Alt. D	Alt. E	Alt. F
Miles of designated motorized trail co-located with non-motorized trail	0	1.9	1.6	1.6	0	1.6
Miles of National Forest System Maintenance Level 2 (ML-2) road (Administrative Use Only) co-located with non-motorized trail	0	7.7	4.0	4.0	9.3	4.0
Total Miles	**0**	**9.6**	**5.6**	**5.6**	**9.3**	**5.6**

Alternatives C and D

Alternatives C and D would reduce the miles of routes with the potential for mixed use and increase the miles with the potential for shared use in the project area. The effects of Alternatives C and D would be the same as those described for Alternative B in section 3.7.5.3, except as described below.

Alternatives C and D would reduce the miles with the potential for mixed use between highway-legal and nonhighway-legal vehicles by 17.9 miles. The miles of NFS ML 2 and ML 3 roads with the potential for mixed use would decrease from 78.6 miles to 54.4 miles under Alternatives C and D (Table 3-119).

Shared use in the project area would increase over existing conditions by about 5.6 miles under these alternatives (Table 3-120). Alternatives C and D would have about 4.0 miles of NFS ML 2 roads closed to the public but open for administrative use only and co-located with non-motorized trail. Shared use on these roads would only occur in the event that the road is used by motorized vehicles for administrative purposes. Alternatives C and D would also have about 1.6 miles of non-motorized trails co-located with designated motorized trails, increasing the potential for non-motorized and motorized conflict on those trail segments.

Alternative C would reduce the potential for conflicts between motorized and non-motorized users in the winter by adding a 3,215-acre winter motorized restriction area surrounding the existing non-motorized winter trail system. (Appendix J, Map 15). This addition would decrease the potential for damage from snowmobile use on the non-motorized winter trail system in the project area and meet MA 7 Objective 0773, as described in the Forest Plan errata in Appendix I of this document. Separation of motorized and non-motorized winter users would provide a safer recreation user experience by reducing the potential for conflicts between user types.

Alternative D would have the same effects as Alternative B for winter shared-use miles.

Alternative E

Alternative E would reduce miles of routes with the potential for mixed use and increase miles with the potential for shared use in the project area. The effects of Alternative E would be the same as those described for Alternative B in section 3.7.5.3, except as described below.

Alternative E would reduce miles with the potential for mixed use between highway-legal and nonhighway-legal vehicles by 28.7 miles. The miles of NFS ML 2 and 3 roads with the potential for mixed use would decrease from 78.6 miles to 49.9 miles under Alternative E (Table 3-119). Alternative E would not have the potential for mixed use on the designated motorized trail co-located on NFS ML 2 and ML 3 roads, given that Alternative E would not designate a motorized trail system.

Shared use in the project area would increase over existing conditions by about 9.3 miles under this alternative (Table 3-120). Alternative E would have about 9.3 miles of NFS ML 2 roads closed to the public but open for administrative use only and co-located with non-motorized trail. Shared use on these roads would only occur in the event that the road is used by motorized vehicles for administrative purposes. Alternative E would not have non-motorized trails co-located with designated motorized trails, thus reducing the potential for conflicts between non-motorized and motorized users.

Alternative E would reduce the potential for conflicts between motorized and non-motorized users in the winter by adding a 3,215-acre winter motorized restriction area surrounding the existing non-motorized winter trail system. restricting motorized oversnow use to groomed routes but only around those in proximity to the winter non-motorized trails that were not previously located in a winter motorized restriction area (Appendix J, Map 27). This addition would decrease the potential for damage from snowmobile use on the non-motorized winter trail system in the project area and meet MA 7 Objective 0773, as described in the Forest Plan errata in Appendix I of this document.

Alternative F

Alternative F would reduce miles of routes with the potential for mixed use and increase miles with the potential for shared use in the project area. The effects of Alternative F would be the same as those described for Alternative B in section 3.7.5.3, except as described below.

Alternative F would reduce miles with the potential for mixed use between highway-legal and nonhighway-legal vehicles by 18.6 miles. The miles of NFS ML 2 and ML 3 roads with the potential for mixed use would decrease from 78.6 miles to 54.4 miles under Alternative F (Table 3-119). Under Alternative F, the potential of mixed use would exist on NFS ML 2 roads closed to the public but open for administrative use only and co-located with 5.6 miles of designated motorized trail. Mixed use on these roads would only occur when the road is used by full-sized vehicles for administrative purposes, such as IDPR access to yurts for cleaning and/or maintenance.

Shared use in the project area would increase over existing conditions by about 5.6 miles under this alternative (Table 3-120). Alternative F would have about 4.0 miles of NFS ML 2 roads closed to the public but open for administrative use only and co-located with non-motorized trail. Shared use on these roads would only occur in the event that the road is used by motorized vehicles for administrative purposes. Alternative F would also have about 1.6 miles of non-motorized trails co-located with designated motorized trails, which would increase the potential for non-motorized and motorized conflict on those trail segments.

Alternative E would reduce the potential for conflicts between motorized and non-motorized users in the winter by adding a 3,215-acre winter motorized restriction area surrounding the

existing non-motorized winter trail system. restricting motorized oversnow use to groomed routes but only around those in proximity to the winter non-motorized trails that were not previously located in a winter motorized restriction area (Appendix J, Map 33). This addition would decrease the potential for damage from snowmobile use on the non-motorized winter trail system in the project area and meet MA 7 Objective 0773, as described in the Forest Plan errata in Appendix I of this document.

Cumulative Effects

Alternative A

Under Alternative A, cumulative effects for the public safety indicator would not exist because no direct or indirect effects occur under this alternative.

Action Alternatives

Table 1 in Appendix B identifies past, present/ongoing, and reasonably foreseeable activities considered for this cumulative effects analysis. The impacts of past activities have contributed to the existing conditions for public safety in the project area and, therefore, are included in the affected environment discussed in section 3.7.4.1. Ongoing activities, such as road use, trail use, IDPR cost-share agreement activities, livestock grazing, fire suppression , and snow grooming, would likely continue within the project area. Minor recreational access disruptions have occurred and may continue to do so during scheduled maintenance of NFS roads and trails in the project area. Recreational users may encounter livestock during their visits to the project area, depending on the time of year and the grazing rotation and routing patterns. In addition, areas could be temporarily closed to visitors during fire suppression activities to mitigate public health and safety hazards. None of the present/ongoing activities would be expected to incrementally add to the effects of these alternatives; therefore, no cumulative effects would be expected.

No cumulative effects activities would incrementally add to the effects of these alternatives; therefore, no cumulative effects to this indicator would be expected with implementation.

3.7.6 Recreation Opportunity Spectrum Indicator

3.7.6.1 Affected Environment

The ROS (USDA Forest Service 1986) is a classification system in which components of recreation settings and facilities, such as access, developed sites/facilities, activities, and experiences, are organized and arranged along a continuum or spectrum. The continuum ranges from very primitive settings and experiences to highly concentrated, urbanized ones. Each class is defined in terms of its specific combination of activities, setting, facilities, and experience opportunities.

The ROS provides a framework for defining the types of outdoor recreation settings, opportunities, and experiences that exist or could be provided in a given area. It also provides a context and tool for estimating and describing recreation resources as well as effects to those resources from alternative management strategies and actions.

Two summer ROS classifications occur in the project area: Roaded Modified (13,263 acres) and Roaded Natural (5,923 acres) (Figure 3-96; Boise National Forest, Summer ROS GIS

data). Winter ROS for the project area occurs in 3 ROS classifications: Roaded Natural (4,443 acres), Semi-primitive Motorized (8,280 acres), and Semi-primitive Non-motorized (6,463 acres) (Figure 3-97; Boise National Forest, Winter ROS GIS data).

Roaded Natural areas are characterized by a predominantly natural or natural-appearing environment with moderate evidence of the sights and sounds of people. Such evidence usually harmonizes with the natural environment. Interaction between users may be moderate to high, with evidence of other users prevalent. Resource modification and utilization practices are evident but harmonize with the natural environment. Conventional motorized use is allowed and incorporated into construction standards and design of facilities. Summer activities may include viewing scenery, using motorized vehicles, bicycling, hiking, horseback riding, camping, and hunting. Winter activities may include ice and snowcraft, sledding, downhill skiing, snowshoeing, cross-country skiing, and snowplay (USDA Forest Service 1986, pp. II-31 to II-33).

Roaded Modified areas provide for a range of recreational experiences consistent with substantially modified, motorized settings in which the sights and sounds of humans are readily evident and the interaction between users can range from low to high. Camping experiences are relatively primitive, with few onsite facilities provided. The area is very accessible using the numerous roads. Ample evidence of human activity includes roads, extensively logged timber stands, skid trails, and log landings. Visitors have a low probability of experiencing solitude and risk, but a moderate chance of enjoying a sense of closeness to nature, depending on the timing of their visits. Opportunities for challenge and risk are minimal. Summer activities may include viewing scenery, using motorized vehicles, bicycling, hiking, horseback riding, camping, and hunting. Winter activities may include ice and snowcraft, sledding, downhill skiing, snowshoeing, cross-country skiing, and snowplay (USDA Forest Service 1986, pp. II-31 to II-33).

Semi-primitive Motorized areas are characterized by a predominantly natural or natural-appearing environment of moderate to large size. Concentration of users is low, but evidence of other users is often present. The area is managed in such a way that minimum onsite controls and restrictions may be present but would be subtle. Motorized use is permitted. Summer activities may include viewing scenery, using motorized vehicle, bicycling, hiking, horseback riding, camping, and hunting. Winter activities may include icecraft and snowcraft, sledding, downhill skiing, snowshoeing, cross-country skiing, and snowplay (USDA Forest Service 1986, pp. II-31 to II-33).

Semi-primitive Non-motorized areas are characterized by a predominantly natural or natural-appearing environment of moderate to large size. Interaction between users is low, but evidence of other users is often present. The area is managed in such a way that minimum onsite controls and restrictions may be present but would be subtle. Motorized recreation use is not permitted, but primitive roads used for other resource management activities may be present on a limited basis. Use of such roads may be restricted to minimize impacts on recreational experience opportunities or other resources. Summer activities may include viewing scenery, using motorized vehicles, bicycling, hiking, horseback riding, camping, and hunting. Winter activities may include downhill skiing, snowshoeing, cross-country skiing, and snowplay (USDA Forest Service 1986, pp. II-31 to II-33).

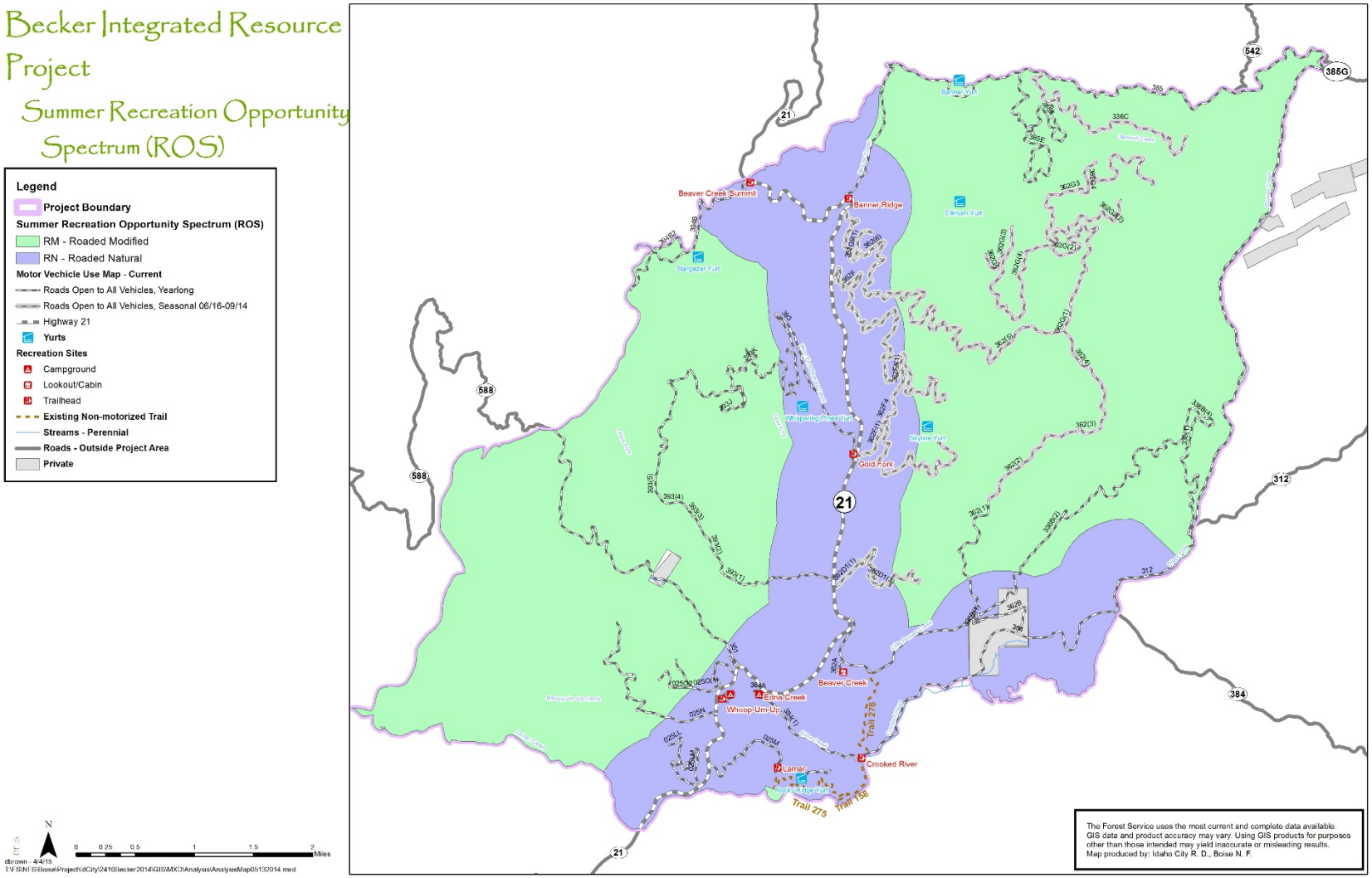

Figure 3-96. Becker project area summer Recreation Opportunity Spectrum (ROS) map

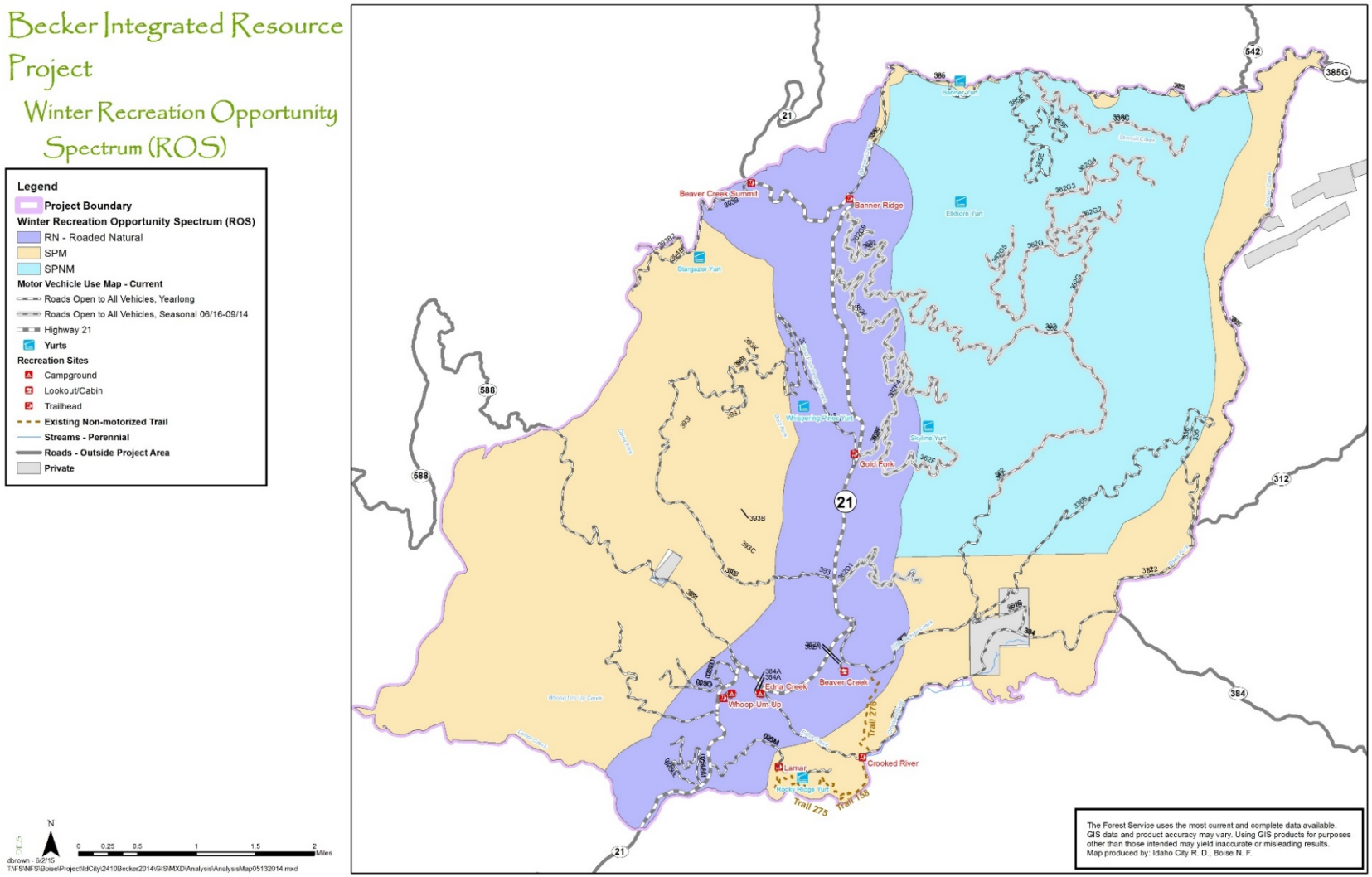

Figure 3-97. Becker project area winter Recreation Opportunity Spectrum (ROS) map

3.7.6.2 Environmental Effects

Direct and Indirect Effects

Alternative A (No Action)

Under Alternative A, no changes are proposed to the current NFS transportation system, NFS non-motorized trail system, or winter recreation opportunities in the project area; therefore, no change to the current ROS classifications would be expected. Alternative A would be consistent with the ROS classifications in the project area.

Alternative B (Proposed Action) and Alternative D

Neither Alternative B nor Alternative D would have direct or indirect effects to summer or winter ROS classifications because the activities proposed in the project area are consistent with current ROS classifications. Implementing either alternative would, however, modify the long-term NFS transportation system in the project area by designating motorized trails, relocating NFS roads, closing NFS roads to public motorized access, and decommissioning roads (Table 3-114). These changes to the transportation system would be consistent with the activities, setting, facilities, and experience opportunities of the current summer ROS classifications of Roaded Natural and Roaded Modified. Both Alternatives B and D would authorize about 60.2 miles of existing winter (oversnow) non-motorized trails in areas classified in the Roaded Natural, Semi-primitive Non-motorized, and Semi-primitive Motorized ROS categories for the winter months. Approximately 29.2 miles of winter non-motorized trails would continue to be groomed by IDPR. These alternatives would maintain the existing 7,491-acre winter motorized restriction area in the project area currently classified as Semi-primitive Non-motorized ROS. Implementing either of these alternatives would be consistent with activities, setting, facilities, and experience opportunities of the current winter ROS classifications in the project area.

Alternative C, E, and F

Alternatives C, E, or F would not be expected to have direct or indirect effects to summer or winter ROS classifications within the project area. Implementing any of these action alternatives would, however, modify the long-term NFS transportation system in the project area by designating motorized trails, relocating NFS roads, closing NFS roads to public motorized access, and decommissioning roads (Table 3-114). These changes to the transportation system would be consistent with activities, setting, facilities, and experience opportunities of the current summer ROS classifications of Roaded Natural and Roaded Modified. Each of these alternatives would authorize about 60.2 miles of existing winter (oversnow) non-motorized trails in areas classified in the Roaded Natural, Semi-primitive Non-motorized, and Semi-primitive Motorized ROS categories for the winter (Table 3-119). Approximately 29.2 miles of the winter non-motorized trails would continue to be groomed by IDPR. Approximately 3,215 acres of a new winter motorized restriction would be added under each of these alternatives in areas classified as Roaded Natural and Semi-primitive Motorized ROS during the winter. This addition would not impact the Forest Plan ROS classifications of these areas because activities can be more restrictive than the assigned ROS classifications to allow for site-specific management (USDA Forest Service 1986). Addition

of the new winter motorized restriction areas would allow the Forest to manage the winter non-motorized trail system while still providing for winter motorized use in other areas in the project area. Implementing any of these alternatives would be consistent with activities, setting, facilities, and experience opportunities of the current winter ROS classifications in the project area.

Cumulative Effects

Alternative A

Under Alternative A, cumulative effects for the ROS indicator would not exist because no direct or indirect effects occur under this alternative.

Action Alternatives

Given that, within the project area, no direct or indirect effects to the existing ROS classifications would occur, no cumulative effects regarding the ROS classifications would be expected with the implementation of any of the action alternatives.

3.8 FISHERIES RESOURCES

The following changes were made between the DEIS and FEIS:

General edits were completed to improve clarity and readability of the section.

Effects in RCAs were updated to reflect the changes to the RCA no treatment buffer that occurred between DEIS and FEIS. Refer to section 2.4.2 for detailed description of the RCAs delineation for the RCAs.

This section incorporates by reference the fisheries specialist report (see project record), which contains the detailed data, methodologies, analyses, conclusions, maps, references, and technical documentation. This section summarizes the effects of the alternatives upon fisheries and addresses the issue that proposed management activities may affect individuals, populations, or habitats of fish species in the project area.

3.8.1 Analysis Scale, Data Sources, and Methodology

3.8.1.1 Analysis Scale

Direct, indirect, and cumulative effects were tracked at the subwatershed scale (6th field HUC—National Hydrography Dataset). For the Becker Integrated Resource Project, this includes 2 subwatersheds: the Middle Crooked River subwatershed and the Pikes Fork subwatershed. The subwatershed scale best describes resource conditions and estimated potential effects consistent with applicable Forest Plan direction, including aquatic resource standards and guides and the Matrix of Pathways and WCIs. This scale also addresses forest-specific goals described in the Forest Plan ACS and national goals in the WCF (USDA Forest Service 2011). Additionally, the subwatershed scale (10,000–40,000 acres) is similar to the spatial scale of the project boundary (approximately 19,000 acres).

Analysis timeframes were chosen to disclose the temporary (0-3 years), short-term (3–15 years), and long-term (15+ years) effects for the relevant Matrix of Pathways and WCIs as recommended under Forest Plan standards SWTS01 and SWTS04.

Proposed activities outside RCAs are not expected to result in measureable/immeasurable or direct/indirect effects on ESA-listed fish species or to USFWS-designated bull trout critical habitat. Potential effects on bull trout and their habitat inside the RCA were analyzed at the stream reach, especially when occurring within the Forest's "suitable, potentially occupied habitat," the Forest's "suitable but unoccupied" bull trout patches, and USFWS-designated critical bull trout habitat.

3.8.1.2 Data Sources

Data used include GIS layers, the Forest's aquatic survey database (USDA Forest Service 2014a), baseline descriptions and data for the affected subwatersheds, and project-specific surveys and observations. The environmental baseline was completed at the subwatershed scale. Stream surveys have been conducted on various rivers and streams throughout the project area for decades, and stream data for this analysis come from

information stored in the Forest's fisheries database. Fish surveys have concentrated on streams believed to be capable of supporting fish populations.

Current Condition—Stream data for this analysis come from information stored in the Forest's fisheries database:

Crooked River

- Sampled n-2 (1994, 2000); no bull trout found within the project area.
- Crooked River is USFWS designated critical habitat for bull trout.
- Bull trout utilize this river as foraging, migration, and overwintering (FMO) habitat outside the project area.

Pikes Fork of Crooked River

- Sampled n-3 (1994–1996); no bull trout found within the project area.
- IDFG sampled n-11 (2003); no bull trout found.
- Pikes fork is within the Forest patch model for suitable but unoccupied bull trout habitat.
- Pikes Fork is USFWS designated critical habitat for bull trout.
- Bull trout have been found upstream outside of the project area.
- Bull trout utilize this river as FMO habitat outside the project area.

Sawmill Creek

- Sampled n-6 (1993–1999); no bull trout found.
- This creek is located within the Boise National Forest patch model for suitable but unoccupied bull trout habitat.

Banner Creek

- Sampled n-10 (1993–2014); bull trout found.
- This creek is located within the Forest patch model for suitable but unoccupied bull trout habitat.
- This creek is USFWS designated critical habitat for bull trout.

Beaver Creek

- Sampled n-8 (1997–2006); no bull trout found.
- The headwaters of this creek are located within Boise National Forest patch model for unsuitable bull trout habitat.

West Fork Beaver Creek

- Sampled n-2 (1993, 2006); no bull trout found.
- This creek is located within the Forest patch model for unsuitable bull trout habitat.

Little Beaver Creek

- Sampled n-5 (1993, 2006); no bull trout found in the project area.
- This creek is located within the Forest patch model for unsuitable bull trout habitat.
- Surveyors found no detection of bull trout environmental DNA (eDNA) in 2014 (Carim et al. 2015).

China Fork of Beaver Creek

- Sampled n-2 (2006); no bull trout found in the project area.

Edna Creek

- Sampled n-7 (1993, 1995, 2006); no bull trout found.
- This creek is located inside Forest patch model for unsuitable bull trout habitat.
- Surveyors detected bull trout eDNA in 2014 (Carim et al. 2015).

Whoop-Um-Up Creek

- Sampled n-2 (1993); no bull trout found.
- Surveyors detected bull trout eDNA in 2015 (H. Roerick, Forest Fisheries Biologist, pers. comm.).

Lamar Creek

- Sampled n-2 (1993); no bull trout found in the project area.

3.8.1.3 Methodology

Methodology for the fisheries analysis consisted of delineating RCAs, determining the relevant and affected WCIs, and projecting effects on fish species and habitat based on a combination of literature reviews, modeling, and professional judgment.

Riparian Conservation Area Delineations

RCAs incorporate riparian areas along streams, as well as wetlands and floodplains associated with stream systems and ponds, lakes, and reservoirs. Aquatic and riparian systems may be affected by adjacent land management activities. RCAs provide a linkage and a transitional habitat between hillslopes and upland terrestrial habitats and the aquatic habitats within the stream channels. The Forest Plan outlines criteria to aid IDTs in delineating RCAs for perennial and intermittent streams, ponds, lakes, reservoirs, and wetlands (USDA Forest Service 2010a, Appendix B, pp. B-32–B-41). The objective of RCA delineation is to provide boundaries around streams for which management activities must consider and maintain riparian processes and functions important to overall stream and aquatic habitat functionality. Individual management activities may affect riparian process and functions in different ways and magnitudes, depending on the type of activity and its proximity to the stream channel, as well as the characteristics of the stream channel at that location.

RCAs were delineated using Option 2, as described in the Forest Plan (USDA Forest Service 2010b, Appendix B, pp. B-32–B-41), which uses SPTHs based on the dominant PVG in the stand (Table 3-121). Option 2 applies a single SPTH as the RCA width for intermittent stream channels (as well as ponds, lakes, reservoirs, and wetlands), and 2 SPTHs as the RCA width for perennial streams. Because the project area contains a wide array of PVGs, the dominant PVG based on the most recent vegetation data was used to delineate RCAs. Table 3-122 displays the delineated RCAs for the project area and overall acreage associated with RCAs within the project area, and Figure 3-98 displays the RCAs within each subwatershed.

Table 3-121. Site potential tree height distances, by Potential Vegetation Group, from the Boise National Forest Land and Resource Management Plan (USDA Forest Service 2010a)

Potential Vegetation Group	Age	1 Site Tree Height (feet)	2 Site Tree Heights (feet)
1—Dry Ponderosa Pine/Xeric Douglas-fir	200	110	220
2—Warm Dry Douglas-fir/Moist Ponderosa Pine	200	120	240
3—Cool Moist Douglas-fir	200	120	240
4—Cool Dry Douglas-fir	200	100	200
5—Dry Grand Fir	200	110	220
6—Cool Moist Grand Fir	200	130	260
7—Cool Dry Subalpine Fir	200	100	200
8—Cool Moist Subalpine Fir	200	100	200
9—Hydric Subalpine Fir	200	100	200
10—Persistent Lodgepole Pine	[a]	80	160
11—High-elevation Subalpine Fir	200	70	140

[a] In PVG 10, individual trees and stands normally do not achieve an average age of 200 years; however, mature lodgepole pine site trees can achieve an average height of approximately 80 feet.

Table 3-122. Acres of riparian conservation area (RCA) by subwatershed

Subwatershed	Acres of RCA
Middle Crooked River	4,518
Pikes Fork	1,046
Total	**5,564**

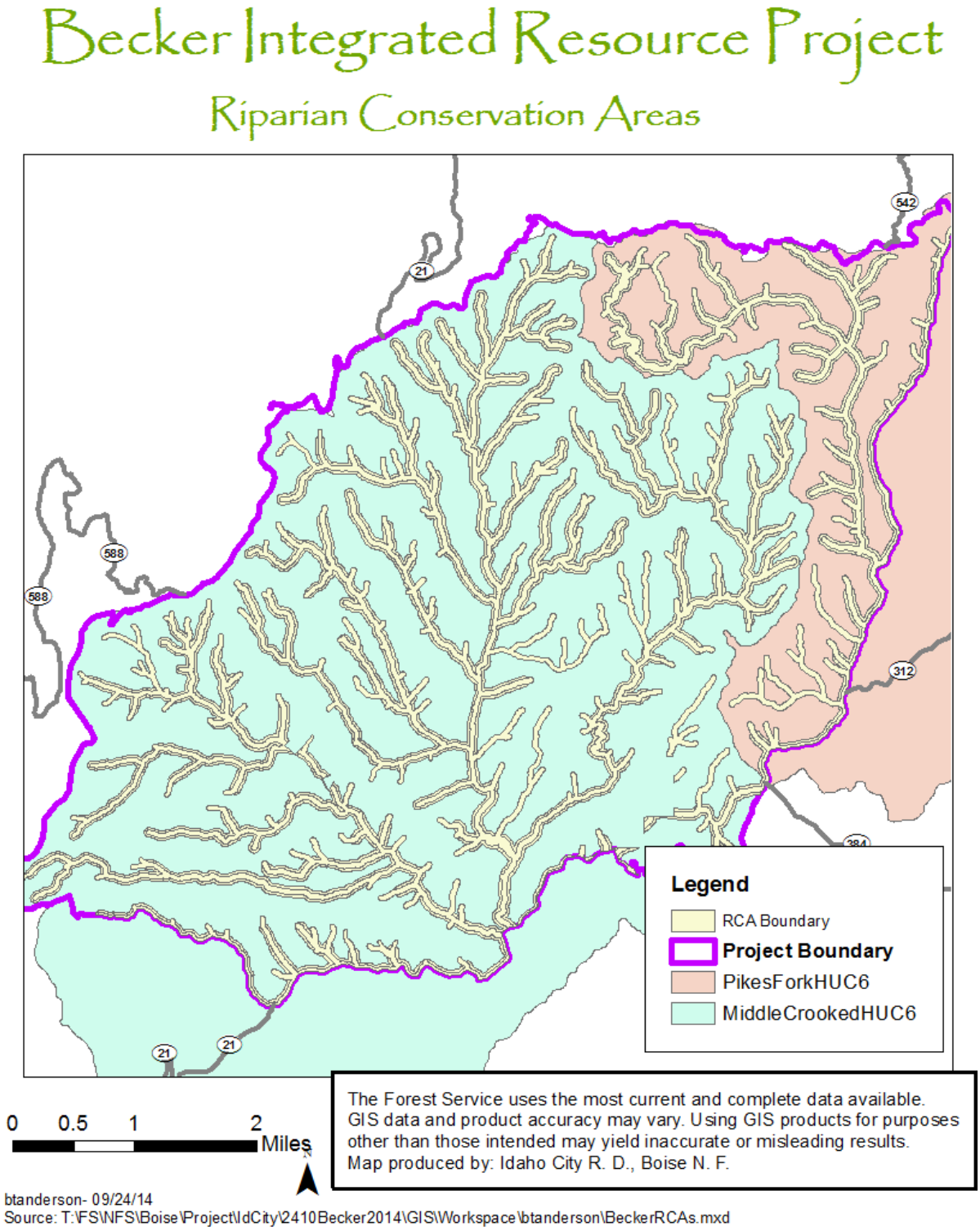

Figure 3-98. Becker Integrated Resource Project Riparian Conservation Areas (RCAs) and subwatersheds

Proposed management actions within RCAs have been evaluated with consideration of riparian functions and processes. Distances (from streams) for activities proposed within RCAs have been delineated, based on anticipated effects related to site conditions, surveys, modeling results, existing research, and professional judgment. Activities proposed within RCA buffers at various distances from the stream channel, vegetation management activities associated with Purpose and Need 1 (thinning, thinning with product removal and burning), transportation management activities associated with Purpose and Need 2 (road realignment and road decommissioning [both authorized and unauthorized]), and recreation management activities associated with Purpose and Need 3 (motorized and non-motorized trail designation, and trailhead construction). See Table 2-5 and Table 2-6 for a complete list of activities and distances at which these activities may occur, and refer to Figure 2-1 for a graphical illustration of these criteria.

Analyses of potential effects to RCA processes and functions from implementing the proposed activities are discussed in section 3.8.2, using the analysis indicators identified in that section. The stream temperature, sediment/turbidity (bull trout and other fishes) and substrate embeddedness, change in peak/base flows, change in drainage network/road density and location, and disturbance history/disturbance regime WCIs related to RCA functions and processes are analyzed in the hydrology section.

Watershed Condition Indicators

Appendix B of the Forest Plan (USDA Forest Service 2010a), also referred to as the "Matrix," comprises a decision support tool developed to assist land managers in describing the existing conditions and assessing how well management actions affect watershed and fisheries resources' goals and objectives. There are 4 components/tables in the Matrix, with each table divided into 8 overall pathways (major rows). Each of these rows represents a significant pathway by which actions can have potential effects on native and desired nonnative fish species, their habitats, and associated water quality beneficial uses. The pathways are further broken down into 24 WCIs.

The pathways and WCIs constitute an integrated suite of aquatic (including biophysical components), riparian (including riparian-associated vegetation species), and hydrologic (including uplands) condition measures intended to be used at a variety of scales. WCIs represent a diagnostic means to determine current condition and to assist in determining future conditions caused by the direct, indirect, and cumulative effects associated with the implementation of management actions or natural restoration over time.

Fisheries Resource

Fish Species Analyzed

Bull Trout and Bull Trout Critical Habitat

On June 10, 1998, the USFWS produced a final rule listing the Columbia River Basin distinct population segment of bull trout (*Salvelinus confluentus*) as threatened under the ESA (USDI FWS 1998).

The biology, ecology, population status, and habitat conditions of bull trout are described in the following publications:

- *Draft Bull Trout Recovery Plan* (USDI FWS 2002a)
- *Ongoing Bull Trout Biological Assessment* (Burton and Erickson 1999)
- *Designation of Critical Habitat for the Klamath River and Columbia River Distinct Population Segments of Bull Trout* (USDI FWS 2010b)

The USFWS released the *Draft Bull Trout Recovery Plan* in compliance with Section 7 of the ESA. Each state within the historic range of bull trout has recovery units, designated core areas, critical habitat units, and management directives (USDI FWS 2002b). The Southwest Idaho Recovery Unit includes the Boise River, Payette River, and Weiser River basins.

The *Bull Trout Recovery Plan* uses criteria such as habitat quality, historic documentation of presence, recent documentation of presence, land use, and presence of potentially competitive species. The recovery unit team identified priority streams to focus the implementation of recovery activities on areas with the greatest potential for supporting bull trout. The priority streams include known bull trout spawning streams, streams with evidence of bull trout recruitment and early life stage rearing, and stream habitat possessing the conditions and elements necessary for bull trout occupancy.

The goal and objectives of the *Bull Trout Recovery Plan* are to ensure the long-term persistence of self-sustaining, complex, interacting groups of bull trout distributed throughout the species' native range, so that the species can be delisted. To achieve this goal, the following objectives have been identified for bull trout in the Southwestern Idaho Recovery Unit: 1) maintain current distribution of bull trout and restore distribution in previously occupied areas; 2) maintain stable or increasing trends in abundance of bull trout; 3) restore and maintain suitable habitat conditions for all bull trout life history stages and strategies; and 4) conserve genetic diversity and provide opportunity for genetic exchange.

Fish Species Not Analyzed

Westslope Cutthroat Trout

Westslope cutthroat trout (*Oncorhynchus clarkii lewisi*) are listed as a sensitive species by the Regional Forester (USDA Forest Service 2013). No cutthroat trout are known to be native to major Snake River tributaries below Shoshone Falls, such as the Wood, Weiser, Boise, Payette, Owyhee, and Malheur rivers (Behnke 1992). Any cutthroat trout within the Boise River drainage is likely due to historic fish stocking practices. As a result, westslope cutthroat trout and their habitat within the historical range would not be impacted and, consequently, were not considered further in this effects analysis.

Management Indicator Species

Bull trout are the only fish MIS in the Forest Plan (USDA Forest Service 2010a, Appendix E, p. E-3).

Other Species

Rainbow/redband trout (*O. mykiss*) have been found throughout the Boise River drainage. Redband trout are the native subspecies of rainbow trout; however, other subspecies of rainbow trout have been stocked in the Boise River drainage over the years, and the various

subspecies cannot be distinguished without genetic analysis. In addition, interbreeding between redband and nonnative subspecies complicates the population's genetics.

Various data from the Forest's aquatic survey database (USDA Forest Service 2014a) and local district data have shown populations of whitefish (*Prosopium* spp.), cutthroat trout (*O. clarkii*), brook trout (*S. fontinalis*), dace (*Rhinichthys* spp.), and sculpin (*Cottus* spp.) in the Boise River drainage and various tributaries (USDA Forest Service 2014a). Effects on these species and their habitat were not analyzed.

3.8.2 Fisheries Analysis Process/Pathways and Watershed Condition Indicators

Analysis indicators represent metrics used to describe the cause-and-effect relationships between components of the proposed activities and desired conditions for attributes of stream health important for maintaining healthy fish populations, quality aquatic habitat, and water quality beneficial uses. Analysis indicators have been taken, where appropriate, from the list of WCIs in the Forest Plan (USDA Forest Service 2010a, Appendix B). Indicators used to estimate potential effects from proposed activities to aquatic resources come from two sources: the Forest Plan WCIs (see previous WCI discussion) and the *Draft Bull Trout Recovery Plan* (USDI FWS 2002a). The fisheries effects analysis also relied on information found in the hydrology technical report (see project record), particularly with respect to modeling for potential changes in sediment.

Determining which WCIs are present, relevant, and influential necessitated evaluating the 24 WCIs outlined in the Forest Plan to characterize current watershed, riparian, and aquatic conditions and the potential effects of proposed management activities on bull trout local populations, water quality, habitat access, habitat elements, channel conditions and dynamics, flow/hydrology, watershed conditions, and the integration of species and habitat conditions (USDA Forest Service 2010a, Appendix B, pp. B-12–B-21).

The baseline matrix (Appendices R and S in the fisheries technical report [project record]) was updated to reflect the current conditions. A summary of the current functional ratings and effects of each alternative for the relevant WCIs in the Middle Crooked River and Pikes Fork subwatershed are included in the following sections.

An additional indicator, Effects to Bull Trout Population Characteristics and Critical Habitat, evaluates how proposed activities may influence bull trout recovery by assessing effects to individual bull trout or designated critical habitat within the project area.

For this analysis, the following assumptions exist:

- Those associated with the characterization of existing (baseline) conditions for analysis indicators described in the "Affected Environment" sections below
- All project design features identified in Chapter 2 will be implemented in timely and effective manners

A full discussion of this process is located in the fisheries technical report (see project record). The fisheries analysis also relied on information found in the hydrology technical report (see project record), particularly with respect to modeling for sediment changes.Pathways and Watershed Condition Indicators

The following WCIs and pathways were used in this analysis:

Indicator: Bull Trout Population Characteristics (Local Population Size, Growth and Survival, Life History Diversity and Isolation, Persistence and Genetic Integrity WCIs)

- Concern: Vegetation management (commercial harvest and noncommercial thinning) in the RCA could result in falling trees within streams or rivers, which may kill or harass bull trout.
  - Methods: Methods include qualitative assessment of bull trout populations using available data included in section 3.8.1.2. Analysis includes the number of acres in USFWS-designated bull trout critical habitat and the Boise National Forest bull trout "habitat" patch model.
- Concern: Prescribed burning in the RCA could result in direct/indirect effects to this WCI based on exposed soils (Sediment WCI), LWD recruitment (LWD WCI), and chemicals near tributaries (Chemical Contamination WCI).
  - Methods: Methods include qualitative assessment included in the appropriate WCI.
- Concern: Transportation management (including temporary road construction, decommissioning/closure road activities, road reconstruction, converting unauthorized roads to NFS roads) could result in direct/indirect effects to this WCI based on exposed soils (Sediment WCI), LWD recruitment (LWD WCI), streambank condition (Streambank WCI), and chemicals near tributaries (Chemical Contamination WCI).
  - Methods: Methods include qualitative assessment included in the appropriate WCI.
- Concern: Culvert replacements may temporarily block fish passage within tributaries. Temporary adverse effects to individual fish could occur, including incidental handling injury and mortality when performing fish removal prior to culvert construction activities.
  - Methods: Methods include qualitative assessment of bull trout populations using available data included in section 3.8.1.2. Analysis includes number of acres in USFWS-designated bull trout critical habitat and the Boise National Forest bull trout "habitat" patch model.
- Concern: Recreation management (including construction of motorized trail, designation of non-motorized trail, and new trailhead construction) could affect bull trout habitat.
  - Methods: Methods include qualitative assessment of bull trout populations using available data included in section 3.8.1.2. Analysis includes number of acres in USFWS-designated bull trout critical habitat and the Boise National Forest bull trout "habitat" patch model.

Indicator: Chemical Contaminants/Excess Nutrients

- Concern: Accidental spill of petroleum-based products could occur inside the RCA.
- Concern: Magnesium chloride ($MgCl_2$) application on NFS road 384 could affect the RCA.
- Concern: Noxious weed treatments could affect the RCA.
- Concern: Snowmobile groomer operations could affect the RCA.
    - Methods: Methods include qualitative assessment of bull trout populations using available data included in section 3.8.1.2. Analysis includes number of acres in USFWS-designated bull trout critical habitat and the Boise National Forest bull trout "habitat" patch model.

Indicator: Physical Barriers

- Concern: During culvert replacements, bull trout passage may be temporarily obstructed upstream or downstream.
    - Methods: Methods include qualitative assessment of timing of activity.

Indicator: Large Woody Debris (LWD)

- Concern: Future LWD recruitment could be affected by vegetation management, prescribed burning, culvert replacement activities, transportation management, and recreation activities.
    - Methods: Methods include qualitative assessment of quantity of trees removed. Analysis includes number of acres of vegetation management, prescribed burning, culvert replacement activities, transportation management, and recreation activities in USFWS-designated bull trout critical habitat and the Forest bull trout "habitat" patch model.

Indicators: Pool Frequency/Quality and Large Pools and Width/Depth Maximum Ratio

- Concern: Increases in sediment from various project activities described in the hydrology technical report (project record) could fill or alter these WCIs.
    - Methods: Methods include qualitative assessment of location of activities and effects to bull trout habitat. Analysis includes number of acres of project activities in USFWS-designated bull trout critical habitat and the Forest bull trout "habitat" patch model.

Indicator: Refugia

- Concern: Various project implementations within the RCA as part of vegetation management, prescribed burning, culvert replacement activities, transportation management, and recreation activities could alter bull trout habitat requirements.
  - Methods: Methods include qualitative assessment of bull trout populations and habitat using available data included in section 3.8.1.2. Analysis includes number of acres of vegetation management, prescribed burning, culvert replacement activities, transportation management, and recreation activities in USFWS-designated bull trout critical habitat and the Forest bull trout "habitat" patch model.

Indicator: Streambank Condition

- Concern: Various project implementations near the streambank as part of vegetation management, prescribed burning, culvert replacement activities, transportation management, and recreation activities could damage this WCI.
  - Methods: Methods include quantitative assessment of the distance from the activities to the stream.

Indicator: Change in Peak/Base Flows, Change in Drainage Network/Road Density and Location, Disturbance History/Disturbance Regime

The hydrology section contains a full analysis of these WCIs.

Indicator: Riparian Conservation Areas

- Concern: Riparian functions and ecological processes may be negatively affected as a result of vegetation management, prescribed burning, culvert replacement activities, transportation management, and recreation activities.
  - Methods: Methods include qualitative assessment of various project activities within the RCA.

Indicator: Integration of Species and Habitat Conditions

- Concern: Various project implementations within the RCA as part of vegetation management, prescribed burning, culvert replacement activities, transportation management, and recreation activities could affect integration of the biophysical and aquatic habitat conditions.
  - Methods: Methods include qualitative assessment of bull trout population WCIs, bull trout habitat requirements, and previous WCI analysis. Analysis includes number of acres of activities in USFWS-designated bull trout critical habitat and the Forest bull trout "habitat" patch model.

3.8.3 Fisheries Resource Indicators

Indicator: Effects to Bull Trout Population Characteristics and Critical Habitat

- Concern: Project activities may affect bull trout recovery by affecting individual bull trout or designated critical habitat within the project area.
  - Methods: Methods include qualitative assessment of bull trout population characteristics (local population size, growth and survival, life history diversity and isolation, and persistence and genetic integrity WCIs) and bull trout habitat requirements (temperature, sediment/turbidity, physical barriers, LWD, pool frequency and quality, large pools/pool quality, refugia, width/depth maximum ratio, streambank condition, RCAs, and integration of species and habitat conditions WCIs).

3.8.4 Pathways and Watershed Condition Indicators—Affected Environment and Environmental Effects

3.8.4.1 Indicator: Bull Trout Population Characteristics (Local Population Size, Growth and Survival, Life History Diversity and Isolation, Persistence and Genetic Integrity WCIs)

Affected Environment

Desired Condition—The mean total local population size or local habitat capacity is greater than several thousand individuals and all life stages are represented. The local population has the resilience to recover from temporary or short-term disturbances or local population declines within 1 or 2 generations. The migratory form is present and the local populations are near each other. Migratory corridors and rearing habitat are in good-to-excellent condition. Connectivity is high between multiple local populations. Each of the relevant local populations has a low risk of extinction. The probability of hybridization or displacement by competitive species is low to nonexistent.

Current Condition—Middle Crooked River subwatershed is FUR for all bull trout WCIs because no local populations of bull trout have been documented within this HUC. Telemetry studies have documented migratory adults passing through this subwatershed. The upper North Fork Boise River local population is considered strong within the core area; other neighboring local populations within the core area are not considered strong. Connectivity between these local populations is constrained by barriers.

Fish presence/absence surveys in 1993, 1995, and 2006 did not detect bull trout in Edna Creek although brook trout are present throughout the Middle Crooked River subwatershed. Environmental DNA (eDNA) is a new surveillance tool used to monitor for the genetic presence of an aquatic species by collecting a water sample and testing the water for DNA. In September 2014, a sample was collected in Edna Creek and sent to the Rocky Mountain Research Station in Missoula, Montana, for processing. Bull trout DNA was detected in Edna Creek (Carim et al. 2015) within the project area.

Pikes Fork subwatershed is FUR for all bull trout WCIs because only a few bull trout have been detected within Banner Creek. No bull trout have been documented in Pikes Fork

within the project area, but bull trout have been located upstream outside the project area. The *Bull Trout Recovery Plan* (USDI FWS 2002a) identified Pikes Fork as potential spawning and rearing habitat. In addition, the Forest bull trout patch model classified this creek as "suitable but unoccupied" habitat. Many barriers (culverts) and nonnative species (e.g., brook trout) exist within this subwatershed.

Environmental Effects

The analysis for this WCI focused on proposed activities within the RCA and, more importantly, within designated critical habitat for bull trout or Forest "suitable but unoccupied habitat" as per the bull trout patch model. Furthermore, actions occurring near Edna Creek in the Middle Crooked River subwatershed were analyzed due to the new eDNA data suggesting bull trout may occupy that tributary.

Direct and Indirect Effects

Alternative A

This alternative does not propose any new management activities; however, current conditions in these subwatersheds suggest bull trout and their habitat are at risk. Existing migration barriers limit the diversity and abundance of accessible habitat and change community composition by limiting recolonization opportunities following events such as drought and floods. Under this alternative, no migration barriers would be replaced with AOP structures. Fish habitat would continue to be fragmented at the current level, decreasing gene flow and potential usable habitat.

RCA road densities would remain high and negatively affect this WCI, as well as pool quality/large pools, width/depth maximum pool ratio, and refugia WCIs. Furthermore, instream fine sediment levels would continue to be elevated due to roads. Dispersed recreation sites, along with various recreational activities (e.g., OHV, motorcycle use) are exhibiting immeasurable negative effects to critical bull trout habitat. These effects are visible along NFS roads 384 and 312 paralleling Crooked River and Pikes Fork of Crooked River (Pikes Fork), respectively. Although fish survey data show no bull trout in this river within the project area, it remains USFWS-designated critical habitat and researchers have classified Crooked River as FMO habitat. Pikes Fork has a high potential for establishing a local population of bull trout and is mentioned in the USFWS *Draft Bull Trout Recovery Plan* as potential spawning and rearing habitat. Improving the long-term core habitat values would increase the chances of bull trout migration into this tributary and of potential spawning and rearing habitat. The No Action Alternative would have immeasurably negative effects on both subwatersheds in the temporary, short, and long term.

Alternative B

The effects on bull trout and their habitat associated with the Proposed Action are not expected to change the functional ratings of any population characteristics WCIs (see discussions of affected WCIs below), and effects on bull trout or their habitat are expected to be localized and negligible for all proposed activities except culvert replacements. Potential adverse effects on individual fish include incidental handling injury and survival during fish removal before culvert replacement construction. Further, turbidity as a result of culvert replacements, could temporarily displace bull trout residing downstream. Finally, the

importance of direct and indirect effects on bull trout and their habitat from the proposed NFS roads 312/385 trailhead (near critical bull trout habitat) in the long term is unclear, because the level of use in the future is unknown. The analysis for this WCI focused on proposed actions within the RCA and, more importantly, within designated critical habitat for bull trout or Forest "suitable but unoccupied habitat" as per the bull trout patch model. Furthermore, actions occurring near Edna Creek in the Middle Crooked River subwatershed were analyzed due to the new eDNA data suggesting bull trout may occupy that tributary.

Indirect effects are not expected to be measurable in the temporary, short, or long-term timeframes associated with any of the proposed activities except sediment input (see sediment WCI section of the hydrology section). Indirect effects on bull trout would include effects on their prey base (terrestrial insects or macroinvertebrates) and on supporting habitat. Effects on the prey base are highly unlikely because no insecticide treatments are proposed and the majority of insects consumed by fish are associated with broadleaf riparian vegetation overhanging the streams, not with coniferous species. Wipfli (1997) found that young-growth, broadleaf riparian species provide fish with more terrestrial prey than do old-growth conifers in riparian areas. Cadwallader et al. (1980) demonstrated that overhanging vegetation was more important for terrestrial invertebrate inputs in some Victorian (Australia) streams and that terrestrial prey were more common in diets of fish from sites with overhanging vegetation. By implementing RCA no-treatment buffers, overhanging vegetation and broadleaf riparian species are not expected to be impacted by project activities. Additional indirect effects, such as increased fine sediment delivery, reduction in pool quality, magnesium chloride ($MgCl_2$) dust abatement application, or changes to water quality, are addressed below under the respective WCI.

The estimated temporary and future sediment delivery increases (see sediment WCI section of the hydrology section) are not expected to change this WCI's functional rating nor considerably affect bull trout., The described sediment increases would not impact USFWS-designated critical habitat, Forest "suitable, potentially occupied habitat," or Forest "suitable but unoccupied" bull trout patches. Furthermore, Design Features FH-25, TS-4, and TS-6 and the Forest Service's National BMPs Program would reduce the likelihood of exposed soils reaching streams. Potential effects from proposed activities on tributaries flowing into critical habitat is expected to be negligible because the stream network is expected to both transport and store the temporary sediment increase throughout the channel reach during an annual range of streamflow velocities (Wohl 2000), reducing the potential for site-specific deposition in usable bull trout habitat. Based on the hillslope sediment travel distances, the likelihood for the estimated "over natural" sediment delivered to tributaries is low and not expected to exist in quantities that would have an adverse effect on downstream fish species or negatively change their habitat. With project implementation is proposed over 15 years; it is expected that immeasurable amounts of sediment deposited would be deposited over time, with measurable decreases from restoration and road decommissioning realized over the long-term timeframe. Sediment inputs as a result of these proposed actions are not expected to hinder the biological integrity or productivity of the Crooked River. Please refer to Table 3-136 for sediment travel distances.

Vegetation Management—The Proposed Action includes commercial and non-commercial vegetation treatments within RCAs. One objective of these treatments is to increase the spacing between trees, which would improve tree vigor, increase growth, and encourage future development of large tree size class. Of the total 5,564 RCA acres, approximately 15.6 acres of treatment is adjacent to USFWS-designated bull trout critical habitat; 0.05 acres of treatment within Forest "suitable but unoccupied habitat" bull trout patches would occur, equating to 0.11 river miles along Crooked River in areas located outside known spawning and rearing habitat and outside Forest "occupied" bull trout patches.

Noncommercial thinning would occur in the RCA but no closer than 50 feet from the stream outside plantations and 1 SPTH (approximately 35 feet) within plantations. The 50-foot buffer would protect bull trout residing in Crooked River during implementation because trees would be directionally felled parallel to or away from streams (Design Feature FH-30). No direct or indirect effects on bull trout or on their critical habitat would be expected from this action.

Commercial vegetation treatments may occur between 1 and 2 SPTHs within the RCA, no logging equipment would be allowed off existing routes. Treatments are proposed on 1.38 acres of the RCA adjacent to USFWS-designated bull trout critical habitat and no acres adjacent to Forest "suitable but unoccupied" bull trout patch. This equates to 0.09 river miles along Crooked River, in areas located outside spawning and rearing habitat and outside Forest "occupied" bull trout patches. No expected effects to this WCI would occur because 1 SPTH is expected to be ample enough room to buffer bull trout and their habitat from effects associated with commercial treatments. No treatments are proposed within the RCA adjacent to Whoop-Um-Up Creek. Within Edna Creek, 434 acres of non-commercial and commercial treatment are proposed in the RCA and trees would be felled parallel to or away from Edna Creek. Therefore, effects on bull trout would also be negligible.

Prescribed Burning—The Proposed Action includes prescribed burning and pile burning within the RCA to prevent fuel loads and ladder fuels from increasing, thereby reducing the likelihood of undesirable effects should a lethal fire occur in the future. Reducing the potential for undesirable effects from a future large fire also reduces the potential for direct and indirect effects on bull trout populations. Prescribed burning would be managed at a low-to-moderate burn intensity. Hand piles within RCAs would be limited to 6 feet in diameter and distributed across the burn unit.

Prescribed burning would occur on 15.6 acres within USFWS-designated bull trout critical habitat, along 0.11 river miles of Crooked River; however, NFS road 384 is located between the burn block and Crooked River which would buffer critical bull trout habitat from prescribed fire effects. This area is located outside known spawning and rearing habitat. Given the expected low fire intensities, limited extent, and relatively wet nature of streamside RCAs, little (if any) tree mortality or consumption of down and dead material is expected. In the event of a rainstorm in the weeks after ignition, intact groundcover would filter runoff. Most of the WCIs are unaffected by prescribed burning (see explanations below) and effects to sediment and temperature are expected to be negligible (see hydrology section). Design Feature FF-3 is intended to protect bull trout and their habitat if undesirable fire behavior is evident. The prescribed burning would have negligible effects on bull trout and their habitat.

Transportation Management—Within RCAs, this alternative would decommission 13.8 miles and close 1.1 miles of road. Of those miles, 0.93 are within Forest "suitable but unoccupied" bull trout patches and none are within USFWS-designated critical habitat for bull trout.

Roads can reduce the suitability of streams to support bull trout through a variety of mechanisms. Roads directly adjacent to streams can lead to increased water temperatures because more sunlight reaches the stream. Poorly designed or maintained roads can increase fine sediment loads, impacting the quality of spawning and rearing habitat and reducing food supplies for young fish (Furniss et al. 1991, Waters 1995). Roads also facilitate the introduction of pathogens and increased angling pressure, which can negatively influence bull trout presence and abundance (Dunham and Rieman 1999). Overall reduction in roads and specifically those impacting "suitable but unoccupied" habitat patch would benefit bull trout habitat in the long-term. Design Features FH-8 and FH-10 would mitigate any temporary effects to bull trout during implementation.

The hydrology analysis estimates a 2% increase in sediment delivery from proposed road treatments in the Pikes Fork subwatershed. Decommissioning two sections of unauthorized road may affect bull trout should they be in Edna Creek (Middle Crooked River subwatershed). Road segment X025N5 is 77 feet and road segment X351C1 is 31 feet from perennial waters, both within the predicted sediment travel distances. These actions contribute 0.05% of the short-term over-natural sediment increase. Intact vegetation between the disturbance and streams is expected to retain sediment, which would protect bull trout and their habitat. The short and long-term sediment reductions (1% over natural) from additional road decommissioning would be beneficial to all life stages of bull trout. Overall, effects to bull trout and their habitat would be negligible.

Temporary Road Construction/Road Reconstruction/Converting Unauthorized Roads to NFS Roads— No road activities are proposed within RCAs in USFWS-designated critical habitat or Forest "suitable but unoccupied" bull trout patches. In Alternatives B through F, 4 segments of temporary road segments are proposed that could affect bull trout and their habitat in the Edna Creek drainage. These road segments range in distances of 219 feet (temporary road section 18) to 539 feet (temporary road section 15) from Edna Creek. These actions contribute 1.25% of the over-natural sediment increase in the temporary timeframe. Vegetation between road segments and streams are expected to retain sediment, which would protect bull trout and their habitat. Effects to bull trout and their habitat would be negligible.

Culvert Replacement— The proposed action includes replacing 22 culverts with AOP structures and modifying the pool outlet of 1 culvert. These activities would reduce fish migration barriers providing access to quality fish habitat; however, temporary adverse effects to individual fish could occur, including incidental handling injury and mortality. These effects would not degrade overall subpopulation size, growth and survival, life history diversity, or genetic integrity of bull trout populations. Removing and replacing culverts would increase the baseline population toward a restore rating in the long-term. New AOP structures would reestablish passage for all life stages of bull trout, resulting in increased resiliency of subpopulations by reconnecting fragmented habitats within and between watersheds, helping to restore various life history patterns and emphasizing genetic integrity.

Recreation Management—Recreation management activities that may affect this WCI include construction of a motorized trail, designation of non-motorized trails, and new trailhead construction within the RCA.

The Proposed Action includes designating 6.6 miles of motorized trails within the RCA. Of this mileage, 6.2 miles is located on existing road prisms and 0.4 miles would be new construction. Approximately 0.4 miles of new construction and 0.6 miles of existing road conversion (ML 1) to a motorized trail are located in Forest "suitable but unoccupied habitat" bull trout patches. No trail construction (either new or on existing road prisms) is located near USFWS-designated critical habitat for bull trout. With very little new trail construction inside RCAs near bull trout habitat, effects are expected to be localized and negligible.

This alternative designates 15.2 miles of existing non-motorized trail located within RCAs; none within USFWS-designated critical habitat and 1.4 miles within Forest "suitable but unoccupied habitat" bull trout patches. Field reviews supporting the hydrology technical report indicated no observations of accelerated sediment from existing non-motorized trail segments. Additionally, all stream crossings, including bridges, were in good condition. Effects of this action on ESA-listed fish would be negligible.

New trailhead construction is proposed at the junction of NFS road 385 and NFS road 312 in the Pikes Fork subwatershed, which is directly adjacent to Pikes Fork Creek. The new trailhead is located inside the RCA and near USFWS-designated critical habitat. Fish survey data (n-14) have not found bull trout in Pikes Fork within the project area, but modifying fish barriers to provide fish passage would allow bull trout to repopulate this creek.

Sediment delivery from trailhead construction is not represented in sediment modeling; however, sediment delivery from this activity is expected to be negligible. Incorporation of the Forest Service's National BMP Program and Design Feature FH-14 during construction would reduce the likelihood of eroded soils reaching Pikes Fork. Furthermore, topography at the site is sloped away from the creek and surfacing the parking area with aggregate would minimize surface erosion. The location of the proposed trailhead is over a highly disturbed site. The Pikes Fork Trailhead Monitoring and Rehabilitation Plan requires stabilization of the streambank, vegetation planting in the disturbed area, and blocked access of an existing, unauthorized OHV creek crossing. Fencing would be installed prior to construction to protect the restoration activities and reduce future expansion of the site. Long-term monitoring (>30 years) would document if predicted effects on bull trout and their habitat are consistent with those disclosed in this document. The project design features would mitigate effects on bull trout and their habitat in the temporary and short-term timeframes. Also, vegetation between the trailhead parking area and stream would buffer sediment delivery, decreasing the likelihood bull trout would experience negative effects.

Uncertainty exists regarding the long-term effects on bull trout or their critical habitat from the construction of a trailhead facility. The proposed recreation improvements would encourage a much larger human footprint (use of the restrooms, walking around the site, dispersed camping nearby, etc.) adjacent to bull trout critical habitat. Increases in outdoor recreation have taken place at a rapid rate and NFS road 384 is a heavily traveled route; Barbaro et al. (1969) report a 7% increase per year over the last decade. More recently it has been estimated that mountain areas are host to 15–20% of the tourism industry (FAO 2005).

Revegetation at this highly impacted site could be difficult if forest visitors aren't excluded from the recovery areas. Recreational use leads to the loss of vegetative cover, contributing to the erosion and compaction of surface soils. These impacts result in increased overland runoff and deposition of eroded sediments in waterways (Cole 1993). Plant deterioration occurs much more rapidly than recovery and trampling of plant species at recreation sites is a serious threat to the natural attractiveness of developed recreation areas (Devoto 1953, Clawson 1959, James and Ripley 1963). Further, trampling problems usually result in vegetation loss, soil compaction, landscape degradation, and erosion (Li et al. 2005). Past land management activities (road construction along Pikes Fork) has resulted in degraded aquatic and riparian habitats by altering streamflows and riparian vegetation that has, in turn, negatively affected bull trout in several areas of the Boise River bull trout recovery unit (USDI FWS 2010a). Existing impacts to bull trout critical habitat components combined with constructing a new trailhead would encourage public use that could hinder the success of the streamside restoration activities. The effects of the trailhead over the long-term are not discountable and may expand beyond the proposed site, potentially having direct or indirect effects on bull trout or their habitat.

Temporal Effects of Alternative B

Temporary Effects— Culvert replacements and sediment increase (2% over natural) would be the biggest factors affecting bull trout or their habitat. The negative effect associated with these actions would be expected to be localized and immeasurable. The Pikes Fork Trailhead Monitoring and Rehabilitation Plan would implement stabilization, vegetation planting, fence installation, and eliminate an OHV creek crossing. These improvements would result in a localized positive effect; however, this positive effect is not expected to outweigh the potential negative effects associated with the culvert replacements.

Short-term Effects— Culvert replacements would likely continue in this timeframe and have a negative, localized effect on this WCI. The sediment reduction (1% over natural) resulting from transportation management actions would be beneficial to bull trout and their habitat. Construction of the trailhead adjacent to Pikes Fork may have an immeasurable negative effect on bull trout habitat with project design features and the Forest Service's National BMP Program BMPs.

Long-term Effects— Thinning activities occurring in the temporary timeframe would result in benefits (slight positive, immeasurable effect) to bull trout and multiple WCIs (LWD, pool frequency/quality, width/depth max ratio, and streambank condition). The sediment reduction (1% over natural) from transportation management actions would be beneficial to bull trout and their habitat. Uncertainty regarding the effects on bull trout and their habitat from the trailhead adjacent to Pikes Fork may have a localized and measurable negative effect. The culvert replacements would have the biggest and most noteworthy effect on this WCI. The replacements would reestablish passage for all life stages of bull trout into USFWS-designated critical habitat. The resulting positive effect from culvert replacements, sediment reduction, and vegetation management activities would be expected outweigh the localized negative effects of the trailhead use.

Alternative C

Recreation— Roughly 0.1 mile of new trail construction associated with the proposed motorized trail would be located within the RCA. Although 0.3 miles less, this alternative would have potential effects similar to those described under Alternative B, the Proposed Action. The proposed trailhead is included with this alternative and effects would be the same as the Proposed Action.

Temporary, Short-term, and Long-term Effects of Alternative C—With no considerable differences in activities influencing RCAs and associated population characteristics of ESA-listed fish, effects on this WCI would be the same as Alternative B.

Alternative D

Vegetation Management— This alternative includes an additional 10 acres of thinning with no product removal, 9 acres of thinning with product removal, and 1 acre of mixed treatment with product removal. The treatments would not occur closer than 50 feet from streams. These treatments would occur outside of USFWS-designated bull trout critical habitat and Forest "suitable but unoccupied habitat" bull trout patches. The 50-foot buffer and directional tree felling design feature would mitigate effects associated with the additional acres. Therefore, no additional effects beyond those described for the Proposed Action are expected from this action, and any effect would be localized and immeasurable.

Recreation—The proposed trailhead is included with this alternative, and effects would be the same as described above in the Proposed Action.

Temporary, Short-term, and Long-term Effects—With no considerable differences in activities influencing RCAs and associated population characteristics of ESA-listed fish, effects on this WCI would be the same as Alternative B.

Alternative E

Transportation Management—This alternative includes an additional 0.7 mile of road decommissioning and 0.7 mile of road closure (ML 1) within the RCA. The temporary/short-term negative effects (potential sediment input) and the long-term benefits of these activities would not occur near USFWS-designated critical habitat or Forest "suitable but unoccupied habitat" bull trout patches. Therefore, road activities associated with this alternative are not expected to affect this WCI.

Recreation—This alternative does not include the motorized trail and trailhead. In the Pikes Fork subwatershed, the elimination of these recreation activities would result in a reduction of sediment (2% decrease over natural) as compared to Alternative B (2% increase over natural) in the temporary timeframe. Additionally, this alternative would result in a 2% over-natural reduction in sediment, which is the same as found under Alternative B in the short-term and long-term timeframes.

The proposed trailhead site is in a previously disturbed area that, at present, may be inputting fine sediment in Pikes Fork. Alternative E would reduce indirect and direct effects (new construction activities) in the RCA by not including the new trailhead. On the other hand, this alternative would not implement the Pikes Fork Trailhead Monitoring and Rehabilitation Plan, which would reduce present effects on this creek.

Temporary, Short-term, and Long-term Effects—With no considerable differences in activities influencing RCAs and associated population characteristics of ESA-listed fish, effects on this WCI would be the same as Alternative B.

Alternative F

Transportation Management—This alternative includes an additional 0.1 miles of road decommissioning and 0.7 miles of road closure (ML 1) within the RCA. The temporary/short-term negative effects and the long-term benefits of these activities would not occur near USFWS-designated bull trout critical habitat or Forest "suitable but unoccupied habitat" bull trout patches. Therefore, road activities associated with this alternative are not expected to affect this WCI.

Recreation—New trail construction would occur during building of the motorized trail, of which 0.1 miles exist within the RCA. Additionally, as compared to Alternative B, RCA trails are reduced from 6.6 miles to 5.6 miles. In the Middle Crooked River subwatershed, eliminating these recreation activities would result in a small reduction of sediment (22% over natural) as compared to Alternative B (25% over natural). It is doubtful, however, that the benefits of this alternative would translate to this WCI or to bull trout habitat. These actions occur near Forest "unsuitable, likely unoccupied habitat" bull trout patches and not near USFWS-designated bull trout critical habitat.

The proposed trailhead is included in this alternative; effects would be the same as described above in the Proposed Action.

Temporary, Short-term, and Long-term Effects—With no considerable differences in activities influencing RCAs and associated population characteristics of ESA-listed fish, effects on this WCI would be the same as Alternative B.

3.8.4.2 Indicator: Chemical Contaminants/Nutrients

Affected Environment

Desired Condition—Ideal conditions show low levels of chemical contamination from agricultural, industrial, and other sources. Also, ideal conditions show no excess nutrients and no 303(d) water quality limited water bodies.

Current Condition—This indicator is functioning appropriately for the Middle Crooked River subwatershed and FR for the Pikes Fork subwatershed. No 303(d)-listed streams or TMDLs are present within either subwatershed. Sources of chemical contamination are limited in both subwatersheds, with a couple exceptions. The project area has portions of two active sheep grazing allotments; field reconnaissance has not identified areas of overuse or water quality impairment due to livestock grazing. Snow grooming operations for both motorized and non-motorized recreation uses currently occur in the project area. Petroleum fuels associated with snow groomer operations could be a concern if there is an accidental spill. Groomers are typically parked within storage facilities near the major grooming routes. All fuel and other chemicals are stored at the groomer storage facilities or outside the RCAs. Fuel spill containment equipment is kept at the storage facilities. The potential of fuel spills or other chemicals from the groomer reaching open water is highly unlikely due to the operating plan. Numerous mining claims exist throughout the analysis area, and a few large-scale but not active mines (e.g., Banner Mine). Adit and spring discharge with elevated levels

of arsenic, cadmium, chromium, lead, mercury, and silver that exceed State groundwater and drinking water standards has been documented at the Banner Mine in the Pikes Fork subwatershed (State of Idaho 2008). The Pikes Fork subwatershed is FR due to this adit discharge.

Environmental Effects

Direct and Indirect Effects

Alternative A

Alternative A would continue the existing condition with regard to the Chemical Contaminants/Nutrients WCI which is functioning appropriately in the Middle Crooked River subwatershed and FR in the Pikes Fork subwatershed. There are no 303(d) listed streams, no sources of excessive nutrient loading, and no known sources of chemical contamination within the subwatersheds.

All Action Alternatives

The proposed activities would have the potential to deliver gas and oil to RCAs and streams during project activities in the temporary and short-term timeframes. The relevant mechanism of effect is accidental spill of petroleum-based products during road construction work inside the RCA or during construction of AOP stream crossings. However, Design Feature FH-1 limits fuel storage within the RCA and Design Feature FH-3 requires a spill containment kit onsite any time equipment/machinery operates within the RCA. These design features would minimize the likelihood of petroleum-based products reaching streams. Additionally, fuel managers implementing prescribed burning inside the RCA would use gas/oil mix to perform direct ignition no closer than 75 feet from the stream to areas outside USFWS-designated critical habitat and Forest "suitable, potentially occupied habitat" or Forest "suitable but unoccupied" bull trout patches, as well as, areas outside of known spawning and rearing habitat. From past experience performing these operations, the gas/oil mixes are expected to burn entirely and leave no remnants. Design Feature FH-1 requires drip torch cans to be refilled outside the RCA, reducing the potential for accidental spill inside the RCA. There would be ignition of hand piles occurring within the RCA on 15.6 acres adjacent to USFWS-designated bull trout critical habitat. The burning would occur along 0.11 river miles along Crooked River. Effects from this action are expected to be negligible and project design features would protect the RCA, bull trout. and bull trout habitat from chemical contaminants.

Magnesium chloride ($MgCl_2$) could be applied to NFS road 384 in an effort to control dust during commercial logging operations. This compound is a simple salt found in natural brine deposits within the earth and is applied to NFS roads for dust control and surface stabilization. These natural products likely biodegrade in the environment, so toxic effects are expected to be minimal (EPA 2002). Numerous studies have been documented about chloride groundwater pollution, mainly in the northeastern United States. Most studies have found that concentrations vary from season to season and year to year. Some freshwater fish exhibit a great deal of tolerance to salts in general and chloride in particular. One study showed that pike, bass, and perch can tolerate chloride levels exceeding 4,000 parts per million (ppm). Trout, however, could only withstand chloride levels of 400 ppm. Design Feature TS-5 prohibits application over live water road crossings. Creeks within the project

area would not likely have concentrations high enough to cause growth or survival problems for fish. Goodrich et al. (2009) found that although chloride and magnesium were both extremely high close to the roads, both were dramatically lower 3.0 meters away from the road; $MgCl_2$ ions were detected in the soil matrix and vegetation up to 6.1 meters from the edge of the road. They speculated that the majority of ions remained in the road base with $MgCl_2$ treatments and a large proportion of those that did move off treated roads were either taken up by plant roots or moved further down into the soil profile than sampled depths (>61.0 centimeters) (Goodrich et al. 2009). Therefore, considering the location of bull trout habitat during application, along with the design feature, would protect ESA-listed fish species and their habitats from negative effects associated with the application of $MgCl_2$.

The action alternatives include noxious weed treatments. Specifically, the application of chemical herbicides at certain stages of plant growth to kill targeted weed species that is accomplished with spot treatments in localized areas using backpack sprayers. Herbicides are made up of various substances that make them effective and easier to apply. Using an integrated approach for these treatments, applicators would use methods consistent with the ongoing Forest-wide invasive plant species program. The chemicals or types of herbicides considered in the analysis include those used under the Forest-wide noxious weed program. Standard management practices would restrict application and type of chemicals around riparian buffer zones (100 feet) and during periods when environmental factors (wind, rain) may result in chemical misapplication.

Temporary, Short-term, and Long-term Effects—No effect to this WCI is anticipated during these timeframes.

Alternatives B, C, D, and F

Recreation Management—Proposed activities include new construction of motorized trail (0.4 miles) and trailhead construction within the RCA. Also, proposed activities include conversion of old road prism to motorized trail within the RCA (6.2 miles) as part of this trail system. These actions would require petroleum-fueled equipment inside the RCA. The possibility of petroleum-based products reaching streams is unlikely because of the design feature (FH-3). The proposed activities would not use treated wood products to construct bridges over live water for the motorized trail. Bull trout would not be affected by this action because these activities are not in "occupied" or "suitable but unoccupied" habitat bull trout patches. Furthermore, this action would not have an effect because the minimal duration of time needed to perform the work and the vegetation buffer between the proposed activities and bull trout streams and habitat.

Cumulative Effects

All Alternatives

Past and ongoing management actions have been considered in describing the baseline existing condition for the Chemical Contaminants/Nutrients WCI. Idaho Power Cloud Seeding stations represent ongoing/foreseeable future activities that may affect the Chemical Contaminants/Nutrients WCI due to silver iodide use as a seeding agent. Based on existing literature, it is unlikely that silver iodide use for cloud seeding would result in detectable increases in silver iodide in water bodies (Cooper and Jolly 1970). As a result, no additional

or cumulative effects, either indirectly or directly related to planned management actions, would occur.

3.8.4.3 Indicator: Physical Barrier

Affected Environment

Desired Condition—Any man-made barriers present in watershed allow upstream and downstream fish passage at all flows.

Current Condition—There are 7 fish passage barriers within the project boundary in the Pikes Fork subwatershed; as well as 16 within the Middle Crooked River subwatershed that do not pass all life stages at a range of flows. Additional passage barriers may exist along Idaho State jurisdiction occurring along State Highway 21. As a result, both subwatersheds are FUR.

Environmental Effects

Direct and Indirect Effects

Alternative A

Alternative A does not propose any new management activities; however, this WCI is FUR for both subwatersheds. The functional rating is mainly because of the 23 barriers in the 2 subwatersheds that were classified as impassable during the 2003 and 2004 culvert inventory. Under Alternative A, this WCI would continue FUR.

All Action Alternatives

Vegetation Management/Prescribed Burning/Transportation Management/Temporary Road Construction/Converting Unauthorized Roads to NFS Roads/Road Reconstruction/Recreation Management—Activities associated with the action alternatives would have no effect on this WCI.

Culvert Replacement— All the proposed culvert replacements and removals would eliminate existing migration barriers. During implementation of culvert treatments, diversions may temporarily block upstream or downstream passage. Because these locations are currently limiting fish access, diverting the stream during implementation will not change the current condition.. After project completion, fish passage would be improved for all native fish and associated life stages. Therefore, in the short-term and long-term timeframes, the results of this action would move the WCI functionality rating to FR from FUR.

Temporal Effects of All Action Alternatives

Temporary Effects—Some culvert replacements/removals would occur in this timeframe; therefore, benefits (positive, measurable effect) from this action would be realized in this timeframe.

Short-term Effects—Some culvert replacements/removals would occur in this timeframe; therefore, benefits (positive, measurable effect) from this action would be realized in this timeframe.

Long-term Effects—As funding becomes available, the Middle Crooked River subwatershed culverts would be replaced, resulting in an improved functional rating. Priortity of culvert replacement/removals are identified on the Map 9 in Appendix J

3.8.4.4 Indicator: Large Woody Debris

Affected Environment

Desired Condition—Adequate sources of LWD for both long and short-term recruitment exist in RCAs. Adequate sources are defined as >20 pieces per mile, >12 inches in diameter, and >35 feet in length.

Current Condition—The LWD WCI values are functioning appropriately for both subwatersheds. Pikes Fork subwatershed has a mean of 87 pieces/mile with a range from 0 to 240 pieces/mile, and the Middle Crooked River subwatershed has a mean of 177 pieces/mile with a range from 0 to 430 pieces/mile.

Environmental Effects

Direct and Indirect Effects

Alternative A

The current baseline data suggest adequate LWD exists within streams in both subwatersheds. This alternative does not propose any new management activities, and existing trees would continue to provide recruitable LWD into the long-term.

All Action Alternatives

Vegetation Management—Noncommercial thinning in RCAs would not occur within 50 feet of perennial streams and within 15 ft of intermittent streams. Noncommercial thinning is not expected to have measureable effects on the LWD WCI. The restriction limiting thinning of trees <8 inches DBH within the first SPTH reduces the potential for decreasing recruitable LWD into the future. This WCI is expected to remain functioning appropriately in the temporary and short-term timeframes. In the long term, as project objectives enhance the growth of retained trees and restore species toward historic conditions, slight positive improvements in this WCI are expected as the availability of larger (taller) trees more likely to reach the stream channel increases.

Commercial timber harvest in the RCA between the second and first SPTHs could have an immeasurable negative effect in the temporary and short-term timeframes. The effect may be realized when remaining large trees in the second SPTH fall and smaller trees have not yet matured to the diameter and height to be considered future recruitable LWD. It is expected the existing large trees within the first SPTH would still be available for recruitment and maintain the WCI functionality rating. No commercial timber harvest is planned adjacent to designated critical bull trout streams or in Forest "occupied" or "potentially suitable" bull trout habitat patches. The potential loss of recruitable LWD is expected to have negligible effects the WCI.

Prescribed Burning— Prescribed fire would be used to reduce increased fuel loads from thinning activities (pile burning and broadcast burning of lop/scatter slash) and to manage species composition and stand densities, buildup of natural fuels, and decrease ladder fuels .

Prescribed fire treatments include direct ignition within the RCA, but prohibit fire ignition within 75 feet of streams. Beginning at the outer boundary of the second SPTH, prescribed fire ignitions are planned at approximately 50-foot spacing, working downhill and ending 75 feet from the stream. Fire would be allowed to back toward the stream. This design allows fire personnel to adjust the stripping intervals based on the arrangement and amount of activity and natural fuels. On other projects fire has been allowed to back into RCAs, resulting in mosaic burn patterns. It is expected this fire ignition design would result in a similar effects while contributing to greater achievement toward desired vegetation condition objectives, and providing more control of fire within the RCA. Design Feature FH-3 has been incorporated into the project to control fire intensity within RCAs. Given the expected low fire intensities, limited extent, and the relatively wet nature of streamside RCAs, little (if any) tree mortality or consumption of down and dead material is expected. Negligible and immeasurable effects to this WCI are expected..

Transportation Management—All action alternatives include decommissioning 13.8 miles and closing 1.1 miles of maintenance level (ML1) NFS roads within RCAs. Road decommissioning and closure activities may include a variety of stabilization techniques; refer to Design Feature TS-6 for a detailed description of decommissioning treatment options. Because these decommissioned and closed road areas have time to naturally seed in, the benefits of this action would be realized in the long term.

Road Reconstruction—This activity occurs on existing road templates and involves some reshaping and realignment of the existing road bed. This activity would occur on 0.9 miles of road within the RCA. Because these roads were used in the past, it is unlikely trees big enough to contribute LWD reside within these areas. The effect of this activity on the LWD WCI is expected to be negligible.

Temporary Road Construction—Approximately 0.6 miles of temporary road construction is proposed within the RCA; 0.58 mile would occur on existing road templates and 0.02 miles would be new disturbance. This activity is not located near designated critical habitat for bull trout and is outside of the Forest "unoccupied but suitable" habitat model. During construction of the temporary roads, it is possible that medium to smaller sized trees may be cut, eliminating those trees for future LWD recruitment. This effect is expected to be localized and negligible.

Converting Unauthorized Roads to NFS Roads—These roads are currently in place and would not require new construction but may require some realignment (blading and installation of drainage features). The LWD WCI is not expected to be affected by this action because these roads are already in place.

Culvert Replacement—LWD may be temporarily moved at individual sites to allow access for construction machinery; however, all LWD would be placed to or near original locations once construction is completed (Design Feature FH-18). Because pieces of LWD per mile would not be changed and potential LWD would not be removed, this action would have a negligible effect on this WCI..

Recreation Management—Approximately 0.4 miles of new trail construction associated with the motorized trail proposal would occur within the RCA. Additionally, 6.2 miles of trail designation within the RCA would occur on existing prisms of ML 1 or ML 2 roads. Because these roads have been used in the past for administrative use, trees have not had the

time required to mature and benefit this WCI. However, large trees are present just off the road prism, and project Design Feature FH-25 has been incorporated to ensure proposed activities would not exclude these trees from future LWD recruitment. This activity is expected to have localized and immeasurable effects on the WCI.

Constructing the trailhead located in the RCA would result in removing less than 5 mature trees. Project Design Feature FH-25 ensures that any trees felled would be left inside the RCA to serve as LWD. Effects to this WCI are expected to be negligible because few trees need to be felled during construction and they would remain within the RCA.

Temporal Effects of All Action Alternatives

Temporary and Short-term Effects—With the no-treatment areas in the RCAs applied to noncommercial and commercial thinning treatments and design features protecting large trees during transportation and recreation management activities, negligible effects to the LWD WCI are anticipated during these timeframes.

Long-term Effects—Road decommissioning and closures, along with tree thinning within the RCA, would result in a positive, immeasurable long-term benefit.

Alternatives C and D

Recreation—New trail construction would occur to designate the motorized trail, of which 0.1 miles would occur within the RCA, as compared to 0.4 miles under the Proposed Action. This activity is expected to have negligible effects on the LWD WCI because effects are localized and immeasurable.

Alternative D

Vegetation Management—This alternative includes an additional 10 acres of thinning with no product removal, 9 acres of thinning with product removal, and 1 acre of mixed treatment with product removal. The treatments would not be implemented within 50 feet of perennial streams and 15 feet of intermittent streams. This treatment would not occur near designated critical habitat for bull trout and would occur outside of the Forest "unoccupied but suitable" habitat patches. Therefore, the addition of these acres is expected to be negligible.

Alternative E

Transportation Management—This alternative includes an additional 0.7 miles of road decommissioning and 0.7 miles of road closure (ML 1) within the RCA. The benefits of these activities are similar to the effects common to all action alternatives described above.

Recreation—This alternative does not include the motorized trail and trailhead. As a result, this alternative would reduce effects in the RCA and promote LWD recruitment in the long term. Positive effects to the LWD WCI are expected to be localized and immeasurable.

Alternative F

Transportation Management—This alternative includes an additional 0.1 miles of road decommissioning and 0.7 miles of road closure (ML 1) within the RCA. The benefits of these activities are similar to the effects common to all action alternatives described above.

Recreation—New construction of 0.1 miles for the motorized trail is proposed within the RCA. When compared to Alternative B, this alternative reduces RCA trail segments from

6.6 miles to 5.6 miles. This activity is expected to have negligible and immeasurable effects on the LWD WCI.

3.8.4.5 Indicator: Pool Frequency/Quality and Large Pools/Pool Quality and Width/Depth Maximum Ratio

Affected Environment

Desired Condition—Ideal conditions include good cover and cool water, and only minor reduction of pool volume by fine sediment. Desired conditions for Pool Frequency and Large Pool/Pool Quality WCIs can be found in the Forest Plan (USDA Forest Service 2010a, Appendix B, p. B-16 and B-17).

Average wetted width/maximum depth ratio in scour pools in a stream reach is ≤10.

Current Condition—Pool frequency in the subwatersheds is at desired conditions with respect to the different stream sizes and channel types. However, pool quality, measured by the abundance of pools greater than 1 meter in depth, is FR for both subwatersheds. Increased erosion and sediment delivery to stream channels from roads and post-wildfire events have reduced pool depths in the subwatersheds.

Stream channel maximum width-to-depth ratios are functioning appropriately in both subwatersheds.

Environmental Effects

Direct and Indirect Effects

Alternative A

Increased erosion and sediment delivery to stream channels from roads, human influence, and post-wildfire events have reduced pool depth and quality in both subwatersheds. As a result, these WCIs are FUR. Because Alternative A does not propose any management activities to correct the factors causing the risk, negligible negative effects to these WCIs could continue into the future.

All Action Alternatives

Within the Middle Crooked River subwatershed, the hydrology technical report (project record) states proposed activities could increase sediment by 25% in the temporary timeframe. Additionally, there would be a short-term 3% increase in sediment; with a long-term decrease of 7%. Within the Pikes Fork subwatershed, proposed activities could increase sediment by 2% in the temporary timeframe. There would be a short-term and long-term decrease in sediment delivery by 1%. Refer to section 3.9.7.2 for more detail on sediment analysis.

Vegetation Management—One of the long-term objectives of the proposed RCA treatments is to promote mature tree growth, which will provide future LWD recruitment. LWD within RCAs contributes to the formation of new pools. An increase in potential for LWD recruitment represents an improving trend in pool frequency, pool quality, and width/max depth ratios. The proposed commercial and noncommercial vegetation management activities would treat upland vegetation (conifer trees) both within and outside RCAs.

Sediment delivery potentially affecting pool quality associated with vegetation management activities is not expected due to the incorporation of distance restrictions for activities occurring inside and outside RCAs (see hydrology technical report [project record]). Therefore, this action could benefit this WCI in the long-term timeframe.

Prescribed Burning—The prescribed burn component of this project would reduce the risk of uncharacteristically large and high severity wildfire that has historically not been a component of these PVGs. Model predictions indicate prescribed fire may increase sediment delivery in the temporary timeframe and 2 years into the short-term by exposing bare soil. However, by only allowing a backing fire within the RCA 75 feet from streams would be expected to result in a mosaic burn pattern. In addition, unburned vegetation would filter sediment in the event of a rainstorm immediately following this treatment. Implementation is staggered in time and location throughout the project area. Overall, sediment delivery associated with fuels treatments are expected to be minor (see hydrology technical report [project record]). This is due to incorporation of burn prescriptions that would limit fire intensity and burn severity, as well as the use of ignition patterns to control fire spread and limits on the size and density of hand piles (Design Features FF-3 and FF-5). Any effects from the proposed activity are expected to be localized, negligible, and immeasurable.

Transportation Management—All action alternatives include road treatments throughout the project area including temporary road construction, road realignment, road reconstruction (heavy and light), road closure, and road decommissioning. These changes in the transportation system represent the largest overall contributions and reductions in sediment delivery over the life of the project. Temporary increases in sediment delivery are attributed to temporary road construction, road reconstruction, and road realignment. Road-related sediment delivery can fill pools and reduce the number and depth of pools in an area (Quigley and Arbelbide 1997). Model predictions indicate there is a temporary 25% over-natural increase in sediment delivery in the Middle Crooked River subwatershed, which may fill or degrade pools and pool quality and negatively affect stream width/depth ratios (see hydrology technical report [project record]). These WCIs would experience an immeasurable negative effect in the temporary time frame. Decreases in sediment delivery in the long-term are attributed to road decommissioning, road realignment, and road closure (conversion of ML 2 roads to ML 1 roads, or conversion of ML 2 roads to ML 2 Administrative Use Only). Implementing Design Features FH-7, FH-25, TS 4, TS-6, and TS-7 in all action alternatives would be expected to mitigate impacts from transportation management actions to soil, water quality and riparian resources. The reduction of roads over the long-term is expected to have immeasurable positive effects to the Pool Frequency and Large Pool/Pool Quality WCI.

Within the Pikes Fork subwatershed, there is an estimated 2% increase in sediment in the temporary time frame. The functionality rating of this WCI is expected to be maintained during all time frames. There is a 1% reduction in sediment over the short-term and long-term time frames within this subwatershed. This small increase/reduction over all time frames is not expected to affect the Pool Frequency and Large Pool/Pool Quality WCIs. None of the actions are near designated critical bull trout streams and are outside Forest "occupied" or "potentially suitable" bull trout habitat.

Culvert Replacement—All action alternatives include 22 AOP culvert replacements and 1 culvert outlet modification. Activities would occur in previously disturbed sites, although projects may eliminate any scour pools created by undersized culverts. Given that the scour

pools to be eliminated are artificial and limited in number, along with the fact that project-related sediment introduced into the stream channel would be minimized to preclude a noticeable reduction in pool quality and depth, removing or replacing culverts would result maintain the existing WCI functionality for Pool Frequency and Large Pool/Pool Quality (Table 3-123 and Table 3-124). Limited increases in turbidity associated with crossing reconstruction are anticipated but are not expected to last more than the duration of the construction period (Yenko 2007). Furthermore, Design Features FH-15, FH-20, FH-21, FH-22, and FH-23 would be employed to minimize sediment delivery and turbidity during construction. Therefore, effects to the Pool Frequency and Large Pool/Pool Quality WCIs are expected to be localized and negligible.

Recreation Management—All action alternatives include authorization of existing and proposed trail systems for both motorized and non-motorized use, with the exception of Alternative E, which does not include authorization of a new motorized trail loop system. Effects of trail management actions on sediment delivery are incorporated into estimates of sediment delivery related to roads displayed in the hydrology section. The contributing factor in trails' related effects to sediment are linked to the designation of a new motorized trail. The motorized trail includes segments in both the Middle Crooked River and Pikes Fork subwatersheds.

New trailhead construction is proposed at the junction of NFS roads 385/312 in the Pikes Fork subwatershed, which is directly adjacent to Pikes Fork Creek. Sediment delivery from trailhead construction is not represented in sediment analysis due to lack of a routine within the model to simulate this activity; however, topography designs show the proposed trailhead slope away from Pikes Fork. The location of the trailhead is about 68.5 feet over relatively flat ground to Pikes Fork. Sediment delivery from this activity is expected to be negligible due to the incorporation of BMPs during construction and utilization of a trailhead design that would include surfacing of the parking area with aggregate to minimize surface erosion. Furthermore, the vegetative buffer would protect the creek, as well as block the OHV access across the creek. Lastly, implementing the Pikes Fork Trailhead Rehabilitation and Monitoring Plan would result in fencing, revegetation, and stabilizing of the stream bank in the disturbed area. These mitigation measures are expected to keep the effects localized in the temporary and short-term timeframes.

Non-motorized trail authorizations for both winter and summer recreation are not expected to affect sediment delivery. In many cases, non-motorized trails are co-located on existing ML 1 or ML 2 roads; in these cases, sediment delivery from the road is incorporated into overall sediment delivery estimates. Field reviews of the non-motorized trails not co-located on roads were made in May and June of 2014 and did not find accelerated sedimentation problems. Additionally, all stream crossings, including bridges, were in good condition.

Alternatives C and D

Recreation—Approximately 0.1 mile of new trail construction associated with the motorized trail is locatedwithin the RCA, as compared to 0.4 mile in the Proposed Action. This activity is expected to have localized, immeasurable effect on the Pool Frequency and Large Pool/Pool Quality WCIs

Alternative D

Vegetation Management—This alternative includes an additional 10 acres of thinning with no product removal, 9 acres of thinning with product removal, and 1 acre of mixed treatment with product removal. The treatments would not occur closer than 50 feet from streams. The 50-foot buffer would mitigate effects associated with the additional acres. Therefore, no additional increase in sediment that would impact pool quality is expected from this action.

Temporal Effects of Alternatives B, C, and D

Temporary Effects—Sediment associated with prescribed fire, transportation management, and culvert replacements is expected to have an immeasurable negative effect on the Pool Frequency and Large Pool/Pool Quality WCIs. There is an estimated 25% increase in the Middle Crooked River subwatershed in sediment in the temporary time frame; this increase may fill or degrade pools and pool quality and negatively affect stream width/max/depth ratios. These WCIs would experience an immeasurable negative effect in the temporary time frame within the Middle Crooked River subwatershed.

Within the Pikes Fork subwatershed, proposed activities are predicted to increase sediment by 2%. There is a low likelihood for proposed vegetation treatments, transportation management, or other activities to increase sediment delivery to streams. The incremental, immeasurable, positive effects to the Pool Frequency and Large Pool/Pool Quality WCIs are expected during this time frame.

Short-term Effects—Although there is an estimated 3% increase in sediment increase (3% over natural in the Middle Crooked River subwatershed) in this time frame is expected to result in negative effects to the sediment/turbidity WCI; however, it is doubtful this small increase would translates into negative effects to these Pool Frequency and Large Pool/Pool Quality WCIs., because of the relatively minor increase in sediment it is unlikely to reach the streams, with little sediment input there would not be a change to pool frequency/quality or width/max depth ratio of pools. Therefore, negligible effects associated with these alternatives are expected.

Within the Pikes Fork 6th subwatershed, proposed activities would decrease sediment by 1% below background rates. Again, it is doubtful this small decrease in over-natural sediment would translate into measurable effects to this WCI; therefore, no effects are expected.

Long-term Effects—The decrease (7% over natural) in sediment delivery in the Middle Crooked River subwatershed is attributed to road decommissioning, road realignment, and road closure. The buffer described in the noncommercial and commercial vegetation management section and the design features protecting large trees during transportation and recreation management activities would help form new pools into the future. Consequently, an immeasurable positive effect is expected during this timeframe.

Within the Pikes Fork subwatershed, proposed activities could decrease in sediment by 1% below background rates. Again, it is doubtful this small decrease in over-natural sediment would translate into measurable or immeasurable effects to this WCI; therefore, no effects are expected.

Alternative E

Transportation Management—This alternative includes an additional 0.7 mile of road decommissioning and 0.7 mile of road closure (ML 1) within the RCA. The temporary/short-term negative effects, as well as the long-term benefits, of these activities are similar to the effects common to the action alternatives described above.

Recreation—This alternative does not include the motorized trail and trailhead. In the Middle Crooked River subwatershed, eliminating these recreation activities would result in a reduction of sediment (13% over natural) as compared to Alternative B (25% over natural). Alternative E is expected to have immeasurable negative effects in the temporary timeframe. Unlike the Proposed Action (Alternative B), this alternative would result in a measurable positive (2% over natural) decrease in sediment within the short-term timeframe. Additionally, this alternative would have a measurable positive (8% over natural) decrease in sediment within the long-term timeframe (see sediment discussion in hydrology section).

In the Pikes Fork subwatershed, the elimination of these recreation activities (motorized trail) would result in a reduction of sediment (2% over natural) as compared to Alternative B (2% over-natural increase) in the temporary timeframe. This alternative would result in a 2% over-natural reduction in sediment, which is the same as found under Alternative B in the short-term and long-term timeframes (see sediment discussion in hydrology section).

The proposed trailhead site is in a previously disturbed site that, at present, could be inputting fine sediment in Pikes Fork. This alternative would reduce effects in the RCA. The positive effects on this WCI may be realized in a decreased trailhead footprint at the proposed trailhead site.

Temporal Effects of Alternative E

Temporary Effects—In the Middle Crooked River subwatershed, sediment associated with prescribed fire, transportation management, and culvert replacements is expected to have an immeasurable negative effect on the Pool Frequency and Large Pool/Pool Quality WCIs. There is an estimated 13% increase in sediment delivery within the Middle Crooked River subwatershed in the temporary time frame, which may fill or degrade pools/pool quality and negatively affect stream width/max/depth ratios.

Within the Pikes Fork subwatershed, proposed activities could decrease in sediment by an estimated 2%. There is a low likelihood for proposed vegetation treatments, transportation management, or other activities to increase sediment delivery to streams. It is doubtful this small decrease in over-natural sediment would translate into measurable effects to the Pool Frequency and Large Pool/Pool Quality WCIs.

Short-term Effects— Unlike the Proposed Action (Alternative B), this alternative would result in a 2% decrease in sediment within the Middle Crooked River subwatershed. Within the Pikes Fork subwatershed, proposed activities could also decrease sediment by 2%. Again, it is doubtful this small decrease in over-natural sediment would translate into measurable effects to the Pool Frequency and Large Pool/Pool Quality WCIs.

Long-term Effects—This alternative would result in an 8% decrease in sediment in the Middle Crooked River subwatershed. Road decommissioning and closures, along with tree thinning in the RCAs would start to show a positive, immeasurable effect during the

temporary time frame. Noncommercial thinning would promote faster maturity of trees, which would provide future LWD recruitment. This would be expected encourage formation of new pools and improve existing pools. Consequently, a negligible positive effect is expected during this timeframe.

Alternative F

Transportation Management—This alternative includes an additional 0.1 mile of road decommissioning and 0.7 mile of road closure (ML 1) within the RCA. The temporary/short-term negative effects, as well as the long-term benefits, of these activities are similar to the effects common to all action alternatives described above.

Recreation—New construction of 0.1 mile within the RCA would occur during building of the motorized trail. Additionally, as compared with Alternative B, there is a reduction of motorized RCA trails, from 6.6 miles to 5.6 miles. In the Middle Crooked River subwatershed, the elimination of these recreation activities would increase sediment delivery by 22%, as compared to Alternative B (25% over natural). Alternative F is expected to have measureable negative effects in the temporary timeframe. This alternative would result in a measurable negative effect with a 2% increase in sediment in the short-term, and a measurable positive effect with a 7% decrease in sediment over the long-term. In the Pikes Fork subwatershed, this alternative has the same effect as the Proposed Action (Alternative B).

Temporal Effects of Alternative F

Temporary Effects—Sediment associated with prescribed fire, transportation management, and culvert replacements is expected to have an immeasurable negative effect on the Pool Frequency and Large Pool/Pool Quality WCIs. There is a 22% increase in sediment in the Middle Crooked River subwatershed in the temporary timeframe; this sediment increase may fill or degrade pools/pool quality and negatively affect stream width/max/depth ratios.

Within the Pikes Fork subwatershed, proposed activities could increase sediment by 2% over natural. There is a low likelihood for proposed vegetation treatments, transportation management, or other activities to increase sediment delivery to streams.. It is doubtful this predicted small increase in sediment would translate into measurable effects to the Pool Frequency and Large Pool/Pool Quality WCIs.

Short-term Effects—In the Middle Crooked River subwatershed, the 2% increase in sediment in the short-term is not expected to have an effect on the Pool Frequency and Large Pool/Pool Quality WCIs.

Within the Pikes Fork subwatershed, proposed activities could decrease current over natural sediment by 1%. Again, it is doubtful this small decrease in over-natural sediment would translate into measurable effects to the Pool Frequency and Large Pool/Pool Quality WCIs.

Long-term Effects—This alternative would result in a 7% decrease in over natural sediment in the Middle Crooked River subwatershed. Road decommissioning and closures, along with tree thinning in the RCA could start to show a positive, immeasurable effect in the temporary timeframe. Noncommercial thinning would promote faster tree growth, which would provide future LWD recruitment. This would encourage formation of new pools and improve existing pools. Consequently, a negligible positive effect is expected during this timeframe.

Within the Pikes Fork subwatershed, proposed activities would decrease over natural sediment by 2%. Again, it is doubtful this small decrease in sediment would translate into measurable effects to the Pool Frequency and Large Pool/Pool Quality WCIs.

3.8.4.6 Indicator: Off-Channel Habitat

Affected Environment

Desired Condition—The watershed has many ponds, oxbows, backwaters, and other off-channel areas with cover.

Current Condition— The Pikes Fork subwatershed streams are primarily Rosgen A and B type channels, so off-channel habitat is limited but functioning appropriately for the channel types. The Middle Crooked River subwatershed has few oxbows and off-channel areas mainly because of the channel types in the subwatershed. Where these limited features do occur they are impacted by roads paralleling the stream channels and an artifact of the channel types in the subwatershed;, therefore, the off-channel habitat is WCI is FR.

Environmental Effects

Direct and Indirect Effects

Alternative A

Alternative A does not propose any new management activities and would therefore have no effect on this WCI. The Middle Crooked River subwatershed is FR, primarily because of high RCA road density. This trend is expected to continue into the future.

All Action Alternatives

Vegetation Management/Prescribed Burning—The majority of streams are confined Rosgen A or B channels, which have limited floodplains. There are no in-channel or streamside activities with the potential to affect off-channel habitat. As a result, no effects on this WCI in any timeframe is anticipated.

Transportation Management—It is not anticipated that the reduction in RCA roads or other activities included in the action alternatives would affect a change in how floodplains and/or wetlands are hydrologically linked to main channels. Although road reduction is beneficial to other WCIs, it is not expected to have any effect to this WCI.

Temporary Road Construction—Temporary road construction is not expected to have any influence on how floodplains and/or wetlands are hydrologically linked to the main channel. These proposed activities are not expected to effect this WCI in any timeframe.

Converting Unauthorized Roads to NFS Roads—Converting unauthorized road to NFS road is not expected to have any influence on how floodplains and/or wetlands are hydrologically linked to the main channel.

Culvert Replacement—The culvert replacements would be designed to accommodate 100-year flow events and would maintain the current functionality rating for this indicator.

Recreation Management—Construction of the motorized trail, designating the non-motorized trail, or construction of trailhead would not be expected to change how

floodplains and/or wetlands are hydrologically linked to the main channel. Proposed Activities is not expected to have any effect to the off channel habitat WCI in any timeframes.

3.8.4.7 Indicator: Refugia

Affected Environment

Desired Condition—Habitats capable of supporting strong and significant local populations are protected and are well distributed and connected for all life stages.

Current Condition—The Middle Crooked River subwatershed is FUR, while the Pikes Fork subwatershed is FR. Within the Crooked River 5th HUC, 6 bull trout patches are located; however, roads within the RCA, poor water quality, high stream temperatures, and poor connectivity within the Middle Crooked River subwatershed result in minor amounts of fish refugia. Habitats capable of supporting local populations in the Pikes Fork subwatershed are likely insufficient in size and number. No bull trout have been documented in the subwatershed, but potential spawning and rearing habitat has been observed. Most of the neighboring local populations are small. Connectivity to habitat is currently is limited by culvert barriers.

Environmental Effects

Direct and Indirect Effects

Alternative A

Refugia is a large-scale indicator based on the quality, uniqueness, and importance of habitat within the subwatershed. Alternative A does not propose any new management activities. The Middle Crooked River subwatershed is FUR, while the Pikes Fork subwatershed is FR. With no future foreseeable activities to modify the existing trend, the refugia WCI would stay on the same trajectory under the No Action Alternative.

All Action Alternatives

Vegetation Management/Prescribed Burning/Transportation Management/Converting Unauthorized Roads to NFS Roads/Road Reconstruction—A weak local fish population appears to be related to roads within the RCAs, elevated instream fine sediment, high stream temperatures, and poor connectivity with functional refugia in core areas. The proposed activities may have a temporary immeasurable negative effect on this WCI.. Promoting mature tree growth and future LWD recruitment in the watershed would increase shading (lowering stream temperatures), create more channel complexity/pool formation, and increase sediment storage capacity in the future, all of which are critical components of bull trout core habitat areas. Additionally, road closure and decommissioning and road/trail improvements within the RCA would reduce future sediment and improve this WCI. Culvert replacement activities would open up future bull trout spawning and rearing habitat and improve connectivity between core areas. As a result, the action alternatives would have negligible positive effects on the refugia WCI in the short-term and long-term timeframes.

Temporary Road Construction—The action alternatives include 5.8 miles of temporary roads. Of the total miles, only 0.6 mile is proposed in the RCA. Temporary roads in the RCA

would consist of 0.58 mile located on existing road templates with 0.02 mile of new disturbance. Vegetation occurring between the proposed activities and the RCAs would likely decrease sediment delivery to streams from constructing, using, and decommissioning temporary roads. These activities are not occurring adjacent to designated critical bull trout streams and are outside Forest "occupied" or "potentially suitable" bull trout habitat. Effects to the refugia WCI from these activities are expected to be localized and negligible.

Culvert Replacement—Connections between local bull trout populations within the core area are limited by culvert barriers. All of the alternatives propose replacing or modifying 7 culverts with AOP structures, improving access for bull trout to usable spawning and rearing habitat in the Pikes Fork subwatershed. In addition, 16 other culverts are proposed to be replaced within the project area. It is expected these actions would improve bull trout connectivity.

Recreation Management—Trail construction is estimated to increase sediment. Although trail construction and use after could continue to produce sediment, these activities are expected to have a negligible effect on refugia. This irrelevance is because these activities are mostly located outside the RCA and vegetation between the trail and streams would filter potential sediment. It is expected this action would not result in amounts of sediment that could affect this WCI. The effects associated with this action are expected to be negligible, localized, and immeasurable.

Constructing the trailhead near Pikes Fork would disturb and expose soils inside the RCA. This is an existing, highly impacted site, and Design Feature FH-25 would reduce sediment delivery to streams by implementing erosion control measures and revegetating disturbed areas. Topography designs show the proposed trailhead would slope in the opposite direction of Pikes Fork. The location of the trailhead is 68.5 feet over relatively flat ground adjacent to Pikes Fork. Sediment delivery from this activity is expected to be negligible due to the incorporation of BMPs during construction and utilizing a trailhead design that includes surfacing the parking area with aggregate to minimize surface erosion. Implementation of the Pikes Fork Trailhead Rehabilitation and Monitoring Plan would result in fencing and revegetation to stabilize eroding streambanks. This proposed activity would encourage more forest visitors to use this site. As National Forests have seen with other developed sites, the human footprint would grow around the site over time. In the temporary and short-term time frames, effects would be localized and immeasurable. The effects of this facility in the long-term time frame are not discountable and may grow outside the proposed site, having direct or indirect effects on the refugia WCI.

Temporal Effects of All Alternatives

Temporary and Short-term Effects—The action alternatives may have a temporary negligible negative effect based on various project implementations within the RCA.

Long-term Effects—The culvert replacements would have the most substantial effect on this WCI because AOP structures would reestablish access to designated critical habitat for all life stages of bull trout. The resulting positive effect from culvert replacements, sediment reduction, and vegetation management activities would be expected to outweigh the uncertain effects of the trailhead use.

Alternatives C and D

Recreation—Approximately 0.1 mile of new construction for the proposed motorized trail would occur within the RCA. The reduced RCA miles proposed in this alternative would not have a different effect as described for other action alternatives because the activities would not occur adjacent to designated critical bull trout streams and are outside Forest "occupied" or "potentially suitable" bull trout habitat. This activity is expected to have a negligible effect on the refugia WCI.

Alternative D

Vegetation Management—This alternative includes an additional 10 acres of thinning with no product removal, 9 acres of thinning with product removal, and 1 acre of mixed treatment with product removal. The treatments would not occur closer than 50 feet from streams. This treatment would not occur near designated critical habitat for bull trout and is outside of the Forest "unoccupied but suitable" habitat model. The additional acres is not expected to have any effect on the refugia WCI.

Alternative E

Transportation Management—This alternative includes an additional 0.7 miles of road decommissioning and 0.7 miles of road closure (ML 1) within the RCA. The benefits of these activities are similar to the effects common to all action alternatives described above.

Recreation—This alternative does not include the motorized trail and trailhead. As a result, this alternative would not have the RCA effects associated with development of the trailhead. Under this alternative, the functionality rating of the WCI would maintain at FUR in Middle Crooked River subwatershed and FR in Pike Fork subwatershed and existing conditions would be expected to continue into the long-term. ..

Alternative F

Transportation Management—This alternative includes an additional 0.1 miles of road decommissioning and 0.7 miles of road closure (ML 1) within the RCA. The benefits of these activities are similar to the effects common to all action alternatives described above.

Recreation—Approximately 0.1 mile of new construction for the proposed motorized trail would occur within the RCA. Compared to Alternative B, there is a reduction of RCA motorized trails from 6.6 miles to 5.6 miles. This activity is expected to have localized and immeasurable effects on the refugia WCI.

3.8.4.8 Indicator: Streambank Condition

Affected Environment

Desired Condition—More than 90% of any stream reach has stable banks.

Current Condition—The Pikes Fork subwatershed is functioning appropriately; however, based on field visits to the proposed Pikes Fork trailhead site, the site's condition have localized and measurable negative effects on this WCI from current dispersed recreation uses including camping, foot traffic, and unauthorized OHV ford crossing. Streambank condition WCI in the Middle Crooked River subwatershed is FR. Past land management activities and resulting high road densities have contributed to this condition.

Environmental Effects

Direct and Indirect Effects

Alternative A

Alternative A does not propose any new management activities. Therefore, existing conditions would stay the same. The Pikes Fork subwatershed is functioning appropriately and the Middle Crooked River subwatershed is FR. There is existing disturbance at the location of the proposed trailhead near Pikes Fork. Currently, the streambank is degraded and eroding from human foot traffic and an OHV ford crossing. Although the Pikes Fork 6th subwatershed is functioning appropriately, the condition of this site is exhibiting a localized and measurable negative effect on this WCI (based on field visits to this site).

All Action Alternatives

Vegetation Management—The action alternatives include noncommercial thinning within the RCAs. Given the no-treatment buffers identified in the for the action alterantives of 0–50 feet for perennial streams and 0–15 feet for intermittent streams), streambank condition is expected to be maintained in the temporary and short-term timeframes. There could be a slight positive effect from this action in the long-term timeframe. This improvement is attributed to an increase in LWD recruitment, which could promote streambank stability by contributing high-quality LWD. The majority of these treatments would occur in the Middle Crooked River subwatershed, so that is where the positive effect may be realized.

Commercial treatments would include cutting trees between 1 and 2 SPTHs, which is not expected to have an effect on this WCI because of the distance to the stream. This component of the project requires trees to be winched outside the RCA, and no ground-based equipment (skidders, feller bunchers, tractors) would be allowed to travel off existing routes. No skid trails would be constructed within RCAs. The proposed activities would not have any effects on this WCI in any timeframe.

Prescribed Burning—As a result of distances outlined in the project proposal, low fire intensities, the limited extent, and the relatively wet nature of streamside RCAs, little (if any) tree mortality or degraded stream banks is expected. Therefore, no effects on this WCI would be expected.

Transportation Management—The action alternatives include decommissioning 13.8 miles and closing 1.1 miles of NFS roads within RCAs. These activities would promote vegetative growth near the stream bank and are expected to have a negligible positive effect on streambank stability in the long-term timeframe.

Road Reconstruction— This activity would occur on existing road templates and require some shaping of the existing road bed with some realignment (blading and installation of drainage features). The activity is proposed on 0.9 miles within the RCA. This activity is, on average, 12.25 feet from the streambank along a 160-foot section of an unnamed perennial tributary to North Fork China Creek. Design Feature FH-25 and BMPs would mitigate any negative effects to this WCI. These effects would be localized and immeasurable.

Temporary Road Construction— Approximately 0.6 mile of temporary roads are proposed within the RCA. There is a 174-foot section proposed on an existing road template that averages 19.14 feet from an unnamed perennial tributary of Beaver Creek (temporary road

section 12). Design Features FH-25 and TS-4 would mitigate any potential effects improvement and use may have on streambank condition at this site. Also, intact vegetation and distance between the road construction and streams would buffer disturbances from the streambanks. These activities would not occur adjacent to designated critical bull trout streams and are outside Forest "occupied" or "potentially suitable" bull trout habitat. Effects to this WCI are expected to be localized and negligible.

Converting Unauthorized Roads to NFS Roads— Road maintenance activities include reshaping road surfaces, installing additional relief culverts, adding or enhancing waterbars, and redirecting road surface runoff on 0.7 mile of existing roads within the RCA, not located within occupied bull trout habitat or designated critical habitat for bull trout. Of the 0.7 mile, 0.3 mile would be "closed to all motorized use/state of storage" and 0.4 miles would be "closed to public motorized use." The closest these activities occur to an unnamed perennial stream is 89 feet. Field data indicate that vegetation between the road and creeks would minimize potential effects to the streambank WCI. Furthermore, Design Feature FH 25 would mitigate potential effects associated with the proposed activities. There is no anticipated effect to this WCI.

Culvert Replacement— Replacing culverts would have localized, negative effects in the temporary and short-term timeframes. Overall, this activity would maintain the streambank functionality rating. Design Features FH-18, FH-19, FH-21, and FH-24 require streambanks be rehabilitated, providing no effects on this WCI in the long-term..

Recreation Management—The action alternatives include 0.4 mile of motorized trail construction inside the RCA. Minimal riparian vegetation is expected to be removed when constructing trails. The closest this activity occurs to unnamed perennial streams is 54 feet. The vegetation buffer between the proposed activity and streams is expected to protect this WCI from effects; additionally, requiring Design Feature FH-25 will minimize effects. This activity is not expected to have an effect on this WCI.

The construction of the trailhead could have an effect on streambank condition. Site visits to this location have shown the terrain is flat. Currently, the streambank is degraded and being eroded by human foot traffic and an OHV ford crossing. Design Feature FH-25 would protect the streambank at this location from further erosion. Implementing the Pikes Fork Trailhead Rehabilitation and Monitoring Plan would result in fencing and revegetation to stabilize eroding streambanks. These actions are expected to keep the effects localized in the temporary and short-term time frames. There is uncertainty regarding the long-term effects to this WCI from future use with the trailhead facility located immediately adjacent to Pikes Fork Creek. The monitoring plan would evaluate effects of the trailhead to ensure these effects from recreation use and restoration activities are consistent with the objectives described in this document.

Alternatives C and D

Recreation— Approximately 0.1 mile of new construction for the proposed motorized trail would occur within the RCA. The reduction in RCA miles would not have different effects as described in the Proposed Action. The activities would not occur adjacent to designated critical bull trout streams and are outside Forest "occupied" or "potentially suitable" bull trout habitat. This activity is expected to have a negligible effect on the streambank condition WCI.

Alternative D

Vegetation Management— This alternative includes an additional 10 acres of thinning with no product removal, 9 acres of thinning with product removal, and 1 acre of mixed treatment with product removal. The treatments would not occur closer than 50 feet from streams. The buffer would be adequate to maintain functionality of this WCI. The additional acres treated is not expected to effect on this WCI.

Alternative F

Transportation Management—This alternative includes an additional 0.1 miles of road decommissioning and 0.7 miles of road closure (ML 1) within the RCA. The benefits of these activities are similar to the effects common to all action alternatives described above.

Temporary Road Construction—This alternative includes 0.2 miles inside the RCA and does not include temporary road section 12 as previously discussed. Design Features FH-25 and TS-4 would mitigate any potential effects construction may have on the streambank condition. Effects to this WCI from these activities are expected to be localized and negligible.

Recreation—Approximately 0.1 mile of new construction for the proposed motorized trail would occur within the RCA. Compared with Alternative B, there is a reduction of RCA trails from 6.6 miles to 5.6 miles and this activity is expected to have similar effects.

Temporal Effects of Alternatives B, C, D, and F

Temporary Effects—The proposed activities may have negligible negative effects based on culvert replacement construction activities.

Short-term Effects—The proposed activities may have negligible negative effects based on culvert replacement activities.

Long-term Effects—The Middle Fork Crooked River subwatershed could experience a slight positive improvement because of the promotion of LWD recruitment and road decommission/closure activities. The Pikes Fork subwatershed could experience a localized negative effect associated with the uncertainties on the use of the proposed trailhead.

Alternative E

Transportation Management—This alternative includes an additional 0.7 miles of road decommissioning and 0.7 miles of road closure (ML 1) within the RCA. The benefits of these activities are similar to the effects common to all action alternatives described above.

Temporary Road Construction—This alternative does not include any RCA temporary road construction or temporary road section 12 as discussed in the Proposed Action above. There would be no effect to this WCI.

Recreation—Under this alternative, the functionality rating of the WCI would maintain at FR in Middle Crooked River subwatershed and existing conditions would be expected to continue into the long-term. This alternative does not include the motorized trail and trailhead (junction of NFS roads 312 and 385) in the Pikes Fork subwatershed. As a result, this alternative would not have the RCA effects associated with development of the trailhead. Implementation of this alternative would maintain the existing FA rating for the streambank condition WCI; however this alternative would result in measurable localized negative

effects at the proposed trailhead site since the restoration activities associated trailhead development with the other action alternatives would not occur. At this site, it would be expected that current disturbances to the streambanks would continue into the long-term.

Temporal Effects of Alternative E

Temporary Effects—The proposed activities may have negligible negative effects based on culvert replacement construction activities.

Short-term Effects—The proposed activities may have negligible negative effects based on culvert replacement activities.

Long-term Effects— The Middle Fork Crooked River subwatershed could experience a slight positive improvement because of the promotion of LWD recruitment and road decommission/closure activities. The Pikes Fork subwatershed would experience localized effects to this WCI as described under the No Action alternative.

3.8.4.9 Indicator: Floodplain Connectivity

Affected Environment

Desired Condition—Within RCAs, floodplains and wetlands are hydrologically linked to the main channel. Overbank flows occur and maintain wetland/floodplain functions.

Current Condition—The Pikes Fork subwatershed is FR and the Middle Crooked River subwatershed is FUR. Extremely high RCA road densities have impacted floodplains and wetlands within both subwatersheds.

Environmental Effects

Direct and Indirect Effects

Alternative A

Alternative A does not propose any new management activities. Therefore, existing conditions would remain the same.

Action Alternatives

Vegetation Management/Prescribed Burning/Transportation Management/Road Reconstruction/Temporary Road Construction/Converting Unauthorized Roads to NFS Roads/Culvert Replacement/Recreation Management—The majority of the streams are confined Rosgen A or B channels with, by definition, limited floodplains. Based on the limited RCA treatments and lack of in-channel or streamside activities with the potential to affect the hydrological linkage of floodplains to the main channel, there would be no temporary effects on this WCI. The proposed decommissioning or closing of existing roads may enhance the hydrologic linkage of floodplains in the short-term and long-term timeframes. However, most of these treatments are located outside the RCA, and uncertainty regarding the possibility of a positive change in any timeframe has resulted in a no effect determination for this WCI.

3.8.4.10 Indicator: Change in Peak/Base Flows

Affected Environment

Desired Condition—Watershed hydrograph indicates peak flow, base flow, and flow timing characteristics comparable to an undisturbed watershed of a similar size, geomorphology, and climatology.

Current Condition— This indicator is FR for both subwatersheds. There are no active surface water diversions in either subwatershed. Past vegetation management and fires have resulted in a 4% and 5% ECA for Middle Crooked River and Pikes Fork subwatersheds, respectively, which is well below the amount required to detect changes in water yield. However, there are high numbers and lengths of roads within these areas may route water to the channel faster and increase peak flows from precipitation events. Stream hydrographs are typically dominated by spring snowmelt and not precipitation event flows. So it is unlikely that the largest peak flows would be significantly altered by an increased drainage network from roads.

Environmental Effects

The all action alternatives include activities that could affect this WCI, thereby affecting bull trout and their habitat. There would be no effect to this WCI in the Pikes Fork subwatershed and the existing FUR rating would be maintained. Under each action alternative, an immeasurable long-term improvement in this indicator is expected in the Middle Crooked subwatershed due to vegetation management activities, prescribed fire, and road decommissioning. Vegetation thinning and prescribed fire are expected to alter vegetation conditions toward desired conditions and reduce the risk of uncharacteristic wildfire as well as reduce the effects of fire exclusion on overall water yield. This may have negligible positive effects on fishes residing in the Middle Crooked subwatershed and ESA-listed fishes residing in the Crooked River. Refer to section 3.9 or the hydrology technical report (project record) for more detail on this WCI.

3.8.4.11 Indicator: Change in Drainage Network/Road Density and Location

Affected Environment

Desired Condition—Zero or minimum change in active channel length correlated with human caused disturbance. Ideal conditions consist of a total road density <0.7 miles per square mile of the subwatershed and no roads within the RCA.

Current Condition—This indicator is functioning at FUR in both subwatersheds. Road density in both subwatersheds is very high, constituting a greater than moderate change in active channel length as roads act as conduits to route water to stream channels. The road density for the Middle Crooked River subwatershed is 5.7 mi/m^2; the Pikes Fork subwatershed is 6.48 mi/m^2.

Environmental Effects

See the hydrology section for the full analysis. The Proposed Action and all alternatives include activities that could affect this WCI and thereby affect bull trout and their habitat. All action alternatives would maintain both the Changes in Drainage Network WCI and the Road

Density and Location WCI in the long term; the WCIs are FUR in both subwatersheds. This rating will be maintained and is not expected to improve, because the reductions in road miles associated with the action alternatives do not meet the desired road density statistics specified in the Forest Plan (USDA Forest Service 2010a, Appendix B). However, each of the action alternatives would result in reductions in both overall subwatershed road density and RCA road density. The Middle Crooked River subwatershed would receive the bulk of the benefit as the majority of the road decommissioning occurs within this subwatershed. Under Alternatives B, C, and D, Middle Crooked River road density would be reduced by 0.69 mi/mi^2, and by 0.8 mi/mi^2 under Alternatives E and F. RCA road density in the Middle Crooked River subwatershed would be reduced by 1.78 mi/mi^2 under Alternatives B and C, 1.7 mi/mi^2 under Alternative D, and 1.89 mi/mi^2 under Alternatives E and F. In the Pikes Fork subwatershed, road density would be reduced by 0.19 mi/mi^2 under Alternatives B and E, 0.08 mi/mi^2 under Alternative C, and 0.13 mi/mi^2 under Alternatives D and F. RCA road density within the Pikes Fork subwatershed would be reduced by 0.37 mi/mi^2 under Alternatives B, C, D, and F, and by 0.75 mi/mi^2 under Alternative E. Overall, Alternative E results in the greatest reduction in both road density and RCA road density of any of the action alternatives.

3.8.4.12 Indicator: Disturbance History/Disturbance Regime

Affected Environment

Desired Condition—Ideal conditions consist of <15% ECA (entire watershed) with no concentration of disturbance in areas with landslide or landslide-prone areas, and/or refugia, and/or RCAs.

Disturbance resulting from land management activities is negligible or temporary. Streamflow regimes are appropriate to the local geomorphology, potential vegetation, and climatology resulting in appropriate high quality habitat and watershed complexity that provide refugia and rearing space for all life stages or multiple life-history forms. Ecological processes are within historical ranges. Resiliency of habitat to recover from land management disturbances is high.

Current Conditions—For disturbance history, this indicator is functioning at risk (FR) in both subwatersheds. Past vegetation management and fires have resulted in a 4% and 5% ECA for Middle Crooked River and Pikes Fork subwatersheds, respectively. Both subwatersheds have high concentrations of roads in RCAs.

For the disturbance regime WCI, the Pikes Fork and Middle Crooked River subwatersheds are FR. Vegetation is documented as being outside desired conditions due to alteration of the natural fire regime from fire suppression. This increases the risk of wildfire in the area which, if a fire were to occur, could result in negative effects to or loss of aquatic habitat.

Environmental Effects

See the hydrology section for the full analysis. All action alternatives include activities that could affect this WCI and thereby affect bull trout and their habitat. All action alternatives include closure, realignment, and decommissioning of roads within RCAs, which benefits overall RCA function in the short-term and long-term timeframes. All action alternatives are expected to maintain the existing functionality of the RCA's WCI in the long term. An

immeasurable degrade to this indicator is expected in the temporary timeframe, with an immeasurable improving trend to the WCI in the short-term and long-term timeframes within the Middle Crooked River subwatershed. Replacements of existing undersized or otherwise impassable culverts with AOP-type structures provide passage to available habitat and migration corridors for aquatic species, as well as increase the capacity of the crossing to handle higher streamflows and debris during flood events. The temporary immeasurable negative and short-term and long-term immeasurable positive effects to this WCI may benefit bull trout and their habitat.

3.8.4.13 Indicator: Riparian Conservation Areas

Affected Environment

Desired Condition—The RCAs have historic and occupied refugia for listed, sensitive, or native/desired nonnative fish species that are present and provide adequate shade, LWD recruitment, sediment buffering, connectivity, and habitat protection to minimize adverse effects from land management activities (>80% intact).

Current Condition—This indicator is functioning at risk (FR) in both subwatersheds. The FR status is primarily due to the high amounts of roads within RCAs, which increase sediment delivery and reduce potential shade along streams. Additional factors contributing to the current functionality are stream barriers and vegetation conditions outside of desired conditions. Site specific disturbance in the RCA occurs in the Pikes Fork subwatershed at the junction of NFS roads 312/385 (proposed trailhead location)that have localized and measurable negative effects on this WCI from current dispersed recreation uses including camping, foot traffic, and unauthorized OHV ford crossing. Past land management activities including logging, roads, and mining have contributed to fragmented habitats and altered hydrologic, sediment, and temperature regimes. Some of these influences have recovered over time; however, roads and fish barriers at stream crossings continue to hinder attainment of desired conditions. Both subwatersheds have had very little fire in the past several decades and are at high risk of uncharacteristic wildfire due to fuels conditions and missed fire cycles.

Environmental Effects

Direct and Indirect Effects

Alternative A

Alternative A would continue the existing FR condition with regard to the RCA WCI. Under Alternative A, AOP would continue to be limited by 23 physical barriers in the form of unpassable road/stream crossings throughout the project area. Additionally, Alternative A would leave the project at high risk of wildfire and insect infestation due to higher stand densities and abundance of ladder fuels resulting from fire exclusion over the past century. If a large fire were to occur, negative effects from increased sediment and temperature are expected, as increased erosion and reductions in stream shade are likely.

All Action Alternatives

Vegetation Management—Riparian areas show disturbance from past and ongoing land management activities, including road construction and developed/dispersed recreation. The

proposed activities include RCA thinning treatments. Decreased tree density from thinning would allow growth rates to increase, providing potential LWD sooner than would have taken place under overstocked conditions. Promotion of mature tree growth and future LWD recruitment in the watershed would increase shading (lowering stream temperatures), channel complexity/pool formation, and sediment storage capacity, all of which are critical components of bull trout core habitat areas. Noncommercial thinning would occur in the RCA, but no closer than 50 feet from the stream outside plantations and 1 SPTH (approximately 35 feet) within plantations. The vegetation management actions would have negligible effects on this WCI in the temporary timeframe. In the short-term and long-term timeframes, as project objectives enhance the growth of retained trees and alter species toward historic conditions, negligible positive improvements to this WCI are expected. These improvements would result in more vigorous, larger trees in the RCA.

Commercial treatments would include cutting large trees between the second and first SPTHs. There would be soil disturbance within the second tree height of the RCA, but because these trees would be whole tree yarded, minimal disturbance is expected. In addition, the hydrology technical report (available in the project record) states that the Megahan/Ketcheson sediment delivery model estimates sediment delivery for yarding activities is less than RCA buffer distances (1 SPTH). Therefore, sediment associated with vegetation thinning and yarding operations is not expected to be delivered to streams. It is expected the remaining large trees within the first SPTH would still be available for LWD recruitment and would maintain the WCI functionality rating. Consequently, the vegetation management disturbance in the RCA would result in immeasurable negative effects in the temporary and short-term timeframes and would result in long-term benefits.

There are 11 listed important riparian processes and ecological functions in the Forest Plan's Appendix B (B-32–B-41). Of these 11 elements, stream shading, LWD recruitment, and sediment control are the elements most likely to be affected by commercial vegetation treatments such as those proposed in the Becker project. Other elements such as fine organic litter, bank stabilization, riparian microclimate and productivity, nutrients, and other dissolved materials are not expected to be affected by commercial treatments in the second SPTH, due to the distance from the stream that these activities occur. Windthrow is not expected to be a concern for commercial vegetation treatments in the second SPTH because the proposed activities do not include clearcuts and are not expected to measurably increase windthrow. The effects to wildlife habitat associated with commercial vegetation treatments in the second SPTH are discussed in detail in the FEIS, in section 3.5.3.6 (Family 13, Riverine Riparian and Wetland Terrestrial Species) and in this section (3.8, Fisheries Resources). Effects analysis for fisheries and wildlife resources conclude that commercial treatments in the second SPTH would not result in measureable negative effects to these resources.

As discussed in section 3.9, stream shading is not expected to be affected by commercial treatments proposed in RCAs because previous research has demonstrated that harvesting outside of 1 SPTH is not expected to measurably reduce stream shade (Beschta 1987, FEMAT 1993, Moore et al. 2005).

Analysis in section 3.8.3.4 discusses the effects of commercial vegetation treatments on LWD. Current and future LWD recruitment is expected to be maintained because no commercial vegetation treatments are proposed within the first SPTH. Research has shown

that the majority of LWD contributed to the stream comes from the first SPTH (see Figure 3-100, section 3.9). Currently, LWD is functioning appropriately within the areas proposed for treatment.

Effects of commercial vegetation treatments on sediment delivery (and associated hillslope steepness) is analyzed in section 3.9. Erosion associated with vegetation treatments is limited to areas that receive ground disturbance from machinery and/or equipment utilized to move and process logs, as well as landings and roads used to facilitate hauling logs from the units. Skid trails, landings, and haul roads have the potential to contribute sediment to streams, depending on the distance from those areas to the stream. For commercial treatments in RCAs, no new skid trails, landings, or haul roads would be constructed and no machinery and/or equipment would be allowed off existing roads. Trees felled within the RCA in the second SPTH would be yarded to existing roads using cables or tongs and then removed. Analysis in section 3.9 evaluates sediment travel distances using the MK sediment model (Ketcheson and Megahan 1996). Based on landscape characteristics found within the project area, MK sediment travel distances for skid roads, yarding, and landing construction are estimated to be less than RCA buffer widths. Commercial timber harvest operations proposed in RCAs are not expected to measurably increase sediment delivery because there will be no prism construction and associated ground disturbance, and the use of existing routes to yard and haul trees is limited to the second SPTH.

Overall, commercial proposed timber harvest in the second SPTH is not expected to negatively affect the 11 listed riparian processes and ecological functions in the Forest Plan's Appendix B (B-32–B-41). Additionally, WCI analysis associated with fisheries and hydrology reporting indicates that current functionality for all WCIs influenced by project activities would be maintained, with some showing an improving trend in the short and long terms. This conclusion provides rationale for consistency with SWST01 and SWST04.

In the context of the proposed commercial vegetation treatments, which include removal of logs within the second SPTH RCA, the vegetation, fisheries, and hydrology resource analyses conclude that these trees proposed to be felled within the RCA are not needed for achieving soil, water, riparian and aquatic (SWRA)-desired conditions. This determination is based on the analysis of riparian processes and ecological functions as well as on associated WCIs found in the hydrology and fisheries resource sections of the FEIS. Important SWRA-desired conditions include "sufficient large woody debris appropriate for land and stream channel forms to maintain water quality, filter sediment, aid floodplain development, improve[s] floodwater retention and groundwater recharge, and contribute[s] to diverse habitat components." Current LWD and recruitment are functioning appropriately and are not expected to be negatively affected by proposed vegetation treatments. Additionally, the project identifies a need to address upland vegetation conditions within RCAs that have departed from desired conditions primarily due to higher stand densities and abundance of ladder fuels. Commercial treatment in the second SPTH is intended to address the identified need (section 1.4.1) to move toward more functioning vegetation conditions in RCAs, including addressing stand densities, ladder fuels, and moving toward desired conditions for large CWD (see section 3.2) to ensure that "riparian and aquatic ecosystems have appropriate types and amounts of vegetation." Removal of trees felled within the RCA is an important component of addressing this need, because departed vegetative conditions and associated risks to riparian–upland transition zones would not be addressed through noncommercial

mechanical treatment and/or prescribed fire alone. By establishing a trend toward desired vegetation conditions, riparian–upland transition zones are expected to be more resilient when subjected to natural disturbance processes. This resiliency to disturbance processes is important to maintain a trend toward properly functioning riparian and ecological processes such as long-term sediment control, proper stream shading, and maintaining a sufficient amount of recruitable LWD. These conclusions provide rationale for consistency with SWST10.

Prescribed Burning—The proposed activity includes prescribed burning within the RCA. Design Feature FF-3 would mitigate effects associated with fire intensity and undesirable spread within the RCA. Given the low fire intensities, limited extent, and relatively wet nature of streamside RCAs, little (if any) tree mortality or consumption of down and dead material is expected. These prescribed burns would occur in the spring or fall under specific weather conditions. As a result, the prescribed burn would result in a mosaic burn pattern on the ground and unburned ground cover would be expected to be sufficient to filter runoff following a rain storm event. Effects associated with the prescribed burning component of this project are expected to be localized, negligible, and immeasurable.

Transportation Management—The action alternatives would reduce road miles within the watershed and RCAs. Road decommissioning and closure activities would include installing drainage features, installing effective barriers to motorized vehicles, and seeding with grass and forbs. These decommissioned and closed roads within the RCA may temporarily have a negligible negative effect during project implementation. However, these improvements are expected to have a negligible positive effect to this WCI in the short-term and long-term timeframes; because there would be a reduction in sediment to streams, these areas would regrow vegetation and promote large tree growth, resulting in less overall disturbance near streams.

Road Reconstruction—This activity would occur on existing road templates but would require some shaping of the existing road bed and some realignment. Project activities would occur on 0.9 miles within the RCA. These roads are currently closed to all motorized use and in a state of storage. Therefore, disturbance to this WCI is likely to occur; however, based on the limited mileage and Design Features FH-25 and TS-4, effects would be negligible, localized, and immeasurable.

Temporary Road Construction—Most temporary road construction is located outside of RCAs, with only a short amount (0.6 mile) within an RCA. Of the 0.6 mile, only 0.02 miles is new temporary road construction; the other 0.58 miles would occur on existing road templates. The vegetation buffer between temporary road construction and streams would decrease the likelihood that sediment or other effects from the construction of temporary roads would affect this WCI. Therefore, effects from this activity are expected to be localized, negligible, and immeasurable.

Converting Unauthorized Roads to NFS Roads—Road maintenance activities would reduce sediment entry into streams from existing roads through reshaping road surfaces, installing additional relief culverts, adding or enhancing waterbars, and redirecting road surface runoff. Approximately 0.7 miles are located inside the RCA. These roads are already in place and therefore most of the disturbance to this WCI has occurred. Design

Features FH-25 and TS-4 would help minimize sediment delivery to streams. As a result, effects to this WCI are expected to be localized, negligible, and immeasurable.

Culvert Removal/Replacement—The proposed activities include replacing or modifying 23 culverts in the Middle Crooked River and Pikes Fork subwatersheds. These activities are expected to have an immeasurable and localized effect on riparian vegetation in the temporary and short-term timeframes. No effect is expected in the long-term timeframe.

Recreation Management—The Proposed Action includes 6.6 miles of motorized trail construction within the RCA. Of this mileage, only 0.4 miles would be new construction; the remainder is located on existing road prisms. There is 0.38 miles of new construction and 0.61 miles converting an existing road (ML 1) to motorized trail located in Forest "suitable but unoccupied habitat" bull trout patch. No trail construction (either new or on existing road prisms) is located near designated critical habitat for bull trout. Minimal amounts of riparian vegetation are expected to be removed when installing these trails. Vegetation would be cleared around the trail to a height of 6 to 8 feet and a width of 3 to 4 feet. As a result of very little trail construction occurring inside RCAs, the effects of this action are expected to be localized and negligible.

The designation of the non-motorized trail proposed in this alternative would occur on 15.19 miles within the RCA. Of this mileage, none is proposed within USFWS-designated critical habitat and 1.36 miles are within Forest "suitable but unoccupied habitat" bull trout patches. The hydrology resource technical report (project record) stated field reviews of non-motorized trails not co-located on roads was made in May and June of 2014 and did not find accelerated sedimentation problems. Additionally, all stream crossings, including bridges, were in good condition. This trail is currently in place and any continued effect to this WCI would be negligible.

New trailhead construction is proposed at the junction of NFS roads 385/312 in the Pikes Fork subwatershed, which is directly adjacent to Pikes Fork Creek. The new trailhead is located inside the RCA and near designated bull trout critical habitat. The site is located in a previously disturbed area. The location of the trailhead is 68.5 feet from Pikes Fork. The Pikes Fork Trailhead Rehabilitation and Monitoring Plan requires stabilization of the stream bank, vegetation planting in the disturbed area, and blocking access of the OHV creek crossing. Installed fencing would also be required prior to construction of the new trailhead to reduce future expansion of this site. The project design features and rehabilitation/monitoring plan would mitigate effects to bull trout and their habitat in the temporary and short-term timeframes. Also, vegetation between the trailhead and stream would decrease the likelihood that this WCI, the bull trout, or the bull trout habitat would experience negative effects from this action.

Uncertainty exists regarding the long-term effects to this WCI from construction of a trailhead facility within the RCA. This action would encourage a much larger human footprint (e.g., use of the restrooms, walking around the site, dispersed camping nearby) at this site. The effects of this facility in the long-term timeframe are not discountable and may grow outside of the proposed site, having direct or indirect negative effects to this WCI.

Alternatives C and D

Recreation—New trail construction would occur during building of the motorized trail, of which 0.1 miles exists within the RCA. The reduction of RCA miles as a result of these alternatives would not have a different effect as described in the Proposed Action, because the activities would not occur adjacent to designated critical bull trout streams and are outside Forest "occupied" or "potentially suitable" bull trout habitat. As a result, this action is not expected to have significant effects on this WCI.

Alternative D

Vegetation Management—This alternative includes an additional 10 acres of thinning with no product removal, 9 acres of thinning with product removal, and 1 acre of mixed treatment with product removal. The treatments would not occur closer than 50 feet from streams. This buffer would be expected to protect this WCI. Therefore, the addition of these acres is not expected to have any effect on this WCI.

Alternative F

Transportation Management—This alternative includes an additional 0.1 miles of road decommissioning and 0.7 miles of road closure (ML 1) within the RCA. The benefits of these activities are similar to the effects common to all action alternatives described above.

Temporary Road Construction—This alternative includes 0.2 miles of temporary road construction inside the RCA. Design Features FH-13 and TS-4 would mitigate any potential effects construction may have on this WCI. Therefore, effects from these activities are expected to be localized and negligible.

Recreation—New trail construction would occur during building of the motorized trail, of which 0.1 miles exists within the RCA. Additionally, as compared to Alternative B, there is a reduction of RCA trails, from 6.6 miles to 5.6 miles. This action is expected to have similar effects to those described in the Proposed Action.

Temporal Effects of Alternatives B, C, D, and F

Temporary Effects—The proposed activities may have negligible negative effects based on multiple project implementations described above.

Short-term Effects—The proposed activities may have negligible negative effects based on multiple project implementations described above.

Long-term Effects—The Middle Crooked River subwatershed could experience a slight positive improvement because of the promotion of LWD recruitment and road decommission/closure activities. In the Pikes Fork subwatershed, transportation management activities and reduction in sediment would result in an immeasurable positive effect. The uncertainty over effects associated with the usage of the new trailhead is not expected to outweigh the positive effects of management actions.

Alternative E

Transportation Management—This alternative includes an additional 0.7 miles of road decommissioning and 0.7 miles of road closure (ML 1) within the RCA. The benefits of these activities are similar to the effects common to all action alternatives described above.

Temporary Road Construction—This alternative does not include any RCA temporary road construction. Therefore, effects to this WCI are expected to be negligible.

Recreation—Under this alternative, the functionality rating of the WCI would maintain at FR in Middle Crooked River subwatershed and existing conditions would be expected to continue into the long-term. This alternative does not include the motorized trail and trailhead (junction of NFS roads 312 and 385) in the Pikes Fork subwatershed. As a result, this alternative would not have the RCA effects associated with development of the trailhead. Implementation of this alternative would maintain the existing FR rating for the streambank condition WCI; however this alternative would result in measurable localized negative effects at the proposed trailhead site since the restoration activities associated trailhead development with the other action alternatives would not occur. At this site, it would be expected that current disturbances to the streambanks would continue into the long-term.

Temporal Effects of Alternative E

Temporary Effects—The proposed activities may have negligible negative effects based on multiple project implementations described above.

Short-term Effects—The proposed activities may have negligible negative effects based on multiple project implementations described above.

Long-term Effects—The Middle Crooked River subwatershed could experience a slight positive improvement because of the promotion of LWD recruitment and road decommission/closure activities. The Pikes Fork subwatershed could also experience a slight positive effect due to a reduced footprint at the proposed trailhead site. Additionally, road decommissioning activities and reduced sediment in the subwatershed would improve this WCI. The resulting positive effect to this WCI are expected to be negligible and immeasurable.

3.8.4.14 Indicator: Integration of Species and Habitat Conditions

Affected Environment

Desired Condition—Habitat quality and connectivity among local populations is high. The migratory form of bull trout is present. Disturbance has not altered channel equilibrium. Fine sediment and other habitat characteristics influencing survival and growth are consistent with pristine habitat. The local population has the resilience to recover from short-term disturbance within 1 or 2 generations (5 to 10 years).

Current Condition—The Pikes Fork subwatershed is FR; the Middle Crooked River subwatershed is FUR. Habitat quality is functioning appropriately for some habitat elements; however, temperature, surface fines, pool quality, large pools, substrate embeddedness, refugia, chemical contaminants and nutrients, road density and location, and disturbance history appear to be limiting factors in this watershed. Many known barriers to fish passage exist, and brook trout occupy habitat within these subwatersheds.

Environmental Effects

Direct and Indirect Effects

Alternative A

Alternative A does not propose any new management activities. As explained above, some WCIs would continue their negative trends. These WCIs would have a direct influence over the integration of species and habitat conditions WCI. As a result, this WCI would continue to experience immeasurable negative effects in both subwatersheds in all timeframes.

All Action Alternatives

Vegetation Management—The action alternatives include both commercial and noncommercial treatments within the RCAs. The objective of this treatment is to increase the spacing between trees, which would improve tree vigor, increase growth, and encourage future development of large tree size class. These activities are expected to maintain the LWD WCI in the temporary and short-term timeframes and improve the WCI in the long term by providing better growing conditions for remaining trees. It is likely these activities would have the potential to immeasurably increase stream temperatures in the temporary and short-term timeframes (see the Temperature WCI discussion in the hydrology section). FEMAT (1993) found that a buffer of 1 existing tree height is sufficient to maintain litter fall and root strength and retain most of the shading and LWD functions. Increasing LWD recruitment would contribute to new pool formations, which, in turn, allows for increased sediment storage and improved width/max/depth ratio of streams. There are approximately 15.6 acres of vegetation treatment within USFWS-designated bull trout critical habitat and 0.05 acres in Forest "suitable but unoccupied" bull trout patches. These actions would occur outside known bull trout spawning and rearing habitat. Additionally, the 50-foot stream buffer and the directional felling away from creeks/rivers (Design Feature FH-30) would ensure no direct or indirect effect to the resource occur. Effects to this WCI, bull trout, or bull trout habitat from vegetation management activities are expected to be negligible and immeasurable.

Prescribed Burning—The action alternatives include prescribed burning and pile burning within the RCA to prevent fuel loads and ladder fuels from increasing as compared to historic conditions and to reduce the likelihood of a lethal fire occurring in the future. Reducing the potential for a future large fire would also reduce the potential for direct or indirect effects to bull trout populations. As previously described, prescribed fire would be managed to burn at low-to-moderate intensity and severity. Hand piles within RCAs would be limited to 6 feet in diameter and would be distributed across the burn unit.

This prescribed burning would occur on 15.6 acres within designated bull trout critical habitat located outside spawning and rearing habitat. Given the low fire intensities, limited extent, and the relatively wet nature of streamside RCAs, little (if any) tree mortality or consumption of down and dead material is expected. In the event of a rainstorm, unburned groundcover would be available to filter runoff following a prescribed burn. Project Design Feature FF-3 would protect bull trout and their habitat if undesirable fire behavior is present. Effects to this WCI, bull trout, or bull trout habitat from this activity are expected to be localized, negligible, and immeasurable.

Transportation Management—As described above in the relevant WCIs, implementation of road activities within the RCA could have temporary negative effects on some WCIs. In the future, these improvements are expected to have positive effects (measurable and immeasurable) on this and other WCIs. As described in the Sediment WCI section of the hydrology section, over-natural sediment may be temporarily increased but there is limited influence to bull trout and their habitat because of the location of the proposed road activities. Effects from these actions would be minimized by design features related to RCAs (FH-1), specific work restrictions (FH-25 and TS-4), and sediment controls (TS-6), which would be expected to improve potential spawning and rearing or migratory habitat in the future. Additionally, this project helps to reduce stream temperatures by promoting streamside vegetative growth. Both are important components of promoting quality bull trout habitat for generations to come. Once the habitat is more conducive, bull trout may migrate into tributaries currently unoccupied and start repopulating over the long-term timeframe.

Road maintenance has the potential to contribute to temporary sediment increases. These increases are included in the sediment analysis. Road maintenance activities are designed to prevent the deterioration of roads due to regular use and natural erosion. In particular, road maintenance helps to limit sediment input and turbidity from road systems over time. Maintenance activities themselves, however, can contribute sediment to streams. The amount of fine sediment contributed is generally proportional to the frequency, timing, and intensity of maintenance, a road's location on the landscape, and the quality and effectiveness of its drainage (e.g., ditchline extension, number of stream crossings). Design Features TS-4 and TS-6 would minimize this risk by requiring work be performed in dry conditions, by implementing sediment control measures, and by not allowing side-cast waste material within RCAs. These mitigations are expected to decrease the likelihood of sediment delivery, disturbance of bull trout, or degraded habitat. Therefore, effects from these activities are expected to be negligible.

There is a temporary increase (2% over natural) in the Pikes Fork subwatershed from proposed road treatments. This HUC has small pockets of habitat utilized by bull trout, and USFWS-designated critical habitat exists within this subwatershed. Vegetation between the action and streams is expected to filter sediment before it reaches streams, which would protect bull trout and their habitat. The minimal amount of proposed activities (construction of 0.97 miles of motorized trail and road closure activities totaling 0.93 miles) are not expected to have measurable effects. Therefore, effects on this WCI, bull trout, or their habitat are expected to be negligible and localized. The resulting short-term (1% over natural) and long-term (1% over natural) sediment reductions would be beneficial to all life stages of bull trout and to their habitat.

Road Reconstruction— This activity involves shaping and some realignment (blading and installation of drainage features) of existing road templates. The activity would occur on 0.9 miles of road within the RCA. This activity occurs on an average of 45.14 feet from the streambank along an 832-foot section of an unnamed perennial tributary to North Fork China Creek not occupied by bull trout (see section 3.8.1.2) and not designated by USFWS as bull trout critical habitat. These roads are currently closed to all motorized use. Although disturbance from this activity is likely to occur over a limited distance, project Design Features FH-25 and TS-4 and BMPs would ensure the effects are negligible, localized, and immeasurable.

Temporary Road Construction—Most temporary road construction is located outside RCAs, with only a short amount (0.6 mile) proposed within an RCA. Only 0.02 miles of new temporary road construction is proposed; the other 0.58 miles would occur on existing road templates. The vegetation buffer between temporary road construction and streams would decrease the likelihood that sediment from the construction of temporary roads would reach streams. Effects on this WCI, bull trout, or bull trout habitat from this activity are expected to be localized, negligible, and immeasurable.

Converting Unauthorized Roads to NFS Roads—Road maintenance activities would reduce sediment delivery into streams from existing roads through reshaping road surfaces, installing additional relief culverts, adding or enhancing waterbars, and redirecting road surface runoff. Approximately 0.7 miles of road are located inside the RCA. These roads are already in place and therefore most of the disturbance to this WCI has occurred. Design Features FH-25 and TS-4 would minimize sediment delivery to streams. Therefore, effects to this WCI are expected to be localized, negligible, and immeasurable.

Culvert Replacement—The proposed activities would reduce the number of impassable barriers identified in the 2003 and 2004 Forest culvert inventory. This activity is beneficial to bull trout populations and could lead to repopulation within tributaries in both subwatersheds.

Recreation Management—The action alternatives include construction of motorized trail and new trailhead, as well as authorization of existing non-motorized trail. Trail construction could temporarily increase sediment production. There are 6.6 miles of construction within the RCA; however, only 0.4 miles is new construction. The remaining trail construction (6.2 miles) would occur on existing road prisms. Sediment delivery resulting from construction would not be measurable and therefore would not affect bull trout or their habitat. Vegetation between the trail construction and streams would provide a filter between exposed soils and streams. Future sediment delivery is expected to be minimal because establishment of a sustainable trail with proper and adequate drainage and grade. Effects to bull trout or their habitat are expected to be negligible because there is very limited trail construction in Forest "suitable but unoccupied" bull trout patches, no trail construction in bull trout critical habitat, and minimal sediment delivery to streams.

Non-motorized trail authorizations for both winter and summer recreation are not expected to measurably affect sediment delivery. In many cases, non-motorized trails are co-located on existing ML 1 or ML 2 roads and sediment delivery from roads is incorporated into overall sediment delivery estimates. Field reviews in May and June of 2014 of non-motorized trails not co-located on roads did not find accelerated sedimentation problems. Additionally, all stream crossings, including bridges, were in good condition.

New trailhead construction is proposed at the junction of NFS roads 385/312 in the Pikes Fork subwatershed, which is directly adjacent to Pikes Fork. The new trailhead is located inside the RCA and near USFWS-designated critical habitat. The site is located in a previously disturbed area and is 68.5 feet from Pikes Fork. The proposed activity is located outside of bull trout spawning and rearing locations. Fish survey data (n-14) have not found bull trout in Pikes Fork within the project area, but changing fish barriers could allow bull trout to repopulate this creek. Vegetation, aggregate surface, and proper drainage features (ditches) between the trailhead and the creek would reduce potential sediment effects and

ensure proper riparian function. Trailhead construction would result in some disturbance (tree removal and soil disturbance). The current location is in need of vegetation and streambank restoration. The Pikes Fork Trailhead Rehabilitation and Monitoring Plan (Appendix B of the fisheries technical report, available in the project record) would require restoration and fencing prior to new trailhead construction, which would improve the current site and mitigate potential temporary and short-term effects from implementing the new trailhead. The long-term effects to bull trout or their habitat from building a trailhead facility near Pikes Fork are uncertain. It is possible the facility could encourage increased use with a much larger human footprint than what currently occurs because of restrooms, dispersed camping, and other activities. The effects of this facility in the long-term are not discountable and may grow outside of the proposed site, having direct localized effects on this WCI.

Alternatives C and D

Recreation—Approximately 0.1 mile of new construction for the proposed motorized trail would occur within the RCA,, as compared to 0.4 mile in Alternative B. The reduction of RCA miles would not have effects different than those described under Alternative B. Because the activities would not occur adjacent to designated critical bull trout streams and are outside Forest "occupied" or "potentially suitable" bull trout habitat effects on this WCI are expected to be negligible .

Alternative D

Vegetation Management—This alternative includes an additional 10 acres of thinning with no product removal, 9 acres of thinning with product removal, and 1 acre of mixed treatment with product removal. The treatments would not occur closer than 50 feet from streams, and that buffer would be expected protect this WCI. Furthermore, this treatment would not occur near designated critical habitat for bull trout and is outside of the Forest "unoccupied but suitable" habitat model. Therefore, the addition of these acres is expected to have negligible effects on this WCI.

Alternative F

Transportation Management—This alternative includes an additional 0.1 miles of road decommissioning and 0.7 miles of road closure (ML 1) within the RCA. The benefits of these activities are similar to the effects common to all action alternatives described above.

Temporary Road Construction—This alternative includes 0.2 miles inside the RCA. Project Design Features FH-25 and TS-4 would mitigate any potential effects construction may have on this WCI. Therefore, effects from these activities are expected to be localized and negligible.

Recreation—Approximately 0.1 mile of new construction for the proposed motorized trail would occur within the RCA. Additionally, as compared to Alternative B, there is a reduction of RCA trails, from 6.6 miles to 5.6 miles. This activity is expected to have similar effects to those described for Alternative B.

Temporal Effects of Alternatives B, C, D, and F

Temporary and Short-term Effects—The proposed activities may have negligible negative effects based on multiple project implementations described above.

Long-term Effects—The Middle Crooked River subwatershed could experience a slight positive improvement because of the promotion of LWD recruitment and road decommission/closure activities. In Pikes Fork subwatershed, culvert replacements would result in a measurable positive effect. The uncertainty of effects associated with the usage of the new trailhead is not expected to outweigh the positive effects of all other management actions.

Alternative E

Transportation Management—This alternative includes an additional 0.7 miles of road decommissioning and 0.7 miles of road closure (ML 1) within the RCA. The benefits of these activities are similar to the effects common to all action alternatives described above.

Temporary Road Construction—This alternative does not include any RCA temporary road construction. Therefore, effects to this WCI are expected to be negligible.

Recreation—Under this alternative, the functionality rating of the WCI would maintain at FUR in Middle Crooked River subwatershed and existing conditions would be expected to continue into the long-term. This alternative does not include the motorized trail and trailhead (junction of NFS roads 312 and 385) in the Pikes Fork subwatershed. As a result, this alternative would not have the RCA effects associated with development of the trailhead. Implementation of this alternative would maintain the existing FR rating for the streambank condition WCI; however this alternative would result in measurable localized negative effects at the proposed trailhead site since the restoration activities associated trailhead development with the other action alternatives would not occur. At this site, it would be expected that current disturbances to the streambanks would continue into the long-term.

Temporal Effects of Alternative E

Temporary and Short-term Effects—The proposed activities may have negligible negative effects based on multiple project implementations described above.

Long-term Effects— The Middle Crooked River subwatershed could experience a slight positive improvement because of the promotion of LWD recruitment and road decommission/closure activities. The Pikes Fork subwatershed could experience reduced effects in the RCA with no trailhead construction. Further, culvert replacements would reestablish passage for all life stages of bull trout. As a result, management actions would result in an immeasurable positive effect to this WCI.

3.8.5 Fisheries Resource Indicators—Affected Environment and Environmental Effects

3.8.5.1 Indicator: Effects to WCIs associated with Bull Trout and Critical Habitat

Affected Environment

Please refer to the "Pathways and WCIs" section and to the "Affected Environment" and "Direct and Indirect Effects" analyses above for information on the affected environment for WCIs associated with bull trout and critical habitat.

Environmental Effects

Direct and Indirect Effects

Effects information for all WCI indicators is summarized in Table 3-123 for the Proposed Action (Alternative B) and in Table 3-124 for all other action alternatives and the No Action Alternative (Alternative A). More detailed information about potential impacts is given in the narratives above. These tables detail the potential temporary (0–3 years), short-term (3–15 years), and long-term (15+ years) effects.

Table 3-123. Effects of management actions on Watershed Condition Indicators for the Becker Integrated Resource Project under the Proposed Action

Watershed Condition Indicator	Summary of Baseline Functionality Ratings		Proposed Action (Alternative B)	
	Middle Crooked River	Pikes Fork	Middle Crooked River: Temporary/ Short-term/Long-term Effects (+/-/o)	Pikes Fork: Temporary/Short-term/Long-term Effects (+/-/o)
Local Population Size	FUR	FUR	M:-*/-*/+*	M:-*/-*/+*
Growth and Survival	FUR	FUR	M:-*/-*/+*	M:-*/-*/+*
Life History Diversity and Isolation	FUR	FUR	M:-*/-*/+*	M:-*/-*/+*
Persistence and Genetic Integrity	FUR	FUR	M:-*/-*/+*	M:-*/-*/+*
Stream Temperature—Bull Trout	FUR	FR	M:-*/-*/+*	M:-*/-*/+*
Sediment/Turbidity—Bull Trout and Substrate Embeddedness and Substrate Embeddedness	FUR	FUR	M:-/-/+	M:-/+/+
Chemical Contamination/Nutrients	FA	FR	M:-*/-*/o	M:-*/-*/o
Physical Barriers	FUR	FUR	I:+/+/+	I:+/+/+
Large Woody Debris	FA	FA	M:o/o/+*	M:o/o/+*
Pool Frequency and Quality	FR	FR	M:-*/o/+*	M:o/o/o
Large Pools/Pool Quality	FR	FR	M:-*/o/+*	M:o/o/o
Off-Channel Habitat	FR	FA	NI:o/o/o	NI:o/o/o
Refugia	FUR	FR	M:-*/-*/+*	M:-*/-*/+*
Width/Depth Maximum Ratio	FA	FA	M:-*/o/+*	M:o/o/o
Streambank Condition	FR	FA	M:-*/-*/+*	M:-*/-*/-*
Floodplain Connectivity	FUR	FR	NI:o/o/o	NI:o/o/o
Change in Peak/Base Flows	FR	FR	M:o/o/+*	M:o/o/o
Change in Drainage Network	FUR	FUR	M:o/+*/+*	M:o/+*/+*
Road Density/Location	FUR	FUR	M:o/+/+	M:o/+/+
Disturbance History	FR	FR	M:-*/+*/+*	M:o/o/o
Riparian Conservation Areas	FR	FR	M:-*/-*/+*	M:-*/-*/+*
Disturbance Regime	FUR	FR	M:-*/+*/+*	M:o/o/o
Integration of Species and Habitat Conditions	FUR	FR	M:-*/-*/+*	M:-*/-*/+*

Note: Effects to WCI functionality classes consist of the following: M = Maintain (within functionality class), D = Degrade (change functionality class), NI = No Influence, I = Improve (change functionality class).

Note: "+" means an improvement in the condition of an indicator, not necessarily an increase in the number or measurement of an indicator; "-" means a degradation in the condition of an indicator, not necessarily a decrease in the number or measurement of an indicator; "o" means no impact on the indicator. An asterisk "*" following a "+" or "-" means the impact is immeasurable or negligible.

Table 3-124. Effects of management actions on Watershed Condition Indicators (WCIs) for the Becker Integrated Resource Project for all alternatives

WCI	Alternative A		Alternative C		Alternative D		Alternative E		Alternative F	
Subwatershed	**Middle Crooked River**	**Pikes Fork**	**Middle Crooked River**	**Pikes Fork**	**Middle Crooked River**	**Pikes Fork**	**Middle Crooked River**	**Pikes Fork**	**Middle Crooked River**	**Pikes Fork**
Local Population Size	M:-*/-*/-*	M:-*/-*/-*	M:-*/-*/+*	M:-*/-*/+*	M:-*/-*/+*	M:-*/-*/+*	M:-*/-*/+*	M:-*/-*/+*	M:-*/-*/+*	M:-*/-*/+*
Growth and Survival										
Life History Diversity and Isolation										
Persistence and Genetic Integrity										
Temperature	M:o/o/o	M:o/o/o	M:-*/-*/+*	M:-*/-*/+*	M:-*/-*/+*	M:-*/-*/+*	M:-*/-*/+*	M:-*/-*/+*	M:-*/-*/+*	M:-*/-*/+*
Sediment/Turbidity	M:o/o/o	M:o/o/o	M:-/-/+	M:-/+/+	M:-/-/+	M:-/+/+	M:-/+/+	M:-/+/+	M:-/-/+	M:-/+/+
Chemical Contamination/Nutrients	M:o/o/o	M:o/o/o	M:-*/-*/o	M:-*/-*/-*	M:-*/-*/o	M:-*/-*/o	M:-*/-*/o	M:-*/-*/o	M:-*/-*/o	M:-*/-*/o
Physical Barriers	M:-/-/-	M:-/-/-	I:+/+/+	I:+/+/+	I:+/+/+	I:+/+/+	I:+/+/+	I:+/+/+	I:+/+/+	I:+/+/+
Substrate Embeddedness	M:o/o/o	M:o/o/o	M:-/-/+	M:-/+/+	M:-/-/+	M:-/+/+	M:-/+/+	M:-/+/+	M:-/-/+	M:-/+/+
Large Woody Debris	M:o/o/o	M:o/o/o	M:o/o/+*	M:o/o/+*	M:o/o/+*	M:o/o/+*	M:o/o/+*	M:o/o/+*	M:o/o/+*	M:o/o/+*
Pool Frequency and Quality	M:o/o/o	M:o/o/o	M:-*/o/+*	M:o/o/o	M:-*/o/+*	M:o/o/o	M:-*/o/+*	M:o/o/o	M:-*/o/+*	M:o/o/o
Large Pools/Pool Quality	M:o/o/o	M:o/o/o	M:-*/o/+*	M:o/o/o	M:-*/o/+*	M:o/o/o	M:-*/o/+*	M:o/o/o	M:-*/o/+*	M:o/o/o
Off-Channel Habitat	NI:o/o/o	NI:o/o/o	NI:o/o/o	NI:o/o/o	NI:o/o/o	NI:o/o/o	NI:o/o/o	NI:o/o/o	NI:o/o/o	NI:o/o/o
Refugia	M:o/o/o	M:o/o/o	M:-*/-*/+*	M:-*/-*/+*	M:-*/-*/+*	M:-*/-*/+*	M:-*/-*/+*	M:-*/-*/+*	M:-*/-*/+*	M:-*/-*/+*
Width/Depth Maximum Ratio	M:o/o/o	M:o/o/o	M:-*/o/+*	M:o/o/o	M:-*/o/+*	M:o/o/o	M:-*/o/+*	M:o/o/o	M:-*/o/+*	M:o/o/o
Streambank Condition	M:o/o/o	M:-/-/-	M:-*/-*/+*	M:-*/-*/-*	M:-*/-*/+*	M:-*/-*/-*	M:-*/-*/+*	M:-/-/-	M:-*/-*/+*	M:-*/-*/-*
Floodplain Connectivity	NI:o/o/o	NI:o/o/o	NI:o/o/o	NI:o/o/o	NI:o/o/o	NI:o/o/o	NI:o/o/o	NI:o/o/o	NI:o/o/o	NI:o/o/o

WCI	Alternative A		Alternative C		Alternative D		Alternative E		Alternative F	
Change in Peak/Base Flows	M:-*/-*/-*	M:o/o/o	M:o/o/+*	M:o/o/o	M:o/o/+*	M:o/o/o	M:o/o/+*	M:o/o/o	M:o/o/+*	M:o/o/o
Change in Drainage Network	M:o/o/o	M:o/o/o	M:o/+*/+*	M:o/+*/+*	M:o/+*/+*	M:o/+*/+*	M:o/+*/+*	M:o/+*/+*	M:o/+*/+*	M:o/+*/+*
Road Density/Location	M:o/o/o	M:o/o/o	M:o/+/+	M:o/+/+	M:o/+/+	M:o/+/+	M:o/+/+	M:o/+/+	M:o/+/+	M:o/+/+
Disturbance History	M:-*/-*/-*	M:o/o/o	M:-*/+*/+*	M:o/o/o	M:-*/+*/+*	M:o/o/o	M:-*/+*/+*	M:o/o/o	M:-*/+*/+*	M:o/o/o
Riparian Conservation Areas	M:-*/-*/-*	M:-*/-*/-*	M:-*/-*/+*	M:-*/-*/+*	M:-*/-*/+*	M:-*/-*/+*	M:-*/-*/+*	M:-*/-*/+*	M:-*/-*/+*	M:-*/-*/+*
Disturbance Regime	M:-*/-*/-*	M:o/o/o	M:-*/+*/+*	M:o/o/o	M:-*/+*/+*	M:o/o/o	M:-*/+*/+*	M:o/o/o	M:-*/+*/+*	M:o/o/o
Integration of Species and Habitat Conditions	M:-*/-*/-*	M:-*/-*/-*	M:-*/-*/+*	M:-*/-*/+*	M:-*/-*/+*	M:-*/-*/+*	M:-*/-*/+*	M:-*/-*/+*	M:-*/-*/+*	M:-*/-*/+*

Note: Effects to WCI functionality classes consist of the following: M = Maintain (within functionality class), D = Degrade (change functionality class), NI = No Influence, I = Improve (change functionality class).

Note: "+" means an improvement in the condition of an indicator, not necessarily an increase in the number or measurement of an indicator; "-" means a degradation in the condition of an indicator, not necessarily a decrease in the number or measurement of an indicator; "o" means no impact on the indicator. An asterisk "*" following a "+" or "-" means the impact is immeasurable or negligible.

3.8.5.2 Indicator: Effects to Bull Trout Population Characteristics and Critical Habitat

Affected Environment

Desired Condition for Bull Trout Critical Habitat—The *Designation of Critical Habitat* identifies Crooked River, Pikes Fork of the Crooked River, and Banner Creek as critical habitat for bull trout (USDI FWS 2010b). Protecting bull trout critical habitat is essential in long-term recovery efforts. Bull trout appear to have more specific habitat requirements than other salmonids (Rieman and McIntyre 1993). Habitat characteristics including water temperature, stream size, substrate composition, cover, and hydraulic complexity have been associated with distribution and abundance (Rieman and McIntyre 1993, Jakober and MacMahon 1997). Bull trout exhibit patchy distributions because even under pristine conditions, the required habitat components are not present throughout river basins.

Stream temperature and substrate composition are important characteristics of suitable bull trout habitat. Bull trout have repeatedly been associated with the coldest stream reaches within basins. Very cold water is required for incubation (<8 °C [46 °F]), and juvenile rearing appears to be restricted to areas with cold water (15 °C [59 °F]) (MBTSG Montana Bull Trout Scientific Group 1998). However, because bull trout can display several life history types within a single geographic area, they can also be found in larger, warmer river systems that may cool seasonally or provide migratory corridors and important forage bases.

Many factors can potentially limit the distribution of spawning and rearing habitat for bull trout, including barriers, water temperature, interactions with nonnative fish species, geomorphic processes, or human disturbances. These factors are often not independent of one another. Factors considered in managing bull trout habitat are 1) sediment in spawning and rearing habitat; 2) water temperature; and 3) habitat connectivity.

High quality bull trout habitat is typically characterized by abundant cover in the form of large wood, undercut banks, boulders, clean substrate for spawning, interstitial spaces large enough to conceal juvenile bull trout, and stable channels. Juveniles prefer larger substrate and deep pools along with other forms of complex cover (MBTSG Montana Bull Trout Scientific Group 1998). Because habitat has been degraded in many basins and bull trout populations in these basins may be depressed, the fish may use less optimal habitat.

Adult bull trout are top predators and require a large prey base and home range. Sub-adult and adult migratory bull trout move throughout and between basins in search of prey. Adult and sub-adult bull trout are largely piscivorous[33]. Their food preferences include whitefish, smelt, sculpins, eggs drifting following red construction, and other salmonids. Juvenile fish are benthic foragers and also feed on drifting insects.

Primary Constituent Elements (PCEs), as identified in the *Designation of Critical Habitat for Bull Trout* (75 FR 2269), are those habitat components essential for the primary biological needs of foraging, reproducing, rearing of the young, dispersal, genetic exchange, or sheltering. Table 3-125 describes the PCEs and their corresponding WCIs.

[33] Piscivorous = feed on fish

Table 3-125. Description of Primary Constituent Elements (PCEs) and corresponding Watershed Condition Indicators (WCIs)

PCE #	PCE Description	Corresponding Pathway Indicator (WCIs)
1	Springs, seeps, groundwater sources, and subsurface water connectivity (hyporheic flows) to contribute to water quality and quantity and provide thermal refugia	Sediment, channel conditions and dynamics (wetted width/maximum depth ratio, streambank condition, floodplain connectivity), riparian conservation areas
2	Migratory habitats with minimal physical, biological, or water quality impediments between spawning, rearing, overwintering, and freshwater and marine foraging habitats, including but not limited to permanent, partial, intermittent, or seasonal barriers	Temperature, physical barriers, refugia
3	An abundant food base, including terrestrial organisms of riparian origin, aquatic macroinvertebrates, and forage fish	Water quality (temperature, sediment, chemical and nutrient contaminants), channel conditions and dynamics (wetted width/maximum depth ratio, streambank condition, floodplain connectivity), changes in peak/base flows, riparian conservation areas
4	Complex river, stream, lake, reservoir, and marine shoreline aquatic environments and processes with features such as large wood, side channels, pools, undercut banks and substrates, to provide a variety of depths, gradients, velocities, and structure	Habitat elements (substrate embeddedness, large woody debris, pool frequency and quality, large pools, off-channel habitat, and refugia)
5	Water temperatures ranging from 2 to 15 C (36 to 59 F), with adequate thermal refugia available for temperatures at the upper end of this range	Temperature
6	Substrates of sufficient amount, size, and composition to ensure success of egg and embryo overwinter survival, fry emergence, and young-of-the-year and juvenile survival. A minimal amount (e.g., less than 12%) of fine substrate less than 0.85 mm (0.03 in.) in diameter and minimal embeddedness of these fines in larger substrates are characteristic of these conditions	Sediment, substrate embeddedness
7	A natural hydrograph, including peak, high, low, and base flows within historic and seasonal ranges or, if flows are controlled, minimal departures from a natural hydrograph	Flow/hydrology (changes in peak/base flows and drainage network increase)
8	Sufficient water quality and quantity such that normal reproduction, growth, and survival are not inhibited	Water quality (temperature, sediment, chemical contaminants and nutrients)
9	Few or no nonnative predatory (e.g., lake trout, walleye, northern pike, smallmouth bass); inbreeding (e.g., brook trout); or competitive (e.g., brown trout) species present	Persistence and genetic integrity

Environmental Effects

Appendices in the fisheries technical report (project record) display suitable/occupied, suitable/not-occupied, and unsuitable bull trout habitat overlaid with Alternative B vegetation, transportation, and recreation proposed activities.

Direct and Indirect Effects

Alternative A

Alternative A does not propose any new management activities. As explained in the Pathways and WCIs and in the Affected Environment and Direct and Indirect Effects analyses above, some WCIs, and hence PCEs, would continue a negative trend. These WCIs could have a direct influence over bull trout population characteristics and critical habitat. As a result, immeasurable negative effects in all timeframes could persist with respect to bull trout population characteristics and critical habitat.

Action Alternatives

Primary Constituent Elements

For each PCE, effects of project activities on bull trout population characteristics and critical habitat for the action alternatives are described below.

1) Springs, seeps, groundwater sources, and subsurface water connectivity (hyporheic flows) contribute to water quality and quantity and provide thermal refugia

   None of the proposed activities would interrupt springs, seeps, groundwater sources, or water connectivity.

2) Migratory habitats with minimal physical, biological, or water quality impediments between spawning, rearing, overwintering, and freshwater and marine foraging habitats, including but not limited to permanent, partial, intermittent, or seasonal barriers

   No water quality barrier would be created during implementation of the proposed activities. Episodes of temporary limited turbidity may occur during some project activities; however, these episodes are not expected to constitute a water quality degradation that would create a water quality barrier.

3) An abundant food base, including terrestrial organisms of riparian origin, aquatic macroinvertebrates, and forage fish

   Effects on the prey base are highly unlikely because no insecticide treatments would occur in any alternative. Some macroinvertebrates could be displaced or smothered entirely during culvert replacement activities, which may result in temporary episodes of heavy turbidity. These effects are expected to be localized and fish would be able to find a new food base upstream or downstream of the construction site. Furthermore, macroinvertebrates residing near the construction sites would re-inhabit the disturbed areas rather quickly. Other proposed activities (vegetation management, prescribed fire, and some transportation management) have a vegetation buffer between project activities and streams that would filter sediment. Therefore, effects on this PCE from any alternative are expected to be localized and negligible.

4) Complex river, stream, lake, reservoir, and marine shoreline aquatic environments and processes with features such as large wood, side channels, pools, undercut banks and substrates, to provide a variety of depths, gradients, velocities, and structure

   Existing LWD would not be affected by any alternative. Overall, channel complexity/structure, wetted width-to-depth ratios, and usable habitat area would not be affected by any alternative. A small section of the channel (10 feet) upstream and

downstream of the new AOP structure could be affected during culvert replacement. However, this finish work would mimic the natural structure of the creek. During the temporary timeframe, a 25% over-natural increase in sediment within the Middle Crooked River subwatershed sediment could fill pools and negatively affect stream width/max/depth ratios and pool quality. However, no designated bull trout critical habitat exists in this subwatershed and project activities would not occur anywhere near critical habitat. Furthermore, multiple project design features and the vegetation buffer between the proposed activities and streams would be expected to provide filter exposed soils and streams. As a result, effects on this PCE would be negligible.

Proposed activities located within critical bull trout habitat within the Pikes Fork subwatershed could increase sediment by 2% above background rates in the temporary timeframe. However, this increase would not change channel complexity because very little sediment is likely to enter streams.

5) Water temperatures ranging from 2–15 °C (36–59 °F), with adequate thermal refugia available for temperatures at the upper end of this range

Currently, baseline conditions are FR for both Middle Crooked River and Pikes Fork subwatersheds. Monitoring data from the USFS Rocky Mountain Research Station indicate MWMT average 15 °Celsius with a minimum of 9 °C and a maximum of 19.6 °C for both subwatersheds. Activities proposed in RCA, with the exception of culvert replacement activities, would not affect this PCE because project design features and distance buffers between activity locations and streams would protect this indicator. Culvert replacement activities could reduce shade around the construction site by removing existing vegetation; the vegetation removal would not substantively change the temperature within streams.

In the long-term timeframe, proposed thinning activities would result in benefits by enhancing the growth of retained trees. Also, road decommissioning and closure activities would result in increased stream shade by eliminating perennial stream crossings. The intent of RCA vegetation treatments is to promote the establishment of larger trees and increase canopy cover, effectively reducing the amount of solar absorption and irradiation along the stream in the future.

6) Substrates of sufficient amount, size, and composition to ensure success of egg and embryo overwinter survival, fry emergence, and young-of-the-year and juvenile survival; a minimal amount (e.g., less than 12%) of fine substrate less than 0.85 mm (0.03 inches) in diameter and minimal embeddedness of these fines in larger substrates are characteristic of these conditions

All action alternatives would maintain the existing FUR rating for the Sediment/Turbidity (Bull Trout—Other Fishes) WCI in both the Middle Crooked River and Pikes Fork subwatersheds. There are approximately 15.6 acres within USFWS-designated bull trout critical habitat and 0.05 acres within Forest "suitable but unoccupied habitat" bull trout patches of where vegetation treatments area proposed, including 1.35 acres near Edna Creek and 1.32 acres near Beaver Creek 600 feet upstream of Crooked River.

The transportation system represents the largest overall contributions and reductions in sediment delivery over the life of the project. Effects of trail management actions on sediment delivery were incorporated into estimates of sediment delivery related to roads. Increases in sediment delivery in the temporary timeframe are attributed to temporary road construction, road reconstruction, and road realignment. Decreases in sediment delivery are attributed to road decommissioning, road realignment, and road closure. Most of the sediment inputs represented in the hydrology technical report (project record) are occurring in the Middle Crooked River subwatershed, where very little designated critical habitat occurs and no known spawning and rearing areas exist.

Temporary-term increases in turbidity associated with culvert construction within bull trout critical habitat is not expected to last more than the duration of the construction period (days). Although all action alternatives would result in a measureable negative effect to the sediment/turbidity WCI in the temporary timeframe, this effect is not expected to be significant to this PCE because it would not occur near known bull trout spawning and rearing areas. Small incremental improvements to this PCE and the Sediment/Turbidity WCI are expected as a result of project implementation in the long-term timeframe.

7) A natural hydrograph, including peak, high, low, and base flows within historic and seasonal ranges or, if flows are controlled, minimal departures from a natural hydrograph

Under each of the action alternatives, a slight immeasurable improvement to this PCE is expected in the Middle Crooked River subwatershed due to vegetation management activities, prescribed fire, and road decommissioning/closure activities. Vegetation thinning and prescribed fire would restore vegetation conditions toward desired conditions and reduce the risk of uncharacteristic wildfire, as well as reduce effects of fire exclusion on overall water yield. The combination of these actions would result in a streamflow regime more reflective of an undisturbed watershed of similar size and characteristics.

8) Sufficient water quality and quantity such that normal reproduction, growth, and survival are not inhibited

Water quantity and/or quality may experience episodes of where turbidity ranges from low to high during culvert replacement and transportation management activities. These activities would occur in the temporary and short-term timeframes, with a temporary increase in turbidity in a portion of the channel. However, this increase would not result in inhibition of normal behavior to any bull trout that may be present downstream. The disturbance could displace any bull trout within the immediate area, but would not result in bull trout mortality or degradation of their habitat.

9) Few or no nonnative predatory (e.g., lake trout, walleye, northern pike, smallmouth bass); inbreeding (e.g., brook trout); or competitive (e.g., brown trout) species present

All of the alternatives would remove existing fish culvert barriers and open new fish habitat in the Middle Crooked River and Pikes Fork subwatersheds. Nonnative brook trout are present in other tributaries in these subwatersheds and may hybridize with

bull trout or access the newly accessible habitat. However, bull trout would most likely continue to inhabit Crooked River, and hopefully reestablish in Pikes Fork in the long-term timeframe.

3.8.6 Cumulative Effects

Within the Middle Crooked River and Pikes Fork subwatersheds, the following State, federal, and private activities are currently taking place and are expected to continue in the future:

- Road maintenance and use
- Trail maintenance and use
- Camping at designated and dispersed campsites
- Fishing and hunting
- Fuel wood gathering and Christmas tree cutting (private activities authorized by Forest Service permit)
- Noxious weed control by biological control agents and chemical spraying (Boise County and Forest Service joint projects)
- Sheep grazing allotments
- Snowmobile use
- Recreation (e.g., hiking, horseback riding, cross-country skiing, kayaking)

Appendix B of this document outlines the past, present/ongoing and reasonably foreseeable actions in the landscape patch and pattern analysis area. Past and ongoing management actions have been considered in describing the existing baseline conditions for all WCIs and population and habitat characteristics. Foreseeable future activities that may have additional effects on WCIs and population and habitat characteristics are listed above. These actions are ongoing and have been considered in describing the existing conditions. As a result, no additional or cumulative effects would be either indirectly or directly related to the proposed management actions for all alternatives.

3.8.7 Summary of Determination of Effects

3.8.7.1 Determination of Effects and Rationale

Based on the effects analysis completed for each Pathway/WCI and the associated PCE analysis, the IDT determined the Becker Integrated Resource Project would be "likely to adversely affect" bull trout and designated critical habitat for bull trout. The basis for this conclusion is summarized below:

- Bull trout (adults and juveniles) in the Pikes Fork subwatershed may be stressed, injured, or killed during fish handling activities prior to dewatering during culvert replacement activities.
- Fish passage through the work area may be blocked during culvert replacement and transportation management activities.

- Project-related sediment in the Pikes Fork subwatershed would be carried downstream, possibly displacing fish or altering behaviors, but would not be expect to result in bull trout mortality or degradation of their habitat.
- The proposed activities (all action alternatives) would have a negative effect on PCEs 2, 8, and 9.

Although temporary adverse effects to individual fish could occur during culvert replacement or transportation management activities, including incidental handling injury and mortality, these effects are not expected to degrade the overall subpopulation size, growth and survival, life history diversity, or genetic integrity of bull trout populations. Removing and replacing culverts and improving the road system would help increase the baseline population toward a restore rating in the long-term timeframe and would reduce fish migration barriers and improve access to miles of quality fish habitat. The new AOP structures would reestablish passage for all life stages of bull trout, resulting in increased resiliency of subpopulations by reconnecting fragmented habitats within and between watersheds, helping to restore various life history patterns and emphasizing genetic integrity.

3.9 HYDROLOGY RESOURCES

The following changes were made between the DEIS and FEIS:

The Stream Temperature indicator section has been updated to describe consistency of project activities with the Idaho Forest Practices Act Shade Rule. This section has also been updated to reflect the change in no-treatment buffers for non-commercial thinning in plantations. In the DEIS, a "one shade tree height (assumed to be 35 feet)" no-treatment buffer for non-commercial thinning in plantations was proposed. For the FEIS, a 50 foot no-treatment buffer for non-commercial thinning both inside and outside plantations along perennial streams is proposed.

This section incorporates by reference the hydrology technical report (project record), which contains the detailed data, methodologies, analyses, conclusions, maps, references, and technical documentation. This section summarizes the effects of the alternatives to the hydrology resources.

3.9.1 Watershed Characterization

The project area includes approximately 14,462 acres of the Middle Crooked River 6th field HUC (170501110504) and 3,475 acres of the Pikes Fork 6th field HUC (17501110503), both of which drain to the North Fork Boise River via the Crooked River. The project area is nested within the Crooked River 5th field HUC (1705011102), which is nested within the North and Middle Fork Boise River subbasin (4th field HUC [17050111]) (Table 3-126).

Table 3-126. Becker Project Area Watershed Characterization

Aquatic Ecological Units	Name	Hydrologic	Hydrologic Unit Code No.	Acres
Subbasin	North Fork Boise River	4th	17050111	486,115
Watershed	Crooked River	5th	1705011102	66,971
Subwatersheds	Middle Crooked River	6th	170501110504	20,958
	Pikes Fork		170501110503	13,023

Elevations range between approximately 5,000 feet near where the Crooked River drains from the project area, up to approximately 8,100 feet at Pilot Peak. The hydrologic regime in these subwatersheds is best characterized as "snowpack dominated". Stream discharge is dominated by spring runoff with peak flows typically beginning in April and continuing through May. The spring runoff period is followed by dry summer and early fall conditions, greatly reducing streamflow. Streams not supported by groundwater sources are often intermittent and become dry in late summer. A chance exists for an occasional summer and fall thunderstorm that can produce short, intense precipitation. Streams in the project area include A, B, and C Rosgen (1996) channel types. Rosgen (1996, pp. 5–6) classifies natural rivers by their characteristics, including entrenchment ratio, width/depth ratio, sinuosity, slope, and channel material. A-type channels are typically entrenched, have low width-to-depth ratios, low sinuosity, and moderate-to-high stream gradients. B-type channels are typically moderately entrenched, have moderate width-to-depth ratios, moderate sinuosity, and low-to-moderate stream gradients. C-type channels are low gradient, meandering, riffle

pool, alluvial channels with broad, well-defined flood plains. (Rosgen, 1996, p. 5-6). Table 3-127 displays the miles of perennial and intermittent streams within the project area based on the National Hydrography Dataset.

Table 3-127. Stream Reach Miles within the Analysis Area

Stream Reach	Middle Crooked Subwatershed (miles)	Pikes Fork Subwatershed (miles)	Totals (miles)
Perennial Streams	75.3	38.8	114.1
Intermittent Streams	11.0	16.2	27.2
Totals	86.3	55	141.3

The project area is contained in the Northern Rocky Mountain Geomorphic Province. The subbasin is situated on the Atlanta Lobe, the southern portion of the Cretaceous granite formation commonly known as the Idaho Batholith. Rock types found within the batholith range from quartz gabbro to granite. The most common rocks are granodiorite and quartz monzonite. These granitic parent materials weather to form gravelly, coarse to moderately coarse textures, and shallow to moderately deep soils. The majority of the soil units have low-to-moderate cohesion, medium-grained soils that are moderately to highly erodible, especially when disturbed. Sediment delivery to stream channels is naturally high. Water yielded from these soil units occurs at moderately deep (>40 inches) subsurface flow. Overland flow is uncommon except in responsive to intense rainfall from thunderstorms or rain-on-snow-events. Hazards of debris slides cut slope stability and fill slope stability range from low to high in all of these soils. The geology and soils, topography, and hydrology combine to produce moderate-to-high sedimentation rates.

3.9.2 Wetlands and Floodplains

Wetlands and floodplains have distinctive soils, hydrology, and vegetation types that provide food and cover for many mammals, birds, and amphibians, and they influence aquatic habitat conditions. Protecting these areas is required by the 2010 Forest Plan, as well as EOs 11988 and 11990. The intent of EO 11988 is that proposed activities must not increase flood hazards and must preserve the resource benefits of floodplains (i.e., their ability to dissipate flood flows and moderate peak flows). The goal of EO 11990 is that proposed activities must preserve the resource benefits of wetlands (i.e., their ability to produce abundant diverse biota, buffer water quality, and recharge groundwater). One mapped wetland occurs within the project area on private land at Kempner Ranch. However, several sections of low gradient perennial streams (Rosgen B and C channels) occur within the project area, supporting wetland soils and vegetation within the surrounding floodplains. Floodplains in the analysis area are associated with perennial and intermittent stream channels. The current conditions of these floodplains vary from site to site but, generally, the floodplains have maintained their overall resource benefits. A substantial population of beavers occurs in the project area, contributing to seasonal inundation of floodplains through dam building. Existing road crossings are located within the floodplains and may influence floodplain connectivity or pose risks of road failure due to flooding. Roads located within the RCAs that parallel the streams may intercept subsurface water, thereby, reducing recharge to the shallow subsurface flow necessary for properly functioning wetlands and floodplains.

3.9.3 Municipal Watersheds

No municipal watersheds occur within the project area. The nearest downstream water body designated as a municipal watershed is Arrowrock Reservoir, which provides drinking water for the city of Boise. The definition for Municipal Supply Watershed is one that serves a public water system as defined in Public Law 93-523 (Safe Drinking Water Act); or as defined in State safe drinking water regulations. The definition does not include communities served by well or confined ground water unaffected by Forest Service activities (FSM 2542.05).

3.9.4 Water Quality

The federal CWA requires States and tribes to restore and maintain the chemical, physical, and biological integrity of the nation's waters. States and tribes, pursuant to Section §303 of the CWA, are to adopt water quality standards necessary to protect fish, shellfish, and wildlife while providing for recreation in and on the nation's waters whenever possible. Section §303(d) of the CWA establishes requirements for States and tribes to identify and prioritize water bodies that are water quality limited (i.e., water bodies that do not meet water quality standards). States and tribes must publish a priority list (a "§303(d) list") of impaired waters every 2 years. For waters identified on this list, States and tribes must develop a TMDL for the pollutants, set at a level to achieve water quality standards. The EPA is the agency responsible for reviewing and approving TMDLs.

Every 2 years, IDEQ is required by the CWA to conduct a comprehensive analysis of Idaho's water bodies to determine whether they meet State water quality standards and support beneficial uses or if additional pollution controls are needed. This analysis is summarized in an "Integrated Water Quality Monitoring and Assessment Report" (Integrated Report), which is submitted to the EPA for approval. The report serves as a guide for developing and implementing water quality improvement plans (TMDLs) to protect water quality and achieve federal and State water quality standards.

An Integrated Report must be approved by the EPA before it can be used by a State to guide its management decisions. Idaho's most recent approved version is its 2012 Integrated Report (State of Idaho 2014).

3.9.4.1 Water Quality Beneficial Uses for the Middle Crooked and Pikes Fork Subwatersheds and the North and Middle Fork Boise River Subbasin

Beneficial uses are protected by a set of criteria, which include narrative criteria for pollutants, such as sediment and nutrients, and numeric criteria for pollutants, such as bacteria, dissolved oxygen, pH, ammonia, temperature, and turbidity (IDAPA 58.01.02.250).

3.9.4.2 Status of Water Quality Beneficial Uses for Middle Crooked and Pikes Fork Subwatersheds and the North and Middle Fork Boise River Subbasin

The assessment units within the analysis area are listed by the IDEQ as fully supporting all designated water quality beneficial uses (Table 3-128). All receiving water bodies downstream of the analysis area are fully supporting beneficial uses until the confluence of

the Middle and North Forks of the Boise River. The Boise River, from the North Fork/Middle Fork confluence to Arrowrock Reservoir, is 303(d) listed for temperature.

Table 3-128. Designated Beneficial Uses for the Middle Crooked and Pikes Fork Subwatersheds and the North and Middle Fork Boise River Subbasin

Water Body	Water Quality Beneficial Uses	Type of Uses	Status
Crooked R, Pikes Fork, and Beaver Cr—1st and 2nd order ID17050111SW014_02	Cold water aquatic life, primary contact recreation and salmonid spawning	Designated	Fully Supporting
Crooked R, Pikes Fork, and Beaver Cr—3rd Order ID17050111SW014_03	Cold water aquatic life, primary contact recreation and salmonid spawning	Designated	Fully Supporting
Crooked River—4th order ID17050111SW014_04	Cold water aquatic life, salmonid spawning, primary contact recreation	Designated	Fully Supporting

3.9.5 Analysis Scale, Data Sources, and Methodology

3.9.5.1 Analysis Scale

Spatially, direct, indirect, and cumulative effects were tracked at the subwatershed scale (6th field HUC—National Hydrography Dataset). Subwatersheds included in the analysis include Middle Crooked River 6th field HUC (170501110504) and Pikes Fork 6th field HUC (17501110503). This scale was chosen because the spatial scale of proposed management activities (approximately 19,000 acres) is consistent with typical subwatershed scales (10,000–40,000 acres); additionally, broader national and Forest-specific watershed goals, such as those described in the WCF (USDA Forest Service 2011) and Forest ACS (USDA Forest Service 2010a), utilize subwatershed scales for depicting resource conditions and functionality.

Analysis timeframes were chosen to be consistent with Forest Plan Standards SWTS01 and SWTS04 (USDA Forest Service 2010a), and consist of temporary (0–3years), short-term (3–15 years), and long-term (15+ years) timeframes.

3.9.5.2 Data Sources

Data and descriptions used in this analysis leverage numerous sources located in the project record, some of which include field data, notes and photos collected by hydrologists and fisheries biologists; the Becker Transportation Analysis; the fisheries, vegetation, fuels , transportation, recreation, and soils technical reports; IDEQ Beneficial Use Reconnaissance Program (BURP) data; 2012 Integrated Report database, available in the project record); USFS Pacfish Infish Biological Opinion Effectiveness Monitoring (PIBO) data; USFS Rocky Mountain Research Station monitoring data; BNF aquatics survey database (ASD); Agency-wide, Forest, and District GIS databases; and the District Soil and Hydrologic Reconnaissance Report (Wendt et al. 1973). Field monitoring data that have been used, in part, to characterize existing conditions are shown in Figure 3-99.

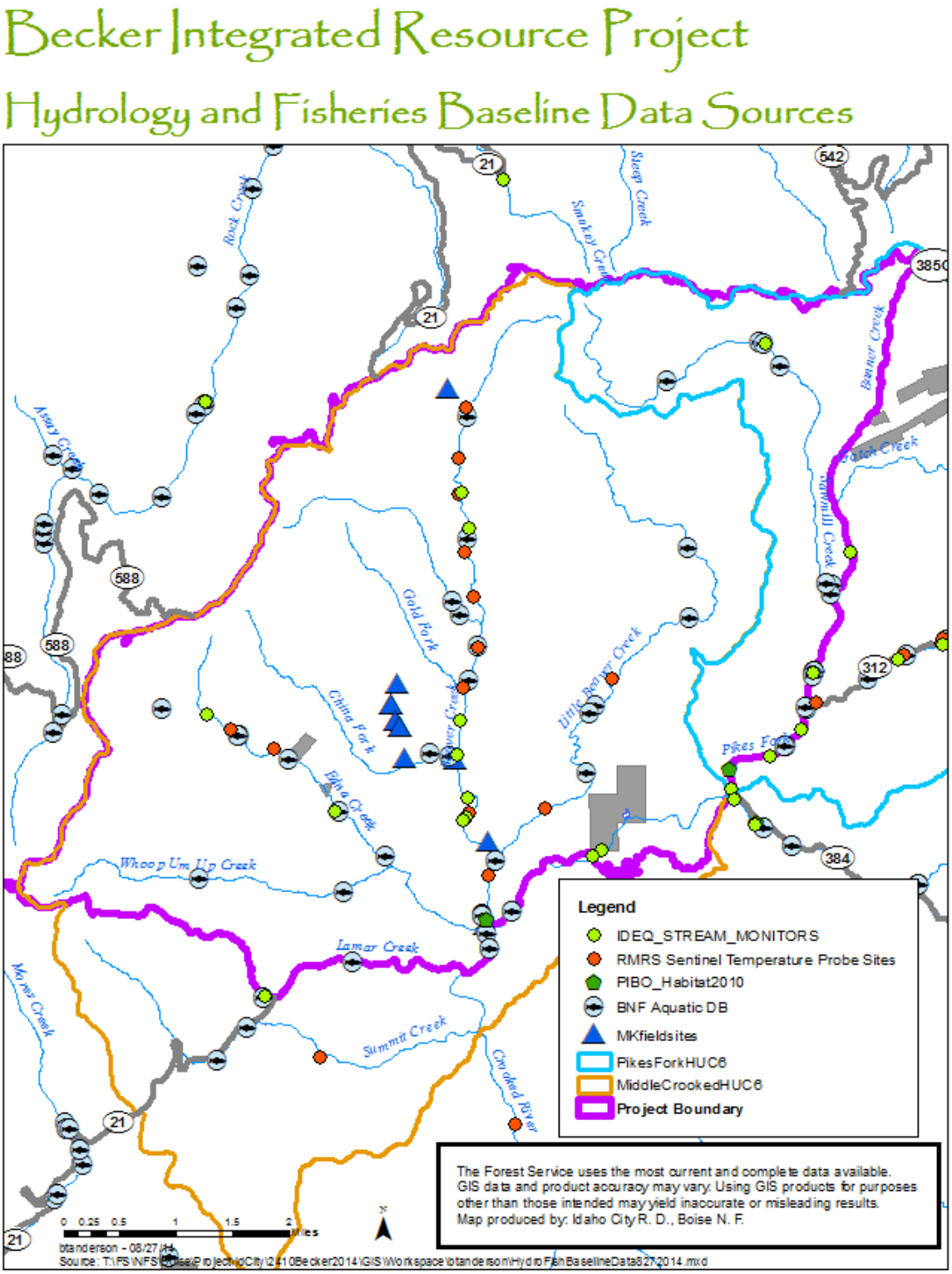

Figure 3-99. Baseline Survey Locations within the Analysis Area

3.9.5.3 Methodology

Sediment production was estimated using a combination of several models. The BOISED model was utilized to calculate inherent/natural background sediment yields as well as sedimentation from prescribed fire and vegetation thinning; the GRAIP_Lite (Geomorphic Roads Analysis and Inventory Package_Lite Package) model was utilized for sediment delivery from roads (Nelson et al. 2014); and the Megahan/Ketcheson (MK) Sediment Delivery Model (Megahan and Ketcheson 1996, Ketcheson and Megahan 1996) was used to estimate sediment travel distances and the likelihood of management-induced sediment being delivered to streams. The results of each of these models are combined to provide an estimate of annual sedimentation (tons per year) as well as a percent over natural background sedimentation (% ON) for the existing condition as well as the Proposed Action and additional alternatives considered.

The following activities proposed under the action alternatives were analyzed in the effects analysis:

- Road management activities—construction (system and temporary), realignment, reconstruction, change in management level designation, addition of unauthorized routes to the system, decommissioning, conversion to motorized and/or non-motorized trail, and AOP culvert replacements
- Vegetation management activities—commercial thinning, noncommercial thinning, activity fuels burning, and natural fuels burning
- Recreation management activities—trail construction, trail designation, and trailhead construction

Snow grooming associated with Park N' Ski routes was not analyzed because no evidence exists to suggest it would affect primary hydrology indicators (temperature, sediment, chemical contaminants). Seasonal restrictions on motorized and mechanized travel restrictions for both areas and designated routes/uses were not analyzed because the infrastructure (road and trails) are accounted for in the effects analysis. Additionally, area closures to motorized over-snow travel were not expected to result in effects (either positive or negative) to any analysis indicators due to lack of ground/vegetation disturbance, and season-of-use closures on existing roads were not expected to measurably influence the overall effect. Differences in effects related to designation of a motorized trail for either ATV (50 inches or less) or UTV (60 inches or less) were not analyzed because the overall difference is expected to be negligible considering the majority of the proposed motorized trail exists on old road prism. Designation and/or movement of trailhead facilities at Beaver Creek Summit was not analyzed because the location of this activity is near the ridge top far from streams and effects of the adjacent road system have been accounted for in the road/sediment analysis.

The Forest Plan outlines criteria to aid IDTs in delineating RCAs for perennial and intermittent streams, ponds, lakes, reservoirs, and wetlands (USDA Forest Service 2010a, Appendix B, p. B-32 through B-41). The objective of RCA delineation is to provide boundaries around streams for which management activities must consider and maintain riparian processes and functions that are important to overall stream and aquatic habitat functionality. Individual management activities may affect riparian process and functions in different ways and magnitudes depending on the type of activity and its proximity to the

stream channel, as well as the characteristics of the stream channel at that location. For the Becker Project, RCAs were identified by the IDT using Option 2 as described in the Forest Plan (USDA Forest Service 2010a, Appendix B), which utilizes SPTHs based on the dominant PVG in the stand. Option 2 indicates that one SPTH is the RCA buffer distance for intermittent stream channels (as well as ponds, lakes, reservoirs, and wetlands) and two SPTH is the RCA buffer distance for perennial stream channels. Because the project area contains a wide array of PVGs, the dominant PVG based on the most recent vegetation data was used to delineate RCAs. Vegetation treatment activities proposed to occur within RCAs are limited to buffer widths described in Chapter 2 (Figure 2-1) to address concerns with the effects of treatments on riparian area processes and functions.

3.9.6 Analysis Process/Pathways and Indicators

Analysis indicators represent metrics used to describe the cause and effect relationships between components of the Proposed Action and desired conditions for attributes of stream health important for maintaining water quality beneficial uses and quality aquatic habitat. Analysis indicators have been taken, where appropriate, from the list of WCIs in the Forest Plan (USDA Forest Service 2010a, Appendix B). Temperature, sediment, and chemical contaminants indicators in the Water Quality Pathway have been designated as primary indicators because they are water quality and habitat components that the action alternatives may directly affect. Other relevant and influenced WCIs included in the analysis were designated as secondary indicators, which may influence or be influenced by the primary indicators. These secondary indicators include streamflow hydrology pathway indicators of change in peak/base flows and changes in drainage networks, and watershed condition pathway indicators of road density and location, disturbance history, disturbance regime, and RCAs. For this analysis, the substrate embeddedness WCI is combined with the sediment/turbidity WCI as it was determined that the overall effects would be identical and did not warrant a separate analysis. WCI analyses are split between the hydrology resources and fisheries resources technical reports with references between the two.

The following assumptions exist for this analysis:

- Assumptions associated with the characterization of existing (baseline) conditions for analysis indicators.
- Assumptions associated with the application of sediment models to estimate existing and future sediment yields for the alternatives analyzed. Assumptions for sediment modeling are included in the hydrology technical report (project record).
- The assumption that all project design features identified in Chapter 2 would be implemented in a timely and effective manner.

3.9.6.1 Water Quality Pathway—Primary Indicators

Indicator: Stream temperature (bull trout and other fishes)

- Concern: Vegetation harvest (commercial harvest and precommercial thinning) and prescribed fire could reduce the amount of vegetative stream shading, resulting in increased stream temperatures with a potential reduction in water quality beneficial uses and quality of aquatic habitat. Changes in the transportation system, specifically the amount and extent of disturbance at road or trail stream crossings, may affect stream shading and subsequently stream temperature.
    - Methods: Qualitative assessment of stream shading canopy and area of streams affected by management activities. Analysis includes the number of stream crossings and extent and location of vegetation thinning in RCAs.

Indicator: Sediment/Turbidity (bull trout and other fishes) and Substrate Embeddedness

- Concern: Vegetation harvest (commercial harvest and precommercial thinning); construction of landings; prescribed fire; and road and trail management actions (including road decommissioning, reconstruction/realignment, road and trail construction, road surfacing and drainage improvement, road and trail management level/designation status, and AOP culvert replacements) could increase sediment delivery to streams, thereby negatively affecting water quality beneficial uses and aquatic habitat.
    - Methods: Estimated changes in sediment yield from existing and proposed activities were analyzed using GRAIP_Lite, BOISED, and MK sediment models.

3.9.6.2 Changes in Streamflow Hydrology Pathway—Secondary Indicators

Indicators: Changes in Peak/Base Flows and Changes in Drainage Network

- Concern: Vegetation harvest (commercial harvest and precommercial thinning); landing construction; prescribed fire; and road and trail management actions (road decommissioning, reconstruction/realignment, road and trail construction, and road surfacing and drainage improvement) could alter the streamflow hydrology within the analysis area. Increases in water yield can lead to increased streambank erosion, channel extension, and accelerated sedimentation to streams; while improvements to summer stream base flows may also occur.
    - Methods: The discussion for changes in streamflow hydrology is based on an assessment of transportation and vegetation management activities in relation to effects on water yield and streamflow generation processes. Changes in drainage network are analyzed in relation to changes in the transportation system.

3.9.6.3 Changes in Watershed Condition Pathway—Secondary Indicators

Indicators: Road Density and Location; Disturbance History; Disturbance Regime; and Riparian Conservation Areas

- Concern: Vegetation harvest (commercial harvest and precommercial thinning); landing construction; prescribed fire; and road management actions (road decommissioning, reconstruction/realignment, road construction, road surfacing and drainage improvement, and AOP culvert replacements) could alter the overall watershed condition. Changes in the overall watershed condition may affect the water quality beneficial uses, wetland and floodplains, and aquatic habitat.
    - Methods: The discussion for changes in watershed condition is based on a synthesis of information, including road densities, natural and anthropogenic disturbance processes, riparian area functions and processes, and overall watershed functionality.

3.9.7 Water Quality Primary Indicators—Affected Environment and Environmental Effects

The existing conditions of all the analysis indicators used for the hydrology analysis within the project area range from functioning appropriately (FA) to FUR and are identified in Table 3-129. These functionalities reflect how current conditions, represented by various monitoring data, field visits, and geospatial data, compare to desired conditions described in the Forest Plan and tailored to suit the affected subwatersheds. Existing conditions are the result of natural processes as well as past or ongoing management activities as documented in the cumulative effects analysis. Monitoring data and field visits were used to characterize existing conditions. While numerous monitoring data are available for the various WCIs analyzed within the analysis area, a complete understanding of current conditions for WCIs across the entire analysis area is not possible due to natural variability and the large size of the area. Where possible, data have been analyzed with general statistics (mean, maximum, minimum, and standard deviation) to characterize the existing condition throughout the analysis area for one functionality rating.

Baseline existing conditions reflect the natural physiography of the area as well as human influence in the form of past timber harvest and fuel wood gathering, an extensive transportation system, historic mining, past wildfires and fire suppression, livestock grazing, and broad recreational uses. In general, past activities have been accounted for in the existing baseline condition of analysis indicators via field surveys within the project area. These influences have affected streams, riparian areas, and the overall hydrologic function of the project area. Monitoring data indicate that instream fine sediment and stream temperatures are not meeting desired conditions. Road densities are high within the project area, and many primary access roads are located directly adjacent to streams. Vegetation is documented as being outside desired conditions because fire suppression has altered the natural fire regime (see the vegetation technical report [project record]). Altering the fire regime increases the risk of wildfire in the area, and if a fire were to occur, could result in negative effects to or loss of aquatic habitat (see the fuels technical report [project record]). No 303(d) listed streams or TMDLs exist within the analysis area (State of Idaho 2014), and alteration of

riparian areas by disturbances other than roads is generally low. Existing functionality for each analysis indicator are discussed further in the following sections.

Table 3-129. Current condition of analysis indicators for hydrology

Pathways and Indicator	Middle Crooked subwatershed Watershed	Pikes Fork subwatershed Watershed
Water Quality Watershed Condition Indicators		
Stream Temperature—bull trout and other fishes	FUR	FR
Sediment/turbidity—bull trout spawning areas	FUR	FUR
Chemical Contaminants/excess Nutrients	FA	FR
Streamflow/Hydrology Watershed Condition Indicators		
Change in Peak/Base Flows	FR	FR
Change in Drainage Network	FUR	FUR
Watershed Condition Watershed Condition Indicators		
Road Density and Location	FUR	FUR
Disturbance History	FR	FR
Disturbance Regime	FR	FR
Riparian Conservation Areas (RCAs)	FR	FR

Note: FA = Functioning Appropriately, FR = Functioning at Risk, FUR = Functioning at Unacceptable Risk, NA = Not Applicable

3.9.7.1 Stream Temperature (bull trout and other fishes)

Affected Environment

The desired condition for stream temperature (bull trout and other fishes—tailored to suit conditions for bull trout [see *Fisheries Technical Report* available in the project record] as directed in the Forest Plan [USDA Forest Service 2010a, Appendix B]) is a 7-day average maximum temperature in a reach during the following life stages: incubation 2–5 degrees Celsius (°C), rearing 4–12 °C, spawning 4–9 °C, adults <15 °C.

This indicator is functioning at risk (FR) in the Middle Crooked subwatershed and functioning at risk (FR) in the Pikes Fork subwatershed (Table 3-129). Monitoring data from the USFS Rocky Mountain Research Station indicates that MWMT for the Middle Crooked subwatershed averages 15 °C, with a minimum of 12.9 °C and a maximum of 19.6 °C. The Pikes Fork subwatershed averages 14 °C, with a minimum of 9 °C and a maximum of 19.1 °C.

Environmental Effects

Elevated stream temperatures are detrimental to cold water fisheries and negatively affect the ability of species such as bull trout to spawn, rear, and inhabit streams identified as potential habitat (Rieman and McIntyre 1993). Temperature analysis for this project focuses on shade alteration along perennial streams. While intermittent streams are important contributors to quality aquatic habitat, they are assumed to be dry or at low flows during critical summer periods when stream temperatures are a limiting factor for aquatic habitat. Overall, management actions proposed in all action alternatives are not expected to measurably alter stream shade. A detailed analysis of effects tied to individual actions for each action alternatives is included below.

Direct and Indirect Effects

Altenative A

Alternative A would perpetuate the existing condition with regard to stream temperature in all timeframes. The Temperature (Bull Trout—Other Fishes) WCI would continue to be functioning at risk (FUR) and (FR) due to elevated stream temperatures. Existing stream-temperature estimates are based on temperature monitoring conducted throughout the analysis area and are summarized in baseline data tables (available in the hydrology technical report in the project record).

Roads—Roads which cross streams and roads within RCAs can negatively affect stream temperature where the road or crossing reduces vegetation canopy and potential shade adjacent to perennial streams Under Alternative A, 122 perennial stream crossings would remain in the Middle Crooked subwatershed and 36 perennial stream crossings would remain within the Pikes Fork subwatershed (Table 3-130). Additionally, road density within RCAs would remain at 9.4 and 8.9 mi/mi^2 in the Middle Crooked and Pikes Fork subwatersheds, respectively (see "Changes in Drainage Network and Road Density and Location" section below).

Table 3-130. Number of perennial stream crossings by alternative

Subwatershed	Alt A	Alt B	Alt C	Alt D	Alt E	Alt F
Middle Crooked	122	103	103	103	101	101
Pikes Fork	36	35	35	35	35	35

Vegetation—Alternative A would not change the existing vegetation condition with respect to stream shade; however, this alternative would leave the project area at high risk to wildfire. If a fire were to occur, it may result in negative effects to stream temperature by eliminating vegetation canopy over streams.

Non-motorized Trails—Fifty-three perennial stream crossings and approximately 16 miles of trail exist within RCAs associated with the non-motorized "agreement routes" that would be authorized under all action alternatives. Trails which cross streams and trails within RCAs may negatively affect stream temperature in locations where the trail or crossing reduces vegetation canopy and potential shade adjacent to perennial streams. Field-inventoried stream crossings do not appear to have measurably altered stream shade from vegetation removal (see the hydrology technical report in the project record for photos). Additional stream shade at these locations has been provided by the installation of footbridges. Because the footbridges are narrow and have a small impact on vegetation, effects to potential shade-providing vegetation and subsequent stream temperatures is negligible

Action Alternatives

All action alternatives would maintain the existing functionality of the Temperature (Bull Trout—Other Fishes) WCI in the short and long term, which is FUR in the Middle Crooked subwatershed and FR in the Pikes Fork subwatershed. Within both subwatersheds, the percent of stream shading and, inversely, stream temperature is expected to immeasurably decrease under each action alternative in the temporary (0–3 years) and short term (3–15 years) and immeasurably increase in the long term (15+ years). Immeasurable changes in

shade mean the magnitude of the effect is anticipated to be small, localized, and/or negligible in the context of the entire analysis area. Small differences in effects exist between Alternatives B, C, and D and Alternative E and F with regard to the Temperature (Bull Trout—Other Fishes) WCI.

Roads—All action alternatives include changes to the transportation system that may affect stream shading at stream crossings. The majority of roads with proposed management actions are located within the Middle Crooked subwatershed; however, some road decommissioning is proposed within the Pikes Fork subwatershed.

Perennial road/stream crossings would be reduced under all action alternatives from road decommissioning activities. Road decommissioning is expected to increase long-term stream shade by eliminating between 19 and 21 perennial stream crossings in the Middle Crooked subwatershed and one perennial stream crossing in the Pikes Fork subwatershed. These crossings would, over time, become vegetated and provide additional shade to the stream.

Road realignment is not expected to affect shading. Only 0.1 miles of realignment are proposed in RCAs. This 0.1 mile segment is located within the RCA boundary, but in the outer SPTH along the NFS Road 393 realignment, which would not impact stream shade.

Temporary road construction is proposed for 0.6 miles of existing unauthorized routes within RCAs with one stream crossing identified. Effects to shade from temporary road construction is expected to be negligible because RCA temporary roads are being co-located on existing unauthorized routes and temporary routes would be decommissioned and reclaimed after use (Design Feature TH-4).

Culvert Replacements—All action alternatives include 23 AOP culvert replacements or modfications. These culvert replacements are expected to temporarily reduce shade around the construction site by removing existing vegetation on road fills during construction. The magnitude of impact associated with this disturbance would vary based on individual site conditions, but impact is expected to be negligible in the context of the entire subwatershed and would be partially mitigated by Design Features FH-19 and FH-24, which limit impacts to riparian vegetation. Stream shade at AOP culvert replacement sites is expected to recover to preconstruction levels in the long term.

Vegetation Thinning—All action alternatives include vegetation thinning within and outside RCAs which is classified into two groups: non-commercial thinning (with no product removal) and commercial timber harvest (with product removal). Because vegetation thinning only occurs within the Middle Crooked subwatershed, no effects from vegetation management actions are anticipated in the Pikes Fork subwatershed.

Thinning prescriptions are proposed to treat upland vegetation (conifer trees) with the intention to shift vegetation conditions toward desired conditions (Purpose and Need 1 and vegetation technical report available in the project record). Upland vegetation and the associated need for treatment, as discussed in Purpose and Need 1, exist in areas outside and within RCAs, where upland vegetation extends down the hillslope to adjacent riparian plant communities.

Streams throughout the project area are predominantly A and B type channels (Rosgen 1996) with a narrow zone of riparian plant communities. These riparian plant community zones are approximately 5 to 30 feet wide from the channel depending on stream entrenchment, valley

narrowness, and stream floodplain access. Option 2 RCA widths (see discussion of RCA widths in section 2.4.2), however, contain a substantial amount of upland vegetation, which assists in providing for important RCA functions and processes to varying degrees based on individual functions and distance from the channel.

Consideration of riparian functions and processes for designing treatments (to address the need with regard to upland vegetation within RCAs) led the IDT to develop additional treatment criteria in the form of designated distances and activity limitations. These additional treatment distances and activity limitations (see Figure 2-1 for an illustration of the buffer widths and vegetation and fuels activities) are intended to be implemented in conjunction with Option 2 buffer designations in a manner that protects RCA values while treating vegetation conditions to reduce risks of uncharacteristic disturbance (i.e., wildfire and insect infestation). Acres of proposed vegetation treatments within RCAs are depicted in Table 3-131.

Table 3-131. Mechanical Treatments in RCA

	Alternatives B, C, E and F			Alternative D		
	1st SPTH	2nd SPTH	TOTAL	1st SPTH	2nd SPTH	TOTAL
Thinning with No Product Removal (8" dia. limit)	927	374	1,301	936	374	1,310
Thinning (Optional Mastication) No Product Removal	0	61	61	0	61	61
Subtotal non-commercial thinning	**927**	**435**	**1,362**	**936**	**435**	**1,371**
Thinning with Optional Misc. Wood Product Removal	0	122	122	0	122	122
Thinning with Product Removal	0	257	257	0	266	266
Mixed Treatment with Product Removal	0	111	111	0	112	112
Subtotal Product Removal	0	489	489	0	500	500
No Treatment Buffer	476	0	476	476		476
TOTAL TREATMENTS IN RCA	**1,403**	**924**	**2,327**	**1,412**	**935**	**2,347**

Commercial timber harvest with product removal is limited to outside the first SPTH along perennial streams. Based on Design Feature FH-27, limited commercial harvest may occur within the second SPTH where equipment is able to operate on existing routes within that zone. This buffer distance is expected to retain existing streamside shade during all timeframes. Previous work has indicated that one SPTH or more provides sufficient protection of streamside shade such that effects to temperature from harvesting outside that distance would be negligible (Beschta 1987, Moore et al. 2005, FEMAT 1993).

Non-commercial thinning would be allowed up to 50 feet from perennial streams and 15 feet along intermittent streams. The total acres of thinning, with no product removal treatment within the first SPTH in RCAs, would be approximately 927 acres under Alternatives B, C, E, and F and 936 acres for Alternative D. Additionally, noncommercial thinning within the first SPTH would be limited to cutting material smaller than 8 inches dbh. The no-cut buffer

distances and the 8-inch diameter limit within the first SPTH are intended to limit the reduction of trees that have the potential to provide shade along streams. At 50 feet from the stream channel, material smaller than 8 inches in diameter would not be large enough to cast shadows that would shade the stream (Wonn and O'Hara 2001). Additionally, treatment prescriptions described in section 3.2.7.2 discuss a selective treatment primarily targeting the seedling/sapling tree size class (0–4.9 inches dbh) (Table 3-10). The thinning prescription reduces TPA in the seedling/sapling size class (0–4.9 inches dbh) by 88%–89% and in the small size class (5.9–11.9 inches dbh) by 36%–44% for the nonlethal and mixed 1 fire regimes, respectively. For both fire regimes, approximately 94% of the overall reduction in TPA comes from the seedling/sapling size class and approximately 6% of the overall reduction in TPA comes from the small tree size class. Based on the small size of material targeted for treatment and the number of trees left un-cut in the various size classes, reductions in stream shade are not expected from the proposed treatments.

Intermittent streams are expected to be dry during the time period when stream temperatures are a limiting factor for aquatic species, therefore, thinning along intermittent channels would not be expected to affect stream temperatures. The 15-foot buffer associated with thinning along intermittent channels is designed to maintain streambank stability. For non-commercial thinning along perennial streams, reducing canopy cover from smaller trees would not be expected to affect stream shade outside of no-cut buffers.

Stream shade from adjacent vegetation comes primarily from riparian plant communities directly adjacent to the stream and from trees directly adjacent to the stream along the streambank. Generalized curves depicting microclimate and shade contributions to streams as a function of distance from the channel in SPTHs (Figure 3-100) indicate that processes controlling stream shade and micro-climatic variables decrease exponentially with distance from the channel. Eighty percent of effective shade comes from approximately ½ SPTH distance from the channel.

Based on existing literature, silvicultural prescriptions, and professional judgment, noncommercial thinning activities within RCAs are not expected to measurably reduce long-term stream shade. However, due to the range of stand conditions, topography, channel orientations, and vegetation species within the project area, it is unclear what kind of temporary and short-term effects to stream shade would occur and the degree to which shade may or may not be reduced at site-specific locations as a result of RCA thinning. A primary objective of silvicultural prescriptions is to shift forest stand conditions toward long-term desired conditions. Thinning is expected to reduce competition between individual trees and increase availability of sunlight and nutrients to grow larger trees over time, therefore increasing shade in the long term.

Additional information about the relationship of this project to the Idaho Forest Practices Act (IFPA) 2014 Shade Rule—The IFPA regulates silvicultural and timber harvest activities within Idaho and includes measures for protecting streams. In general, standards used by the Forest Service include greater protection measures around streams (buffers) than are required under the IFPA. For the project, thinning and burning activities have been proposed within the RCA; therefore, a review of consistency with the IFPA is included here.

The IFPA incorporated a new "shade rule" in 2014 (IDAPA 20.02.01). The new shade rule allowed for 2 variable harvest options within 75 feet of streams (referred to as the Stream Protection Zone [SPZ]) with limitations on post-harvest relative stocking (measure of TPA by size class). This rule is intended to be applied during field layout and or cruising of silvicultural activities to limit reductions in stream shade from timber harvesting activities adjacent to streams. Proposed thinning prescriptions for stands within the project were analyzed for compliance with the shade rule, using pre- and post-thinning stand data (TPA by size class as outlined in IDAPA 20.02.01) generated using FVS to generate relative stocking values for the zones described in the shade rule. Modeled vegetation data used for the project is intended to represent the entire stand and is not specific to the 75 feet from the stream zone that is regulated by the IFPA.

For the project, only non-commercial thinning activities with a diameter limit of 8 inches dbh are included in the SPZ. Treatments are further restricted by buffer distances described in section 1.4.2.

No harvest is proposed within 50 feet of a stream, so this area is addressed using shade rule option 2, also known as the 60/10 (Table 3-132). Under option 2, relative stocking can be reduced to 60 in the zone from 0 to 50 feet from the stream and up to10 in the zone from 50 to 75 feet from a stream. No analysis was needed for the area from 0 to 50 feet from the stream, as no thinning is allowed in this area. Within the area from 50 to 75 feet from the stream, no stands proposed for treatment throughout the entire project area would be reduced below a relative stocking of 10 based on a relative stocking analysis. Reductions in relative stocking for the analyzed stands are included in Table 3-133. The largest reduction in RS is 37. The lowest RS of any stand post-treatment is 12.8.

The language for the shade rule option 2 is as follows: "Option 2: Within fifty (50) feet from the ordinary high water mark on each side of a stream, live conifers and hardwoods will be retained to maintain a minimum relative stocking per acre of sixty (60). A relative stocking per acre of ten (10) must be retained in the stream protection zone between fifty (50) feet and seventy-five (75) feet from the ordinary high water mark on both sides of the stream" (USDA Forest Service 2010a)

Table 3-132. Per Tree Contribution to Relative Stocking by Diameter Class

Forest Type	Diameter Class (dbh in inches)						
	4–7.9	8–11.9	12–15.9	16–19.9	20–23.9	24–27.9	28–31.9
North Idaho Grand Fir	0.097	0.209	0.347	0.506	0.683	0.878	1.088
Central Idaho Grand Fir	0.113	0.244	0.405	0.590	0.797	1.024	1.270
Southern Idaho Grand Fir	0.136	0.293	0.486	0.708	0.957	1.229	1.524
Western Hemlock Subalpine Fir	0.123	0.267	0.442	0.644	0.870	1.117	1.385
Douglas-fir Ponderosa Pine	0.151	0.326	0.540	0.787	1.063	1.366	1.693

Table 3-133. Relative Stocking (RS) Statistics for stands proposed for Riparian Conservation Area treatment between 50 and 75 feet of the stream—Alternative D

	Pre-treatment RS	Post-treatment RS[a]	Difference
Minimum	16.1	12.8	0.01 (minimum difference)
Maximum	109.7	99.5	37.3 (maximum difference)
Average	52.2	43.6	8.6
Standard Deviation	19.0	15.6	
n=	141		

[a]No treated stands fall below 10 RS

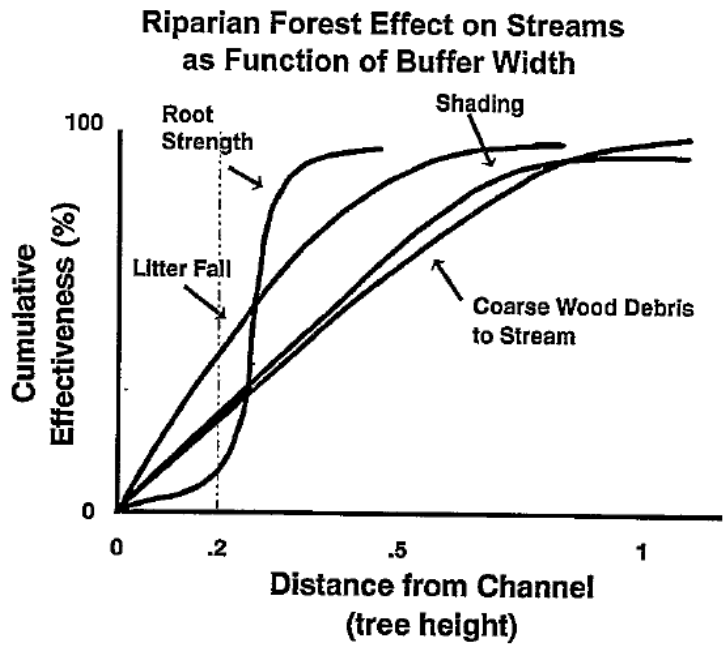

Figure V-12. Generalized curves indicating percent of riparian ecological functions and processes occurring within varying distances from the edge of a forest stand.

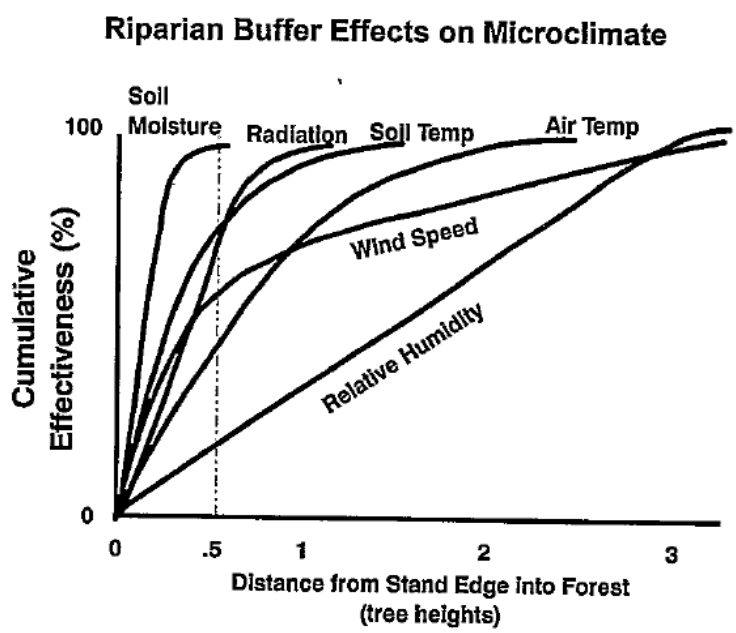

Figure 3-100. Generalized curves indicating percent of riparian functions and processes occurring within varying distances from the edge of a forest stand (Source: FEMAT 1993)

Prescribed Fire—All action alternatives include prescribed fire activities to reduce fuel loads of both naturally occurring fuels and fuels generated by thinning activities. Because prescribed fire is only proposed to occur within the Middle Crooked subwatershed, prescribed fire is not expected to affect stream shade within the Pikes Fork subwatershed. Design criteria stipulate that no direct fire ignitions would occur within 75 feet of stream channels (the 75-foot distance is a requirement under the IFPA), though backing fire would be allowed to occur throughout RCAs. Burn prescriptions and windows for burning are generally designed to occur when fuel and weather conditions allow for a low-to-moderate intensity fire to achieve both desired vegetation conditions and reduce the potential for escape (see the fuels technical report in the project record). This strategy effectively limits the overstory mortality and reduces the potential for loss of shade over streams.

Recent research has investigated the effect of prescribed fire on stream temperature and other riparian attributes. Arkle and Pilliod (2010) studied the effects of prescribed fire on stream and riparian attributes in central Idaho and found that no statistically significant change in maximum stream temperature occurred as a result of prescribed fire. It is expected that a backing prescribed fire would burn at reduced intensity within the RCA, as compared to the uplands, due to increased relative humidity and fuel moisture within RCAs. Fire backing within the RCA could lead to isolated torching of individual and small groups of trees, which could reduce shade around streams. However, this effect is expected to be limited and would not measurably influence stream temperatures.

In general, limits on the locations of ignitions of prescribed fire are considered counterproductive to achieving the desired fire intensity, because heat and fuel consumption are best controlled by ignition patterns both inside and outside RCA boundaries. A 75-foot ignition buffer provides additional flexibility to utilize vegetation and topographic features to control fire spread and flame lengths adjacent to streams. Ignitions occurring within the RCA, up to 75 feet from the stream, are not expected to affect overall stream temperatures because prescribed fire intensity and severity would be controlled through ignition patterns and burn prescriptions that would limit the potential reduction in stream vegetative canopy and subsequent shade.

Treating activity-related fuels within the project area is not expected to affect stream shade because activity fuels would be burned in piles located greater than 50 feet from stream channels. Piles would be limited to less than 6-foot diameter, and include no more than 60 piles per acre. Overall, alteration of stream shade associated with fuels treatments is expected to be negligible, due to incorporation of burn prescriptions that would limit fire intensity and burn severity. Using ignition patterns to control fire spread and limits on the locations, size, and density of handpiles would also minimize impacts (Design Features FF-1, FF-3, and FF-5).

Recreation/Trail Management—Recreation management activities that may affect stream shade include designation of a motorized trail, designation of non-motorized trails, and new trailhead construction. For the proposed motorized trail, perennial stream crossings are the most likely locations where trail designation would impact stream shade. Because the new motorized trail does not include new perennial stream crossings (it does include the use of existing perennial stream crossings), it is not expected to measurably affect stream shade.

A new trailhead to access a motorized trail is proposed at the junction of NFS roads 385 and 312. Trailhead construction is proposed to occur along Pikes Fork Creek within the RCA and within an existing disturbance of dispersed recreation sites that have been used for parking and camping in the past. Construction would include graveling the parking lot, installing a vault toilet, placing barrier rock, and building an interpretive kiosk. As a part of this construction, preexisting impacts at the site, in the form of eroding stream banks and unauthorized stream crossings, are planned to be re-vegetated and access blocked (see photos in the hydrology technical report [project record]). These actions are expected to enhance stream shade and benefit the stream temperature indicator in the long term as currently impacted streambanks are stabilized and re-vegetated.

Fifty-three perennial stream crossings and approximately 16 miles of trail associated with the non-motorized "agreement routes" would be authorized under all action alternatives. Trail/stream crossings and trails within RCAs may negatively affect stream temperature in locations where the trail or crossing reduces vegetation canopy and potential shade adjacent to perennial streams. However, because of the narrow width of the non-motorized trails (single track width, where not on existing road prism) and small impact on vegetation, effects to potential shade-providing vegetation and subsequent stream temperatures would be negligible (see photos in the hydrology technical report).

Alternatives B, C, and D

Roads—Because Alternatives B, C, and D would remove 21 perennial crossings, resulting in103 perennial stream crossings in the Middle Crooked subwatershed, these alternatives would benefit the Temperature WCI.

Alternatives E and F

Roads/Trails—Alternatives E and F would remove 23 perennial stream crossings, resulting in 101perennial stream crossings in the Middle Crooked subwatershed. The two additional crossings are associated with roads that would be converted from system routes to non-motorized trails. This conversion results in a slightly larger benefit to the Temperature WCI than is expected under Alternatives B, C, and D.

Cumulative Effects

All Alternatives

Past and ongoing management actions have been considered in describing the baseline existing condition for the Temperature WCI. No foreseeable future activities would have any additional effect on the Temperature WCI. As a result, no additional or cumulative effects would be related, either indirectly or directly, to the planned management actions.

3.9.7.2 Sediment/Turbidity (bull trout and other fishes) and Substrate Embeddedness

Affected Environment

The desired condition for Sediment/Turbidity (bull trout and other fishes—tailored to suit conditions for bull trout [see *Fisheries Technical Report* available in the project record] as directed in the Forest Plan [USDA Forest Service 2010a, Appendix B]) is less than 12% fines in gravel (<0.85 millimeters [mm]), <20% surface fines (<6 mm).

This indicator is FUR in both the Pikes Fork and Middle Crooked subwatersheds (Table 3-129). Stream surveys indicate that surface fine sediment <6 mm in size is elevated. Data from the Forest Aquatics Database, PIBO, and BURP show average surface fines to be 31%, 40%, and 46%, respectively. GRAIP_Lite sediment analysis indicates that 322 tons/year and 200 tons/year of road-related sediment are being delivered to streams in the Middle Crooked and Pikes Fork subwatersheds, respectively. See hydrology technical report (project record) for a complete description of sediment modeling methods and results, including maps of GRAIP_Lite sediment delivery estimates (Figure 3-101).

Environmental Effects

Sediment analysis for the Becker Project includes analysis of the proposed actions related to vegetation management, prescribed burning, transportation management, and recreation management. While each of the individual actions is included in sediment delivery estimates, the focus of much of the sediment analysis effort is directly related to roads.

Forest roads are significant sources of sediment (Megahan and Kidd 1972; Megahan 1983; Megahan and Bonn 1989; Ketcheson and Megahan 1996; Madej 2001). Roads may directly affect natural sediment and hydrologic regimes by altering stream flow, sediment loading, sediment transport and deposition, channel morphology, channel stability, substrate composition, stream temperatures, water quality, and riparian conditions within a watershed (Quigley and Arbelbide 1997). Roads alter surface and subsurface water flow, concentrate water, expose and alter soil, increase the slope angles on cuts and fills, and decrease infiltration. Roads can adversely affect fish habitat by increasing sediment loads, altering channel morphology and destabilizing streambanks, modifying the drainage network, creating barriers to movement, and increasing the potential for chemical contamination (Gucinski 2001). Surface erosion from forest roads affects the fine sediment budget and may impose a chronic condition of sediment inputs to streams, directly affecting the stream substrate and the health of aquatic life (Luce et al. 2001).

Overall, results of the sediment analysis indicate that chronic sedimentation from the existing road network would be reduced through road decommissioning and road realignment, which supports the needs for action identified under Purpose 2 (section 1.4.2). Increases in sediment yield are expected during the temporary timeframe associated with implementation of project activities (such as temporary road construction and road reconstruction needed to facilitate vegetation management activities); however, reductions in sediment yield are expected in the short- and long-term timeframes.

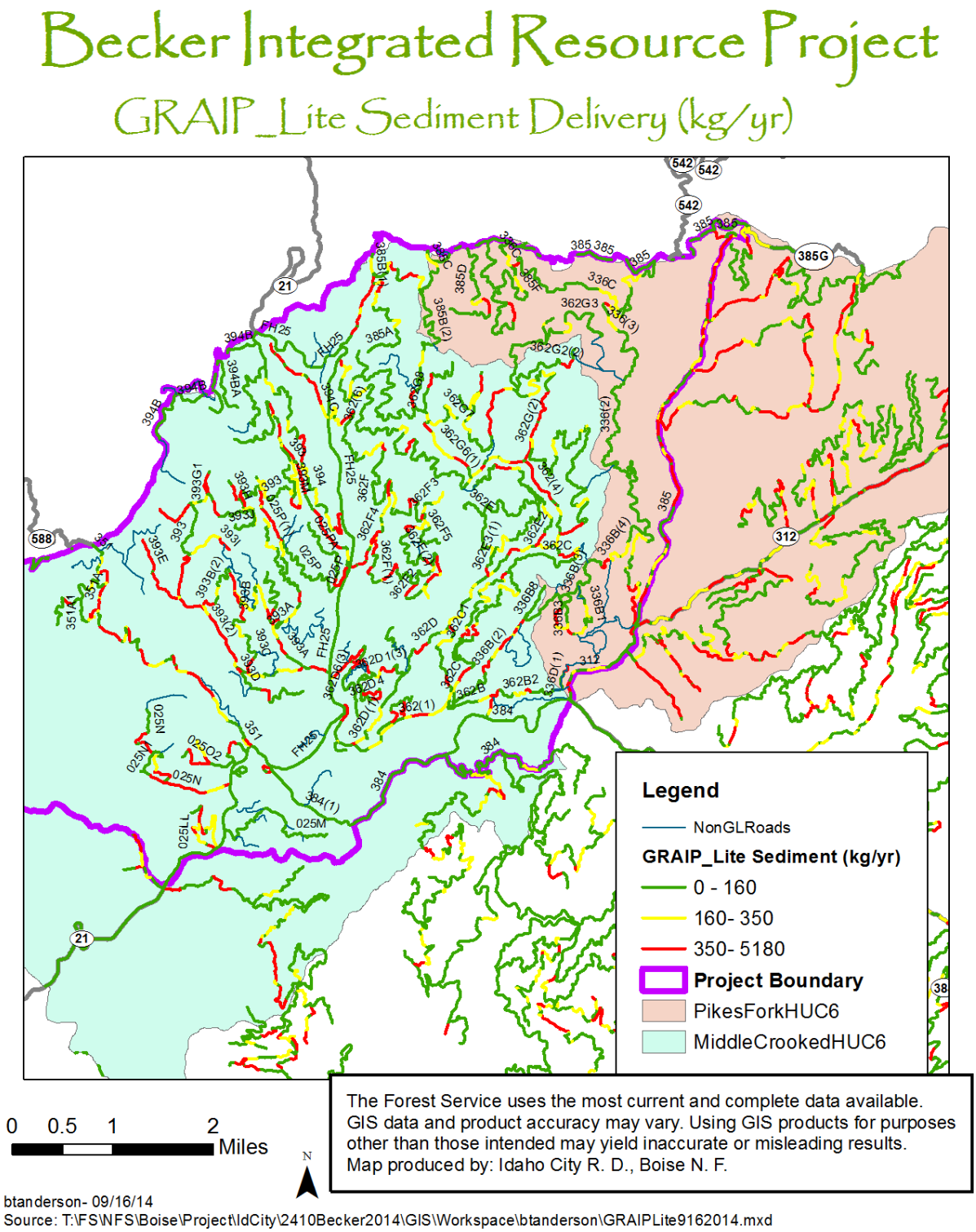

Figure 3-101. GRAIP_Lite sediment delivery estimates for the project area

Direct and Indirect Effects

Alternative A

Alternative A would perpetuate the existing condition with regard to sediment in all timeframes. The Sediment/Turbidity (Bull Trout—Other Fishes) WCI would continue to be FUR in both subwatersehds due to elevated in-stream sediment.

Roads—Based on an analysis of the current road system using GRAIP_Lite and BOISED, it is estimated that 322 tons/year and 200 tons/year of sediment would continue to be delivered to streams in the Middle Crooked and Pikes Fork subwatersheds, respectively (Figure 3-102, Table 3-134, Figure 3-103, Table 3-135). The transportation system would be left unchanged under Alternative A and would continue to contribute high amounts of sediment.

Non-motorized Trails—Alternative A would not authorize the non-motorized trail system; however, the existing system would remain under agreement. Approximately 16 miles of trails within RCAs are associated with the non-motorized "agreement routes". Trail/stream crossings and trails within RCAs may deliver sediment to streams where trail tread is adjacent to streams and actively eroding. Field inventoried trail segments do not appear to have measurable sediment delivery currently occurring (see photos in hydrology technical report [project record]). Trail tread appears to be in good condition and active erosion or gully initiation is not occurring.

Vegetation—Alternative A does not address vegetation conditions, which are at a high risk for uncharacteristic wildfire. If a fire were to occur, sediment delivery would likely increase above current levels depending on fire size and severity.

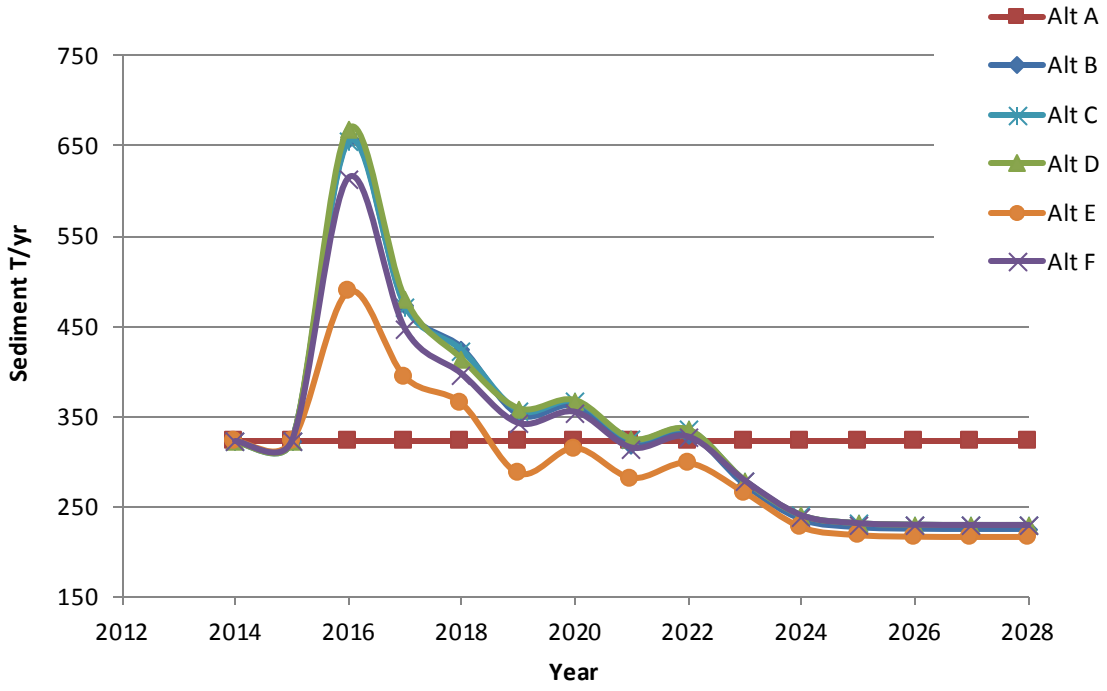

Figure 3-102. Middle Crooked River subwatershed sediment modeling results

Table 3-134. Middle Crooked River subwatershed sediment modeling results

	Alt-A		Alt-B		Alt-C		Alt-D		Alt-E		Alt-F	
	T/yr	% ON	T/yr	% ON	T/yr	% ON	T/yr	% ON	T/yr	% ON	T/yr	% ON
Temp	322	24%	657	49%	655	49%	668	50%	489	37%	614	46%
Short	322	24%	352	27%	357	27%	359	27%	287	22%	342	26%
Long	322	24%	225	17%	230	17%	230	17%	216	16%	229	17%

Note: the values shown for each timeframe represent the highest year of sediment delivery within that timeframe. For the temporary timeframe, this occurs during 2016; and for the short-term timeframe, this occurs in 2019. All values for the long-term timeframe are constant.

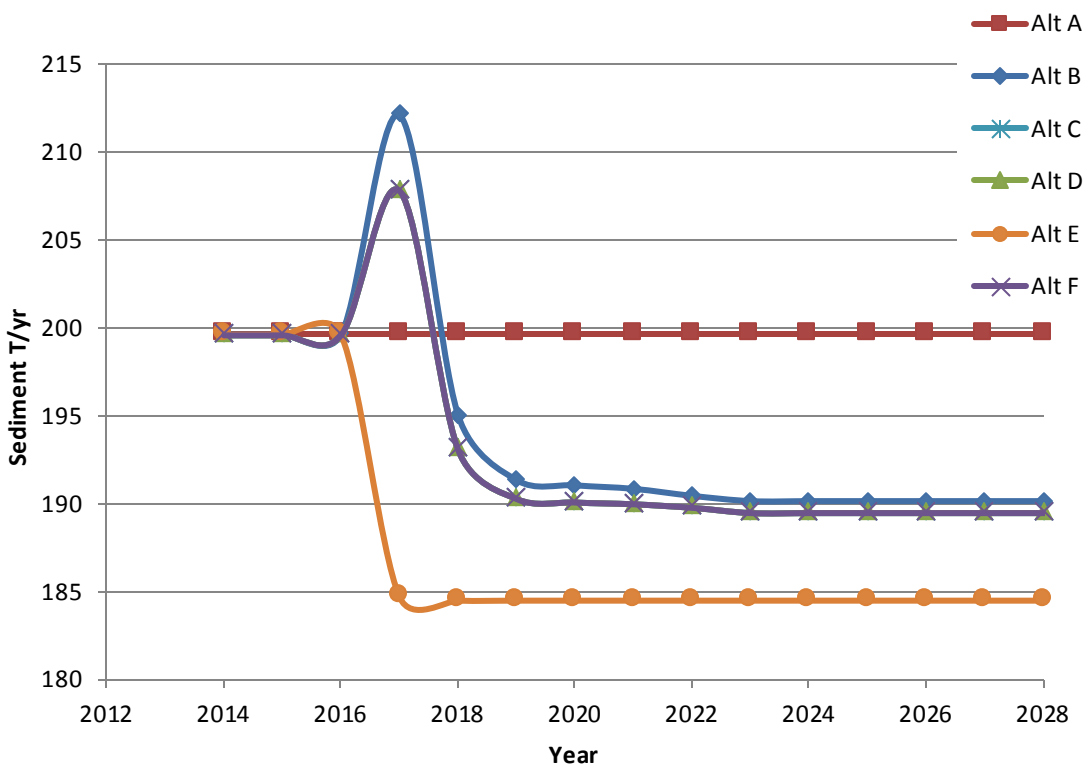

Figure 3-103. Pikes Fork subwatershed sediment modeling results

Table 3-135. Pikes Fork subwatershed sediment modeling results

	Alt-A		Alt-B		Alt-C		Alt-D		Alt-E		Alt-F	
	T/yr	% ON	T/yr	% ON	T/yr	% ON	T/yr	% ON	T/yr	% ON	T/yr	% ON
Temp	200	33%	212	35%	208	35%	208	35%	185	31%	208	35%
Short	200	33%	191	32%	190	32%	190	32%	185	31%	190	32%
Long	200	33%	190	32%	190	32%	190	32%	185	31%	190	32%

Note: the values shown for each timeframe represent the highest year of sediment delivery within that timeframe. For the temporary timeframe, this occurs during 2016; and for the short-term timeframe, this occurs in 2019. All values for the long-term timeframe are constant.

Action Alternatives

All action alternatives would maintain the existing functionality of the Sediment/Turbidity (Bull Trout—Other Fishes) WCI, which is FUR in both the Middle Crooked and Pikes Fork subwatersheds. Under each action alternative, sediment delivery to streams would measurably increase in the temporary timeframe (0–3 years) and measurably decrease (below current levels) during the short (3–15 years) and long term (15+ years). Each of the individual actions proposed for the action alternatives was analyzed to determine effects on the sediment indicator; a detailed discussion is included below. While all action alternatives would result in a measureable improvement in the Sediment/Turbidity WCI in the long-term timeframe, elevations in stream fine sediment conditions are expected to continue in the long-term in both subwatersheds due to the number of roads located within RCAs. Therefore the Sediment/Turbidity WCI would incrementally improve under all action alternatives, but remain FUR in the long-term.

Roads—All action alternatives include road treatments throughout the project area including temporary road construction, road realignment, and road reconstruction (heavy and light), road closure, and road decommissioning. These changes in the transportation system represent the largest overall contributions and reductions in sediment delivery over the life of the project. Increases in sediment delivery in the temporary timeframe are attributed to temporary road construction, road reconstruction, and road realignment. Decreases in sediment delivery in the short- and long-term timeframes are attributed to road decommissioning, road realignment, and road closure (conversion of ML 2 roads to ML 1 roads, or conversion of ML 2 roads to ML 2 Admin Only). Design Features FH-7, FH-8, FH-27, FH-28, FH-29, TS-1, and TS-4 would be implemented in association with these alternatives to help control sediment. Sediment modeling for roads was completed using a combination of the GRAIP_Lite and BOISED models. See the hydrology technical report (project record) for detailed descriptions of the analysis methods and assumptions incorporated in model estimates of sediment delivery from roads. Differences in road-related sediment delivery by alternative are discussed below.

Culvert Replacements—All action alternatives include 23 AOP culvert replacements. Short-term increases in turbidity associated with crossing reconstruction are anticipated but are not expected to last more than the duration of the construction period (Yenko 2007). Furthermore Design Features FH-9, FH-10, FH-14, FH-15, FH-16, FH-17, FH-18, FH-20, FH-22, FH-23, FH-24, FH-25, and FH-26 would be employed to minimize sediment delivery and turbidity during construction.

Vegetation Thinning—All action alternatives include thinning with product removal (commercial timber harvest) and thinning with no product removal (cutting of non-commercial material). These activities are proposed to treat upland vegetation (conifer trees) both within and outside RCAs (Table 3-134). Sediment delivery to streams is not expected to occur from these activities due to the incorporation of buffer distances from streams (section 2.4.2)

Thinning with no product removal is proposed both within and outside RCAs (section 2.4.2). This activity involves fallers cutting trees with chainsaws and hand piling or scattering material, and may occur within 15 feet (of intermittent streams) and 50 feet (of perennial streams). Ground disturbance from these activities would be limited because no heavy

equipment or machinery would be used. Therefore, the soil would not be exposed, and erosion and sediment delivery to streams would not occur.

Thinning with product removal is proposed both within and outside RCAs. This activity involves fallers or tracked machinery cutting trees and tractors/skidders using cables/tongs to yard material to landings—to be loaded on trucks or flown from units using helicopters. These activities may occur outside the first SPTH along both intermittent and perennial streams; however, no ground-based equipment (skidders, feller-bunchers, tractors) is allowed to travel off existing routes, and no skid trails would be constructed within RCA boundaries (Design Feature FH-27). No construction of landings would occur within RCAs; and, if existing landings used for the project are located within RCAs, erosion control measures would be used to minimize sediment delivery (Design Feature FH-5). All landings would be reclaimed when activities are completed (Design Feature FH-6). Based on these limitations and results of sediment modeling, no sediment delivery to streams is expected to occur from thinning with product removal.

Both the BOISED model and the MK sediment delivery model were used to estimate sediment contributions from vegetation thinning activities. The BOISED model simulates sediment delivery from commercial timber harvest but does not incorporate information about the proximity of those activities to streams; thus sediment amounts related to commercial timber harvest from BOISED are likely an over-estimate. Estimates of sediment contributions from commercial timber harvest from BOISED are included in overall project sediment delivery estimates displayed in Figure 3-102 and Figure 3-103. The MK sediment delivery model was used to further refine sediment delivery estimates to determine if eroded material from commercial timber harvest units would be delivered as sediment to streams.

Based on MK modeling, it is estimated that sediment may travel up to 85 feet from tractor skid trails, 5 feet from helicopter yarding, 8 feet from tractor yarding, and 81 feet from landings (Table 3-136). As stated above, BOISED modeled amounts of sediment delivery for commercial timber harvest may be an over-estimate of the amount of sediment that is contributed to streams because sediment is only expected to travel 85 feet from areas of soil disturbance before becoming deposited on the hillslope. BOISED, however, does not account for the RCA buffer distances included in Figure 2-1. No construction of new landings would occur within RCAs, and BMPs to control erosion during use and reclamation would be used (Design Features FH-5 and FH-6). See the hydrology technical report (project record) for a complete discussion of methods and assumptions incorporated in model estimates of sediment delivery distances from the MK and BOISED models. See discussion below for differences in effects between action alternatives.

Table 3-136. MK Model sediment travel distances

Activity	Sediment Travel Distance (feet)
Helicopter logging	4.5
Tractor skid road	85.2
Tractor yarding	7.5
Prescribed burn	4.9
Landings/Road construction	111.3
Existing road—good	26.7
Existing road—moderate	30.7
Existing road—poor	39.6
Existing road—serious	61.5
New road construction	119.8
Road reconstruction (heavy)	70.2
Road reconstruction (light)	54.1
Landing (concentrated drain)	81.4

Prescribed Fire—All action alternatives include the application of prescribed fire both in treating activity-related fuels and broadcast burning natural fuels. Estimates of sediment delivery related to the application of prescribed fire were completed using the BOISED model and are included in the sediment delivery estimates displayed in Figure 3-102 and Figure 3-103. It is expected that prescribed fire applications in the form of broadcast burning would increase sediment delivery amounts in the temporary and short term and would stabilize or cease approximately 3 years after implementation.

Implementation of activity fuels treatments, including piling and burning of thinned material, is allowed within RCAs, but is limited to 50 feet from the stream and includes limits on the size and density of handpiles (Design Feature FF-5). These criteria are expected to result in no measureable sediment delivery from activity fuels treatments, because vegetative buffers surrounding burned piles are expected to control any erosion produced from the resulting pile burn scars. Implementation is staggered throughout the project area over a 5-year period. Overall, sediment delivery amounts associated with fuels treatments are expected to be minor, due to incorporation of burn prescriptions that would limit fire intensity and burn severity. The use of ignition patterns would also control fire spread and limit the size and density of handpiles (Design Features FF-1, FF-3, and FF-5). In general, the low severity and intensity of burning under prescribed fire conditions limits the amount of consumption and alteration of ground cover and duff that is important for maintaining erosion control. No measureable differences in effects exist among the action alternatives with respect to prescribed fire activities.

Recreation/Trail Management—All action alternatives include authorization of existing and proposed trail systems for both motorized and non-motorized use with the exception of Alternative E, which does not include authorization of a new motorized trail loop system. Effects of trails management actions on sediment delivery are incorporated into estimates of sediment delivery related to roads displayed in Figure 3-102, Table 3-134, Figure 3-103, and Table 3-135. Major differences in trail-related effects involving sediment have to do with the designation of a new motorized trail and trailhead considered in all action alternatives with the exception of Alterative E. The motorized trail includes segments in both the

Middle Crooked and Pikes Fork subwatersheds. Alternative E also includes decommissioning of ML-1 routes that are converted to motorized trails under the other action alternatives.

New trailhead construction is proposed at the junction of NFS Roads 385 and 312 in the Pikes Fork subwatershed, directly adjacent to Pikes Fork Creek. Sediment delivery from trailhead construction is not represented in sediment modeling results due to lack of a routine within the models to simulate this activity. Sediment delivery from this action is expected to be negligible with the incorporation of BMPs during construction (Design Feature FH-25), and based on the trailhead design characteristics. The trailhead design involves surfacing of the parking area with aggregate to minimize surface erosion, a 67-foot setback of the parking area from the creek to provide a vegetative buffer, blocking OHV access to the creek, and vegetating and stabilizing the streambank adjacent to the trailhead.

New motorized trail construction and conversion of ML-1 roads to motorized trails is included in modeled estimates of sediment delivery and is modeled as new road construction using the assumptions of BOISED. Additionally, existing ML-1 and ML-2 roads are proposed for portions of the ATV trail. Where the ATV trail is proposed on ML-1 road segments, sediment was modeled as conversion to open road. Where the ATV trail is proposed on ML-2 segments, no changes to the BOISED modeled sediment delivery were made.

Non-motorized trail authorizations for both winter and summer recreation are not expected to measurably affect sediment delivery. In many cases, non-motorized trails are co-located on existing ML-1 or ML-2 roads; in these cases, sediment delivery from the road is incorporated into overall sediment delivery estimates. Field reviews of non-motorized trails not co-located on roads occurred in May and June of 2014; these reviews did not find accelerated sedimentation problems (see photographs of non-motorized trails in the hydrology technical report [project record]). Additionally, bridges at all stream crossings were in good condition.

Alternative B

Roads—The Proposed Action would result in a temporary increase in road-related sediment delivery from 322 tons/year to 617 tons/year in the Middle Crooked subwatershed and from 200 tons/year to 212 tons/year in the Pikes Fork subwatershed associated with temporary road construction, road reconstruction, and road realignment (Figure 3-102, Table 3-134). A decrease in road-related sediment delivery due to road closure (conversion from ML 2 to ML 1, or ML 2 to ML 2 Admin) and road decommissioning is expected in the short and long term, with road-related sediment stabilizing at 225 tons/year in the Middle Crooked subwatershed and 190 tons/year in the Pikes Fork subwatershed.

Vegetation Thinning—The Proposed Action would result in a negligible increase in sediment delivery associated with vegetation thinning. Under Alternative B, commercial timber harvest would be implemented on approximately 4,348 acres utilizing tractor/jammer yarding. BOISED estimates an increase in sediment delivery in the temporary and short-term timeframes (8 years) from zero to 101 tons/year in the first year and decreasing over time. Utilizing the MK sediment delivery model with the incorporation of RCA buffer distances, however, it is expected that sediment from commercial timber harvest units would not travel farther than the buffer distance of one SPTH.

Prescribed Fire—Effects of the Proposed Action with regard to prescribed fire are the same for all action alternatives. Sediment related to prescribed fire is expected to be greatest in year two of prescribed fire implementation and would result in 84 tons/year of sediment delivery. Sediment delivery from prescribed fire is expected to return to background levels by 2026. Overall, sediment delivery amounts associated with fuels treatments are expected to be minor, due to incorporation of burn prescriptions that would limit fire intensity and burn severity, as well as the use of ignition patterns to control fire spread, and limits on the size and density of handpiles (Design Features FF-1, FF-3, and FF-5).

Recreation/Trail Management—The Proposed Action would authorize a motorized trail (50 inches or less) and trailhead, and a system of non-motorized trails. Sediment amounts associated with the non-motorized trail system are either included in road sediment calculations or are expected to be negligible (see discussion above).

Sediment delivery associated with the motorized trail is expected to increase during construction of new ATV trail segments. Alternative B would authorize approximately 0.5 miles and 1.0 miles of new motorized trail construction in the Middle Crooked and Pikes Fork subwatersheds, respectively. The only difference between Alternative B and the other action alternatives, with the exception of E, is that Alternative B includes a section of new trail construction that connects NFS road 336 (Sawmill Creek) with NFS road 362G3. Field verification of trail locations completed in spring 2014 indicates that this route would bisect two intermittent drainages with steep gradients. Sediment delivery and impacts to these RCAs were identified as a potential concern at these crossings. A proposal for an alternative route was developed during this field review and that alternative route is proposed in Alternatives C, D, and F.

Alternative C

Roads—Compared to Alternative B, Alternative C has only minor changes in the overall road system that would affect sediment. Only 15.5 miles of ML 2 roads would be converted to ML 2 Admin Only roads, instead of 19.8 miles. This change is associated with roads that access IDPR yurts and results in a slight increase in overall road-related sediment.

Vegetation Thinning—Compared to Alternative B, no differences in effects to sedimentation from vegetation management exist under Alternative C.

Prescribed Fire—Compared to Alternative B, no differences in effects to sedimentation from prescribed fire exist under Alternative C.

Recreation/Trail Management—Compared to Alternative B, Alternative C would alter the proposed ATV new trail construction to connect NFS road 336 to NFS road 363G2 instead of NFS road 363G3 (proposed under Alternative B). This route location is expected to result in less sediment delivery than Alternative B due to the location of the trail on a ridge top outside of stream channels and connecting to existing routes.

Alternative D

Roads—Effects to road-related sediment under Alternative D are identical to Alternative C with the exception of sediment related to the additional 0.7 miles of temporary road construction (6.5 miles total) proposed under Alternative D. This temporary road construction is associated with additional acres of proposed vegetation treatment under Alternative D.

Vegetation Thinning—Alternative D includes an additional 183 acres of commercial timber harvest. Effects to sediment of these additional acres are considered negligible due to the incorporation of RCA buffer distances as discussed above. BOISED sediment results for Alternative D do, however, reflect the additional acres of commercial timber harvest proposed.

Prescribed Fire—Effects to sedimentation from prescribed fire would be the same as Alternative B.

Recreation/Trail Management—Compared to Alternative C, effects to sediment would be identical under Alternative D, with the exception that the motorized trail loop would be authorized to vehicles 60 inches or less in width. This difference would include authorizing UTV-class vehicles, which may increase the amount of motorized vehicle traffic and widen the disturbance of the template, resulting in greater erosion and subsequent sediment delivery under Alternative D. Because the ATV/UTV trail was modeled as a road using BOISED, modeled sediment values for Alternatives C and D are the same. The additional sediment produced from the designation of the motorized trail open to vehicles 60 inches or less is considered negligible.

Alternative E

Roads—Alternative E provides the greatest benefits to sediment, both in generating a smaller temporary increase in sediment and providing the largest reduction in the long-term sedimentation rate. Sediment is expected to temporarily increase to 522 tons/year and decrease to 216 tons/year in the long term. Smaller temporary increases are associated with less temporary road construction (1.5 miles total) and no new motorized trail construction. Although associated with recreation, sediment from the motorized trail was combined with the roads analysis. Further sediment reductions in the long term under Alternative E are associated with additional proposed decommissioning of road segments that would otherwise be incorporated into portions of the motorized trail under the other action alternatives.

Vegetation Thinning—Alternative E includes the same commercial timber harvest units proposed under Alternatives B and C, but helicopter yarding would be used on 1,166 of the 4,348 acres proposed for treatment. As discussed above, sediment delivery from vegetation thinning is not expected due to incorporation of RCA buffer distances that limit ground disturbance from equipment to outside one SPTH. Modeled sediment from BOISED is included in overall sediment numbers in Figure 3-102 and Figure 3-103 (acknowledging that BOISED does not consider distance to streams). Using helicopter yarding under Alternative E results in 1/3 less sediment as predicted by BOISED associated with vegetation thinning as compared to Alternative B.

Prescribed Fire—Effects to sedimentation from prescribed fire would be the same as Alternative B.

Recreation/Trail Management—Alternative E does not authorize the motorized trail or trailhead at the junction of NFS roads 312 and 385, proposed under all other action alternatives. This strategy reduces the overall sediment contribution under Alternative E. Additional decommissioning of ML 1 routes proposed for inclusion in motorized trails also reduces the overall sediment contribution. Non-motorized trails would still be authorized

under Alternative E. See the discussion above for sediment effects associated with the authorization of non-motorized trails.

Alternative F

Roads—Sediment effects from road activities under Alternative F are similar to Alternative C, barring a reduction in the miles of temporary roads (2.2 miles) due to the 377 acres proposed for helicopter yarding under Alternative F. Helicopter yarding acreage results in a smaller increase in sedimentation from temporary road construction under Alternative F. Small differences in sediment delivery in the long term are also associated with road conversions from ML 2 to ML 2, Admin Only.

Vegetation Thinning—Alternative F includes the same commercial timber harvest units proposed under Alternatives B and C, but helicopter yarding would be used on 377 of the 4,348 acres proposed for treatment. As discussed above, sediment delivery from vegetation thinning is not expected due to incorporation of RCA buffer distances that limit ground disturbance from equipment to outside one SPTH. Modeled sediment from BOISED is included in overall sediment numbers in Figure 3-102 and Figure 3-103 (acknowledging that BOISED does not consider distance to streams). The use of helicopter yarding under Alternative F would result in approximately 10% less sediment as predicted by BOISED associated with vegetation thinning as compared to Alternative B.

Prescribed Fire—Effects to sedimentation from prescribed fire would be the same as Alternative B.

Recreation/Trails Management—Under Alternative F, some portions of the motorized trail would be eliminated to respond to overlap between motorized and non-motorized uses. A relatively small reduction in estimated sediment delivery as compared with the other action alternatives would occur with fewer miles of motorized trail.

Cumulative Effects

All Alternatives

Past and ongoing management actions have been considered in describing the baseline existing condition for the Sediment WCI. Foreseeable future activities that may have additional effects on the Sediment WCI are limited to activities that are also ongoing such as sheep grazing, dispersed recreation, and road maintenance. These activities were also considered in describing the existing condition. As a result, no additional or cumulative effects, either directly or indirectly related to the planned management actions, would occur.

3.9.8 Streamflow Hydrology Secondary Indicators—Affected Environment and Environmental Effects

3.9.8.1 Changes in Peak/Base Flows

Affected Environment

The desired condition in Changes in Peak/Base Flows is a watershed hydrograph that indicates peak, base, and flow timing comparable to an undisturbed watershed. This indicator is FR for both subwatersheds (Table 3-129). Though no active surface water diversions exist in either subwatershed, and past vegetation management and fires have resulted in 4% and

5% Equivalent Clearcut Area (ECA) for Middle Crooked and Pikes Fork subwatersheds, respectively, which is well below the amount required to detect changes in water yield, the high mileages of roads (see road density and location WCI) within these areas may route water to the channel faster and increase peak flows from precipitation events, producing the FR rating. However, stream hydrographs are dominated by spring snowmelt and not precipitation event flows. It is therefore unlikely that the largest peak flows are significantly altered by increased drainage network from roads.

Environmental Effects

Roads can act as extensions of the stream channel and route water to the stream more quickly (Gucinski et al. 2001). Harvesting vegetation reduces the amount of potential evapotranspiration from trees, which can result in measurable increases in water yield and additional negative effects in the form of increased channel and streambank scour. Existing research has shown that 20% to 30% of a watershed needs to be clear cut to result in a detectable augmentation of water yield (Stednick 1996).

The effects of selective harvest are often quantified using the ECA method (King 1989). Past vegetation management, roads, and fires have resulted in an ECA of 4% and 5% for Middle Crooked and Pikes Fork subwatersheds, respectively. Research on water yield has, at this point, never fully quantified the effects of fire exclusion on water yield; however, Sala et al. (2001) shows that changes in successional status and species composition are tied to changes in transpiration and, in turn, water yield—indicating that fire exclusion likely reduces water yield.

Direct and Indirect Effects

Alternative A

Alternative A would perpetuate the existing condition with regard to the Changes in Peak/Base Flows WCI, which is currently FR in both subwatersheds. Functionality is FR due to high amounts of roads in both subwatersheds and vegetation conditions being outside desired conditions.

Alternative A leaves the project area at a high risk for uncharacteristic wildfire in all timeframes. This effect results in a negative trend for this indicator in the short and long term timeframes. It has been well documented that, of the numerous disturbance processes that impact wildland watersheds, fires have the greatest potential to alter water yield and streamflow generation processes (Neary et al. 2005). If a fire were to occur, it is likely that changes in vegetation cover and soil infiltration processes would also occur commensurate with soil burn severity (Parsons et al. 2010) and would result in relatively large increases in peak flows.

Action Alternatives

Each of the action alternatives would maintain the existing functionality of the Changes in the Peak/Base Flows WCI in both subwatersheds, which is FR. This indicator is not expected to be affected in the temporary and short-term timeframes. Road and vegetation treatments are expected to immeasurably improve this indicator in the long term by decommissioning roads and shifting vegetation conditions toward desired conditions, primarily in the

Middle Crooked subwatershed. These results are not expected to be fully realized until the long term.

Alternatives B, C, D, E, and F

Roads—The 30.9 miles of road decommissioning proposed under Alternatives B, C, and D, and the 32.9 and 31.7 miles of road decommissioning proposed under Alternatives E and F, respectively, would reduce accelerated stream flow routing by roads. Though slight differences exist in the amount of miles of road decommissioning under these alternatives, the level of effect is not measurably different.

Vegetation Thinning and Prescribed Fire—Under each of the action alternatives, an immeasurable improvement in this indicator in the long-term is expected in the Middle Crooked subwatershed due to vegetation management activities, prescribed fire, and road decommissioning. Vegetation thinning and prescribed fire would change vegetation conditions toward desired conditions and reduce the risk of uncharacteristic wildfire and effects of fire exclusion on overall water yield. The combination of these effects would result in a stream flow regime more reflective of an undisturbed watershed of similar size and characteristics. While numerous miles of roads would remain in this subwatershed, the negative effect of roads on water yield would be incrementally reduced. The differences in effect among the action alternatives is limited to the additional acres of vegetation treatment under Alternative D. Overall, additional acres treated under Alternative D represents a small positive effect to the Peak/Base Flows WCI. Otherwise all action alternatives result in the same affect.

Cumulative Effects

All Alternatives

Past and ongoing management actions have been considered in describing the baseline existing condition for the Peak/Base Flows WCI. Idaho Power Cloud Seeding stations represent ongoing/foreseeable future activities that may affect the Peak/Base Flows WCI by increasing snowfall and subsequent runoff volumes in and around the project area. Idaho Power (PowerPoint presentation by Shaun Parkinson, PhD, PE, available in the project record) estimates a 10% overall increase in precipitation as a result of cloud seeding in the Upper Snake River Basin. This increased winter precipitation could result in increased peak flows, but would be difficult to quantify. In the context of the Project, this potential increase in peak flows would not result in negative effects to overall hydrology and aquatics resources.

3.9.8.2 Changes in Drainage Network and Road Density and Location

Because the primary indicators for effects for both the Changes in Drainage Network and the Road Density and Location WCIs are road density and RCA road density, the affected environment and effects discussions for these WCIs have been combined.

Affected Environment

The desired condition for Changes in Drainage Network is zero or minimum change in active channel length correlated with human caused disturbance. This indicator is FUR in both subwatersheds (Table 3-129). Road density in both subwatersheds is very high (see Road

Density and Location WCI), and this WCI is also FUR in both subwatersheds (Table 3-129), constituting a greater than moderate change in active channel length as roads act as a conduit to route water to stream channels.

The desired condition for Road Density and Location is a total road density of <0.7 mi/m^2 for the subwatershed and no roads within RCAs. Overall road density is 4.6 mi/mi^2 in the Middle Crooked subwatershed and 6.7 mi/mi^2 in Pikes Fork; RCA road density is 9.4 mi/mi^2 in the Middle Crooked subwatershed and 8.9 mi/mi^2 in Pikes Fork.

Environmental Effects

Direct and Indirect Effects

Alternative A

Alternative A would perpetuate the existing condition with regard to the Changes in Drainage Network WCI, which is currently FR in both subwatersheds. Functionality is FUR due to high amounts of roads in both subwatersheds (Table 3-137).

Table 3-137. Road density and riparian conservation area (RCA) road density statistics

	Alt A (mi/mi^2)	Alt B (mi/mi^2)	Alt C (mi/mi^2)	Alt D (mi/mi^2)	Alt E (mi/mi^2)	Alt F (mi/mi^2)
Middle Crooked HUC6	4.57	3.88	3.88	3.88	3.77	3.77
Middle Crooked RCAs	9.44	7.66	7.66	7.74	7.55	7.55
Pikes Fork HUC6	6.70	6.51	6.62	6.57	6.51	6.57
Pikes Fork RCAs	8.90	8.53	8.53	8.53	8.15	8.53

Note: Total road density (mile/mile^2) was calculated at the subwatershed scale using miles of designated routes (ML 1 5) and known unauthorized routes in the subwatershed area. RCA road density (mile/mile^2) was calculated at the RCA area scale using designated routes (ML 1 5) and known unauthorized routes.

Action Alternatives

All action alternatives would maintain both the Changes in Drainage Network WCI and the Road Density and Location WCI in the long term, which is FUR in both subwatersheds. The FUR rating occurs because the reductions in road miles associated with the action alternatives do not meet the desired road density statistics specified in the Forest Plan (USDA Forest Service 2010a, Appendix B). However, each of the action alternatives would result in reductions in overall road densities for both subwatersheds and RCAs.

The Middle Crooked subwatershed would receive the bulk of the benefit as the majority of the road decommissioning occurs within this subwatershed. Middle Crooked road density would be reduced by 0.69 mi/mi^2 under Alternatives B, C, and D, and by 0.8 mi/mi^2 under Alternatives E and F. RCA road density in the Middle Crooked subwatershed would be reduced by 1.78 mi/mi^2 under Alternatives B and C, 1.7 mi/mi^2 under Alternative D, and 1.89 mi/mi^2 under Alternatives E and F. In the Pikes Fork subwatershed, road density would be reduced by 0.19 mi/mi^2 under Alternatives B and E, 0.08 mi/mi^2 under Alternative C, and 0.13 mi/mi^2 under Alternative D and F. RCA road density within the Pikes Fork subwatershed would be reduced by 0.37 mi/mi^2 under Alternatives B, C, D, and F, and by 0.75 mi/mi^2 under Alternative E. Overall, Alternative E results in the greatest reduction in both total road density and RCA road density of any of the action alternatives, producing the

greatest improvement in the Changes in Drainage Network and Road Density and Location WCIs.

Cumulative Effects

All Alternatives

No past, present, or ongoing, or reasonably foreseeable activities would affect the Changes in Drainage Network and Road Density and Location WCIs.

3.9.9 Watershed Condition Pathway Secondary Indicators—Affected Environment and Environmental Effects

3.9.9.1 Road Density and Location

The affected environment and environmental effects for this WCI have been combined with the Drainage Network WCI and are discussed above.

3.9.9.2 Disturbance History and Disturbance Regime

The Disturbance History and Disturbance Regime WCIs effects analysis has been combined into a single section because the processes and effects associated with these indicators are complementary. Disturbance processes are an important component of dynamic soil, water, and hydrologic riparian and aquatic habitats that determine the physical and biological capability within watersheds. See the Forest Plan (USDA Forest Service 2010a, Appendix B) for a complete definition of each indicator.

Affected Environment

The desired condition for Disturbance History is less than 15% ECA with no concentration of disturbance in landslide or landslide-prone areas, and/or refugia, and/or RCAs. This indicator is FR in both subwatersheds (Table 3-129). Past vegetation management and fires have resulted in 4% and 5% ECA for the Middle Crooked and Pikes Fork subwatersheds, respectively. Both subwatersheds have high concentrations of roads in RCAs.

The desired condition for Disturbance Regime is negligible or temporary disturbances resulting from land management activities. This indicator is FR in both subwatersheds (Table 3-129). Vegetation is documented as being outside desired conditions due to alteration of the natural fire regime from fire suppression (see vegetation technical report [project record]) resulting in a potential increase in the risk of wildfire. Furthermore, if a fire were to occur, it could result in negative effects or loss of aquatic habitat (see fuels technical report [project record]).

Environmental Effects

Direct and Indirect Effects

Alternative A

Alternative A would perpetuate the existing condition with regard to the Disturbance History and Disturbance Regime WCIs, which are both FR. FR status is based on the high mileage of

roads within RCAs, and vegetation conditions outside desired conditions due to fire exclusion.

Action Alternatives

All action alternatives would maintain the current functionality of the Disturbance History and Disturbance Regime WCIs in the long term, which is FR. An immeasurable degrade to these WCIs is expected in the temporary timeframe with immeasurable benefits expected in the short and long term within the Middle Crooked subwatershed. In the Pikes Fork subwatershed, these indicators are not expected to be affected to the extent they are in the Middle Crooked subwatershed due to the lack of vegetation management activities and limited road decommissioning. Benefits exist, however, in the Pikes Fork subwatershed from the proposed AOP culvert replacements, resulting in an immeasurable benefit in the long term. No measurable differences in effects to these WCIs exist among the action alternatives.

Roads—An immeasurable degrade to these indicators is expected associated with road realignment, temporary road construction, and road reconstruction in the temporary timeframe, primarily within the Middle Crooked subwatershed. Road decommissioning, road closures, and temporary road reclamation is expected to result in an immeasurable benefit in the short and long term.

Culvert Replacements—Twenty-three AOP culvert replacements result in an immeasurable benefit for both subwatersheds in the long term. AOP culvert replacements provide for additional aquatic habitat access for aquatic species and reduce the risk that a road/stream crossing failure would negatively affect aquatic habitat by increasing the ability for these structures to handle increased flows and associated debris.

Vegetation Management and Prescribed Fire—Vegetation thinning throughout the Middle Crooked subwatershed is expected to benefit these WCIs in the long term by reducing stand densities and reducing the risk of uncharacteristic wildfire. For example, the risk of uncharacteristic wildfire can be attributed to fire exclusion, which causes uncharacteristic vegetation conditions potentially leading to an uncharacteristically large and severe wildfire. Within the project area, current stand densities and ladder fuels increase the potential for stand-replacement type fires, which would burn at a higher intensity and severity over a larger area for longer periods of time than in the landscape without fire exclusion. If a wildfire of larger size and higher intensity were to occur, post-fire effects would likely negatively affect many of the WCIs, including stream temperature and sediment delivery, in the long term (Ice et al. 2004). The proposed vegetation thinning would reduce stand densities and ladder fuels, therefore benefiting these WCIs.

Recreation/Trail Management—Recreation/trails management activities included in the Proposed Action are not expected to measurably affect the Disturbance History/Disturbance Regime WCIs under the three timeframes. The designation of the motorized trail system would result in the use of primarily existing routes and is expected to shift motorized use from open road systems and unauthorized routes to a designated maintained system. Establishment of a motorized trailhead is expected to better manage use at the proposed trailhead location and result in a benefit to other WCIs (Temperature, Sediment) at that site. Non-motorized trail authorization is not expected to result in effects to these WCIs because the trail system is currently in place (no new construction) and does not represent a measureable effect to any WCIs.

Cumulative Effects

Alternative A

Past and ongoing management actions have been considered in describing the baseline existing condition for Disturbance History/Disturbance Regime WCIs. Reasonably foreseeable activities that could potentially affect these WCIs include ongoing and future wildfire suppression activities. Vegetation conditions have been influenced by fire exclusion within the project area due to fire suppression. This activity would continue in the future and could result in negative effects to the Disturbance History/Disturbance Regime WCIs by increasing the risk of uncharacteristic wildfire and potential for insect infestation.

Action Alternatives

Past and ongoing management actions have been considered in describing the baseline existing condition for Disturbance History/Disturbance Regime WCIs. Reasonably foreseeable activities that could potentially affect these WCIs include ongoing and future wildfire suppression activities. Vegetation conditions have been influenced by fire exclusion within the project area due to fire suppression. This activity would continue in the future and could result in negative effects to the Disturbance History/Disturbance Regime WCIs. When combined with the action alternatives, the negative effects of fire exclusion are reduced by vegetation and fuels treatments that shift vegetation and fuels conditions toward desired conditions, and reduce the risk of uncharacteristic wildfire and potential for insect infestation.

3.9.9.3 Riparian Conservation Areas

This WCI is discussed in the "Fisheries Resources" section.

3.9.9.4 Effects Summary

Overall, negative effects to analysis indicators from implementing the action alternatives in the project area are expected to be temporary (0–3 years) with short-term (3–15 years) and long-term (15+ years) positive effects. Temperature and sediment would have the greatest short- and long-term positive effects. Temporarily, riparian shade is expected to decrease from AOP stream crossing installations and, potentially, from noncommercial thinning and prescribed burning within RCAs, though uncertainty exists about the degree to which these activities would reduce shade. However, stream shade is expected to improve over the short and long term through reductions in the number of overall road/stream crossings and from increased overall tree size and canopy cover resulting from non-commercial understory vegetation thinning. There is also a reduced risk of loss of stream shade from implementing vegetation treatments that reduce the potential for uncharacteristic wildfire in RCAs.

Increases in sediment delivery associated with road construction, reconstruction, and realignment are expected during project implementation; however, short- and long-term decreases in sediment delivery are expected from road closures and road decommissioning. Temporary negative effects would be outweighed by demonstrable long-term benefits, which comply with Forest Plan standards (SWST01 and SWST04; USDA Forest Service 2010a).

While differences in effects between action alternatives exist for each of the identified indicators, the overall determination of whether an indicator is being maintained, improved, or degraded, either measurably or immeasurably, does not change between the action

alternatives for any of the indicators (section 3.8, Table 3-123, and Table 3-124). For example, sediment delivery amounts in the temporary and short-term timeframes are measurably different under Alternatives C and E due to differences in road and trail actions. The effect, however, is the same for both alternatives because the resulting sediment delivery in the long term is measurably improved.

3.10 SOIL RESOURCES

The following changes were made between the DEIS and FEIS:

General edits were completed to improve clarity and readability of the section.

3.10.1 Analysis Scale, Data Sources, and Methodology

3.10.1.1 Analysis Scale

The objective of this analysis is to estimate the potential direct, indirect, and cumulative effects of alternative management proposals on soil quality. NFS lands within the Project boundary define the spatial extent for completing the soil resources effects analysis (Figure 3-104). Analysis indicators described in section 3.10.2 are evaluated in the context of their respective "activity areas," which represent the logical land area where effects can be analyzed (USDA Forest Service 2010a, p. Gl-1). The timeframe for direct effects to soil quality is when disturbance occurs, with the duration of effects depending on the intensity of the disturbance or permanency of the feature. The unrecovered or unrestored direct effects that exist when project activities are complete contribute to cumulative effects.

Forest Plan standards and guidelines provide the overriding direction for maintaining or improving desired conditions for soil quality. This analysis estimates and compares the potential effects of the alternatives for consistency with the applicable Forest Plan management direction (including applicable laws and regulations) and for key concerns, identified through public involvement, regarding soil resources.

3.10.1.2 Data Sources

Data used in this analysis were collected and interpreted from various sources. These sources include data and analysis using the Boise National Forest GIS (project record), soil health assessment (SHA) field survey data (project record), and the soil–hydrologic reconnaissance survey (Wendt et al. 1973), as well as data, analysis, and conclusions specific to this project that are included in the vegetation and fuels technical reports (project record). Information was integrated in part through GIS analysis, first to characterize and establish existing conditions for the soil resources within the analysis area, and then to display the spatial arrangement of indicator data to help interpret how proposed activities would affect soil quality.

Characterization of the landforms, soils, and near-surface soil elements in the analysis area used 2 data sources (Wendt et al. 1973, Wendt et al. 1975). This information was compiled and evaluated to describe inherent and baseline conditions for soil texture and cover (i.e., ground cover) and to identify inherent soil capabilities and limitations related to proposed management activities (i.e., erosion and compaction potential). The soil taxonomic naming conventions continue to the family level, using descriptions in the soil–hydrologic reconnaissance survey, where up to 4 soil map units can occur within each landtype (Wendt et al. 1973).

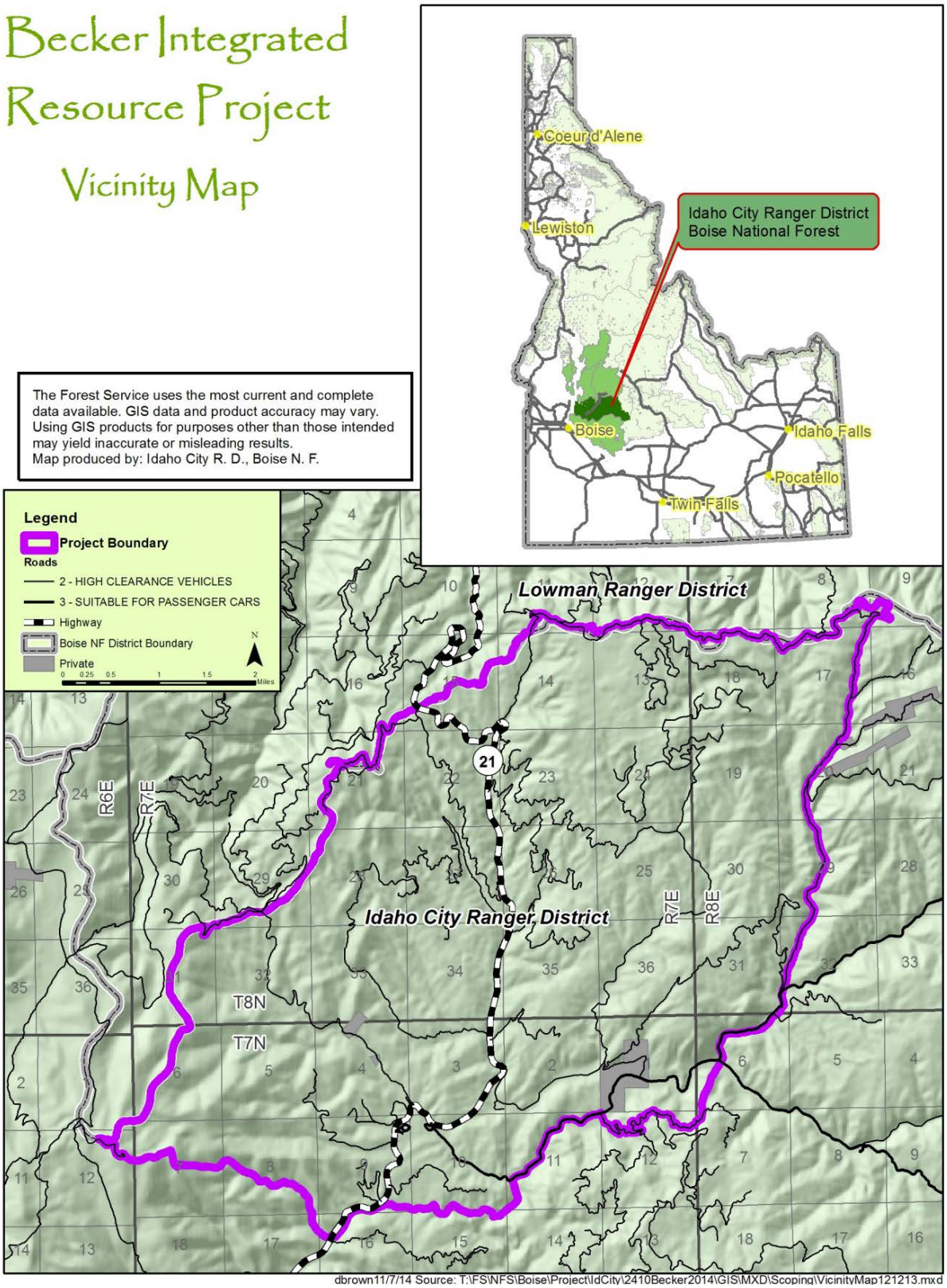

Figure 3-104. Becker Integrated Resource Project area

In addition to GIS, field data collected in 2006 using the SHA protocol informed the analysis for detrimental disturbance (DD) of soil, TSRC, and slope stability. SHA data were collected using sampling transects representing the varying soils and vegetation communities and based on physiographic features that included slope; slope position (top, mid-slope, toe-slope, valley bottom); and aspect.

The GIS-based stability index mapping (SINMAP) model (Pack 1998) was used to initially identify landslide prone (LSP) areas within the project area. Information on vegetation treatment prescriptions and road activities was then drawn from the vegetation specialist and transportation specialist reports, respectively, to define the scope of analysis for where proposed activities could influence slope stability. Field investigations (SHA), combined with a review of the 2008 high-resolution digital imagery, were used as a coarse-filter validation to refine SINMAP results.

3.10.1.3 Analysis Methods

At any time, soil quality conditions across landscapes lie somewhere within a spectrum from undisturbed to TSRC (Figure 3-105). The "undisturbed" and "disturbed" categories best represent the majority of natural soil conditions within forested and nonforested settings. Soils characterized as disturbed have not had their physical and biological properties impacted to a level where soil conditions impair productivity. Soils categorized as DD or as TSRC have been impacted, spatially and temporally, to a level inhibiting plant growth, often with compounding undesirable effects to watershed health (e.g., accelerated erosion, with increased sediment to waterbodies, and increased potential for the spread of noxious and nonnative plants).

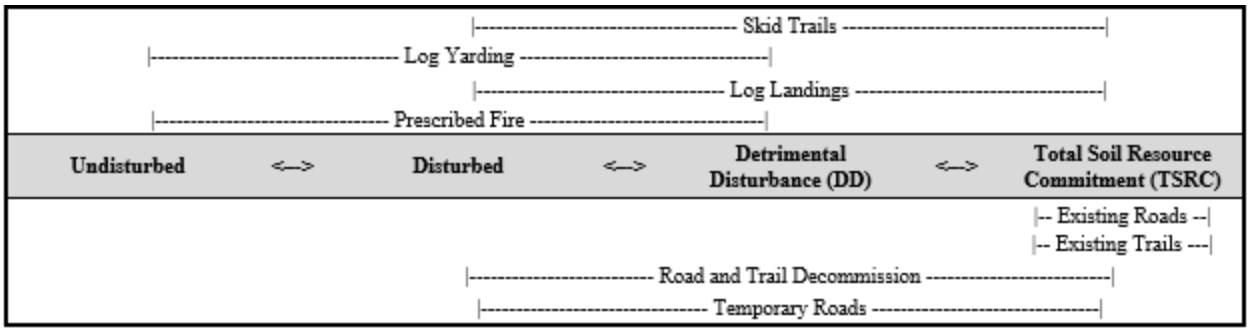

Figure 3-105. Soil Disturbance by activity

The soil quality analysis tracks "cause and effect" relationships that characterize existing conditions and estimate potential environmental effects from proposed activities to a threshold or desired range. The threshold or desired range is defined by an indicator based on applicable Forest Plan standards and guidelines. The change in the indicator from the current condition provides a benchmark for estimating, upon implementation of a proposed activity, the extent and magnitude of the activity's effects, concluding with an assessment of whether or not soil management goals and objectives are being (or can be) met. In many cases, quantitative analysis guides conclusions about the effects, although some conclusions are qualitative interpretations based on professional judgment and using accepted assumptions supported by the best available information.

The analysis for estimating the potential effects of vegetation management treatments (commercial timber harvest, noncommercial thinning, and prescribed fire) and roading activities on soil resources employed several assumptions based on the literature and professional judgment relative to silvicultural prescriptions, log yarding methods, wildland and prescribed fire behavior, existing vegetation conditions, and soil resource responses. The soil resources technical report (available in the project record) details these assumptions.

3.10.2 Analysis Indicators

Analysis indicators allow for comparison of qualitative or quantitative estimates of potential effects, due to implementation of the proposed activities, to the existing conditions of soils (Table 3-138). This comparative analysis validates whether these potential effects are consistent with the Forest Plan's desired conditions, goals, objectives, standards, and guidelines for the applicable soils.

Table 3-138. Indicators and activity areas

Indicator	Activity Area for Direct and Indirect Effects	Analysis Method/Alternative Comparison
Detrimental Disturbance (DD)	Harvest Unit or Burn Unit	Percent change over existing condition
Total Soil Resource Commitment (TSRC)	Project Area	Percent change over existing condition
Slope Stability Hazard (Landslide Prone)	Harvest Unit, Burn Unit, Travel Route	Areas having moderate and high stability hazards where activities are proposed

Note: Activity area is the smallest logical land area where the effect being analyzed or monitored is expected to occur (USDA Forest Service 2010a, p. Gl-1).

3.10.2.1 Detrimental Disturbance—Forest Plan Standard SWST02

The potential direct, indirect, and cumulative effects from proposed activities resulting in DD are estimated for temporary, short-term, and long-term timeframes. The spatial scale for estimating DD is the "activity area," as defined by the areal extent of specific actions that may cause detrimental soil impacts (e.g., commercial timber harvest unit, noncommercial thinning unit, or prescribed fire burn block) (USDA Forest Service 2010a, p. Gl-1) (Table 3-138).

DD is the alteration of natural soil characteristics resulting in immediate or prolonged loss of soil productivity and soil–hydrologic function. At least 85% of an activity area should be in a non-detrimentally disturbed condition. Stated another way, no more than 15% of an activity area should contain detrimentally disturbed soil after management activities are completed. DD can occur where soil has been displaced, compacted, puddled, or severely burned. Determination of DD excludes existing or planned classified transportation facilities, dedicated trails, landings, mining dumps or excavations, parking areas, developed campgrounds, and other dedicated facilities. DD is represented by any or all of the 4 characteristics described below:

- **Detrimental Soil Displacement—**Areas of 1 meter by 1 meter, or larger, exhibiting detrimentally displaced soil as described below:
    - The loss of either 5 centimeters or half of humus-enriched topsoil (A horizon), whichever is less, or

- The exceeding of the soil loss tolerance value for the specific soil type

- **Detrimental Soil Compaction—**Soil compaction is generally evaluated from 5 to 30 centimeters below the mineral soil surface. Specific depths for measurement depend on soil type and management activities. Detrimental soil compaction comprises increased soil density (weight per unit volume) and strength that hampers root growth, reduces soil aeration, and inhibits water movement. Measurements of potential detrimental soil compaction may be qualitative or quantitative. Refer to the Region 4 Soil Management Manual for methods related to measuring/determining soil compaction.
- **Detrimental Soil Puddling—**Puddling is generally evaluated at the mineral soil surface. Visual indicators of detrimental puddling include clearly identifiable ruts with berms in either mineral soil or in an Oa horizon of an organic soil. Detrimental puddling may occur in conjunction with detrimental compaction; when this occurs, the guidelines for soil compaction are to be used. Detrimentally puddled soils are not always detrimentally compacted. Infiltration and permeability are affected by detrimental soil puddling. Puddling can also alter local groundwater hydrology and wetland function, and provide conduits for runoff.
- **Severely Burned Soil—**Severely burned soil applies to prescribed fire and natural fires that are managed for resource benefits. Severely burned soils are identified by ratings of fire severity and the effects to the soil. A severely burned soil is generally soil within a High Fire Severity burn, as defined by the Forest Service Burned Area Emergency Response Program (FSM 2520-2014-1, December 17, 2014) (Debano 2000, Parsons et al. 2010).

Standards for detrimentally disturbed soils are to be applied to existing or planned activities available for multiple uses. These standards do not apply to areas with dedicated uses such as mines, ski areas, campgrounds, and administrative sites (USDA Forest Service 2010a, p. Gl-12).

3.10.2.2 Total Soil Resource Commitment—Forest Plan Standard SWST03

Direct, indirect, and cumulative effects of proposed activities resulting in TSRC are estimated for temporary, short-term, and long-term timeframes. The spatial scale for estimating TSRC is the "activity area," usually defined by the project boundary (USDA Forest Service 2010a, p. Gl-1) (Table 3-138).

TSRC is the conversion of a productive site to an essentially nonproductive site for a period of more than 50 years. Examples include classified or unclassified roads, inadequately restored haul roads, designated skid roads, landing areas, parking lots, mining dumps or excavations, dedicated trails (skid trails also), developed campgrounds, other dedicated facilities, and some stock driveways. Productivity on these areas ranges from 0% to 40% of natural.

Standards for TSRC are to be applied to existing or planned activities available for multiple uses. This standard does not apply to areas with dedicated uses such as mines, ski areas, campgrounds, and administrative sites (USDA Forest Service 2010a, p. G l-50).

3.10.2.3 Landslide Prone Areas—Forest Plan Standard SWST12

Proposed management activities are evaluated to avoid increasing the potential for landslides. "Landslide" is a collective term that includes mass, deep-seated geologic failures and smaller, localized mass-erosional events such as slumps, debris flows, and debris slides. Landslides have been documented as the dominant form of sediment delivery to streams in the Idaho Batholith (Megahan et al. 1978, Arnold 1988).

Landslides are discussed in terms of slope stability hazards. Although landslides are naturally occurring events, evaluation of road corridors and, to a lesser extent, timber harvest and other site-specific management actions with the likelihood of modifying landslide processes is warranted. Analysis of proposed activities on LSP areas estimates the potential direct, indirect, and cumulative effects on fish habitat, long-term soil productivity, water quality/watershed function, and identification of risks to life and property. The spatial extend for estimating the effects proposed activities may have on slope stability is the footprint of a specific activity over the inherent LSP rating for a given area (Table 3-138). Refer to the Forest Plan (USDA Forest Service 2010a, Appendix B-41) for guidance on identifying and managing LSP areas.

Landslide initiation is often associated with extremely wet periods, such as rain-on-snow events. It does not include slow soil mass movements that include deep earthflows and rotational slumps, nor does it include snow avalanche or rock fall areas. Translational slides have been documented as the dominant form of landslides for the majority of the Forest (USDA Forest Service 2010a, p. Gl-26).

3.10.3 Characterization of the Soil Resources

Elevations for the project area range from about 5,000 feet to 8,100 feet. Climate is representative of the upland continental setting of the Interior Rocky Mountains. Long, cold winters have heavy snowfalls, which usually melt by mid-May. Summer brings warm days and cool nights, and short, intense convective thunderstorms and considerable lightning, which increases the danger for wildland fires. The gradual changes to and from spring and fall often include rapid changes in weather, either rain-on-snow events or intense rainstorms.

Precipitation and temperature for the project area are described using historical data from the Idaho City weather station (WRCC 2014) and Deadwood Dam weather data adjusted to the geographic location using Rock:Clime (Elliot et al. 1999). These weather stations best represent the climate variability from the south and north, respectively, for the project area. Records show average precipitation is well correlated with elevation and ranges from 23 inches to 35 inches annually, with up to 60% falling in the form of snow during the winter. The highest elevations likely receive up to 60 inches of annual snowfall, with an average maximum depth across the project area of about 30 inches. The average maximum temperature (in degrees Fahrenheit [°F]) ranges from 30 °F to 82 °F, with highs in July from 82 °F to 88 °F. The average minimum temperature ranges from 5 °F to 39 °F, with low temperatures of 5 °F and 12 °F for January.

Landforms and drainages within the project area are aligned predominantly north to south, and the landscape of the project area is moderately to strongly dissected by streams, so that aspects within the smaller catchments include the full range of cardinal and intermediate directions. Roughly 7 miles of the mainstem of Beaver Creek dissect the project area, exiting

the project area at its confluence with Crooked River. Other major streams include Edna Creek, Little Beaver Creek, and Banner Creek, which are fed by a number of small, unnamed first-order and second-order perennial and intermittent tributaries. Streamflows are composed of snowmelt and dominated by runoff peak flows occurring in May or early June.

The underlying geology of the project area consists of Idaho batholith granitics. The dominant rock is the medium-to-coarse–grained, light gray granodiorite. The main ridges and upper slopes that mostly surround the project area were initially formed by glaciation. Subsequent climate and fluvial (water) action reduced the sharply pronounced V-shaped drainages to a high density of moderately to weakly expressed drainages with rounded, subdued topography (Wendt et al. 1973).

Slope lengths from ridgelines to drainage bottoms typically range between 700 feet and 1,500 feet, rarely reaching 2,000 feet. Roughly 90% of the landforms are in the 20% to 50% slope category, with lands exceeding 50% slopes located along the western section of the project boundary and in the Sawmill Creek drainage to the east (as per GIS analysis). Within the project area, less than 2% of the lands are mapped as at high and moderate hazard for landslides, which strongly correlate to lands with slopes greater than 40% (Table 3-139).

Table 3-139. SINMAP landslide hazard ratings

Slope Stability Hazard	Stable		Low		Moderate		High	
	Acres	Percent	Acres	Percent	Acres	Percent	Acres	Percent
Becker Project Area	18,078	94	918	5	201	1	130	<1

Eight landtype associations, 20 landtype units, and 8 soil map units are represented within the project area (Table 3-140; Wendt et al. 1973). Landtype and soil map unit delineations and descriptions, with their respective component interpretations as used in this analysis, can be found in Attachment A of the soil resources technical report (available in the project record). The landtype association and landtype stratification more accurately describe the broad-scale physiographic and ecological (abiotic and biotic) setting, whereas the differentiated soil units represent National Cooperative Soil Survey mapping. Both mapping efforts provide useful information for evaluating the potential effects of proposed land management activities to soils and water.

Landtypes and landtype associations consist of stratified mapping levels representing 2 sequential geographic scales within the land systems inventory concept (Wertz and Arnold 1972). This concept considers the lithology, geologic structure, and climate (basic components) that, over time, produce varying soils, landforms, and plant communities (manifest components). The integrated relationships between the basic and manifest components allow for recognizing the geomorphic development of the earth's surface and understanding how certain biophysical ecosystem elements (hillslope erosion, sedimentation, stream channels, landforms, vegetation, animal life, etc.) respond to natural and management-caused disturbances (Wendt et al. 1975).

Table 3-140. Project area landtype associations and landtypes

Landtype Association Map Unit	Landtype Map Unit	Acres	Percent
F2—Low Relief Granitic Fluvial Lands	120e-2—Maturely Dissected Mountain Slope Land	7,211	37
	120e-1—Maturely Dissected Mountain Slope Land	3,562	18
	120e—Maturely Dissected Mountain Slope Land	2,371	12
F4—Strongly Dissected Granitic Fluvial Lands	120c-3—Strongly Dissected Mountain Slope Land	2,157	11
	S09-3—Stream Cut Valleys, Moderately Steep to Steep-sided, Very Narrow, Moderate to Steep Gradient	161	1
	S20-1—Stream Cut Granitic Valleys, Steep-sided, Narrow, Moderate Gradient	46	<1
	120c-11—Strongly Dissected Mountain Slope Land	40	<1
	120d-3—Steep Headlands	10	<1
F1—Granitic Fluvial Lands	120b-6—Moderately Dissected Mountain Slope Land	1,078	6
	120b-4—Moderately Dissected Mountain Slope Land	873	5
C2—Cryic Mountain Slopes	109d-1—Cryoplanated Headlands	481	2
	109b—Moderately Dissected Cryoplanated Mountain Slopes	425	2
	109-2—Cryoplanated Ridge Land	26	<1
	109a-1—Weakly Dissected Cryoplanated Mountain Slopes	2	<1
D2—Alluvial Lands	D01-1—Depositional Valleys, Steep-sided, Moderately Wide to Wide, Low Gradient	566	3
F5—Steep Granitic Canyon Slopes	S09-1—Stream Cut Valleys, Moderately Steep to Steep-sided with Narrow, Moderate Gradient	170	1
	122—Oversteepened Canyon Land	8	<1
	122-4—Oversteepened Canyon Land	1	<1
G1—Glaciated Granitic Headlands	111d-3—Steep, Benchy Glacial Headland	135	1
C1—Cryic Uplands	109-9—Cryoplanated Uplands	4	<1

Soil classifications and descriptions for the project area are listed in Attachment A of the soil resources technical report (available in the project record). The soils are derived from granitic parent material, with soil textures, coarse fragments, soil cover, and other factors primarily a function of slope position and aspect. At higher elevations and on steeper slopes, the soils are weakly developed, with lesser amounts of organic material. Soils at the mid-slope and lower-slope positions exhibit distinct variations as a function of aspect, with shallow, less productive soils occupying drier south- and southwest-facing slopes. Soils on northwest, north, and northeast aspects and in valley bottoms exhibit greater horizon development, higher moisture levels, and greater organic content. Composition of the surface textures and underlying parent materials suggests that soils in the project area are moderately productive (considering their origin from granitic parent material) and provide sufficient vegetation canopy and ground cover for protection against wind and water erosion.

The vegetation composition in the project area is described as 14,135 forested acres (89%), roughly 2,075 acres (11%) of nonforested vegetation, and a minor amount (<1%) of rock/barren/other lands. Elevation, slope, aspect, and precipitation are the primary drivers influencing the existing vegetation types, with about 33% of the project area classified as PVG 2—Warm Dry Douglas-fir, Moist Ponderosa Pine. Other forested stands are predominantly PVG 1—Dry Ponderosa Pine (18%) and PVG 3—Cool Moist Douglas-fir (20%). The nonforested lands consist of deciduous brush species, with crown densities ranging from 10% to 40%. Refer to the vegetation technical report in the project record for more information on the forested and nonforested vegetation.

3.10.4 Detrimental Disturbance

3.10.4.1 Affected Environment

Existing conditions for the soil quality indicators are a function of inherent characteristics that have been influenced by past and current land uses. NFS lands within the analysis area provide year-round recreational opportunities that include developed and dispersed recreation (camping, motorized and non-motorized trail uses, and snowmobiling) and big game hunting. A number of past (including historic) and ongoing disturbances have influenced the existing conditions of the indicators: Native American settlements and activities; mining; timber harvest, reforestation, and road construction; livestock grazing; insect and disease effects to vegetation; personal fuelwood gathering; and the recreation activities mentioned above. Wildland fire (1989) and prescribed fire have also influenced the existing vegetation and soil conditions, while fire suppression and fire exclusion have likely had a considerable effect on current conditions (fuels technical report available in the project record).

All these disturbances have had some influence on soil quality, primarily due to removal of or changes in native vegetation. Some disturbances have caused residual and chronic soil displacement or compaction in localized areas distributed throughout the project area. Conversely, some activities may result in ground disturbance but with no reduction in soil quality. As impacts to soils ameliorate or are actively reclaimed to begin restoring productivity, soil quality conditions transition back and forth along a disturbance continuum (Figure 3-105). Information from various reconnaissance and inventories for fuels, wildlife, and vegetation indicate that conditions for the soil quality indicators across the majority of the project area are contributing to meeting desired conditions for soils.

The spatial scale for estimating DD is the activity area, as defined by the areal extent of specific actions that may cause detrimental soil impacts (e.g., commercial timber harvest unit, noncommercial thinning unit, or prescriptive fire burn block) (USDA Forest Service 2010a, p. Gl-1). Existing DD in the activity areas ranges from 0% to 5% and is attributed to past timber harvest, livestock grazing, dispersed recreation, OHV use, and personal fuelwood gathering (Appendix D). The existing DD was estimated by overlaying the proposed treatment units with known disturbances from current and ongoing management activities using corporate GIS data and field observations. However, until these existing disturbances are discussed in the context of cumulative effects when combined with direct/indirect effects from activity areas associated with the Proposed Action or action alternatives or as part of Alternative A, there is no relevance for existing DD to be consistent with Forest Plan Standard SWST02.

3.10.4.2 Environmental Effects

Direct and Indirect Effects

Direct and indirect effects on soil quality are limited to those specifically resulting from proposed management actions within activity areas delineated to implement vegetation management activities (commercial and noncommercial thinning and prescribed fire).

Alternative A

No activities are proposed under the No Action Alternative; therefore, there are no activity areas and no direct and indirect effects. Where it exists across the project area, DD from livestock grazing, dispersed recreation, and personal fuelwood gathering are expected to persist but not to increase in the temporary, short-term, or long-term timeframes.

All Action Alternatives

For all action alternatives, the direct and indirect effects from implementing proposed activities that create ground disturbance would increase DD in each activity area in the temporary to short term (0–15 years). The estimated increases in DD would be less than 15% for all activity areas (Table 3-141); therefore, implementing any action alternative would comply with Forest Plan Standard SWST02.

Table 3-141. Summary of detrimental disturbance (DD) by alternative

Alternative	Existing Condition	Direct/Indirect Effect		Cumulative Effect	
		Commercial Timber Harvest	Prescribed Fire	5 Years	10 Years
A	0%–5%	0%	0%	0%–5%	0%–5%
B		6.9%–13.2%	2.0%–3.7%	0%–11.5%	0%–5.8%
C		6.9%–13.2%	2.0%–3.7%	0%–11.5%	0%–5.8%
D		6.9%–13.2%	1.9%–3.7%	0%–11.5%	0%–5.8%
E		2.3%–13.2%	2.0%–3.7%	0%–11.5%	0%–5.8%
F		2.3%–13.2%	2.0%–3.7%	0%–11.5%	0%–5.8%

DD is not predicted to exceed 15% in any of the timber harvest activity areas. About 14 of the 75–78 (depending on the alternative) units or activity areas are estimated to reach 13% DD immediately following timber harvest activities. For each timber harvest unit, a time lag exists between sequentially implemented subsequent activities. Using prescribed burning to treat activity fuels occurs 1–3 years after timber harvest, and some of the initial DD increase from timber harvest would recover to disturbed conditions as skid trails are actively reclaimed. Following prescribed fire implementation, the same 14 units would approach 13% to 15% DD (Appendix D).

Temporary and short-term increases in DD are expected in commercial harvest activity areas where ground-based equipment (dozers/rubber tire skidders or Timco) would cut trees and use skid trails to yard logs. The primary (designated) skid trails are classified as TSRC. It is common, however, to use secondary (6-pass to 10-pass) skid trails that either branch off primary trails or are the only trails in small harvest units, a practice that may or may not cause detrimental soil compaction and displacement (Froehlich et al. 1983). The temporary

and short-term direct effects from ground-based timber harvest decrease through stabilization of skid trail disturbances described under Design Features TH-4 and TH-5; stabilization is also required under the IFPA (IDAPA 20.02.01). However, some short-term (up to 10 years) increases in DD are expected due to residual impacts from primary and secondary skid trails; the expectation that stabilization would occur on 100% of the skid trails or be 100% effective is unreasonable. Also, short-term (up to 15 years) increases in DD would exist from residual impacts where roads and primary skid trails have been decommissioned and soil quality conditions are in transition from TSRC.

As previously stated, DD is associated with ground disturbance that accelerates soil displacement (erosion) or causes compaction. Because noncommercial thinning (felling of small diameter or submerchantable trees) would be accomplished with hand felling by chainsaws and not result in ground disturbance, no detrimental soil impacts (erosion or compaction) are expected from implementing this activity.

Broadcast burning and prescribed fire, as well as harvest-related and noncommercial thinning of slash, would be implemented to reduce existing natural fuel loads. The prescription for these treatments is to burn at low-to-moderate fire intensities with low soil burn severity, thereby causing little impact to soil quality (Debano 2000, Parsons et al. 2010). Activity fuels treatments include lop and scatter and whole tree yarding. The analysis assumes that lop and scatter would result in greater fuel loads as compared with whole tree yarding, with a slightly increased potential for higher soil burn severity. When added to existing ground fuels, breakage and slash from commercial timber harvest and noncommercial thinning can increase the overall fuel load, which leads to longer burning duration and severely burned soils (i.e., DD). However, this is not representative of the overall effects of prescribed burning, as high intensity fire with high soil burn severity occurs infrequently in very small patches (<1 acre) that are widely distributed across each activity area. Therefore, prescribed burning would not measurably affect DD.

The anticipated low severity burn is expected to result in minimal areas of bare soil, decreasing the potential for soil detachment and sediment transport. Moderate-to-high severity burn patches would be surrounded by unburned areas on hillslopes with intact vegetation and downed woody debris. Combined with Design Feature FF-5, which limits ignitions in RCAs, the unburned vegetative buffers would be effective in interrupting overland flow and trapping eroded soil, thereby minimizing sediment travel distances (Arkle and Pilliod 2010). Any hand-constructed fire line needed for the prescribed burning would temporarily increase DD. These disturbances would be reclaimed following implementation, resulting in no net increase in DD (Design Feature FF-3). The extent of detrimental soil disturbance at the conclusion of broadcast burning and related fireline/suppression activities is not expected to result in measurable decreases in soil quality. Nondetrimental effects from prescribed fire would ameliorate the following growing season, with any detrimental conditions considered temporary and recovering in 1 to 3 years (Robichaud and Brown 1999, Robichaud et al. 2000, Neary et al. 2005). Burning piled slash does result in microsite impacts, but with no other activity implemented to cause DD, over 200 slash piles per acre would be needed to exceed 15% DD for any activity area (Design Feature FF-5).

Effects that Differ by Action Alternative

For DD, the fundamental difference in direct and indirect effects between the action alternatives is the level of disturbance resulting from yarding methods used to implement commercial timber harvest activities. Ground-based yarding (tractor/jammer) is proposed exclusively for Alternatives B, C, and D, while Alternatives E and F employ a mix of ground-based and helicopter yarding. Direct and indirect effects of the 2 harvest systems on the same harvest units (activity area) differ by 5% to 9% DD (Appendix D).

Increases in DD from helicopter yarding operations are essentially immeasurable when compared with ground-based systems (Potyondy et al. 1991). The primary factor for increased DD when using ground-based log yarding is the network of skid trails. Skid trails result in immediate and short-term DD, and only through effective application of design features can ground-based yarding be implemented to maintain or achieve acceptable soil quality conditions (Design Features FH-27, FH-28, TH-4, and TH-5).

Cumulative Effects

Within the delineated activity areas, detrimental soil conditions from disturbances occurring in the last 21 years were considered as existing or residual detrimental impacts that, when combined with the direct/indirect effects of the activities proposed in the Project, define the cumulative effect. Permitted livestock (sheep) grazing occurs throughout the northern part of the project, with minor amounts of DD resulting around the perimeter of shipping corrals, water developments, nooning areas, and bed grounds. Similarly, DD exists around the perimeters of developed recreation sites and dispersed recreation areas that are categorized as TSRC. Timber harvest and other ground-disturbing activities contributing to DD but predating 1988 are not included in this analysis, because those impacts have recovered (Arnup 1998). Cumulative effect values in this analysis represent existing DD and additive direct effects for implementing all treatments within a 3 to 5-year time period.

Alternative A

The cumulative effect is the same as direct and indirect effects for Alternative A as described above. Localized areas where soils are currently detrimentally compacted and/or displaced from past timber harvest would recover and stabilize over time, as the causative impacts no longer exist (Arnup 1998). Existing DD from present/ongoing livestock grazing, dispersed recreation, and personal fuelwood gathering is expected to persist but not increase. No reasonably foreseeable management activities influencing DD would be implemented under Alternative A.

All Action Alternatives

For all action alternatives, the cumulative effects for DD by activity area are consistent with Forest Plan Standard SWST02. Within 5 years of project implementation, DD would range from 0% to 11.5%. Additional recovery of disturbances in each timber harvest unit would occur between 5 and 10 years following project implementation, with DD estimates at 10 years ranging from 0% to 5.8% (Table 3-141).

Potential impacts from implementing the action alternatives (specifically, commercial timber harvest) would cause an incremental short-term, cumulative increase in DD in all activity

areas, with greater impacts in activity areas having existing disturbances from past or present/ongoing activities. Over time, the decrease in residual DD through active reclamation or passive amelioration (Arnup 1998) would bring the cumulative DD within each activity area to between 0% and 5.8% by year 10 (Table 3-141). Over the longer term (20 years or more), residual DD resulting from more severe, localized impacts and having longer-lasting effects would likely exist. These impacts would be confined to small areas less than 1 acre that are randomly distributed throughout an activity area.

Existing DD from present/ongoing livestock grazing, dispersed recreation, and personal fuelwood gathering is expected to persist but not increase in the temporary, short-term, or long-term timeframes. No known foreseeable future management activities exist that could measurably increase or decrease cumulative DD within the respective activity areas.

The fundamental difference in cumulative effects between the action alternatives is the level of disturbance resulting from yarding methods used to implement commercial timber harvest activities. Ground-based yarding (tractor/jammer) is proposed for Alternatives B, C, and D, while Alternatives E and F employ a mix of ground-based and helicopter yarding. Cumulative effects of the 2 harvest systems on the same harvest units (activity area) differ by 0.6% to 2.2% DD (Appendix D).

3.10.5 Total Soil Resource Commitment

3.10.5.1 Affected Environment

The spatial scale for estimating TSRC is the activity area, which is usually defined by the project boundary (USDA Forest Service 2010a, p. Gl-1). The existing condition for TSRC in the activity area is approximately 4.7% and can be attributed to impacts from existing transportation facilities, some limited past timber harvest, past and current livestock grazing, developed and dispersed recreation, OHV use, and personal fuelwood gathering.

Similar to DD, until the existing TSRC is evaluated in the context of cumulative effects when combined with direct/indirect effects from the Proposed Action or alternatives or as part of Alternative A, there is no relevance of the existing conditions to Forest Plan Standard SWST032.

3.10.5.2 Environmental Effects

Direct and Indirect Effects

The TSRC activity area for direct/indirect and cumulative effects is the 19,371-acre project area. The rationale for this delineation is based on guidance in the Forest Plan (USDA Forest Service 2010a, p. Gl-1). TSRC acres were estimated by overlaying the developed recreation facilities, transportation facilities, and past harvest data in GIS with the project area boundary, field observations of a subset of TSRC sites, and review of high-resolution imagery. Attachment C of the soil resources technical report (project record) contains the TSRC analysis methodology, including a table of estimated TSRC by activity and of the assumptions made when estimating TSRC.

Alternative A

No activities are proposed under the No Action Alternative; therefore, no direct/indirect effects would change TSRC. Where it exists across the project area, TSRC from livestock grazing, dispersed recreation, and personal fuelwood gathering are expected to persist but not increase in the temporary, short-term, or long-term timeframes.

All Action Alternatives

All action alternatives proposed constructing new NFS roads and trails, decommissioning roads, and constructing trailheads (Table 3-142).

Table 3-142. Action alternative features influencing Total Soil Resource Commitment (TSRC)

TSRC Feature	Alternative					
	A	B	C	D	E	F
NFS Roads (miles)	136.5	136.5	136.5	136.5	133.6	133.6
NFS Roads—Decommission (miles)	—	–22.8	–22.8	–22.8	–24.8	–23.6
NFS Motorized Trails (miles)	—	4.2	4.0	4.0	0.0	2.9
NFS Non-motorized Trails (miles)	19.5	44.5	44.5	44.5	47.4	47.4
Recreation Trailhead (number)	—	2	2	2	1	2

For all action alternatives, construction of skid trails and log landings, construction of travel routes, and construction of recreation facilities would increase TSRC. For some activities (e.g., construction of skid trails, log lands, and temporary roads), the increase would be short term (0–15 years), as those disturbances would be rehabilitated to DD or disturbed conditions. Decommissioning NFS and unauthorized routes would decrease TSRC over the long term. In addition to road decommissioning, Design Features FH-6 (rehabilitate landings), FH-27 (use existing disturbances as skid trails), and TH-5 (rehabilitate skid trails and temporary roads) would be necessary to achieve soil restoration objectives and consistency with Forest Plan Standard SWST03. Disturbance activities, data, and calculations used to derive TSRC estimates are located in the soil resources technical report (available in the project record).

An interim increase of 1.1% to 1.7% in TSRC would occur from constructing and using log landings, skid trails, and up to 3.2 miles of temporary road to facilitate commercial timber harvest (see soils technical report, available in the project record). The determination that these direct effects would be temporary is addressed through Design Features FH-6 and TH-5, which require that these disturbances be reclaimed when they are no longer needed for timber harvest, essentially alleviating the increased TSRC. Constructing approximately 4.8 miles of new specified road and realigning 1.2 miles of NFS roads would slightly increase TSRC over the existing conditions, by about 0.1% (Table 3-143 and Appendix D). Decommissioning roughly 30.9 miles of existing NFS road (22.8 miles) and unauthorized routes (8.1 miles) would reduce TSRC by 0.6%.

Table 3-143. Total Soil Resource Commitment (TSRC) by alternative (values based on 19,371-acre project area)

TSRC Feature	Cumulative Effects by Alternative (%)					
	A	B	C	D	E	F
National Forest System (NFS) roads (includes 8.4-mile State Highway 21)	3.33%	2.83%	2.83%	2.83%	2.77%	2.77%
NFS road—New Construction		0.02%	0.02%	0.02%	0.02%	0.02%
NFS Road—Reconstruction/relocation		0.10%	0.10%	0.10%	0.10%	0.10%
NFS Road—Decommission		–0.47%	–0.47%	–0.47%	–0.51%	–0.49%
Unauthorized Roads	0.71%	0.45%	0.45%	0.45%	0.46%	0.45%
Unauthorized Roads—Decommission		–0.13%	–0.13%	–0.13%	–0.13%	–0.13%
Temporary Road—Construction		0.00%	0.00%	0.00%	0.00%	0.00%
NFS Motorized Trails—Construction		0.04%	0.04%	0.04%	0.00%	0.03%
NFS Non-motorized Trails—Construction	0.11%	0.25%	0.25%	0.25%	0.27%	0.27%
Recreation Disturbances	0.50%	0.53%	0.53%	0.53%	0.52%	0.53%
Skid Trails		0.31%	0.31%	0.32%	0.19%	0.27%
Landings		0.00%	0.00%	0.00%	0.00%	0.00%
Livestock Disturbances	0.08%	0.08%	0.08%	0.08%	0.08%	0.08%
Cumulative TSRC	**4.7%**	**4.0%**	**4.0%**	**3.8%**	**3.8%**	**3.9%**

Values based on 19,371 acre project area.

Most of the forested stands within the project area are roaded and have previously been logged, most notably in the 1980s and most recently in 1995. Remnants of old skid trails are evident, many of which could be reused to implement the proposed commercial harvest. The remnant trails have varying levels of vegetative cover, and the existing effects are discontinuous across the spectrum of soil disturbance. Therefore, existing effects are difficult to quantify from a soil quality perspective. Some of the proposed primary skid trails would be co-located over existing disturbances, and this TSRC is already accounted for under existing conditions.

Based on the configuration of harvest units, 108 to 141 log landings with an average size of 0.5 acres would be needed to implement the proposed commercial timber harvest. The actual number of landings and their equivalent impact area may vary, as the preference is to minimize new construction/ground disturbance and locate landings in currently disturbed areas or co-locate them within existing road prisms. The log landings would temporarily increase TSRC, but disturbance would be rehabilitated to DD or disturbed conditions. Design Feature FH-6 requires that newly constructed landings be ripped and reshaped to provide acceptable infiltration and surface drainage, that slash be distributed to cover approximately 30% of the reshaped surface, and that the area be planted with a Forest Service–approved seed mixture once harvest activities are completed. Depending on existing or potential resource impacts that might occur, any dispersed recreation areas that are reused as landings may or may not be fully restored.

Proposed trailheads would be located in areas already identified as existing TSRC from dispersed recreation. Construction of the trailheads would slightly increase TSRC as the disturbance footprint would be slightly greater than the existing disturbance. New motorized trail construction of 1.6 to 2.1 miles would increase TSRC. Conversion of existing routes

(either NFS or unauthorized) to motorized or non-motorized trails would slightly decrease TSRC over the long term as the disturbed width of the route feature would effectively narrow. Margins along the route prism would recover to DD and eventually to a disturbed condition. This recovery would occur primarily through passive amelioration based on the varied intensity of impact when the original route was constructed and the inherent properties that contribute to soil-forming processes. While the potential change in TSRC can be estimated, it is inappropriate to attempt to quantify the transition to DD or disturbed conditions.

Minor differences in direct/indirect effects occurring in year 1 between the action alternatives cannot be attributed to any single action (Table 3-142). The key feature contributing to decreased TSRC is the proposed decommissioning of 22.8 miles of NFS roads under Alternatives B, C, and D; 24.8 miles under Alternative E; and 23.6 miles under Alternative F (Table 3-142).

Cumulative Effects

With none of the alternatives affecting soil quality outside the project area, the activity area for assessing cumulative effects consists of the 19,371-acre project area. The existing conditions for TSRC reflect the past and present/ongoing impacts of the travel routes and long-term disturbances.

Alternative A

The cumulative effects for Alternative A are the same as the direct and indirect effects described above for this alternative. Existing TSRC from present/ongoing travel routes, limited livestock trailing, developed and dispersed recreation, and personal fuelwood gathering are expected to persist but not increase in the temporary, short-term, or long-term timeframes. No reasonably foreseeable management activities influencing TSRC would be implemented under Alternative A.

All Action Alternatives

Given the minimal potential for any of the past/ongoing actions to increase TSRC, cumulative effects from the implementation of any action alternative would decrease when compared with existing conditions (Table 3-143). At the conclusion of implementing all activities, TSRC is estimated to range between 3.8% and 4.0%, an overall decrease of 0.7% to 0.9% as compared with existing TSRC. Any action alternative would be consistent with Forest Plan Standard SWST03.

The action alternatives would increase cumulative TSRC in the temporary and short term by about 0.5%. In the long term, rehabilitation of log landings and primary skid trails and road decommissioning would decrease TSRC, with road decommissioning accounting for up to a 0.6% reduction.

Similar to direct and indirect effects, a 0.2% difference in cumulative TSRC exists between the action alternatives because of the miles of road decommissioning proposed under each alternative: 22.8 miles under Alternatives B, C, and D; 24.8 miles under Alternative E; and 23.6 miles under Alternative F.

3.10.6 Slope Stability

3.10.6.1 Affected Environment

Understanding the primary factors regulating slope stability (i.e., soil moisture, root strength, and slope gradient) and the disturbances (management-related or natural) that have a greater potential to initiate landslides (Megahan et al. 1978) is important to avoid or prevent landslides. Section 3.2 provides baseline conditions to identify existing slope stability concerns and to provide context for evaluating the potential effects to slope stability from proposed management activities.

Slope stability hazards were initially identified through analysis of high-resolution digital imagery intersected with slope hazard GIS data (SINMAP, Pack et al. 1998). This coarse filter did not reveal large-scale landslide scars or features, nor did it provide indications of obvious stability hazards within the activity areas. Field verification was completed in 2008 on a portion of the project area, focused where management actions are proposed on moderate and high slope stability hazard areas. This ground reconnaissance identified no specific locations of slope instability as a result of natural and past/ongoing management activities or any hillslope failures or stability concerns attributed to past timber harvest activities.

3.10.6.2 Environmental Effects

Direct and Indirect Effects

The activity area for assessing direct and indirect effects for slope stability is the 19,371-acre project area. The analysis focused on locations where management activities are proposed on lands with moderate and high slope stability hazards. These locations present the greatest likelihood for management activities to influence the natural processes affecting slope stability. Management actions considered include the individual vegetation treatment activity areas, corridors for existing and proposed travel routes, and site-specific locations for developed recreation facilities. The rationale for this delineation is based on Forest Plan guidance (USDA Forest Service 2010a, p. B-44). There are 1.1 miles (of 206 total miles) of existing NFS and unauthorized routes located on moderate or high LSP areas in the project area.

Alternative A

Because Alternative A would not implement any management activities, no additional direct/indirect, short-term, or long-term effects increasing the occurrence of landslides are expected. There would be no direct/indirect effects to the 3 primary factors influencing slope stability (i.e., soil moisture, root strength, and slope gradient); therefore, this alternative would neither increase nor decrease the likelihood of new landslides.

All Action Alternatives

Based on the analysis and subsequent field verification of locations where instability features may exist, no direct/indirect effects are expected when implementing any of the action alternatives. All action alternatives would comply with Forest Plan Standard SWST12.

The likelihood is very low for proposed vegetation actions to increase the probability of landslide occurrence. Within the project area, less than 2% of the lands are mapped as a moderate or high hazard for landslides (Table 3-139). The acres of slope stability hazards displayed in the table below represent the sum of numerous smaller sites within any individual activity area; the largest contiguous patch of unstable lands ("moderate" or "high" LSP rating) within a commercial timber harvest activity area is approximately 8 acres. Project Design Feature FH-26 requires identification and field verification of moderate and high hazard LSP areas that coincide with proposed timber harvests, prescribed fire, new/temporary road construction, and trail construction during project implementation. Where proposed activities increase the probability of landslides, site-specific management measures are required.

A review of high-resolution digital imagery intersected with slope stability hazard GIS data reveals that commercial timber harvest, noncommercial thinning, or prescribed fire are proposed on up to 65 acres of the lands identified as moderate or high hazard for slope stability (Table 3-144).

A total of 0.7 mile of existing roads (distributed across 17 road segments, with the longest segment measuring 0.1 mile) is located on land classified as moderate or high hazard for slope stability (Table 3-144). Less than 0.1 mile of proposed road construction occurs on unstable lands. All the temporary road segments are either in stable locations or present low stability hazards; they would exist primarily on level ground or gently sloping ridgelines, to provide access for log haul. No temporary, short-term, or long-term direct/indirect effects increasing the occurrence of landslides from maintaining, constructing, or decommissioning NFS or temporary roads are expected.

Table 3-144. Summary of proposed activities on "moderate" and "high" landslide prone lands

Action	Alternative					
	A	B	C	D	E	F
Vegetation Management (acres)						
Commercial Harvest–Tractor Yarding	—	43	43	43	31	42
Commercial Harvest–Helicopter Yarding	—	0	0	0	12	1
Noncommercial Thinning[a]	—	65	65	65	65	65
Natural Fuels Fire Treatments[b]	—	62	62	62	62	62
Travel Routes (miles)						
National Forest System (NFS) and Unauthorized Roads—Existing	1.1	0.7	0.7	0.7	0.7	0.7
NFS Roads–Construction/realignment	—	<0.1	<0.1	<0.1	<0.1	<0.1
NFS Roads–Decommission	—	0.3	0.3	0.3	0.3	0.3
Unauthorized Roads–Decommission	—	—	—	—	—	—

[a]These areas of noncommercial thinning apply to treatments with no product removal.
[b]These acres consist of areas not having other mechanical treatments.

Cumulative Effects

The area used to assess the cumulative effects on slope stability consists of the 19,371-acre project area. No large-scale, management-induced landslides have been identified within the project area. Known management-induced sites are limited to small hillslope failures of cut-

and-fill slopes associated with road prisms. No additional foreseeable future activities should occur within the project area other than those areas assessed for direct and indirect effects that may influence the occurrence of landslides.

Alternative A

Considering that no large-scale activities are proposed for the future, the existing conditions and direct and indirect effects of Alternative A represent the cumulative effects. Cumulative effects for slope stability would be limited to the susceptibility of failures from existing road-related landslides. Given the project area's disturbance history, the effects of current activities are not expected to change measurably, and because no future land management activities are planned for the project area, there would be no additional or incremental cumulative effects under Alternative A beyond the previously described direct and indirect effects.

All Action Alternatives

The analysis to identify areas with slope stability concerns, combined with implementing Design Feature FH-26 (field verification), provides the rationale for consistency with Forest Plan Standard SWST12 for all action alternatives.

Given the vegetation treatment prescriptions (e.g., selectivity of tree sizes to be removed and overall low intensity of proposed timber harvest activities) and absence of landslide indicators within the project area from more intensive vegetation management since the 1960s, the probability for proposed activities (where they overlap with present/ongoing activities) to increase slope instability is low. Furthermore, with the low potential for direct/indirect effects resulting from the proposed activities, no incremental or cumulative effects are anticipated.

Proposed road maintenance and decommissioning activities would reduce the potential for road failures at many locations, thus having a long-term beneficial cumulative effect on slope stability.

3.11 BOTANICAL RESOURCES

3.11.1 Analysis Scale, Data Sources, and Methodology

The following changes were made between the Draft EIS and FEIS:

All maps in this section were revised to include the updated Plant Consideration Areas (PCAs) based on field verification of occupied *Lewisia sacajaweana* (Sacajawea's bitterroot) habitat.

3.11.1.1 Analysis Scale

Direct, indirect, and cumulative effects were tracked spatially at the project-area level, with the addition of known occupied rare plant and whitebark pine habitat adjacent to the project area. This scale was chosen because this area will likely face potential impacts from proposed management activities for this resource. Temporary (0–3 years), short-term (3–15 years), and long-term (15+ years) timeframes were used to depict effects to the indicators.

3.11.1.2 Data Sources

Habitat suitability for rare plant species was analyzed using currently available information, including analysis from the botanical specialist report and biological evaluation for the project (project record); PVG) and habitat type classification (Steele 1981, Mehl et al. 1998); knowledge of rare species habitat suitability (USDA Forest Service 2000); Natural Heritage Program databases for adjacent states (Oregon Biodiversity Information Center 2014, WNHP 2014); and the Idaho Fish and Wildlife Information System field data collection, database, and status records of local rare plant populations (IDFG 2014b, 2015).

3.11.1.3 Methodology

Botanical surveys were conducted (K. Beall, IDT Botanist) for the project area in conjunction with the originally proposed project (botanical field surveys in 2006; Sacajawea's bitterroot focus surveys in 2008; and seed collection in 2008 , all available in the project record), as well as a project analysis (available in the project record). Additional field surveys of botanical resources and noxious weeds were conducted in 2014 and 2015 (project record). Additionally, portions of the project area had been previously visited for other purposes, and numerous visits were made in summer 2007 to collect native seed. Due to the large size of the project area, however, the entire acreage was not surveyed.

To more effectively identify habitat with a high potential to support Sacajawea's bitterroot, a model based on known information about this bitterroot population within the project area and surrounding local populations was created (Forest GIS; USDA Forest Service 2015e,f,g,h). Biological and physical characteristics at each site or area of interest were determined and then used to generate parameters for what was considered habitat with high potential for occupancy by Sacajawea's bitterroot. These traits included elevation, land type, slope, tree size class, canopy cover, and dominant vegetation type. The model was run with different variables and the results compared with what had been identified visually as potential habitat from aerial photographs based on past field experience with the species.

3.11.2 Analysis Indicators

The following are indicators of concern for botanical resources:

- Absence/presence of rare plants
- Absence/presence of rare plant suitable habitat
- Effect of activities on rare plants and habitat
- Integrity of native plant habitat

The ways in which these resources would be affected by proposed activities informs the issues used to compare alternatives.

3.11.3 Affected Environment

Only rare plants currently existing within or adjacent to the project area or having potential habitat in the area will be discussed here (Table 3-145). No effects or impacts to other rare plants that the Forest considers in NEPA analysis are anticipated, due to lack of suitable habitat within the project area. See the botanical technical report (project record) for a list and habitat descriptions of plant species tracked by the Forest.

3.11.3.1 Rare Plant Habitat

The project elevation ranges from about 5,040 feet to about 8,120 feet. Area soils are dominated by granitic-derived parent materials. The project area encompasses a large space and a diversity of vegetation types. Over 80% of the project area comprises the following upland forested types: PVG 1 (Dry Ponderosa Pine, Xeric Douglas-fir), PVG 2 (Warm, Dry Douglas-fir/Moist Ponderosa Pine), PVG 3 (Cool, Moist Douglas-fir) and PVG 4 (Cool, Dry Douglas-fir). PVG 7 (Warm, Dry Subalpine Fir) and PVG 10 (Persistent Lodgepole) (Forest GIS layers) are minor vegetation types in the project area, and PVG 11 (High Elevation Subalpine Fir) represents less than 1% of the project area.

Land classified as nonforested (including sagebrush, grasslands, aspen, mountain shrubs, and meadows) comprises most of the remainder (11%) of the project area, along with a fraction (less than 1%) categorized as barren rock. Riparian vegetation in the project area can be primarily categorized as riverine riparian or shrub riparian, with riverine riparian most common in areas of proposed activity.

Table 3-145. Rare plant species in the Becker Integrated Resource Project area

Rare Plant Species	Habitat Description	Documented Location in Crooked River 5th Field Hydrologic Unit Code?	Potential Habitat in/near Project Area?
Candidate			
Pinus albicaulis Whitebark pine	Upper subalpine plant communities at cold and windy high-elevation or high-latitude sites in western North America. Occurs at 7,300–10,500 feet in Idaho.	Yes[a]	Yes[a]
Sensitive			
Bryum calobryoides Bryum moss	Low-gradient wetlands, moist soil, or rocks at montane-to-subalpine elevations (5,000+ feet). Meadows to moist cliff sides.	No	Yes[b]
Douglasia idahoensis Idaho dwarf primrose/Idaho douglasia	North and east-facing slopes on open, subalpine ridges in whitebark pine and subalpine fir forests (7,200–9,000 feet).	Yes[a] Extreme NE corner Crooked River 5th HUC	Yes[b]
Lewisia sacajaweana Sacajawea's bitterroot	Relatively sparse upper slopes and ridgetops; may have overstory. Fractured bedrock, granitic soils near late snowbanks (5,400–9,500 feet).	Yes[a] + Multiple populations in surrounding 5th HUCs	Yes[a] Occupied habitat around Pilot Peak
Phacelia minutissima Small phacelia	Sagebrush and aspen stands with late snowbanks or seeps. Dense false hellebore patches, downslope from aspen, open understory (5,000–8,200 feet).	No	Yes[b]
Boise Forest Watch			
Allium validum[c] Pacific onion/Tall swamp onion	Mid-to-high elevation riparian areas, forested seeps, margins of streams in subalpine fir habitat, boggy subalpine lake edges (5,500–8,100 feet).	Yes[a]	Yes[b]
Botrychium crenulatum Scalloped moonwort	Moist meadows, creek banks, shrub or tree-dominated wetlands, springy spots, and wet roadside areas (3,900–8,200 feet).	Yes[a] Harris Creek Summit area	Yes[b]
B. simplex Little grapefern	Wide variety of habitats, including meadows and forested types (4,000–6,600+ feet).	No	Yes[b]
Carex straminiformis Mt. Shasta sedge	Open, rocky, gravelly slopes, often near persistent snowbanks, near or above timberline (6,500–12,000+ feet).	No	Yes[b]
Polystichum kruckebergii Kruckeberg's hollyfern	Rocks and cliffs in subalpine-to-alpine habitats (1,500–3,200 ft)—B.C., CA, ID, MT, NV, OR, UT, WA.	No	Yes[b]
Sanicula graveolens Sierra sanicle	Open or lightly wooded slopes or flats. Found on both granitics and basalts (2,000–6,500 feet).	No	Yes[b]
Sedum leibergii Leiberg stonecrop	Cliffs and rocky slopes with west–northwest aspect, often found with Douglas-fir (5,000–9,000 feet).	No	Yes[b]
Triantha occidentalis ssp. *brevistyla* Sticky tofieldia	Wet meadows, stream banks, peatlands, and marshes (sea level to 7,900 feet)—Alta., B.C., AK, ID, OR, WA.	No	Yes[b]

[a]Documented sites are found in the project area or nearby in the analysis area (5th HUC).
[b]No documented sites are known from inside the project area, but potential habitat/or undocumented populations may occur in the project area.
[c]*Allium validum* is no longer on the Forest Watch list.

3.11.3.2 Rare Plant Species

Idaho Pepperweed

The USFWS maintains the list of Threatened, Endangered, Proposed, and Candidate species and posts updates of the species in Idaho to be included in Section 7 Consultation (ESA) on their web site (USDI FWS 2015). The current list includes the Idaho pepperweed, (*Lepidium papilliferum*) (Proposed Endangered); however, no known populations of this plant exist on the Forest, and the project area is outside the area of Proposed Critical Habitat for the species (USDI FWS 2011a,b; USDI FWS 2014a,b) and no suitable habitat exists at the proposed project site. Listing status and designation of critical habitat for this species is in transition—the USFWS has issued notices (USDI FWS 2014a,b) to designate the species as Threatened and to revise the area considered for critical habitat designation. These changes would have no effect on the habitat and impact analysis for this plant and the actions proposed here. No further discussion of this species is included in this document.

Whitebark Pine

Whitebark pine (*Pinus albicaulis*) is included on the list as a Candidate species for Boise County. Whitebark pine has been documented in the project area, and additional undocumented occurrences may be present. As a Candidate for listing, whitebark pine is now classified as a Sensitive species within the Forest Service Intermountain Region (R4) (USDA Forest Service 2014e).

Whitebark pine occurs in subalpine and timberline zones from British Columbia and Alberta south to central Idaho, southwestern Wyoming, and southern California. This slow-growing, long-lived, 5-needled pine of the subgenus *Strobus* is the only stone pine native to North America. Its elevation range in Idaho is generally 7,300–10,500 feet (USDI FWS 2011c). Whitebark pine also may appear incidentally at lower elevations; such occurrences have been documented in the project area.

The tree may occur in monotypic stands (especially at high elevations) or in mixed stands with other conifers (such as limber pine, subalpine fir, and/or Rocky Mountain lodgepole pine) and can act as climax, early successional, or seral co-dominant within a community. The understory is typically sparsely vegetated, dominated by elk/Ross's sedge or cushion plants at the upper extent of its elevation, and grouse whortleberry, common juniper, pink mountain heath, Oregon boxwood, Idaho fescue, and/or smooth woodrush at lower elevation occurrences (Fryer 2002).

The full-cone–bearing capability of whitebark pine is not typically reached until the tree is 60 years old (lifespan may be up to 500 years). The cones are not serotinous, and the large seeds are typically cached and dispersed by Clark's nutcrackers. Whitebark pine tolerates poor soils, steep slopes, and windy exposures, and it grows from the tree line down to the subalpine zone in relatively dry-to-moist environments.

Whitebark pine is considered a keystone, or foundation, species in North America and, therefore, a critical part of a properly functioning ecosystem. This tree is experiencing a range-wide decline resulting from high mortality and low recruitment due to a number of factors, including white pine blister rust, MPB, catastrophic fires, ecosystem changes related

to a history of fire exclusion (including succession-related encroachment by other conifers), and effects of climate change (USDI FWS 2011c).

Mapped occupied high-elevation whitebark pine habitat includes approximately 128 acres within the southwest corner of the project area, on lands characterized as PVGs 1, 4, 7, 10, 11, and 99 (nonforested; Figure 3-106) (see the botanical technical report for details about PVGs of whitebark pine habitat). Fire regimes for these types range from nonlethal to lethal. This acreage is part of a larger area of occupied habitat extending beyond project area boundaries. Contiguous with the mapped whitebark pine is additional acreage (approximately 286 acres) within the project area having a high likelihood of supporting whitebark pine (above 7,000 feet in appropriate vegetation types; the IDT Silviculturist reports observing additional whitebark pine along the ridge north of the mapped population [S. Wagner, pers. comm.]). Modeling done for Sacajawea's bitterroot (see discussion below) in the project area is being used as a surrogate for whitebark pine habitat, as the species are frequently known to co-occur.

The greatest concentration of whitebark pine in the project area is near Pilot Peak (Figure 3-107). One recorded stand (0035040517) occurs within the project area in subalpine fir habitat type, at an elevation much lower (around 5,400 feet) than is considered typical for the Forest and also lower in elevation from other whitebark pine occupied habitat in the project area. (These trees were not re-located in a follow-up survey conducted May 20, 2015, by the IDT Silviculturist and Botanist.) Whitebark pine is occasionally observed on the Forest, singly or in clumps, in mixed stands of conifers at a lower elevation than expected (K. Beall, pers. obs.); but this is a low-frequency occurrence, as whitebark pine in these locations comprises a very minor part of the surrounding vegetative community.

The role these "disjunct" individuals or small groups play in the larger ecological scheme of the species is unknown; nonetheless, protecting trees that may add to the diversity and resiliency of whitebark pine is important.

Activities with the potential to impact whitebark pine populations or potential habitat include timber harvest and removal; thinning; road and trail construction, reconstruction, and maintenance; fuels treatments, including prescribed burning and slash disposal; and invasive plant treatments. The effects of these activities on whitebark pine populations and their potential habitats are the basis of comparisons between alternatives.

Whitebark pine and additional habitat are present at upper elevations in the project area. The boundary of the known occupied habitat is less than 0.1 mile from the proposed use of direct and indirect underburn fuels treatments, which suggests that occupied and potential habitat may be affected by proposed activities. The documented individual whitebark pines in a lower-elevation stand in the project area may also be impacted by vegetation management and fuels treatment activities.

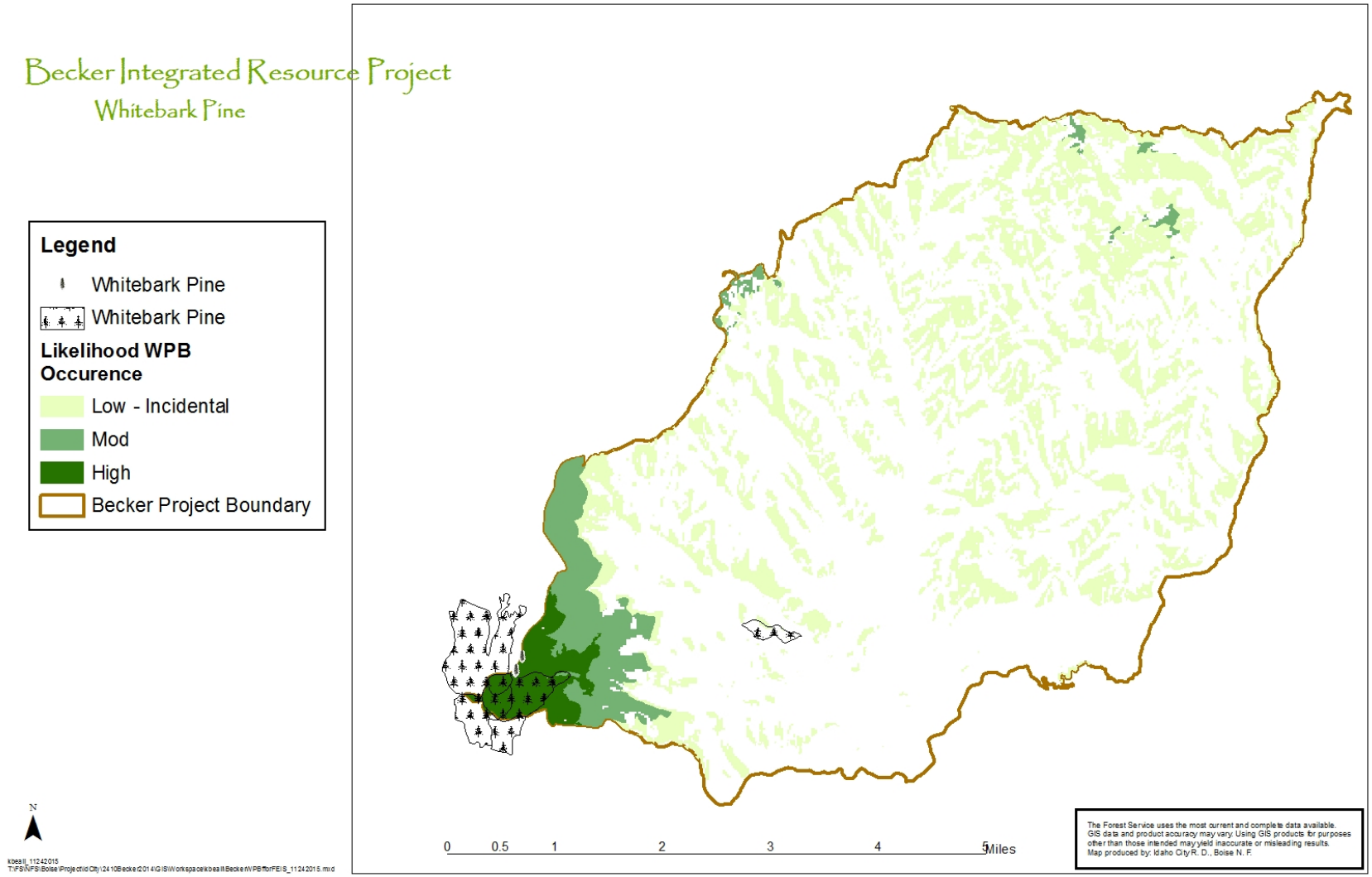

Figure 3-106. Occupied and suitable habitat for whitebark pine in the Becker Integrated Resource Project area

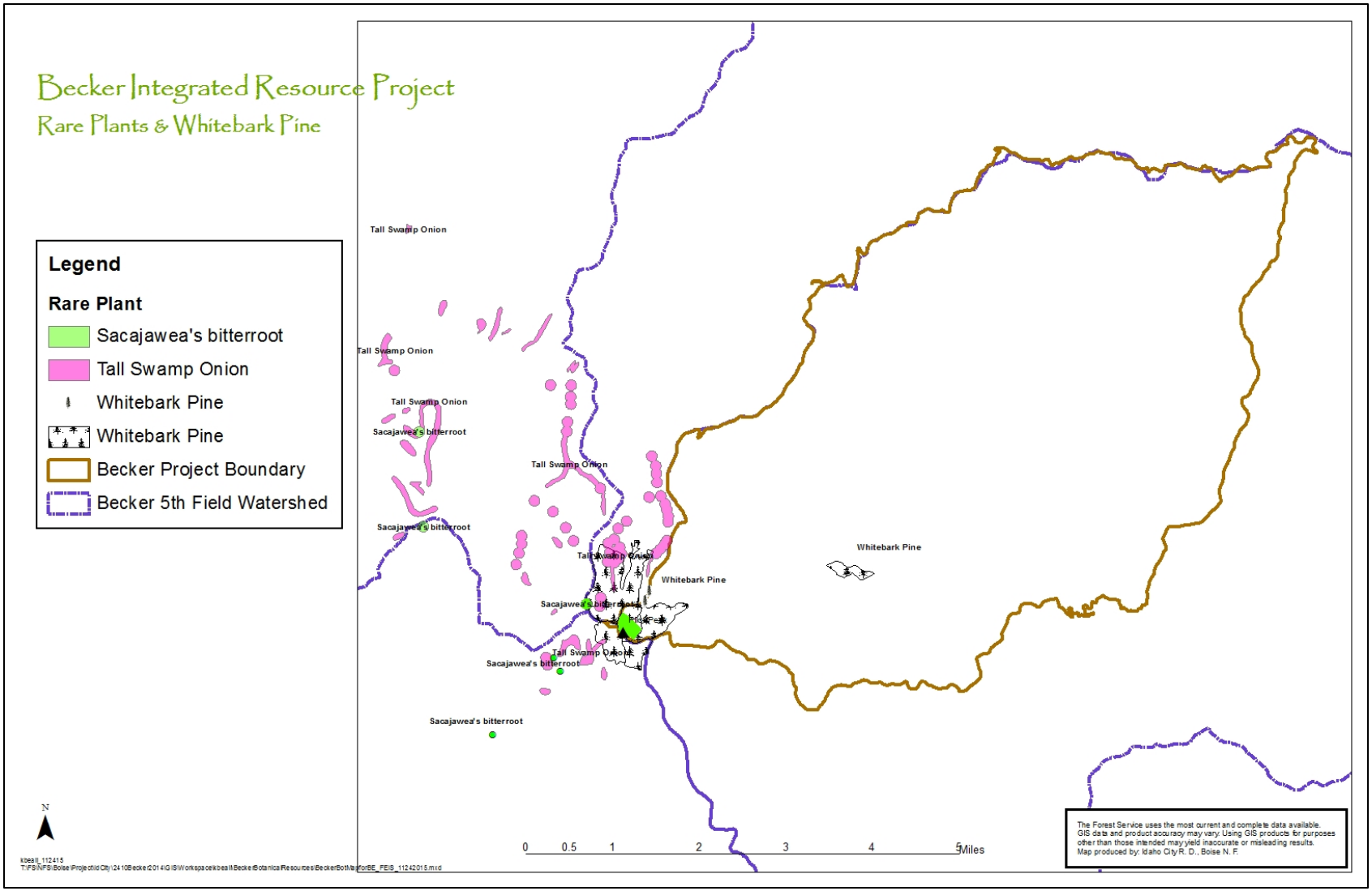

Figure 3-107. Known occupied rare plant and whitebark pine populations in and near the Becker Integrated Resource Project area (data from Forest GIS layers)

Bryum Moss

Bryum moss (*Bryum calobryoides*) (classified as a Sensitive species) is associated with a variety of low-gradient wetland types occurring at 5,000 feet and above. Suitable habitat consists of moist soil or rocks in the montane-to-subalpine elevation zones, often in meadows. Soil types vary from basic to acidic rock, to moist soils (Spence 1986).

The only documented site on the Forest is at Chattanooga Hot Springs near Atlanta (IDFG 2015). The original collection was documented in 1941, and the population has not been re-located since that time. Suitable habitat for Bryum moss may be present within the RCAs of the project area and on riparian stream banks, meadows, moist rocky areas, seeps, or springs and may be affected by proposed culvert replacements and transportation-related activities.

Idaho Dwarf Primrose

Idaho dwarf primrose/Idaho douglasia (*Douglasia idahoensis*) (classified as a Sensitive species) is a pink-flowered, mat-forming perennial endemic to central and north Idaho. It typically grows on north and east-facing slopes on open subalpine ridges in whitebark pine and subalpine fir forests at elevations between 7,200 and 9,000 feet. Its known associates are the same as those for Sacajawea's bitterroot (see below) (USDA Forest Service 2000).

An Idaho dwarf primrose population occupies the extreme northeast corner of the Crooked River 5th HUC, on the ridgeline in the Wolf Mountain vicinity (BNF GIS layer). Limited potential for this species also could occur at the uppermost elevations in the southwest corner of the project area.

No known occupied Idaho dwarf primrose habitat exists in the project area. Approximately 360 acres within project area boundaries exceed 7,200 feet elevation. Rocky, north-facing ridges in this area may provide suitable habitat. Overlap may occur between some of the proposed activities (fuels treatments) and this suitable habitat, but most activities would not overlap this high-elevation portion of the project area.

Sacajawea's Bitterroot

Sacajawea's bitterroot (*Lewisia sacajaweana*) was recently formally recognized as a new species (Wilson et al. 2005) and is now considered to be a "Globally Rare" rather than a "State Rare" taxon. Due to its limited range and rarity, it now carries a rank of G1, S1 (NatureServe 2015).

This small, perennial, fleshy-leaved rosette is typically found on sparsely vegetated, gravelly openings in decomposed granite, commonly near late snow banks, upper slopes, and ridgetops. Sacajawea's bitterroot is endemic to the mountains of central Idaho. It is mapped between 5,560 and 9,200 feet elevation, although most populations are known to occur at 6,000 feet or higher. It is typically found on open balds or under an open overstory of several different conifer species (e.g., ponderosa pine, Douglas-fir, subalpine fir, lodgepole pine, and whitebark pine). The plant is often found with a specific, yet diverse, group of high-elevation forbs (USDA Forest Service 2000).

A documented population of Sacajawea's bitterroot exists in the southwest portion of the project area around Pilot Peak (Figure 3-107). Geographically, the plant extends south and

west to the vicinity of Wilson, Freeman, and Sunset peaks. Undiscovered individuals within the project area may exist on open or sparsely canopied, gravelly ridgetops and slopes at upper elevations.

Using a combination of information from the model (see data sources above) and field experience, high-quality potential habitat for Sacajawea's bitterroot would be described as follows:

- Upper-to-high elevation (the lowest elevations across known range are in the upper 5,000-foot elevations, but the majority of populations are above 6,000 feet, ranging to above 9,000 feet)
- Mountain sagebrush, lodgepole pine, subalpine fir, whitebark pine, or Douglas-fir/ponderosa pine are the dominant vegetation types or species present; dominant vegetation type varies with elevation/aspect and influences the extent of canopy cover under which the plants may occur (Douglas-fir/ponderosa pine sites personally observed are extremely xeric; K. Beall, Becker IDT Botanist)
- Open to low-medium canopy cover of shrubs or conifers (including land classified as sparsely vegetated or nonforested)
- Tree size ranging from none (no trees) to medium tree size class (up to 19.9 inches dbh)
- Course, gravelly soils or shallow duff layer overlying granitic/batholitic parent material
- Certain understory herbaceous species repeatedly present in or around Sacajawea's bitterroot habitat (Element Occurrence Records for *L. sacajaweana*, linked to GIS layers from the Natural Heritage Program database [BNF GIS])

The selected habitat model shows the portion of the project area considered to have a high potential for occupancy by Sacajawea's bitterroot (Figure 3-108). Habitat identified by this means would be field verified and searched for additional occupancy (field verification began in July 2015; additionally located Sacajawea's bitterroot are displayed on Figure 3-108). Based on field experience and aerial photography, 2 stands appearing suitable for Sacajawea's bitterroot, contiguous with other areas identified by the model as having a high potential of occupancy, were added to that modeled habitat for a field check.

Because whitebark pine is often a co-inhabitant, verification for that species would be conducted concurrently.

Overlap may occur between some of the proposed activities (natural fuels treatments) and occupied/suitable habitat near Pilot Peak.

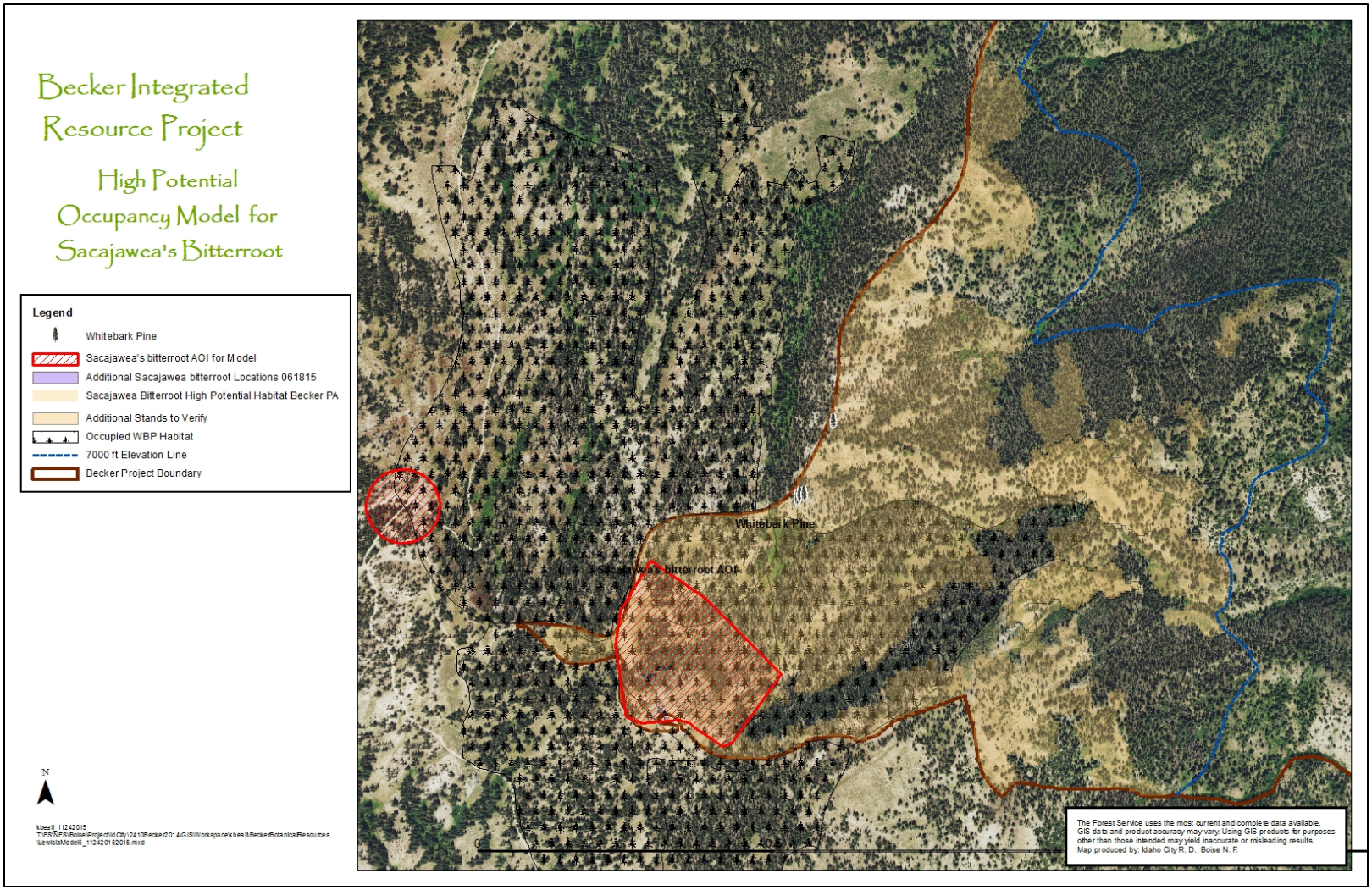

Figure 3-108. Area of occupied habitat/modeled habitat with a high potential for occupancy by Sacajawea's bitterroot and whitebark pine in the Becker project area

Small Phacelia

Small phacelia (*Phacelia minutissima*) is a tiny lavender-flowered annual that grows in upper elevations (5,000 to 8,200 feet) on ephemerally moist drainages in sagebrush–steppe or lower montane ponderosa pine or Douglas fir forests. It is often found near areas of late snowbanks, typically occurring in meadows, springs, and seeps. Idaho populations occur mostly in stands of false hellebore (*Veratrum californicum*) and adjacent forbs/grasses or near mixed aspen, willow, and subalpine fir communities (Atwood 1997).

No known locations of this plant occur on the Forest (IDFG 2015). The 2 documented sites north of the Snake River (Soldier Mountains, Sawtooth National Forest; Hash Spring, Shoshone Bureau of Land Management) are historic; surveys conducted in the 1990s failed to re-locate the sites. Multiple occurrences are known from the Owyhee Mountains.

Moist patches of aspen in the project area provide suitable habitat for this plant. Some overlap is anticipated between aspen stands and a variety of the proposed activities.

Pacific Onion

Pacific onion/tall swamp onion (*Allium validum*) has been removed from the official Forest Watch list because it is more common than the new guidelines for the list dictate (rarity level of G2_S2 or above; USDA Forest Service 2015b). However, the type of upper-elevation riparian/wet meadow habitat that this species occupies is not common on the Forest, and it is particularly sensitive to disturbance. Finally, this species is still tracked by the IDFG (IDFG 2014b).

Tall swamp onion is found in mid-to-high elevation riparian areas, wet meadows, forested seeps, and along stream margins in subalpine fir habitat and boggy subalpine lake edges. When in bloom in July and August, it is easily recognizable by its bright pink flowers and flat, succulent blue-green leaves. This plant is found at elevations between 5,500 and 8,100 feet (USDA Forest Service 2000).

Over 80% of the project area lies above 5,500 feet elevation, but generally, the vegetation types in most of the project area are too dry to support this species. Suitable habitat would occur at the upper elevations in seeps, moist stream banks, or meadows. This plant would not occur in the dry, upland vegetation types.

Occupied Pacific onion habitat exists in the upper reaches of Rock Creek (Lowman 5th HUC), Grimes Creek (Upper Grimes 5th HUC), and Mores Creek (Upper Mores 5th HUC), on the west and southwest sides of the project area just outside the project area boundary (Figure 3-107). No known occupied habitat exists within the project area boundary, but additional suitable habitat may exist in upper-elevation riparian areas and seeps.

Scalloped Moonwort and Little Grapefern

Scalloped moonwort (*Botrychium crenulatum*) and little grapefern (*B. simplex*) are very small perennial ferns typically occurring in moist grass/forb meadows, open woodlands and montane forests, or near streams, springs, seeps, or other wet areas. Moonworts occur over a wide elevational range (from sea level to over 10,000 feet) and members of this genus range widely in rarity (NatureServe 2014). Common associates may be strawberry, pussytoes,

bedstraw, snowberry, huckleberry, fescue, and a variety of conifer species and aspens (USDI FWS 2001).

Because of their diminutive size and the irregular appearance of aboveground fronds, scalloped moonwort and little grapefern are difficult to survey, and populations can often go undetected. Plants may remain dormant underground for as long as 5 years, receiving nutrients through obligate association with endomycorrizal fungi (USDI FWS 2001). *Botrychium* species are notorious for being difficult to distinguish and to further confuse matters, they often appear in "genus clusters," where a number of species grow in the same area.

During recent years, several populations of *Botrychium* species that included little grapefern and scalloped moonwort were discovered in a variety of habitats across the Forest. Three populations of little grapefern are known to occur on the Forest (IDFG 2015). The closest to the project area is in the Banner Creek Fen/Bull Trout Lake area (Lowman Ranger District) and grows on the wetland margin of a Buxbaum's/water sedge community in the gaps of the lodgepole pine/shrubby cinquefoil upland community. A second population occurs at Tranquil Basin (Lowman Ranger District) in openings of mesic forbs/graminoids growing transitionally between willow/tufted hairgrass and bluejoint reedgrass communities and a drier meadow. Little grapefern has also been identified at 2 locations (may be considered subpopulations) in the Johnson Creek Road corridor (Cascade Ranger District), where it occupies grassy swales surrounded by lodgepole dominated uplands, characterized as PVG 7 and PVG 10.

Currently, 3 documented populations of scalloped moonwort occur on the Forest (IDFG 2015). The closest (about 17 miles) to the project area is in the Harris Watershed, located along a small, unnamed stream near Harris Creek Summit in an understory of willows and other riparian shrubs.

Almost equidistant is a population located about one-third of a mile upstream from the Roaring River RNA boundary. This population was identified in a Drummond's willow/red-osier dogwood riparian shrubland during classification work conducted by IDFG (2014a). The Roaring River corridor in this area generally burned at low severity during the 2012 Trinity Ridge Fire; however, it is uncertain as to whether the scalloped moonwort site was burned. Fire can enhance moonwort habitat by creating new openings in forested areas, rejuvenating decadent woody riparian material, and stimulating aspen.

A third scalloped moonwort population is known from the Bear Creek RNA (Lowman Ranger District) and grows on a moist, lower terrace along the stream channel (with possible frequent flooding) under a dense shrub canopy of alderleaf buckthorn (*Rhamnus alnifolia*), with an understory of gooseberry and sedges.

To date, no *Botrychium* species have been identified within the project area, but suitable moonwort habitat exists in drainages, wet areas, meadows, aspen stands, or moist swales in upland habitat, especially in upper elevations. Moonworts are not likely found outside RCAs in the driest, low-elevation habitat types. Due to the difficulty in locating these plants, the lack of consistency in aboveground vegetative displays, and because not all suitable habitats in the project area have been surveyed, it cannot be assumed that the plants do not occur within the project area.

Although there is a lower likelihood of moonwort occupation at lower elevations, a chance of overlap with proposed activities still exists. Activities could overlap undocumented moonwort populations at mid-to-upper elevations.

Mt. Shasta Sedge

Mt. Shasta sedge (*Carex straminiformis*) is found on open, rocky, gravelly slopes, often close to persistent snowbanks at or near timberline. Its elevation range is from 6,500 to 12,000 feet (USDA Forest Service 2000).

The closest (to the project area) documented occurrence of this plant is located in the upper end of the Wapiti Creek (Lowman Ranger District) drainage, near the boundary with the Sawtooth National Forest (IDFG 2015). The immediate terrain at the site is open and rocky, with low-growing herbaceous vegetation. The surrounding habitat is a subalpine fir type, with scattered lodgepole pine and whitebark pine, and an elk sedge/forb understory.

No known occupied habitat exists in the project area, but suitable habitat for Mt. Shasta sedge populations exists at upper elevations (above 6,500 feet) of the project area near Pilot Peak on the southwest side, the project boundary/watershed divide in the northwest, and the divide between Little Beaver and Sawmill creeks.

Kruckeberg's Hollyfern

Kruckeberg's hollyfern (*Polystichum kruckebergii*) occupies rocks and cliffs in subalpine-to-alpine habitats from about 4,900 feet to over 10,000 feet. Its range stretches from British Columbia across the Pacific Northwest and Sierras to the Northern Rockies. Populations sometimes consist of only 2 or 3 dwarfed plants that are difficult to distinguish from other species of swordfern (e.g., mountain hollyfern [*P. scopulinum*]), with which they may co-occur.

The IDFG Natural Heritage database (IDFG 2015) documents 6 recorded populations of Kruckeberg's hollyfern. With respect to the project area, the closest known population is a historic site on the Sawtooth National Forest in the McGown Peak area. The White Rock Peak population of Kruckeberg's hollyfern is about 1.0 mile from the Forest boundary north of Warm Lake on the Payette National Forest. Additional populations are documented in the Seven Devils in the Hells Canyon National Recreation Area, on Cabin Creek Peak on the Sawtooth National Forest, and near the North Fork Owyhee River to the south, completing a semi-circle of sites around the Forest. This configuration increases the odds of this fern occupying undocumented sites in suitable habitat on the Forest. All current locations except the Owyhee population (4,890 feet) occur at elevations above 6,300 feet. Habitat descriptions range from rhyolite cliffs to granite rock crevices, ridges, and talus.

No known occupied habitat exists in the project area for Kruckeberg's hollyfern, but suitable habitat and the potential for undocumented populations may exist in open, rocky areas and cliffs above 6,000 feet.

Sierra Sanicle

Sierra sanicle (*Sanicula graveolens*) occurs on both granitic and basalt soils between 2,000 and 7,800 feet elevation. Known Idaho occurrences (Payette National Forest) (IDFG 2015) are on dry, south-facing openings of decomposed granite above 6,100 feet (USDA Forest

Service 2000). The closest known population, relative to the project area, is to the north on the Payette National Forest.

No known occupied habitat exists for Sierra sanicle in the project area; however, suitable habitat and the potential for undocumented populations may exist in open, rocky habitats above 6,000 feet.

Leiberg Stonecrop

Leiberg stonecrop (*Sedum leibergii*) is a robust stonecrop with a large basal rosette of rounded leaves. It grows on cliffs and rocky slopes, with west and northwest exposures, on a variety of rock materials. It is commonly associated with Douglas-fir and known populations occur in the elevation range from 5,000 to over 9,000 feet (USDA Forest Service 2000). No Leiberg stonecrop populations are known on the Forest, but known populations do exist on the Payette National Forest (IDFG 2015).

No known occupied habitat exists in the project area for Leiberg stonecrop; however, suitable habitat and the potential for undocumented populations exists in open, rocky habitats above 5,000 feet.

Sticky Tofieldia

Sticky tofieldia (*Triantha occidentalis* ssp. *brevistyla*) is a robust member of the lily family found in the northwestern United States, Canada, and Alaska. Flowers are small, greenish-white with numerous long basal leaves and strongly glandular-hairy stems. It occurs in wet meadows, stream banks, marshes, and peatlands from sea level to over 7,000 feet (IDFG 2009, FNA 2012, USDA NRCS 2013).

No known occupied habitat exists in the project area for sticky tofieldia (IDFG 2015); but wet meadows and RCAs at upper elevations may provide suitable habitat. This plant would not be found in the dry, upland vegetation types.

3.11.4 Environmental Effects

The actions proposed in this project vary in their potential impacts to rare plant populations and suitable rare plant habitat. The varying impacts from all of the proposed activities are detailed in the botanical technical report (available in the project record). The botanical technical report also contains best-estimate rankings based on type of habitat that the plants occupy (PVG, elevation, RCA/upland), proximity of known populations, habitat availability with locations of the proposed activities, and the predicted severity of potential impacts. Table 3-146 displays a summary of the effects of each alternative upon each botanical indicator.

Table 3-146. Determinations/risk ranking for rare plant species and potential habitat within the Becker Integrated Resource Project area, for all alternatives

Plant Species Population/Habitat	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F
Candidate	**Effect or Impact**					
Whitebark pine	None	MII	MII	MII	MII	MII
Sensitive	**Impact**					
Bryum moss	None	MII	MII	MII	MII	MII
Idaho dwarf primrose	None	MII	MII	MII	MII	MII
Sacajawea's bitterroot	None	MII	MII	MII	MII	MII
Small phacelia	None	MII	MII	MII	MII	MII
Forest Watch	**Risk to Population Viability/Habitat**					
Pacific onion[a]	None	None	None	None	None	None
Scalloped moonwort	None	Low	Low	Low	Low	Low
Little grapefern	None	Low	Low	Low	Low	Low
Mt. Shasta sedge	None	Very low	Very low	Very low	Very low	Very low
Kruckeberg's hollyfern	None	Very low	Very low	Very low	Very low	Very low
Leiberg stonecrop	None	Low	Low	Low	Low	Low
Sierra sanicle	None	Low	Low	Low	Low	Low
Sticky tofieldia	None	Very low	Very low	Very low	Very low	Very low
Alternative Risk	None	Low	Low	Highest	Lowest	Lower

Note: Highest, Low, Lower, Lowest are relative rankings used to compare what may be subtle differences between alternatives based on risk of disturbance to occupied or potential habitat for rare plants or whitebark pine.

Note For Federal Candidate species, determination language is the same as for FS Sensitive species: NI = No impact to any populations, species or habitat. MII = May impact individuals, but will not likely contribute to a trend toward Federal listing or loss of viability to the populations or species. BI = Beneficial impact to the species or habitat.

[a]Pacific onion (*Allium validum*) is no longer on the Boise Forest Watch List but is still tracked by the Idaho Department of Fish and Game (IDFG 2014b).

3.11.4.1 Direct and Indirect Effects

Alternative A—No Action

Under Alternative A (No Action), none of the activities described in the Proposed Action (Alternative B) or other alternatives would be implemented, and the area would continue under current management.

Whitebark Pine

Occupied and potential habitat for high-elevation species such as whitebark pine within the project area would remain relatively static under Alternative A and ongoing Forest management activities in the short to long term.

Currently, upper-level forested stands known to (or that may support) whitebark pine vary in their departure from Forest Plan desired conditions. Wildfires in stands that have departed from desired conditions may exhibit behavior outside the normal range of variability. Wildfire effects to whitebark pine would be tied to the degree of departure from the normal range of variability, vegetation type (PVG), and fire regime. Approximately one-third of the known occupied habitat is classified as a lethal fire regime (PVG 10, Persistent Lodgepole),

where a stand-replacing fire is predicted to naturally occur every 100 to 400 years (USDA Forest Service 2010a, Appendix A). No fires in the project area's occupied whitebark pine habitat appear in records dating to the early 1900s (BNF GIS layer). Should a fire occur in occupied habitat within intact lodgepole pine stands, whitebark pine mortality is expected.

Climate change also has the potential to affect habitat suitability for whitebark pine. Altered climate regimes affecting local environmental factors and biological function may improve or worsen conditions for the species, expanding or shrinking its range relative to its resiliency to change. Disjunct individuals occurring at lower, hotter elevations may be severely impacted.

Bryum Moss, Pacific Onion, and Sticky Tofieldia

Plants in this group occur in a variety of hydrologic conditions (wet to moist), but most typically grow in relatively open conditions or at the fringe of forested areas. Under Alternative A, activities proposed in the project area would not occur; however, any of these activities could be proposed and implemented individually through separate NEPA analysis.

Under Alternative A, proposed vegetation treatments would not occur in RCAs. The effects of thinning or timber removal for riparian species would have been largely indirect (reduction of wildfire risk; possible alteration of shade, air current, and water movement into the riparian zone or adjacent wetlands), but those changes would not occur. Pile burning in vulnerable places, such as RCAs, would not occur, eliminating the risk of localized ground sterilization. If more intense wildfire activity occurs in areas where thinning treatments would normally take place to reduce fuel loads, the effect of fire in the adjacent RCAs may be more severe. Under natural conditions, wildfire would typically create gaps in the RCA vegetation, setting back succession in those areas and maintaining more diverse plant communities (Arkle and Pilliod 2010). Without fire (as in the No Action Alternative), riparian communities eventually become less diverse. When a wildfire does ignite, the intensity and severity in the RCA is likely greater if the typical fire interval has long been surpassed.

Under Alternative A, road/trail construction, rerouting, or deconstruction activities would not occur. Traditional road maintenance would still be carried out, which would continue to disturb the habitat developing in roadside seeps and ditches.

Under Alternative A, no new trails or trailheads would be constructed and no roads would undergo designation changes for recreational purposes. Where trails and trailheads may have affected riparian plant species, these changes would not occur. The amount of suitable rare plant habitat at these locations would remain relatively static in the short term or, in some cases, could deteriorate if unauthorized use or trail conditions contribute negatively to riparian conditions.

Without culvert removals proposed in the action alternatives, the amount of suitable habitat for wetland species the amount of habitat would likely remain static.

Scalloped Moonwort and Little Grapefern

Effects to scalloped moonwort and little grapefern habitat in moist areas would be the same as disclosed above for Pacific onion, Bryum moss, and sticky tofieldia. In addition to riparian

areas and moist/wet grass/forb meadows, moonwort ferns may be found in moist pockets in open woodlands and montane forests (including aspen stands). Proposed treatments in the mid-to-upper elevation stands would have had the greatest likelihood of impacting moonwort ferns outside the RCAs. However, under Alternative A, the risk of impacts from thinning or tree removal would not occur nor would related disturbance from skid trails, pile burning, or other activities. Prescribed burning would not be implemented. If a major fire or other disturbance does not occur, stands would continue toward a more mature forest structure. Habitat for moonwort ferns may increase or decrease over time, depending on moisture and maintenance of openings in the stands.

Small Phacelia

The effects to riparian or wetland habitat for small phacelia would be similar to that described for other wet-area species and moonwort ferns. The risks or benefits created by project activities in RCAs would not occur under Alternative A. Habitat succession may provide more or less suitable habitat for this plant, depending on the optimal amount of canopy cover and species mix.

As upland succession proceeds, available habitat may be reduced with conifer encroachment into aspen stands and lack of fire to stimulate aspen growth. Potential risk from mechanical harvest and related activities would not be generated under Alternative A.

Idaho Dwarf Primrose, Sacajawea's Bitterroot, Mt. Shasta Sedge, Kruckeberg's Hollyfern, Leiberg Stonecrop, Sierra Sanicle

This group of plants typically occupies dry, open, and possibly rocky areas at upper-mid-to-high elevation. Environments suitable to this suite of plants would be expected to stay relatively static in the short to long term. With successional progression over time, conifers may encroach upon areas now open, reducing suitable habitat for these open-grown species. Climate change may affect successional changes in the opposite direction, serving to maintain openings and reduce competition from more hydrophilic species but also potentially favoring competitive weed species.

With proposed project implementation, prescribed burning would have the greatest potential to impact this group of plants, with a lesser risk from vegetation management activities. Under Alternative A, however, these activities would not occur.

Alternative B—Proposed Action

Whitebark Pine

Proposed activities would occur outside the known occupied upper-elevation stands/high-potential occupancy for whitebark pine (Figure 3-106 and Figure 3-108), thus reducing the threat to the majority of the individuals in the project area. The lower-elevation stand recorded as having whitebark pine present is not proposed for mechanical vegetation management activities. Because of the low likelihood of occupation and due to the use of Design Features RP-1, RP-2, and RP-3, the risk of negative impacts to whitebark pine from proposed project activities (such as thinning with product removal or mastication and associated vegetative management activities such as prescribed burning, road

decommissioning, temporary road construction, and construction of recreational trails outside the known occupied stands) is low.

Vegetation/Fuels Treatments—A low risk exists to the upper-elevation occupied whitebark pine habitat from the application of fire proposed in the southwest portion of the project area (near Pilot Peak). Fire would be used outside the area where known occupied and/or field-verified, high-potential habitat of whitebark pine exists (Figure 3-108). Fire is a natural part of western ecosystems, and most plants in fire-prone areas have adapted to living under such conditions (USDA Forest Service 2003). Although fire is a natural part of whitebark pine ecosystems (and may help reduce competition from encroaching species such as subalpine fir; maintain stands in open, seral condition; and create suitable seed caching areas for Clark's nutcracker), it can also damage whitebark seedlings and saplings. At lower elevations, the risk to trees would be greatest for undocumented whitebark pines appearing in stands where vegetation removal or prescribed burning is proposed.

Design Feature RP-2 would largely reduce the risk to occupied whitebark pine in the Pilot Peak area. No project activities would occur in known occupied and/or field-verified, high-potential habitat of whitebark pine (Figure 3-108). Disjunct whitebark pine known or discovered at lower elevations would be avoided and protected to the maximum extent practicable (Design Features RP-1 and RP-3).

This prescription is not failsafe; accidental injury could occur to known trees or misidentification of trees occurring below expected elevations for whitebark pine, leading to unintentional removal or damage during thinning and activity fuels operations. Prescribed burning in a location of undiscovered whitebark pine seedlings or saplings—those susceptible to even low-intensity fire—is an additional risk. Timing of burning (late fall/spring) and stand densities can influence the potential for effects to whitebark pine.

Transportation—No road or trail actions are proposed for areas above 7,000 feet, where the greatest possibility of activity overlap with whitebark pine (or habitat with a high potential for occupancy) would occur (Figure 3-108). If individual whitebark pine is discovered in an area proposed for new or temporary road construction or reconstruction, it would be avoided (Design Features RP-1 and RP-2) and protected to the maximum extent practicable.

Decommissioning is proposed for unauthorized route X025N5, which passes partially through the lower elevation Stand 0035040517, identified as occupied by whitebark pine (5 seedlings were recorded in stand exam data, although the trees were not re-located in a 2014 follow-up field survey). Although whitebark pine at these locations may be considered disjunct or incidental, the decommissioning action and maintenance of closed status would provide long-term benefits in protecting the species in these stands. Protecting whitebark pine occuring at a somewhat different moisture and temperature regime than more typical occupied habitat may be important for maintaining a diverse gene pool and plasticity, thereby contributing to the longevity of the species.

Recreation—Little-to-no overlap occurs for occupied or suitable whitebark pine habitat and proposed changes in recreational road or trail status and location or construction of new trails or facilities. No recreation-related activities are proposed in habitat identified as having a high potential for whitebark pine occupancy. If individual whitebark pine is discovered at lower elevation locations proposed for new trails or facilities, it would be avoided and protected to the maximum extent practicable (Design Feature RP-1).

Fisheries—No overlap occurs for occupied or suitable whitebark pine habitat and proposed aquatic activities.

Indicators and Outcomes—Whitebark pine is present in the project area, along with additional suitable habitat (Figure 3-108). No direct overlap occurs between proposed activities and known high-elevation occupied whitebark pine in the Pilot Peak area or in habitat identified as having a high potential for occupancy (this would be field verified). Through Design Features RP-1, RP-2, and RP-3, the risk to whitebark pine and suitable habitat is removed or greatly reduced, and the effects of project implementation are expected to range from none to short term for whitebark pine.

Determination—Implementing proposed activities in the project area for Alternative B "**may impact whitebark pine individuals but would not likely contribute to a trend toward Federal Listing or cause a loss of viability to the population or species**" (MII determination).

Pacific Onion, Bryum Moss, and Sticky Tofieldia

These species are known to occur in very moist environments, described variously as wetlands, moist cliff sides, wet meadows, forested seeps, stream margins in subalpine fir habitat, and boggy lakesides, peatlands, and marshes. The project area provides a limited variety of riparian/wetland/moist meadow habitat, particularly in the lower-to-mid elevation forests proposed for treatment. Stream vegetation in this area could largely be categorized as "riverine riparian," where true riparian vegetation occupies a narrow corridor within a drier forested upland. "Shrub riparian" vegetation exists at higher elevations in areas of gentler terrain and stream gradients, with wider floodplains and expanses of true riparian vegetation.

Vegetation/Fuels Treatments—Almost 3,500 acres within the project area are characterized as RCA (defined for the Becker project as 2 tree [dominant species] heights from a perennial channel or a single tree height from an intermittent channel). Most proposed activities would not impact habitat matching the descriptions above. The proposed vegetation treatments would have little or no effect on this group of riparian/wetland plants due to the restriction of activities adjacent to suitable habitat (no vegetation management treatments exist within 50 feet of a perennial stream outside plantations, 35 feet within a plantation; or 15 feet of an intermittent stream; Design Feature FH-27 restricts equipment to NFS roads or temporary roads or skid trails outside RCAs). These plants typically grow in water or in areas with a high water table; any proposed activities would occur outside those areas.

The vegetation treatment with the highest likelihood of generating effects to suitable habitat is broadcast burning in the Natural Fuels Treatment Blocks, which would occur in the upper elevations of the southwest corner of the project area. A potential for overlap exists between suitable riparian habitat and fire. Although ignition would not occur within RCAs, backing fires would be allowed and, under dry enough conditions, this habitat could burn, although intensity should be lower than that in the surrounding uplands (due to higher moisture content in the riparian habitat). Additional protection to species in this group would be provided by Design Feature FF-3, prohibiting fireline or handline construction within the RCAs.)Early-season prescribed burning may not generate conditions mimicking the post-fire ecological conditions in riparian areas that follow a more intense wildfire (Arkle and Pilliod 2010). Under the wetter prescribed fire conditions, these areas may not carry fire thus the direct risk to this riparian/wetland habitat should be low, but the consequences and benefits

of more seasonally correct timing would be absent. The long-term consequence of reducing fire in the riparian systems of dry forest types is not well studied; it may preserve habitat in the short run, but it may affect biodiversity in the future. Generally, the risk of long-term negative consequences of broadcast burning are expected to be low for this species group's habitat.

Burn piles may be constructed in RCAs, but with Design Feature FF-5 (piles must be limited in extent and created away from streams, riparian vegetation, and wetlands/seeps), the risk to these species or suitable habitat is low. This specification reduces the negative impact of intense, localized heat that may damage underground portions of the plants.

Transportation and Recreation—It is unlikely that proposed road and trail activities (status and maintenance-level changes, temporary road construction, decommissioning, and trail construction and rerouting) or proposed recreation activities would coincide with high-quality suitable habitat for plants in this group. If this were to occur, Design Feature FH-25 would reduce the impacts and mitigate negative effects. In areas of decommissioning, a long-term benefit would be expected for potential habitat following a return to more natural hydrologic conditions.

Fisheries—The most highly suitable habitat for these species in the project area would exist where culverts in high-flow areas of perennial streams were replaced. Culverts located on intermittent streams would likely not be in moist enough habitats to sustain species in this group. Although initial disturbance would occur where the culverts are removed, channels are diverted, and culverts are reinstalled, the long-term impacts should be beneficial. If water tables are raised in these areas, suitable habitat may increase. Likewise, increased culvert size should reduce the risk of channel scouring during high water and limit resulting damage to local vegetation. Design Features FH-19 and FH-24 include methods of reducing impacts to riparian vegetation and restoring riparian sites following culvert removals or replacements.

Indicators and Outcomes—No known occupied habitat exists for any plants in this group within project area boundaries. Suitable habitat does not occur in the dry uplands comprising most of the project area. Suitable habitat for these plants would occur in portions of the project area with the highest consistent moisture levels, namely larger perennial streams or high-elevation streams or wet meadows with low channel gradients. Prescribed burning (fire is not expected to reach the Pacific onion population outside the western boundary of the project area) offers a low risk of impacts, but those effects would be short term. Culvert replacements and any other instream work conducted may initially disturb potential habitat for these plants, but with long-term benefits to the habitat. Road and unauthorized route decommissioning also would be expected to yield long-term benefits in RCAs. Implementing Design Feature RP-1 would reduce the risk of project activity impacts. Project implementation for this group is expected to range from none to short-term effects only.

Determination—Implementing proposed activities in the project area for the proposed Alternative B "**may impact Bryum moss individuals, but would not likely contribute to a trend toward Federal Listing or cause a loss of viability to the population or species**" (MII determination).

Forest Watch (and former Forest Watch)—The risk of long-term loss of population viability or habitat for Pacific onion and sticky tofieldia is low.

Small Phacelia, Scalloped Moonwort, and Little Grapefern

This group of species occupies riparian areas and moist-to-wet grass/forb meadows and aspen stands. They occupy a wider range of hydrologic conditions than the species described above.

Vegetation/Fuels Treatments—The effects to riparian or wetland habitat for small phacelia and moonworts would be the same as that described above with the other wet-area species. Small phacelia would be less susceptible to treatments occurring in forested stands, as it occupies more open habitat. RCA buffers (Design Features FH-27 and FH-28) would largely protect the core of suitable habitat for moonwort in forested areas from mechanical disturbance (i.e., yarding, skid trail creation), but small, grassy openings that moonworts may occupy (observed little grapefern populations occupy small, sparsely vegetated swales amidst lodgepole pine stands on Cascade Ranger District), may be perceived as devoid of vegetation and inadvertently used as landings or burn pile locations, or be bisected by skid trails, temporary roads, or recreational trails. However, proposed mechanical vegetation treatments would occur largely in the drier PVG types (Douglas fir, ponderosa pine), which exhibit a low likelihood of supporting moonworts. Only about 6% of the project area is characterized as PVG 7 (Dry Subalpine Fir), PVG 10 (Persistent Lodgepole), or PVG 11 (High Elevation Subalpine Fir). No mechanical vegetation treatment is proposed in either PVG 10 or PVG 11 under this alternative.

Logging systems incurring ground disturbance (tractor jammer, skid trails) may have a greater impact because of potential disruption to subterranean structures and associated endomycorrhizal fungi of *Botrychium* plants.

Where existing landings are already in place, or where wide open spaces/other disturbed areas along existing roads are used, disturbance to suitable small phacelia or moonwort habitat should be negligible. Of 146 landings (including a service landing) proposed for possible use, only 1 would be located in a vegetation type (PVG 10, persistent lodgepole pine) more likely to support suitable moonwort habitat. Where new disturbance is proposed in suitable habitat, species in this group could be negatively impacted.

Another new landing is proposed in a meadow on NFS road 362G9. Under Alternative B, it would be used as a tractor landing. An aspen stand occupies the top of the meadow, and the opening below supports a diverse variety of forbs and graminoids, including false hellebore (*Veratrum californicum*). Aspen and false hellebore are generally found in moister habitats of the Forest and serve as indicators of suitable habitat for small phacelia and moonworts. To minimize risks to potential habitat for small phacelia and moonworts, additional mitigations (Design Feature RP-1) would be needed if this area were to be used as either a tractor or helicopter landing (i.e., used during fall season only; no excavation or leveling; log deck locations limited to 35 feet from edge of road on the east side; and all mechanized equipment would remain on the road surface). To avoid suppression of growth in meadow species, activity slash and disposal would only occur on the west side of the road.

Fire is a natural part of western ecosystems, and most plants in fire-prone areas have adapted to living under such conditions (USDA Forest Service 2003b). This adaptability applies to rare as well as common plant species. Prescribed fire activities favor early seral species (including on aspen and nonforested lands). Most species found on the Forest have adapted to living with fires occurring July–September.

Prescribed burning may cause short-term direct impacts if occupied habitat is burned, but long-term benefits may also occur by improving aspen stands as potential habitat for small phacelia and moonworts. Aspen stands and meadows would likely be too moist to burn in the spring, but they would burn in the fall as fuel moisture decreases and surrounding herbaceous vegetation cures. The annual habitat of small phacelia plants should lower the severity of negative impact from fall burning because the plants would have already dispersed seed and completed their seasonal life cycle. Likewise, moonworts are dormant (without exposed aboveground vegetation) when fall burning would occur. The degree of risk would then vary with fire intensity, but the negative impacts of low-to-moderate intensity burns should be temporary to short term.

Fire may play a role in maintaining forest openings and meadow habitat where moonworts are often found, but the most appropriate disturbance interval or successional stage is not known. Burning may generate changes to canopy cover and size of forest openings, thereby altering moisture and light regimes and, in turn, creating microclimatic changes in the understory. These changes may be positive or negative, and impacts could range from temporary to long term. Similar changes could occur in more open habitat suitable both for small phacelia and moonworts.

Pile burning concentrates heat in one area and has a greater potential for negatively impacting plants or habitat than does broadcast burning, due to possible subsurface heat damage. Excessive ground temperatures can sterilize the soil and damage or kill the endomycorrhizal fungi upon which moonworts depend. These temperatures can also destroy seedbanks harboring small phacelia seeds (this annual plant depends on stored seed for continued existence). In clearings or moist meadows perceived as dry and generally devoid of vegetation late in the season, pile burning could potentially be detrimental to these species from a site preparation or intensive heat perspective. Recovery could be long term. However, the likelihood of occupied habitat outside RCAs or in upper-elevation forested PVGs (which are most likely to support moonwort habitat) coinciding with burn piles is low.

See the above discussion for Pacific onion, Bryum moss, and sticky tofieldia for design features applying to fuels and RCAs.

Transportation—Transportation-related activities, such as proposed road and trail activities (status and ML changes, temporary road construction, decommissioning, and trail construction and rerouting), may coincide with suitable habitat for plants in this group; however, most activity is proposed in the drier vegetation types less likely to support small phacelia or moonwort ferns (see the discussion for Pacific onion, Bryum moss, and sticky tofieldia, above, for design features applying to fuels and RCAs).

Road decommissioning and closures may provide long-term benefits and possibly increase suitable habitat for this group. The effects of unauthorized road conversion to NFS status and conversion of roads to trails may have short-term negative impacts if the routes pass through suitable small phacelia or moonwort fern habitat and if disturbance or removal of additional native vegetation is needed to bring these segments up to Forest Service standards. Temporary roads may represent a long-term loss of potential habitat if environmental conditions do not favor a quicker recovery following decommissioning (Design Feature TH-5). On roads where a status change would occur without any physical changes, no additional impacts are likely.

Recreation—Effects for small phacelia and moonwort fern habitat and any undocumented individuals relative to proposed recreation construction and activities would be the same as those described for other riparian species in similar habitat (see the discussion for Pacific onion, Bryum moss, and sticky tofieldia, above, for design features applying to fuels and RCAs). Construction of recreational trails or facilities in the drier vegetation types, especially at the lower elevations, is unlikely to negatively affect small phacelia or moonwort habitat. If new or revised recreation facility locations are identified, additional surveys will be conducted, and mitigations will be developed to reduce impacts as needed (Design Feature RP-1).

Fisheries—Proposals benefitting fishery and hydrologic resources involve culvert replacements or removals, and all occur within RCAs. The impact on small phacelia and moonwort fern habitat would be the same as for other riparian rare plants described in this report. See the above discussion for Pacific onion, Bryum moss, and sticky tofieldia for design features applying to fisheries and RCAs.

Indicators and Outcomes—No known occupied habitat exists for any plants in this group. Suitable habitat for these species occurs in aspen stands (small phacelia and moonwort ferns) and moist pockets in upper-elevation forested stands (moonwort ferns). The highest quality habitat would occur in RCAs or at upper elevations; drier PVG types (especially PVGs 1, 2, and 4) would unlikely provide suitable habitat. Risks within RCAs are mitigated by a variety of design features (see the discussion for Pacific onion, Bryum moss, and sticky tofieldia, above).

Although the risk of impact outside the RCAs would be greatest from prescribed burning, other proposed activities in uplands—such as vegetation and fuels treatments, landing use and construction, and road and trail construction—may impact suitable habitat for small phacelia and moonwort ferns. Road and unauthorized route decommissioning may yield long-term benefits to suitable habitat. Implementing Design Feature RP-1 would reduce the risk of impacts from project activities. With design features in place, effects of project implementation for this group are expected to range from none to short term.

Determination—Implementing proposed activities in the project area for Alternative B "**may impact small phacelia individuals, but would not likely contribute to a trend towards Federal Listing or cause a loss of viability to the population or species**" (MII determination).

Forest Watch—The risk of long-term loss of population viability or habitat for scalloped moonwort and little grapefern is low.

Idaho Dwarf Primrose, Sacajawea's Bitterroot, Mt. Shasta Sedge, Kruckeberg's Hollyfern, Leiberg Stonecrop, and Sierra Sanicle

A known population of Sacajawea's bitterroot exists in the southwest corner of the project area. It is possible that the extent of the occupied habitat is greater than documented. No other species in this group have documented occurrences within the project area.

Additional suitable habitat for Sacajawea's bitterroot or habitat for the group's other species may be impacted or benefitted by proposed activities, including prescribed fire, vegetation and fuels management activities, road decommissioning, temporary road construction, and construction of recreational trails.

Additional surveys for Sacajawea's bitterroot (and whitebark pine) have been conducted (field surveys conducted in 2015 showed that the population extended farther to the north than previously known) or are proposed in areas with a high probability of occupancy based on PVG, habitat type, elevation, aspect, review of aerial photos, soil type, and proximity to occupied habitat (Design Feature RP-2). In order to ensure protection for known occupied Sacajawea's bitterroot habitat or any occupied habitat newly discovered within the project area, the concept of "Plant Consideration Area" (PCA) (Figure 3-109) will be applied in a similar manner to that developed for this species in other Forest projects (US Forest Service 2015c). A 300-meter buffer of concentric rings around a population or individuals is used to define what level of proposed activity may occur within that circle in order to protect processes and functions crucial to the plants. Ring 1 encircles the occupied habitat; Ring 2 extends 20 meters from the outer extent of the occupied habitat. The area within these inner 2 rings is essentially an "activity free zone" to protect the plants and their pollinators from the direct effects of proposed activities. Rings 3 and 4 extend 100 meters and 300 meters, respectively, from occupied habitat and are used to buffer additional suitable habitat and pollinator foraging habitat from indirect effects such as dust transport, weed invasion, unauthorized vehicular activities, and trampling.

With the exception of natural fuels treatments, no activities are proposed within the PCA for known occupied Sacajawea's bitterroot habitat or in habitat identified as having a high potential for occupancy inside the project area (Figure 3-108). Proposed natural fuels (direct/indirect application of fire) treatments overlap the Pilot Peak area Sacajawea's bitterroot PCA and surrounding area of high potential for occupancy (see discussion on prescribed burning, below). Other risks to this population of Sacajawea's bitterroot stem primarily from potential cumulative effects (grazing, unauthorized off-road vehicle use, invasive species, climate change, and other uses not included in the Becker proposal).

In Idaho, all plants in this group grow at mid-to-high elevations (above 5,000 feet) in open, dry, or rocky environments. Activities occurring below this elevation or in riparian/wetland environments are not expected to affect this group of species.

Vegetation and Fuels Treatments—Due to the elevation and/or open, rocky nature of their habitats, no impacts are expected for Idaho dwarf primrose, Mt. Shasta sedge, or Kruckeberg's hollyfern relative to vegetation management such as thinning, mastication, tree removal, creation or use of landings, or vegetation fuels activities such as slash disposal (i.e., lop and scatter, yarding, pile burning). The same is anticipated for the population of Sacajawea's bitterroot at Pilot Peak, which is over 1.5 miles from proposed vegetation management activities and where any activities within the PCA or habitat identified as high potential for occupancy would be restricted.

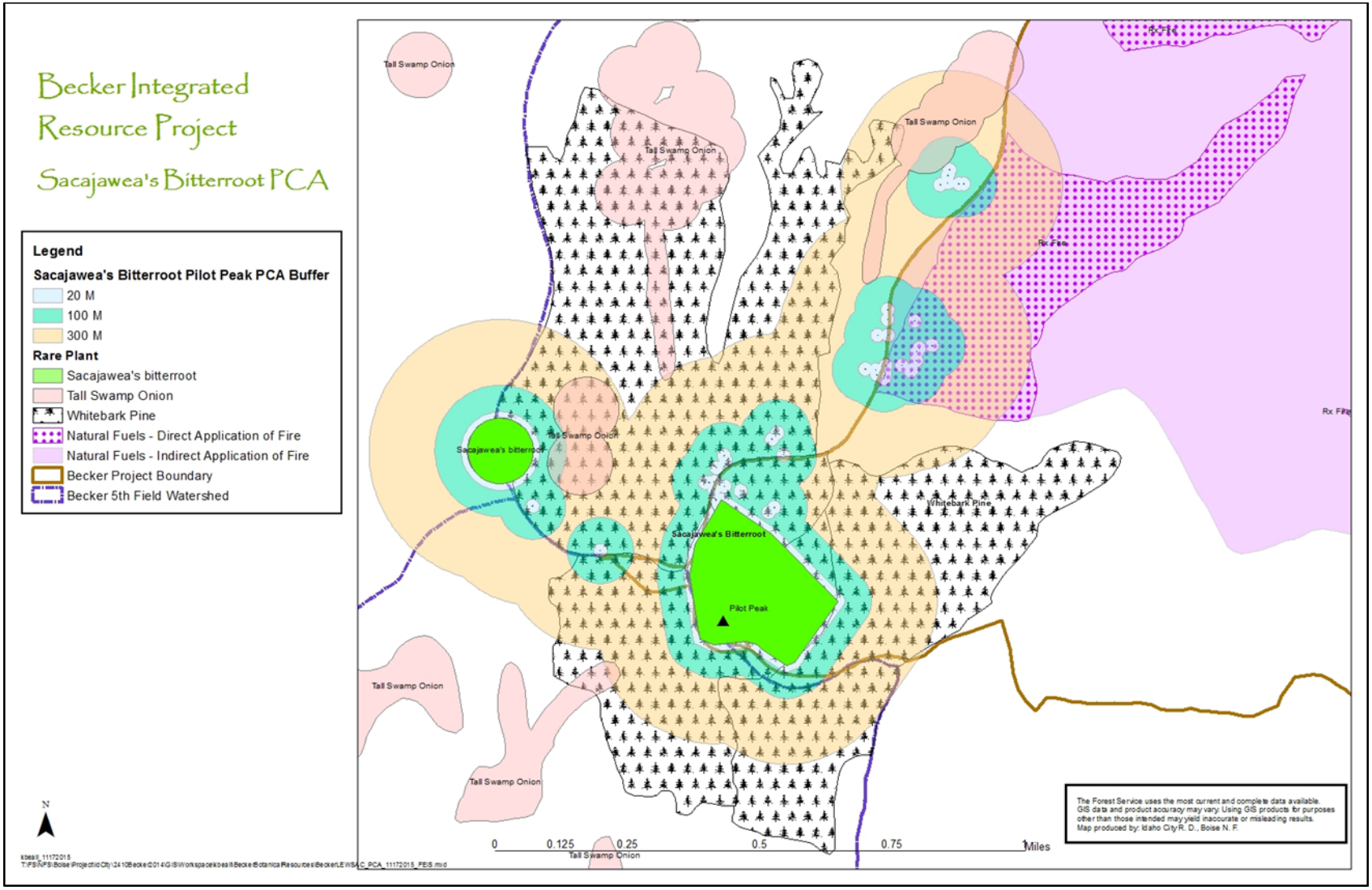

Figure 3-109. Sacajawea's bitterroot Plant Consideration Area (PCA) at Pilot Peak

These same activities may directly or indirectly impact suitable habitat for Sacajawea's bitterroot (at lower elevations), Leiberg stonecrop, or Sierra sanicle. These actions would occur in forested vegetation types, along with some associated open areas, in which actions may overlap potential habitat. The risk of negative impacts should be low relative to actual thinning activities, due to the typically rocky, open nature of the habitat for this group of plants. Stand density near any occupied areas would likely be low, making trees near occupied areas less of a target for thinning or removal. If an undocumented occurrence did coincide with an area of proposed activity, the risk of plants being crushed or otherwise damaged as trees were felled or yarded could occur. Depending on the timing of activities, the risk could be lower for Sacajawea's bitterroot than the other species because its leaves and reproductive structures are only above the ground surface for a short time (June–mid/late July in the project area). Outside these time parameters, Sacajawea's bitterroot should be less susceptible than other species discussed here, unless ground disturbance is more than superficial. Any rare plant populations discovered prior to or during project implementation would be avoided to the maximum extent practicable and, for Sacajawea's bitterroot, a PCA would be developed to mitigate risk to occupied and contributing habitat (Figure 3-109).

Open areas where these species might occur could be selected as landings or slash pile sites. New landings (most are already established on existing roads) in areas with a high potential for rare plant occupancy would be surveyed (Design Feature RP-1) and, if rare plants are located, the landing locations could be adjusted. As per Design Feature RP-2, no piling of slash/vegetation shall occur within any PCA for Sacajawea's bitterroot or in any habitat identified as having a high potential for occupancy. Pile burning concentrates heat in one area and has a greater potential for negatively impacting plants or habitat than broadcast burning, due to possible subsurface heat damage. Excessive ground temperatures can sterilize the soil and damage or kill the underground roots or other plant structures, severing any mycorrhizal connections. Piling could occur unknowingly in undiscovered occupied habitat because the ground would appear open after plants (e.g., Sacajawea's bitterroot) became dormant or otherwise inconspicuous late in the season.

Proposed application of fire at the upper elevations of the southwest portion of the project area could impact habitat for any species in this group. However, the risk to the Pilot Peak area's Sacajawea's bitterroot (as well as to whitebark pine and to habitat for other high-elevation species) would be greatly reduced by excluding the activity in areas identified within the PCA or with the high potential for occupancy (Design Feature RP-2). Outside this area, risks from prescribed fire activities remain low due to the open, rocky, gravelly nature of typical habitat for this group of species. Ground surfaces are typically not densely vegetated and would not carry fire easily. Direct impacts from fire are unlikely. The need for line construction in the most suitable habitat is low, as these areas may act as natural fire barriers due to lower fuel loads and duff layers.

Risks would be greater in lower-elevation natural fuels treatment areas, where potential habitat for this group of species overlaps the fuel loads. The season of burn (spring or late fall) would affect the intensity and risk of direct fire effects and, where handline construction is needed, habitat disturbance is possible.

Transportation—No road or trail actions are proposed for areas above 7,200 feet, where the possibility of overlap with Idaho dwarf primrose would occur. Kruckeberg's hollyfern should

also be unaffected because it occurs in subalpine habitats on rocks and cliffs. Undocumented Mt. Shasta sedge may occur in areas where road/trail activities are proposed. At greatest risk for this group's species and their habitats, as a result of vegetation management and recreation road/trail construction and disturbance, are Sacajawea's bitterroot (if occurring outside the area identified as having the high potential for occupancy), Leiberg stonecrop, and Sierra sanicle. The habitat for these species comprises open, gravelly areas that may be perceived as good locations for roads or trails. Because all vegetation and the top layer of soil is removed from potential roads or trail beds, construction or other transportation activities would have long-term impacts if built through an undocumented site. Construction would remove suitable, but unoccupied, habitat from the base on a long-term basis. To decrease this risk, rare plant surveys would be conducted in areas with expected long-term impacts, such as proposed road or trail locations (Design Feature RP-1). No road or trail construction would occur within a Sacajawea's bitterroot PCA (Design Feature RP-2) identified as having high potential for occupancy.

Changes in road or trail status could have negative impacts where change dictates further ground disturbance. Road decommissioning or a status change reducing use or disturbance on a route could have long-term benefits for Mt. Shasta sedge, Sacajawea's bitterroot (at lower elevations), Leiberg stonecrop, and Sierra sanicle habitat.

Recreation—Results from overlapping recreational routes or other proposals leading to ground disturbance are described in the transportation section above. No overlap with known occupied Sacajawea's bitterroot habitat/PCA would occur. Construction of the proposed trailhead facility would not affect suitable habitat for this plant group.

Fisheries—No overlap of suitable habitat for any of these species and proposed aquatic activities should occur. Species in this group are all located in dry, rocky, open environments, and culvert removal and replacement work would be conducted in streams and adjacent RCAs.

Indicators and Outcomes—Occupied habitat for Sacajawea's bitterroot exists in the Pilot Peak area of the project area's southwestern corner. A PCA has been established for this location (Figure 3-109), and this population and its surrounding PCA are outside proposed activities. No other known occupied habitat exists for any other plants in this group, although suitable habitat is present in dry, rocky areas, most likely at uppermost elevations Sacajawea's bitterroot occupied and modeled habitat is identified in Figure 3-108.

Prescribed burning may impact habitat at these locations during proposed fire applications, although the highest quality habitat would be protected (Design Feature RP-2). Species potentially occurring at mid elevations (Sacajawea's bitterroot, Leiberg stonecrop, and Sierra sanicle) are at low risk from vegetation and fuels activities, transportation, and recreation construction while some activities (e.g., road/trail closure and decommissioning) may provide long-term benefits. Activities relative to culverts would have no effect on the habitat for this group of plants. If additional occupied Sacajawea's bitterroot habitat is discovered prior to or during project implementation, a PCA would be developed to mitigate risk to occupied and contributing habitat. With design features in place (RP-1 and RP-2), risk should be none to low for Sacajawea's bitterroot and low for the other species in this group. Overall, the effects of project implementation for this group are expected to range from none to short term.

Determination—Implementing proposed activities in the project area for Alternative B "**may impact Idaho dwarf primrose and Sacajawea's bitterroot individuals, but would not likely contribute to a trend toward Federal Listing or cause a loss of viability to the population or species**" (MII determination).

Forest Watch—Long-term loss of population viability or habitat for Mt. Shasta sedge, Kruckeberg's hollyfern, Leiberg stonecrop, and Sierra sanicle is a low-risk possibility.

Alternative C, D, E, and F

All Species

For Alternatives C, D, E, and F, all of the indicator and outcome discussions and species determinations would be the same as those found under Alternative B.

The differences between the Proposed Action (Alternative B) and Alternatives C, D, E, and F lie in total acreage and location proposed for some of the vegetation and fuels treatments, and in road/trail construction, facilities, and status. Culvert treatment activities are the same between action alternatives.

Vegetation and Fuels Treatments—Differences between action alternatives are relatively minor in terms of potential effects to rare plants and whitebark pine. Alternative D proposes additional vegetation management activities, but the extra acreage would occur outside known occupied habitat or habitat with a high potential for occupancy for Sacajawea's bitterroot/PCA and whitebark pine. These additional activities would occur at the lowest elevation in the project area, carrying a low risk of supporting undocumented populations. Should new populations of rare plant species or additional whitebark pine be discovered prior to or during project implementation under any alternative, Design Features RP-1, RP-2, and RP-3 would be applied to mitigate risk to occupied and contributing habitat.

Alternative E has fewer acres of tractor-jammer work (with more helicopter logging system use), but overall acreage to be disturbed during vegetation and fuels management activities is the same as for Alternatives B, C, D, and F. Alternative F has the least number of total landings (114 Tractor/Jammer /7 Helicopter), but the helicopter landings are larger than those needed for tractor-jammer landings, bringing this alternative close to the most potential ground-disturbing activity, with respect to the other alternatives. In other words, Alternative E has the second smallest number of landings; however, with 20 helicopter landings, the acres of use as landings is likely higher than all other alternatives, including Alternative D. New landings would be field surveyed for rare plants and whitebark pine prior to construction (Design Feature RP-1). Monitoring for rare plants at the meadow landing on NFS road 362G9 (to be used in any alternative for either tractors or helicopters) has not resulted in any new known occurrences of rare plant species, although potential habitat exists.

The total number of acres proposed for activity fuels treatments is the same under Alternatives C, E, and F (as it is for Alternative B). Additional acreage is proposed under Alternative D, but that acreage carries a low risk of rare plant/whitebark pine occupancy. Known occupied habitats for Sacajawea's bitterroot/PCA and whitebark pine are outside areas proposed for activity fuels treatments. Proposed broadcast burning and direct/indirect application of fire are the same for all alternatives. As proposed under Alternatives C, D, E,

and F, direct/indirect fire treatments would overlap the Pilot Peak area Sacajawea's bitterroot PCA and surrounding area of high potential for occupancy (as well as that for whitebark pine) (see Figure 3-108 andFigure 3-109). Under Design Feature RP-2, however, fire application would be modified to avoid this area.

Transportation—Construction of new, reconstructed, and temporary roads is proposed under all action alternatives. These actions permanently or temporarily remove vegetation and create a bare mineral surface subject to weed invasion. Alternative E proposes the least temporary road construction (about 65%–75% less than the Proposed Action because of the increase in proposed helicopter logging eliminates the need for much road mileage in this alternative), while Alternative D proposes the most. However, the additional mileage in Alternative D would be built outside any known occupied habitat and would occur in the lower-elevation portion of the project area, which reduces the likelihood of negative impact because those lower-elevation habitats typically do not support most of the rare plant species evaluated in this report. Between Alternatives B, C, D, E, and F, the differences in miles of proposed new and reconstructed road are minimal. The greatest risk created from these proposed road activities would occur to potential habitat for Sacajawea's bitterroot, Leiberg stonecrop, and Sierra sanicle (as described above). Roads would likely be constructed in open, gravelly habitat. Under Design Feature RP-1, areas proposed for road and trail construction would be field surveyed prior to project implementation. PCAs would be established for newly discovered populations to mitigate the risk of impacts (Design Feature RP-2). The known occupied habitat for Sacajawea's bitterroot/PCA/whitebark pine around Pilot Peak and the habitat with high potential for occupancy are outside the bounds of road and trail construction and should not be affected by project proposals. Any whitebark pine discovered at lower elevations near proposed road construction would be avoided to the maximum extent practicable (Design Features RP-1 and RP-3).

A slightly greater number of road miles (approximately 6%) would be decommissioned in Alternative E and fewer miles of road would be open to public use (29% less than under Alternatives B and F, and 31% less than under Alternatives C and D). Road decommissioning decreases the risk of impacts from motorized vehicles or non-motorized use, reduces vectors for weed transport, and increases the amount of available habitat for native plant colonization. Reducing roads open to the public reduces the opportunities for ground disturbance and risk of weed introduction and spread. Decommissioning 16 unauthorized routes has been proposed under all action alternatives. Whitebark pine seedlings were identified during stand exam data collection in the vicinity of the proposed decommissioning of unauthorized route X025N5 (see the discussion regarding transportation under the whitebark pine subheading for Alternative B). Road decommissioning may have long-term beneficial effects for these or other disjunct whitebark pines.

Recreation—More miles of road or motorized trail would be authorized or converted to non-motorized trail in Alternative E; in addition, the new ATV trails and trailheads proposed in Alternatives B, C, D, and F would not be constructed under Alternative E. Alternative B would have slightly more motorized trail miles (new or redesignated) than Alternatives C, D, and F, while Alternative E does not propose any motorized trails. Non-motorized travel generally poses less of a risk to native vegetation than motorized travel, with less associated ground disturbance and a lower risk of weed introduction and spread. All action alternatives would create a new trailhead near Beaver Creek Summit. New trail construction would be

field surveyed for rare plant/whitebark pine occupancy prior to project implementation; if occupied habitat is identified, it will be avoided to the maximum extent practicable (Design Feature RP-1). PCAs would be established for any newly discovered populations of Sacajawea's bitterroot to mitigate risk of impacts (Design Feature RP-2). No new trail construction activities are proposed for known occupied Sacajawea's bitterroot/whitebark pine habitat or identified areas where these species have a high potential for occupancy.

Fisheries—Proposed culvert treatments are the same for all action alternatives. No known occupied rare plant or whitebark pine habitat exists at these locations, but areas where long-term disturbance, such as culvert replacement or road construction, is proposed would be field surveyed prior to project implementation.

Direct and Indirect Effects—Summary

Overall, the potential risks and impacts for rare plant species and whitebark pine are expected to be similar across all action alternatives, with a slightly increased risk for any species occurring in dry, rocky habitats at mid-elevations (Table 3-147). Design Features RP-1, RP-2, RP-3) would help reduce risk in these habitats. Although actions proposed in these alternatives may have either negative or beneficial impacts in sustaining or restoring native plant communities, the relevancy to suitable habitat for most of the rare plant/whitebark pine species analyzed in this report is minor, due to proposed locations in areas of low habitat suitability.

Table 3-147. Summary of indicators and outcomes for rare plants and whitebark pine by alternative and habitat grouping, for all action alternatives

Species or Plant Grouping	Action Alternatives
Whitebark pine	Prescribed fire, vegetative treatments, and road and trail treatments are proposed in all alternatives. Possible effects to whitebark pine are similar between alternatives relative to location of occupied and potential habitat. Design features would be in place to mitigate risk to occupied habitat and in those areas identified as having a high potential for occupancy. (Design Features RP-1,2,3)
Riparian, wet meadow, and wetland species: Bryum moss, Pacific onion, sticky tofieldia	Prescribed fire, vegetative treatments, road and trail treatments, facility construction, and culvert replacements are proposed in all alternatives. Possible effects to Bryum moss, Pacific onion, and sticky tofieldia are similar between alternatives relative to location of potential habitat. Design features would be in place to mitigate risk to occupied and contributing habitat. (Design Feature RP-1)
Moist, forested aspen to riparian, meadow species: small phacelia, scalloped moonwort, little grapefern	Prescribed fire, vegetative treatments, road and trail treatments, facility construction, and culvert replacements are proposed in all alternatives. Possible risks and benefits to small phacelia, scalloped moonwort, and little grapefern are similar between alternatives relative to location of potential habitat. Differences found in treatment acreage are not present in places thought to provide suitable habitat for this group. Design features would be in place to mitigate risk to any newly discovered occupied and contributing habitat. (Design Feature RP-1)
Upland species of open forested/rocky habitats: Idaho dwarf primrose, Mt. Shasta sedge, Kruckeberg's hollyfern	Prescribed fire, vegetative treatments, road and trail treatments, and facility construction are proposed in all alternatives. Possible risks and benefits to Idaho dwarf primrose, Mt. Shasta sedge, and Kruckeberg's hollyfern are similar between alternatives relative to location of potential habitat. Design features would be in place to mitigate risk to occupied and contributing habitat. (Design Feature RP-1)
Upland species of open forested/rocky habitats: Sacajawea's bitterroot, Leiberg stonecrop, Sierra sanicle	Known occupied Sacajawea's bitterroot habitat and its surrounding PCA near Pilot Peak should not be affected by project implementation under any action alternative, due to lack of proposed activities at that location or to mitigation through design features. Habitat with a high potential for occupancy for Sacajawea's bitterroot would be also be protected (Design Feature RP-2). It is more likely that potential habitat at moderate elevation for Sacajawea's bitterroot (low-to-medium potential for occupancy), Leiberg stonecrop, and Sierra sanicle would be impacted through prescribed fire, vegetative treatments, and road and trail treatments than for other species reviewed in this assessment, due to overlap with proposed activities. Risk is greatest in alternatives proposing more area of ground disturbance, specifically, new/temporary road and trail construction and reconstruction, or new landings. Design features would be in place to mitigate risk to occupied and contributing habitat (Design Features RP-1,2,3). Although determinations between these alternatives would not differ, they can be ranked with regard to potential impact.

3.11.4.2 Cumulative Effects

Alternative A

Because this alternative would not generate any direct or indirect effects, no cumulative effects are associated with Alternative A.

Action Alternatives

Cumulative effects for botanical resources will be tracked at the project area level, with the addition of known occupied rare plant/whitebark pine habitat immediately adjacent to the project area. Cumulative effects may accrue in the habitat for the species discussed above in conjunction with past, ongoing, and future activities and those proposed within the project area.

A variety of activities, including transportation management, prescribed burning, logging, mining, and grazing, have occurred within the watershed in the past, and active mining claims and grazing permits occur within the project boundaries. Recreational use has increased and includes summer and winter motorized and non-motorized vehicle use, dispersed camping, campgrounds, and hunting/fishing. Noxious weed treatments and firewood collecting are ongoing.

Vegetation Management and Associated Activities—Numerous timber-related, silvicultural and timber stand improvement activities have occurred within the project area. Direct and indirect impacts of timber harvest and thinning to rare plants and potential habitat may be temporary to short term, unless site characteristics are permanently altered and as long as seed/plant propagules are available from surrounding sources. If old skid trails have not been rehabilitated or have been used multiple times, compacting soils or damaging underground root systems, the impacts may still be ongoing. Selective logging or high grading can impact regrowth and may alter species composition and, in turn, rare plant habitat. If past harvest activities involved overstory removal or clearcutting, changes may have occurred in factors directly affecting plant growth (soil quality, water availability, weed invasion, changes in LWD, microbial activity, and seed dispersal). Treatments reducing conifer density may have provided beneficial impacts for species occupying early seral habitats (small phacelia in aspen) or forest openings (moonwort ferns). Past vegetation management activities would have had little impact on whitebark pine, with the possible exception of individual trees located outside the more typical habitat and elevation range for the species.

Proposed vegetation management activities are predicted to have a low risk of impacting rare plants/whitebark pine or habitat, with effects ranging from none to short term in nature, due to either low habitat quality, lack of activity in suitable habitat, or protections offered through design features or mitigations. This low risk of impact reduces negative cumulative effects.

Past timber harvest practices in riparian or wet areas may have been less restrictive than those currently in place, impacting habitat for various species occurring either within the project area or nearby. The proposed project would use practices and incorporate design features to protect riparian habitat (Design Features FF-1, 5; FH-5, 19, 24, 27; IS-10), reducing negative cumulative effects.

Reseeding with nonnative grasses/forbs or undesirable species following timber harvest or fires can delay the return of native species to the site (Geier-Hayes 1995). This past practice has been typical for both the Forest Service and private landowners along roadsides, log landings, and other areas of ground disturbance. As part of Design Features FH-19, FH-24, IS-3, IS-4, and SE-8, a botanist would be consulted on seed selection for areas where seeding is deemed necessary (e.g., skid trails, fire lines, landings) following project implementation, to ensure that appropriate species are selected. Using native seed is preferable if available; otherwise, short-lived native cultivars could be used to provide soil stabilization as long as native recolonization is not compromised. No negative cumulative effects are expected from seeding associated with proposed actions.

Transportation Activities—Past road construction and, to a lesser extent, trail construction represent a virtually permanent commitment of botanical resources as long as they remain in service. If these routes are constructed in rare plant habitat or through a stand of whitebark

pine, a permanent loss of plants or habitat is expected. Even if a route is later decommissioned, conditions may no longer be capable of replicating suitable habitat; neither may the habitat possess readily available seed/plant propagule sources. Recovery may be long term or may not return to habitable condition in the foreseeable future. Restoring vegetation following the closure of temporary roads may take many years, and success may be affected by the degree of initial soil disturbance.

Proposed road/trail construction and reconstruction activities are not generally located in high-quality rare plant habitat, although common native plant communities would be impacted. No construction or decommissioning activities are proposed in known occupied habitat or PCAs or areas identified with high potential for occupancy (Figure 3-108 and Figure 3-109). Risks of negative cumulative effects for rare plants and whitebark pine are low relative to transportation activities and reduced further through Design Features RP-1, RP-2, and RP-3.

Ongoing road maintenance may affect rare plant habitat (e.g., for wetland species) in roadside seeps and drainages and around culverts. These areas are constantly subject to disturbance by equipment during ditch and culvert cleaning activities. Often, the scraped material is deposited on top of other vegetation. The combination of this activity and the proposed road treatments in the project area would likely reduce the amount of long-term suitable habitat. Impacts to rare plant habitat may occur in uplands too. Plants lining roads in either riparian or upland locations also receive a constant application of dust when the road is routinely graded or as a result of normal vehicle traffic, in addition to the threat of physical damage. This exposure to dust reduces photosynthetic and transpiration capability and may, over time and in combination with proposed road treatments, negatively impact the quality of rare plant habitat along roadside seeps and riparian areas as well as upland areas. These same effects may be generated by trail maintenance, although at a lesser scale.

Past and current road and trail maintenance have contributed to the above-described effect in the project area. Occupied Sacajawea's bitterroot/whitebark pine habitat may be impacted by routine maintenance of NFS road 380a to Pilot Peak Lookout; however, no new transportation-related activities are proposed in that part of the project area and, therefore, no resulting cumulative effects would occur. Road/trail maintenance associated with new construction or reconstruction in the project area would contribute to these described effects for habitats at lower elevations into the future. Maintenance activities necessary in riparian areas have the greatest potential to impact botanical resources; however, properly sized culverts may require less damaging maintenance than those currently functioning improperly, with a decreased chance of severe road-damaging blowouts.

Although individual maintenance actions may affect only a small area or feature, over time, the loss of suitable habitat through road/trail maintenance activities may grow incrementally.

Wildfire and Prescribed Burning—In early August 2015, a lightning-caused wildfire burned 66 acres near Pilot Peak, with about 8 acres inside the Becker project area within occupied habitat for Sacajawea's bitterroot (PCA) and whitebark pine. Handline was constructed around the fire perimeter. Direct affects to whitebark pine from fire and fire suppression actions are thought to be minimal (M. Feiger, Mores Fire Resource Advisor, pers. comm.), but effects to Sacajawea's bitterroot have not yet been assessed. Direct impacts from fire to the plants are expected to be minimized by the timing of the event; the plants

were likely retracted below the soil surface at that time. Direct/indirect impacts to individual plants and habitat via suppression efforts (fireline construction, vehicle and foot traffic, dust, particulate matter from smoke/ash) may have occurred. However, because no project activities are proposed in the fire area and because Design Feature RP-2 would largely reduce risk from proposed fuels activities to occupied (PCA) and high-quality potential habitat for Sacajawea's bitterroot around Pilot Peak, no cumulative impacts are expected relative to this event.

In 1989, 2 large fires also burned in the north end of the project area (Gold Fork, Sawmill), affecting over 2,000 acres. These burns may have impacted some riparian (Bryum moss, small phacelia, moonwort ferns) and upland (Sacajawea's bitterroot, Sierra sanicle, Leiberg stonecrop) rare plant habitat, particularly along the ridge between the Crooked River and Lowman Watersheds. Individual whitebark pine may have been impacted, but the fires generally occurred below the elevation typical for the species. Because 25 years have passed since these fires, herbaceous vegetation should have largely recovered, although local environmental conditions may have been altered through forest overstory reduction. The southern end of the watershed has escaped large fire activity. Due to the passage of time and lack of effects from these fires to whitebark pine, no cumulative effects for rare plants/whitebark pine relative to past wildfires should occur.

Prescribed burning is part of the past, proposed, and likely future actions for this project area. It is proposed for almost the entire area, but would remain outside high-elevation lands north and east of Pilot Peak where whitebark pine and Sacajawea's bitterroot habitat occurs (Design Feature RP-2). Depending on time of year and intensity, impacts from prescribed burning to potential habitat could range from none to light in open, sparsely vegetated and rocky habitat carrying low fuel loads, and from light to moderate in more vegetated areas. Design features would be in place to reduce the risk of prescribed burning to rare plants and whitebark pine (Design Features RP-1, RP-2, RP-3). Beneficial effects could occur for species associated with aspen stands or canopy gaps. Typically, the results of prescribed burning should not be long term and overlap of past and proposed activities is not anticipated.

Weeds and Weed treatments—Noxious and undesirable nonnative weed species are abundant on the Idaho City Ranger District and exist within the boundaries of the project area. Past disturbance and current use of the area have created and continue to create areas susceptible to invasive species. Undesirable nonnative plant species, especially those with invasive characteristics, pose a threat to natural ecosystems by competing with native plant species for resources (USDA Forest Service 2010a). Nonnative species threaten suitable habitat for rare plant species. Although no documented invasive populations currently overlap known occupied rare plant/whitebark pine habitat, much of the project area is susceptible to weed invasion (BNF GIS layers), and weeds are present in suitable habitat for other species.

Proposed ground-disturbing activities have the potential for increasing weed colonization vulnerability. To reduce the cumulative effects of weeds and weed treatments resulting from the combination of past disturbance (activities that enhanced opportunities for weed colonization, e.g., grazing, timber harvest, road and trail construction, recreation facilities) and the actions proposed here, weed treatments and suppression must be actively and

successfully executed. Measures to reduce the introduction and spread of weeds in the project area are part of Design Features IS-1 to IS-11.

Treatment of noxious weeds is an ongoing activity on the Idaho City Ranger District in conjunction with Boise County. Between 2012 and 2013, all major road corridors infested with weeds in the project area were treated (BNF facts database). The advantage gained with weed treatments generally outweighs possible negative effects, which can result from herbicide application to nontarget species. Although most of the Idaho-listed noxious species in the project area occupy dry, harsh habitats, some exceptions occur (e.g., the riparian species Canada thistle and oxeye daisy) that might damage potential rare plant habitat in roadside seeps and drainages. The associated affects to rare plants from using biocontrols are not known. Mechanical weed treatments may inadvertently and negatively impact rare plant habitat.

Due to the difficulties of controlling weed populations and the negative impacts to other resources (including rare plants and potential habitat and possible residual effects of past herbicide applications in the environment); the ongoing weed treatments program; and the potential for new or expanded future invasions, cumulative effects from the presence of weeds and weed treatments should be expected.

Recreation (yurts, rental cabin, organized/dispersed camping, winter and summer motorized/non-motorized recreation, hunting)—Recreational activities may or may not involve ground-disturbing events that would impact rare plants or their habitat. Constructing yurts or other buildings, campgrounds, and trails that were built on or near rare plants or habitat may have had detrimental impacts. Continued operation of these facilities/activities should not greatly contribute to new negative impacts to rare plants or whitebark pine if additional ground disturbance is not incurred and if project design features regarding the spread of noxious weeds/invasive species are implemented (Design Features IS-1 to IS-11).

Proposed construction of new trails and trailheads and conversion of roads to trails is primarily confined to areas outside high-quality rare plant habitat and outside the typical range for whitebark pine. No known overlap is likely to occur with occupied habitat. Introduction or spread of weeds during the construction or future use of these trails and facilities, contributing to the effects of weeds already associated with existing facilities and trails, would generate negative cumulative effects. Design features for invasive species (Design Features IS-1 to IS-11) would help reduce risks, although they would not eliminate the probability of cumulative effects (see "Weeds and Weed Treatments" section above).

Firewood Cutting—Firewood cutting and gathering is an ongoing activity within the project area. Cutting of live or dead whitebark pine for firewood is prohibited (BNF 2015 Fuelwood Map, USDA Forest Service 2015a). Although the removal of other dead trees may not have an impact upon rare species, the method of removal and the chance for the spread of noxious weeds/nonnative invasive species during the process may. Prohibiting cutting firewood within RCAs and the vegetation types (e.g., dry Douglas-fir) in which most firewood is harvested helps diminish direct impacts to rare plant species and habitat; however, weeds are easily spread to surrounding locations. To avoid cumulative effects resulting from the combination of disturbances attributed to firewood cutting and the proposed actions, public education about weed spread during various activities needs to be pursued in conjunction

with weed treatments and suppression. Firewood cutting activities, therefore, may indirectly contribute to negative cumulative effects.

Grazing—The Boise Basin and North Fork Allotments are past and ongoing activities in the project area. Sheep grazing typically uses high-elevation ridgetops, riparian areas, and aspen stands, overlapping with occupied and high-quality potential habitat in the project area, for both whitebark pine and rare plant habitat.

Sheep grazing typically occurs annually in at least a portion of the project area, but routes can vary each year. In 2014, the Thorn Creek band of 900 ewes and lambs passed to the southeast of Pilot Peak, traveling northeast through the project area following the Lowman/Crooked watershed divide and exiting south of Banner Mine, arriving at the Crooked River shipping corrals around August 10. After the lambs were shipped, this band was combined with another dry band that passed through the project area during late August/early September in the reverse direction, entering the project area north of Banner Mine and exiting north of Pilot Peak. Whether either group passed through occupied whitebark pine or rare plant habitat is unknown, but both pathways cross through potential habitat. In early August, Sacajawea's bitterroot had likely receded below the ground surface level, but indirect effects of trampling are possible (soil compaction, erosion, effects to pollinators and supporting habitat). Other undocumented rare herbaceous species may also be present. Effects to mature whitebark pine may be negligible, but trampling of seedlings may occur.

In addition to possible herbivory or trampling, invasive species (see "Weeds and Weed Treatments" section above) may also be introduced through grazing. Grazing, therefore, may directly or indirectly contribute to long-term negative cumulative effects.

Mining—Historic mining activities (any type) would have caused DD to native plant communities and rare plant habitat (e.g., Mammoth Mine in adjacent Upper Grimes Watershed is in or near occupied Sacajawea's bitterroot, whitebark pine, and Pacific onion habitat). In areas where the disturbance was severe (e.g., Banner Mine area, Hell or High Water, general placer mining), the species composition and distribution may not be the same as it was historically. These heavily disturbed sites are often difficult to revegetate due to topsoil and native seedbank removal. Sites may become heavily infested with species thriving on disturbance (e.g., noxious weeds). Past and current mining activities contribute negatively to the cumulative effects for rare plants via the initial removal of vegetation, followed indirectly by competition from incoming invasive nonnative species onto disturbed lands.

Special Use Permits (SUPs)—SUPs contributing to effects on rare plants or whitebark pine include the Pilot Peak Lookout, which is currently under permit to Idaho Power as a communications site. The building and access road were constructed in occupied Sacajawea's bitterroot habitat, with whitebark pine occurring in the surrounding area. Ongoing use of the communications site is contributing to long-term negative effects to Sacajawea's bitterroot as a result of dust from road use and maintenance (see the "Transportation System" section above). Any future expansion of the footprint of existing facilities or parking would likely negatively impact the local Sacajawea's bitterroot population; however, with no project proposals overlapping the use of the communications site, no cumulative effects would be generated.

The Idaho Transportation Department Waste Site (NFS road 025M) is an area of disturbance susceptible to colonization of nonnative species. This site is included in the Idaho City Ranger District treatments program. The site is an open expanse of soil/rocks that is repeatedly disturbed, and weeds are inadvertently brought in from other locations. Weed seed is then redistributed as the rock material is needed at other locales. Weeds at this location contribute to the ongoing weed management work on the Idaho City Ranger District and may be spread to locations of suitable rare plant habitat. This, in turn, would contribute cumulatively to negative effects to rare plants/whitebark pine from weeds relative to ground-disturbing activities proposed in the project area.

Determinations—Despite slight differences between alternatives in terms of rare plants and whitebark pine, all action alternatives result in the same determinations for the species (Table 3-146).

3.12 INVASIVE PLANT SPECIES

The following changes were made between the Draft EIS and FEIS:

Discussion about Canada thistle was updated to include a population discovered through additional field reconnaissance within the project area.

This section incorporates by reference the nonnative/noxious weed technical report (project record), which contains the detailed data, methodologies, analyses, conclusions, maps, references, and technical documentation. This section summarizes the effects of the alternatives to nonnative/noxious weeds and addresses the issues that proposed management activities may increase the risk of exposure to noxious weeds, affect the ability to detect and monitor weed populations, and provide access and financial resources to treat established infestations in the project area.

Nonnative plants are species that do not have their origin in a local area. Nonnative plants include noxious weeds—plant species that spread aggressively and are difficult to manage (GAO 2005). Noxious weeds present the most immediate and disruptive threat to ecosystem function of those nonnative plants present on the Forest (USDA Forest Service 2004b, Idaho State Department of Agriculture 2011).

Of the 65 different species of noxious weeds designated by Idaho state law (IDAPA 02.06.22), spotted knapweed, diffuse knapweed, yellow star-thistle, leafy spurge, and rush skeletonweed are focus species of primary concern on the Forest (USDA Forest Service and USDI BLM 2000). In the Becker project area, 3 of these species are present. Infestations of these invaders can substantially change overall biological diversity by affecting the amount and distribution of native plants and animals. They can also negatively affect recreational experiences, forest regeneration, wildlife and livestock forage, native plant resources associated with tribal rights, landscape and soil productivity, fire cycles, nitrogen cycling, riparian and hydrologic function, and water quality (Lacey et al. 1989, Duncan 1997, USDA Forest Service 2004b, Idaho State Department of Agriculture 2011).

3.12.1 Analysis Scale, Data Sources, and Methodology

3.12.1.1 Analysis Scale

The following spatial and temporal scales are used for the noxious weeds effects analysis for the Becker Integrated Resource Project. Spatially, direct effects were tracked at the project-area level (19,371 acres), with a 5-mile buffer for indirect and cumulative effects (147,328 acres). These scales were chosen to include contiguous infested habitat outside the project area boundaries and account for the ability of invasive species to spread. Temporally, temporary (0–3 years), short-term (3-15 years), and long-term (15+ years) timeframes were used to depict effects to indicators.

3.12.1.2 Data Sources

The following resources supplied the data used in this analysis:

- Boise National Forest noxious weed/invasive plant inventory and monitoring data
- Partner (Boise County) noxious weed/invasive plant inventory, and treatment and monitoring data
- Other field survey notes/data (project record)
- Forest Plan noxious weed susceptibility GIS spatial layer and related geodatabase

3.12.1.3 Methodology

The *Interior Columbia Basin Final Environmental Impact Statement* identified lands highly susceptible to noxious weed invasion (USDA Forest Service and USDI BLM 2000). The susceptibility ratings were based on vegetation cover types and precipitation zones exhibiting a high frequency of invasion and presence. Further refinement of the noxious weed susceptibility evaluation was conducted during the Forest Plan revision process and documented in the 2003 FEIS (USDA Forest Service 2003a).

The effects disclosure between alternatives compares identified populations of Idaho-listed noxious weeds and the areas characterized as susceptible to the 5 primary focus species described in the *Interior Columbia Basin Ecosystem Assessment*; in the Becker project area, those focus species include diffuse knapweed (*Centaurea diffusa),* spotted knapweed (*C. stoebe* ssp. *micranthos*), and rush skeletonweed (*Chondrilla juncea*). The effects disclosure also analyzes the overlap between known infestations—which include, additionally, populations of the Idaho-listed noxious weed species Canada thistle (*Cirsium arvense*), gypsyflower (hound's tongue; *Cynoglossum officinale*), and Dalmatian toadflax (*Linaria dalmatica* ssp. *dalmatica*)—and acres proposed for vegetative treatments, fuels and prescribed fire treatments, recreational facilities construction, miles proposed for road and trail reroutes/construction (system roads/trails or temporary), road/trail closures, road decommissioning and status changes, and culvert treatments. This information provides a relative comparison of potential risk for further introductions and spread of noxious weeds.

3.12.2 Analysis Process and Indicators

The focus of the analysis includes the vectors, or potential weed pathways, identified below:

- **Roads—**Road construction, decommissioning, and/or redesignations are proposed under the majority of action alternatives. Most existing infestations within the project area are along or have originated from roadsides, as vehicle traffic provides ideal means for noxious weed spread along travel corridors. Roads and their associated vehicle traffic are the largest contributors to noxious weed expansion and pose the most difficult challenge to manage.

- **Vegetation Management Activities and Fire—**Vegetation management activities and fuels and prescribed fire treatments are proposed under all action alternatives. These ground-disturbing activities and associated equipment transports influence the expansion of noxious weeds. Risks can be reduced with localized site restoration and rehabilitation. Opening of forested canopies created with either fire or mechanical means in the drier forest vegetation groups (e.g., PVGs 1 and 2), which cover about half of this project area, can also influence the spread of existing infestations and the establishment and growth of new infestations, more so than in moister forest vegetation groups.
- **Recreation Areas and Use—**Trail and/or trailhead construction is proposed under all action alternatives. In addition to the ground-disturbing activities associated with these actions, recreational activities can contribute to the introduction and spread of noxious weeds. Changes in road/trail status are also considered. Motorized and non-motorized recreational activities are likely the second most common vector of weed seed transport and establishment because of the minimal control of weed-infested vehicles on NFS roads and trails. Initial infestations for noxious weeds and exotic plants frequently occur in conjunction with trailheads, trails, campgrounds, and other developed recreation sites.
- **Culvert Removals—**Culvert removals/replacements are proposed under all action alternatives. Culverts are associated with roads, the primary means of noxious weed expansion. Ground-disturbing activities create new sites for weed colonization. Dry fill slopes and riparian banks support different weed species, according to the plants' moisture requirements.

The following 3 analysis indicators (section 3.12.2.1, section 3.12.2.2, section 3.12.2.3) represent metrics used to describe the cause-and-effect relationships between components of the proposed action and desired conditions for a weed management program. Although the goal is to eliminate invasive species when possible, where it may not be possible, weeds are managed to minimize introduction and spread. The effects of an integrated weed management program depend largely on the implementation effectiveness of detection, prevention, control, containment, and monitoring practices.

3.12.2.1 Risk of Exposure

Concern: The risk of exposure is affected by the level of activities that either transport weed seed or create potential sites for new seedlings to establish within an area. For example, the amount of vehicular traffic, recreation, and stock use and other forms of dispersed recreation can affect the potential risk for seed dissemination. Soil or ground-disturbing activities such as fire, construction, or logging can also affect the number of potential sites for new seedlings to become established.

The magnitude of risk of invasive species establishing or expanding in any given location is related to the degree of the ground disturbance (exposure of mineral soil versus a relatively undisturbed ground surface), proximity of available seed/plant propagules, and means of transport. Inherently, areas of greatest disturbance in or near a weed seed source carry the highest risk of exposure and are the focus of most concern, from a management perspective, in an effort to prevent invasion and expansion.

Measurement

- Vectors (modes or activities capable of invasive species transport): Roads and trails, vegetation management, fire, recreation activities and facilities, culvert installations or removals
- Number of acres, road miles, or points of development overlapping documented infestations: These areas are assumed to be at risk, as well as generating greater risk of exposure to uninfested surroundings
- Number of acres, road miles, or points of development overlapping areas of susceptibility for the identified focus species

Assumptions

- Invasive species occurring (along with any new occurrences) outside areas of the project's proposed ground disturbance would continue to be treated and monitored under the Idaho City District Weed program (current weed treatment under agreement with Boise County).
- Inventory, treatment, and monitoring for weeds relative to the Becker project implementation may be conducted using Forest Service employees (under agreement, e.g., with Boise County) and/or other contractors. Costs may vary by implementer.
- Priority for treatment (including inventory and monitoring) of noxious weeds within the Becker Integrated Resource project area would be based on current known occupancy and risk of spread and introduction relative to proposed ground-disturbing activities. Lands proposed for ground-disturbing activities coincident with or adjacent to noxious weeds or weed vectors, and that carry a high susceptibility risk due to geographic and vegetative characteristics, would be identified as high priority for treatment. Lands where no known or nearby weed occupancy exists, where geographic and vegetative characteristics typically carry a lower susceptibility risk, and where proposed activities are expected to result in little to no ground disturbance would be a lower priority for weed treatment actions.
- Detection of weeds in areas of lower priority for treatment (e.g., unroaded/untrailed lands prescribed for vegetation or fuels treatments with no known infestations, few vectors, at lower risk for weed invasion, and potentially geographically remote) depends on observations by Forest Service employees (i.e., those in timber/silviculture, fuels, recreation, engineering, resources) and contractors working in areas where activities are to be implemented (as in Design Feature IS-5).
- Acres of noxious weeds are recorded as the total area over which an occurrence is spread. Actual plant distribution and population density varies within any given polygon, but the average occupation is assumed to occur at a rate of approximately 10%–20%.

- Estimated occupation of RCAs by invasive species is only displayed under vegetation treatments. Weeds in the RCAs are not mapped separately apart from uplands; therefore, the number of infested acres in vegetation treatments represents estimates based on the ratio of upland to RCA in any given specified polygon. Types of herbicides applied in the Becker project area are the same inside and outside RCAs, although the reporting criteria differ. See the nonnative/noxious weed technical report (project record) for additional information on herbicide application in RCAs.
- For the vegetation treatments, the area occupied by invasive species overlaps the activity/ natural fuels and the activity-fuels–only treatment blocks. Therefore, acres occupied by invasive species are only displayed by vegetation treatment, with the assumption that the distribution of invasive species is the same in areas where activities overlap.
- Snow travel is not discussed as a vector of invasive species. The risk of exposure would be very low in winter; occupation of these areas by invasive species is covered under summer activities.
- Prescribed burns would be conducted at low to moderate levels of intensity and severity. Although small pockets of higher intensity or severity may occur, levels would average low to moderate across the landscape (fuels specialist report [project record]).

3.12.2.2 Ability to Detect and Monitor Weed Populations

Concern: Noxious weed detection is strongly connected to the frequency and length of time various management activities occur in an area during the year, consistency between personnel to detect or document sites, and the amount of visitation by the general public. For example, in areas where other resource management activities are low and administrative visits are infrequent, the likelihood of detecting new noxious weed populations is also low. If a new infestation becomes established, a couple of years could potentially pass without detection, thus creating a large weed seed source that could take several years to eliminate. In one documented instance, the Supplemental Draft Environmental Impact Statement for the Frank Church–River of No Return Wilderness (Intermountain Region and Northern Region) reported an actual scenario where a new weed infestation expanded from 2 to 15 acres in a 3-year timeframe (USDA Forest Service 1999). Thus, the ability to detect and monitor weed populations can influence the size and density of new weed populations.

Measurement

- Amount of use and visitation in area, including estimates for persons conducting weed inventories or treatments, other Forest employees, and Forest visitors who may report weed infestations; measurement would be qualitative (i.e., high, medium, low) for comparison between alternatives

3.12.2.3 Ability to Treat Established Infestations

Concern: The ability to treat established infestations is affected by the accessibility, financial flexibility, or treatment restrictions associated with an area. The degree of accessibility would influence the costs, logistics, timing, and scope of treatment. Also, effective treatment depends on the application of chemicals, bio-controls, fire, or other means (e.g., mechanical)

during certain time windows. If not treated at the correct phenological stage, eradication or control effectiveness is reduced. In addition, the ability to finance treatments may be limited, given that some activities (e.g., timber harvest) and associated funding sources may not be allowed in certain areas.

Measurement

- Accessibility (distance, allowable mode of transportation) to infested sites; accessibility affects treatment costs and logistics for treatment
- Timing (i.e., the ability to access/treat at the most effective time)
- Presence/absence of nontarget plant species and sensitive environments that may be impacted by weed treatment and may limit access or treatment methods

Assumptions

- All acres are inventoried and all acres require post-implementation monitoring.
- Cost is estimated as if inventory/treatment/monitoring were to be implemented through a cooperative agreement with Boise County.
- Weed treatment rate would be $80/acre where motorized access is available and $120/acre where access is via non-motorized means.
- Costs may be lower if
  - pre-treatment inventory is conducted by qualified Forest personnel working concurrently in the area and
  - the area is demonstrated to be weed free or otherwise not in need of follow-up treatment and monitoring.

3.12.3 Affected Environment

3.12.3.1 Risk of Exposure

Idaho-Listed Noxious Weeds

Noxious weeds have already altered plant communities within the 19,371-acre project area. Within the Becker project area perimeter, 6 species of Idaho-listed noxious weeds have been identified: diffuse knapweed (*Centaurea diffusa)*, spotted knapweed (*C. stoebe* ssp. *micranthos)*, rush skeletonweed (*Chondrilla juncea)*, Canada thistle (*Cirsium arvense*), gypsyflower (hound's tongue; *Cynoglossum officinale*), and Dalmation toadflax (*Linaria dalmatica* ssp. *dalmatica)* (Table 3-148). The most serious infestation to date within the project area is from spotted knapweed, occurring across approximately 17% of the project area (this percentage excludes portions of weed populations that cross outside the project boundary), followed closely by rush skeletonweed, at about 13%. In much of the project area, these species co-occur. Mapped weed populations appear most prevalent adjacent to roads and trails.

Within 5 miles of the Becker project area boundaries, an additional 5 Idaho-listed species are found (Table 3-149). Weeds within this buffer area are identified and displayed because several of these have a high potential rate of spread and may provide source material for new or additional populations within the project area boundary.

Table 3-148. Acres of mapped infestations of Idaho-listed noxious weeds within the 19,371-acre project area

Invasive Noxious Weed		Mapped Acres of Infestation Inside Becker Project Area[a]	Average Annual Rate of Spread (%)[b]
Common Name	Scientific Name and Symbol		
Diffuse Knapweed	*Centaurea diffusa* (CEDI3)	44 (+16)	18–40
Spotted Knapweed	*C. stoebe* ssp. *micranthos* (CESTM)	3,318 (+137)	24–40
Rush Skeletonweed	*Chondrilla juncea* (CHJU)	2,556 (+526)	10–50
Canada Thistle	*Cirsium arvense* (CIAR4)	T[c]	10
Gypsyflower (Hound's Tongue)	*Cynoglossum officinale* (CYOF)	19 (+18)	Unknown
Dalmatian Toadflax	*Linaria dalmatica* ssp. *dalmatica* (LIDAD)	1,010	8

[a] Mapped portions of populations crossing out of the Becker project area boundary and immediately adjacent are included (indicated in parentheses).
[b] Sources: Karl et al. 1996, USDA Forest Service 2003a.
[c] 2015 field survey information (project record); this occurrence not yet logged in Boise National Forest database (project record).

Table 3-149. Species of Idaho-listed noxious weeds present within 5 miles of the Becker project area boundary

Invasive Noxious Weed		Infestation Acres within 5 Miles of Becker Boundary	Average Annual Rate of Spread (%)
Common Name	Scientific Name and Symbol		
Hoary Alyssum	*Berteroa incana* (BEIN2)	29	Unknown
Nodding Plumeless Thistle (Musk Thistle)	*Carduus nutans* (CANU4)	0.6	15
Canada Thistle[a]	*Cirsium arvense* (CIAR4)	304	10
Field Bindweed	*Convolvulus arvensis* (COAR4)	0.1	Unknown
Oxeye Daisy	*Leucanthemum vulgare* (LEVU)	64	Unknown
Scotch Cottonthistle	*Onopordum acanthium* (ONAC)	0.3	16
Diffuse Knapweed[a]	*Centaurea diffusa* (CEDI3)	635	18–40
Spotted Knapweed[a]	*C. stoebe* ssp. *micranthos* (CESTM)	15,981	24–40
Rush Skeletonweed[a]	*Chondrilla juncea* (CHJU)	9,403	10–50
Dalmatian Toadflax[a]	*Linaria dalmatica* ssp. *dalmatica* (LIDAD)	904	8
Gypsyflower[a]	*Cynoglossum officinale* (CYOF)	907	Unknown

[a] These species are also present inside the Becker project area boundaries.

Within the 5-mile buffer surrounding the project area, spotted knapweed and rush skeletonweed are also the dominant weed species (Table 3-149). Gypsyflower is more widespread in this buffer area than in the project area itself, covering an acreage similar to that of Dalmatian toadflax within the buffer zone. Diffuse knapweed is also present in more substantial quantity outside the project area boundaries. In the RCAs, Canada thistle is a noxious weed of concern, spreading rhizomatously and appearing in small patches that may

go undetected. A small occurrence of this species was discovered during 2015 field surveys near one of the culverts proposed for replacement in the Becker project area.

Interior Columbia Basin Ecosystem Assessment Focus Species

The analysis area also has been assessed for its susceptibility to the 5 invasive noxious weed focus species, as identified in the Interior Columbia Basin Ecosystem Assessment (Table 3-150). The assignment of susceptibility ratings is based on vegetation cover types and precipitation zones possessing a high frequency of invasion and presence. Susceptibility areas for several species overlap each other within the analysis area.

Table 3-150. Susceptibility to and presence of the 5 invasive focus species within the 19,371-acre project area and 5-mile buffer

Invasive Noxious Weed (Focus Species)	Area Characterized as Susceptible to Focus Species, Becker Project Area (Acres)	Focus Weed Species Occupying the Becker Project Area (Acres)	Project Area Occupied by Focus Weed Species (%)	Focus Weed Species Occupying the 5-Mile Buffer Surrounding Becker Project Area (Acres)
Diffuse Knapweed *Centaurea diffusa* (CEDI3)	0	60	<1	635
Yellow Star-thistle *C. solstitialis* (CESO3)	0	0	0	0
Spotted Knapweed *C. stoebe* ssp. *micranthos* (CESTM)	0	3,455	18	15,981
Rush Skeletonweed *Chondrilla juncea* (CHJU)	13,173	3,082	16	9,403
Leafy Spurge *Euphorbia esula* (EUES)	10,664	0	0	0

In the case of the project area, the Interior Columbia Basin Ecosystem Assessment model does not represent what is occurring on the ground for all 5 species (Table 3-150). Spotted knapweed represents the heaviest infestation in the project area, which the model characterizes as unsusceptible.

Within the project area, spotted knapweed appears to occupy habitat similar to that of rush skeletonweed; in most instances, these populations co-exist. As well, diffuse/spotted knapweeds have similar potential spread rates to rush skeletonweed—up to 40% and 50%, respectfully (Table 3-148). Modeling for rush skeletonweed may be more representative of suitable conditions for spotted knapweed. The models for leafy spurge and yellow star-thistle still appear accurate; neither species is documented in the project area nor in the surrounding 5-mile buffer.

Spotted knapweed, rush skeletonweed, and Dalmatian toadflax (not a focus species) are the primary weeds of concern in the project area. The highest risks of exposure are associated with those species, and the greatest investments in detection, monitoring, and treatment are needed to bring them under control. Mapped populations of diffuse knapweed and gypsyflower within the project area are still of manageable size (Table 3-148).

Vegetative Cover Types and Fire Regimes as Indicators of Weed Susceptibility

Upland vegetative cover type can be used as a general indicator of weed susceptibility. PVGs (forested habitat types sharing similar environmental characteristics, site productivities, and disturbance regimes) typically found at lower elevations supporting drier suites of climax, seral, and understory species (i.e., dry Douglas-fir and ponderosa pine vegetation types, particularly PVG 1 [Dry Ponderosa Pine/Xeric Douglas-fir] and PVG 2 [Warm Dry Douglas-fir/Moist Ponderosa Pine]) are at greater risk of weed invasion because of the relatively harsh conditions, particularly following disturbance. Weeds are able to subsist, even thrive, under conditions that have often become unfavorable for the native plant community. The southeastern two-thirds of the project area largely comprise these dry types, transitioning to moister and/or higher-elevation types across the north and west sides up to the Crooked River/Lowman watershed divide.

Fire regimes can also act as relative indicators of weed susceptibility. Lands described as having a nonlethal fire regime include PVG 1 and PVG 2. Under these conditions, the fire return interval may be frequent (5–25 years) and, while not lethal to the larger, more fire-resilient species such as ponderosa pine, fire may expose additional mineral soils vulnerable to weed colonization. Where fire occurs with high frequency, native plant communities may be suppressed through a reduction in successful reproduction, allowing disturbance-tolerant species (such as noxious weeds) to become established. The fire regime patterns across the project area mimic those described by vegetation groups, with more nonlethal regimes on the eastern side, grading to regimes of less frequency but higher intensity moving west and upwards in elevation. Risk of weed establishment also may be greater in areas where the vegetation is out of its desired range, leading to combinations of species or conditions that result in higher fire intensity or severity, expose larger areas of mineral soil, and create greater disturbances.

3.12.3.2 Ability to Detect and Monitor Weed Populations

Weed infestations are monitored and treated through the Forest Noxious Weed Program. The Forest is included in the Boise Basin Cooperative Weed Management Area (CWMA), where landowners and agencies work together to improve weed control using integrated pest management. Integrated pest management uses all available control techniques, including mechanical, cultural, biological, and chemical, and applies the most appropriate, effective, and light-on-the-land techniques available (IWMTF 2004). Early detection and rapid response, or EDRR, methods have been employed for several years to eradicate new outbreaks before they become established, or to contain infestations not eradicated, across and around the analysis area. Specific direction for weed treatment options and methods within the project area are documented in the nonnative/noxious weed technical report (project record). Figure 3-110 provides a spatial display of mapped populations of the Idaho-listed and focus noxious weeds documented within the project and cumulative effects analysis areas.

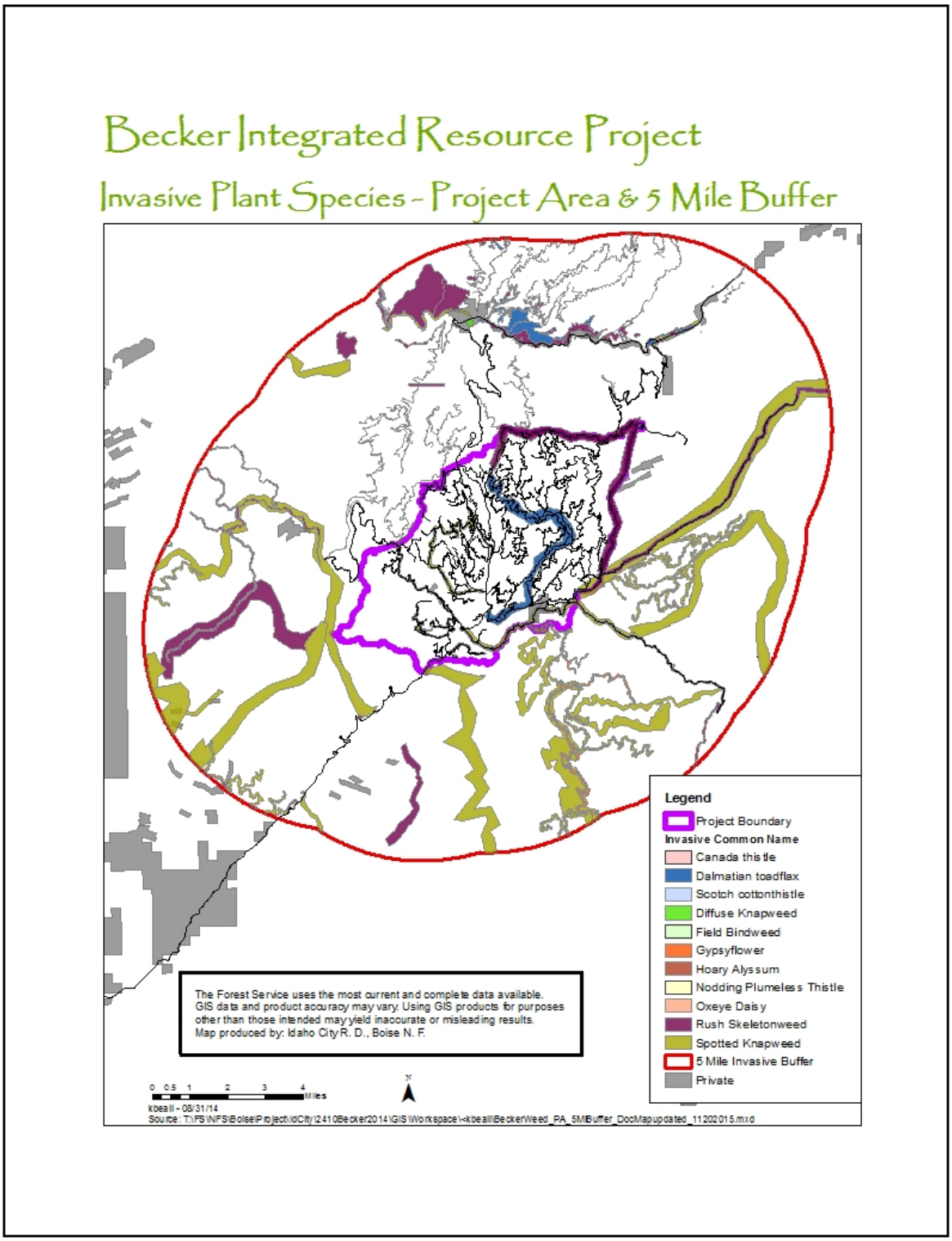

Figure 3-110. Weed infestation in the project area and surrounding 5 miles (species may not be visible due to overlap)

3.12.3.3 Ability to Treat Established Infestations

Invasive Species Treatments in the Becker Project Area

Current treatment of invasive plant species in the project area consists primarily of chemical herbicide applications, although all methods are considered part of an integrated approach to invasive species treatment. As a partner with the Boise Basin CWMA, the Idaho City Ranger District has a cooperative agreement with Boise County (USDA Forest Service 2014d) to inventory, treat, and monitor weeds on the Ranger District, including the project area. The direction in the 2014 agreement specifically addresses concentrating treatment within the project area, including inventory, monitoring, and treatment on motorized roads and dispersed recreation sites. The target for 2014 was 176 chemically treated acres, covering a total of 1,408 acres at a treatment cost of $14,000 (M. Feiger, Weed Partnership Coordinator with Boise Basin CWMA). Chemical treatments also occurred in the project area during calendar years 2012 and 2013 (Table 3-151). Multiple successive years of treatment are typically necessary to ensure that target plants have been killed and the seed bank exhausted.

Table 3-151. Chemical treatments of invasive plant species treatments within the project area during calendar years 2012 and 2013

Year	Product Applied	Active Ingredient	Total Product Applied (gal)	Amount of Active Ingredient Applied (lb)	Species Treated	Acres of Chemical Application	Cost @ $80.00/acre[a]
2013	Milestone	Aminopyralid	0.353	0.702	Rush skeletonweed Spotted knapweed	231.5	$18,520.00
2012	Milestone	Aminopyralid	0.183	0.367	Rush skeletonweed Spotted knapweed Gypsyflower Dalmatian toadflax Diffuse knapweed	290	$23,200.00
2012	Platoon UAP–Timberland	2,4-D Amine	0.125	0.475	Rush skeletonweed Spotted knapweed	37	$2,960.00
2012	Telar XP	Chlorsulfuron	0.038	0.028	Hoary alyssum	25	$2,000.00
2012	Tordon 22K	Picloram	0.325	0.65	Rush skeletonweed Spotted knapweed Hoary alyssum	87	$6,960.00
Total					Acres of Chemical Application	670.5	$53,640.00
Total inventory/monitoring acres in Becker project area, 2012 and 2013						5,364	

[a] Cost per acre/inventory-treatment-monitoring of weeds on lands accessible via motorized vehicle, charged by Boise County under agreement.

3.12.4 Environmental Effects

3.12.4.1 Direct and Indirect Effects

Alternative A (No Action Alternative)

Under Alternative A, no additional effect to the distribution and status of noxious weeds in the project area would occur, given that additional ground-disturbing management activities or changes to the transportation system are not proposed. Depending on changes in risk of exposure; continued ability to detect, access, and monitor new or expanding weed populations; and the success of ongoing treatments; current weed populations may expand or contract. New species of weeds may appear in the project area; most likely, one of the species from the 5-mile buffer surrounding the boundary would invade the project area.

All documented weed populations occurring on or near motorized roads and trails in the project area are being treated with herbicides by Boise County through a cooperative agreement. Weed treatment would continue as appropriate, and as funding allows, across the Idaho City Ranger District, including within the project area.

Effects Common to All Action Alternatives

Under the action alternatives (Alternatives B, C, D, E, and F), a variety of actions or activities are prescribed, ranging from those generating no ground disturbance (administrative status change that would result in no physical change on the ground) to those with extensive ground disturbance (road and trail permanent or temporary construction/reconstruction/realignment, road decommissioning with total recontour, trailhead construction, creation and use of skid trails and landings, culvert removals or replacements, and certain fuels activities such as pile burning). In areas of extensive ground disturbance, the risk of exposure (see section 3.12.3.1) to invasive species introduction and spread would increase, at least on a temporary basis. Changes in road/trail status may increase or decrease the risk of transportation corridors acting as weed vectors. Additional factors in calculating the risk of exposure to weed introduction or spread include the proximity of weed seed/propagules and the inherent environmental susceptibility of an area (i.e., low elevations, dry vegetation types, and high fire frequency or severity). Generally, the most vulnerable areas to weed introduction or spread would occur with the most proposed ground disturbance and environmental susceptibility.

Along with the risk of exposure, information regarding the ability to detect and monitor weed populations (see section 3.12.3.2) and the ability to treat established infestations (see section 3.12.3.3) is needed to assess the potential effects of any proposed activity or action on weeds. To successfully manage invasive species, their locations must be identified and documented, and the most effective treatment strategy determined, implemented, and monitored. Treatment actions must be performed in ways that are timely and financially manageable.

Alternative B (Proposed Action)

Vegetation management activities are proposed across the same acreage for Alternatives B, C, E, and F. All 3 of the project area's predominant weed species (rush skeletonweed, spotted knapweed, and Dalmation toadflax) are known in uplands and RCAs, primarily in proximity

to established transportation corridors. An increase in risk of exposure is expected with Alternative B through the tractor skid trails construction, ground-based logging systems (no helicopter logging is proposed under Alternative B), landing use, and temporary road construction. Risk of weed introduction and spread is high for these activities, but access to detect, treat, and monitor would also rise—at least through the implementation period. Overall costs of weed treatment in the area would increase. Activity fuels work generates a moderate risk, with the potential exception of burn piles (when in proximity to weed seed sources). Natural fuels treatment represents a low risk, as broadcast burns are expected to be light to moderate in intensity and severity; however, access would be more difficult and expensive if treatment was needed.

Transportation corridors serve as the primary vectors for weeds in the Becker project area, and a variety of road and trail proposed actions in Alternative B are in close proximity to weed sources. Alternative B would, in addition, decrease risk of exposure and maintain/decrease the ability to detect, monitor, and treat weeds on ML 2 roads in the process of conversion to ML 2 Admin [administrative use only] roads (due to changes in public access) or to ML 1 roads (due to closure to motorized vehicles). With respect to the other alternatives, Alternative B would convert the most mileage from ML 2 to ML 2 Admin. All 3 primary weed species are present at conversion sites, making it important to successfully treat existing weeds at a lower cost where access would decrease (e.g., ML 1). Road reconstruction, new construction (realignment) and, in some cases, road decommissioning involve a major amount of ground disturbance and carry a high risk of weed introduction and spread. These activities would increase weed management expenses—although, where motorized access is available, inventory, treatment, and monitoring would occur at the lower cost per acre. The amount of reconstruction, realignment, and decommissioning of unauthorized routes is essentially the same across alternatives. Alternatives B and C propose the least mileage of NFS roads to be decommissioned. Other types of road activities (conversion of roads to motorized or non-motorized trails) should pose a lower threat of weed introduction and spread because they involve less ground disturbance; however, all 3 primary weeds of concern are present where these conversions would occur. In the case of conversion to non-motorized trails, access to detect and monitor would decrease and treatment costs would increase.

Proposed culvert treatments are the same for all alternatives. Culverts are located within transportation corridors and often support weeds on the dry, gravelly fill slopes. All but one culvert is mapped as supporting rush skeletonweed and spotted knapweed; diffuse knapweed is also mapped at the Banner Creek/Pikes Fork culvert. The risk of exposure at these locations is high, although access to detect, monitor, and treat is also high (unless a road is closed after culvert removal).

Under Alternative B, new motorized trail construction is proposed on previously undisturbed ground and in old road beds, and all 3 primary noxious weeds overlap proposed construction. Although the risk of exposure would subsequently increase via the creation of new seedbeds and weed vectors, motorized access for weed management activities keeps treatment costs lower. Of all the action alternatives, Alternative B proposes the most mileage for new motorized trail. Alternative B also proposes the most use of ML 2 roads as mixed-use motorized trails and the most designation/conversion of ML 1 roads as motorized trails (for vehicles 50 inches wide or less), and all 3 primary noxious weeds overlap proposed changes

for motorized trails. The risk of exposure here is partially dependent on the amount of ground disturbance proposed. Although motorized trails act as vectors for weeds, they also create or retain the ability for detection, monitoring, and treatment at lower costs. A new motorized trailhead is proposed at Pikes Fork under Alternative B (and all other action alternatives except Alternative E). Construction would involve ground disturbance and weeds already occur on the site; however, the location of the trailhead at a major road junction allows easy access for continued weed management at the lower cost of treatment. Accessibility and treatment costs would be equal under all alternatives for the proposed Beaver Creek trailhead along State Highway 21.

Under Alternative B, non-motorized trails would be created as a result of authorization or conversion of unauthorized routes and ML 1 and ML 2 Admin roads, and all 3 major weeds found in the project area are present at most proposed non-motorized trail locations. Where minimal or no ground disturbance is involved, risk of exposure depends on the proximity of the sites to existing weed populations and visitation. Non-motorized trails have a lower risk of exposure, but also carry a lower ability to detect and monitor weeds. Weed treatments on these trail segments require the use of non-motorized equipment and are, therefore, more costly and time consuming. The exception is where the newly designated non-motorized trails overlays an ML 2 Admin road, retaining access for motorized weed management. In comparison to the other action alternatives, Alternative B falls in the middle of the range for proposed non-motorized trail mileage.

Alternative C

The effects of implementing Alternative C are expected to be very similar to those described for Alternative B. Alternatives B and C are similar with respect to vegetation management, skid trails or logging systems, landing use, temporary road construction, fuels treatment activity, and natural fuels treatments. Risk of exposure, ability to detect, monitor, and treat weed infestations, and cost of weed management would be essentially the same for this group of activities.

The same is true for most of the transportation system changes and culvert work. The exception is that Alternative C has about 25% fewer ML 2 road miles to be converted to ML 2 Admin than does Alternative B. Open roads carry a higher risk of exposure and are more likely to act as weed vectors than roads with restricted traffic. Although the overall ability to detect, monitor, and treat weeds and the cost of weed management would be the same for ML 2 and ML 2 Admin roads and for all the other transportation actions under Alternative C as compared to Alternative B, Alternative C carries a higher risk of exposure for roads than does Alternative B. After project implementation, Alternative C would have approximately 3 more miles of roads and trails open to motorized use by the public than would Alternative B. Proposed culvert treatments are the same under all alternatives.

Alternative C would have less new motorized trail construction and designation of ML 1 road to motorized trail (for vehicles 50 inches or less) than Alternative B. Slightly more ML 1 road miles would be authorized as non-motorized trail, and fewer non-motorized trail miles would be authorized on ML 2 Admin roads, than under Alternative B. The overall result is a decrease of 1 mile of motorized trail and almost 4 miles of non-motorized trails under Alternative C as compared to Alternative B. Trailhead accessibility and weed management costs at those locations would be the same as those found under Alternatives B, D, and F.

Alternative D

Alternative D has the most proposed vegetation management treatment and, subsequently, more skid trails, temporary road construction, use of tractor jammer logging systems and landings, and activity-fuels–only treatment than any other action alternative, and all 3 major weed species are present in these treatment areas. This means the greatest risk of exposure would occur under Alternative D; however, access to detect, monitor, and treat weeds would be relatively high, at least through the implementation period. Costs for treating skid trails would potentially be the greatest of any action alternative. Skid trails would be treated on an as-needed basis during and after implementation. No helicopter logging is proposed under Alternative D, and natural fuels treatments are the same as those found under the other alternatives.

Alternative D's culvert work and transportation system changes are similar to those found under Alternatives B and C. One exception is that Alternatives C and D each have about 25% fewer ML 2 road miles to be converted to ML 2 Admin than does Alternative B. Alternative D also has fewer ML 2 road miles to be converted to ML 1. Open roads carry a higher risk of exposure and are more likely to act as weed vectors than roads with restricted traffic or those closed to motorized vehicles. Although the overall ability to detect, monitor, and treat weeds and the cost of weed management would be the same (with respect to Alternative B) for ML 2 and ML 2 Admin roads and for all the other transportation actions proposed under Alternative D, Alternative D carries a higher risk of exposure for roads than does Alternative B. The latter is due to the fact that, after project implementation, Alternative D would have approximately 3 more miles of roads and trails open to motorized use by the public than would Alternative B. Proposed culvert treatments are the same for all alternatives.

Under Alternative D, new motorized trail or ML 1 roads converted to motorized trail would be designed for vehicles of 60 inches or less (including all UTVs), whereas new or converted trails under Alternatives B or C would be designed for vehicles of 50 inches or less (which would exclude most UTVs). Alternative D would have fewer miles of new motorized trail and ML 1 conversion to trail than Alternative B, but with greater ground disturbance occurring on a per-mile basis relative to allowed vehicle width. Slightly more ML 1 road would be authorized as non-motorized trail and fewer non-motnon-motorized trail miles would be authorized on ML 2 Admin Only roads under Alternative D than under Alternatives B or C. The overall result would be approximately 1 mile less of motorized trail and almost 4 fewer miles of non-motnon-motorized trail under Alternative D, as compared with Alternative B. Trailhead accessibility and weed management costs at those locations would be the same as found under Alternatives B, C, and F.

Alternative E

The total acres of vegetation management treatments under Alternative E are the same as those found under Alternative B. The greatest difference between Alternative E and the other action alternatives is the amount of helicopter logging. Alternative E incorporates 1,166 acres of helicopter logging; Alternative F incorporates 377 acres of helicopter logging; and Alternatives B, C, and D incorporate no helicopter logging. Helicopter logging would substantially reduce the miles of temporary road and skid trails and decrease the numbers of landings, although helicopter landings are typically larger than tractor landings. This

reduction in amount of disturbance would create a lower risk of exposure than other action alternatives, in addition to lower projected inventory and treatment costs for roads, trails, and skid trails than what is found under the other action alternatives. If lands outside roads and trails were to need weed treatment, the cost would be higher per acre for Alternative E than for the other action alternatives because more acreage would be inaccessible via motorized means. With respect to natural fuels treatments under Alternative E, the exposure risk would be the same as that found under the other action alternatives.

Under Alternative E the same mileage of ML 2 road would be converted to ML 2 Admin as in Alternative B, but fewer miles would be converted from ML 2 to ML 1; conversion to an "Administrative Use Only" designation would decrease the risk of exposure and retain the ability to detect, monitor, and treat weeds. All 3 primary weeds of concern are present in the locations where Alternative E's road and trail changes would occur. Following implementation, Alternative E would have fewer road miles than Alternatives B, C, and D, and, therefore, a lower risk of exposure and reduced road and motorized trail weed management costs. Proposed culvert treatments are the same for all alternatives.

No new motorized trail construction is proposed for Alternative E. Although motorized trails serve as vectors for weed spread and carry a higher risk of exposure, they also maintain accessibility for inventorying, monitoring, and treating weed populations. Alternative E proposes more miles of non-motnon-motorized trail than do the other action alternatives. While non-motnon-motorized trails have a reduced risk of exposure, access for detection, monitoring, and treatment also is decreased, and weed management actions would cost more to implement than where motorized access is available. Although the motorized trailhead would not be constructed at Pikes Fork under Alternative E, the proposed actions at the Beaver Creek trailhead would have the same effects as those occurring under the other action alternatives.

Alternative F

The proposed acres of vegetation management treatments under Alternative F are the same as those found under Alternative B; however, as with Alternative E, this alternative incorporates helicopter logging (377 acres). The result is fewer miles of temporary road and skid trails, along with fewer landings (although helicopter landings are typically larger than tractor landings), than proposed in Alternative B. Therefore, Alternative F would create a lower risk of exposure than other action alternatives (with the exception of Alternative E), resulting in a slightly lower expected cost for weed management on roads, trails, and skid trails as compared to Alternatives B, C, and D. For natural fuels treatments, the exposure risk for Alternative F would be the same as that found under the other action alternatives.

Under Alternative F, about 25% fewer ML 2 road miles would be converted to ML 2 Admin Only than under Alternative B, and fewer ML 2 road miles would be converted to ML 1. Open roads or trails carry a higher risk of exposure and are more likely to act as weed vectors than roads or trails with restricted traffic. Although the overall ability to detect, monitor, and treat weeds and the cost of weed management would be the same for ML 2 and ML 2 Admin Only roads (with respect to Alternative B), Alternative F carries a higher risk of exposure as compared to Alternative B. Alternative F proposes the greatest number of NFS road miles to be converted to trails (both motorized and non-motnon-motorized). After implementation, this alternative would have the same miles of roads and trails open to motorized use as

Alternative B and, therefore, similar overall risk of exposure and expense for detection, monitoring, and treatment. Proposed culvert treatments are the same for all alternatives.

Under Alternative F, new motorized trail, ML 2 Admin mixed-use motorized trails, or ML 1 roads converted to motorized trail would be designed for vehicles 60 inches wide or less (which would include all UTVs), whereas new or converted trails under Alternatives B or C would be designed for vehicles 50 inches wide or less (excluding most UTVs). Alternative F would have fewer miles of new motorized trail construction, ML 2 Admin mixed use, and designation/conversion of ML 1 road to motorized trail miles than under Alternative B, but with greater ground disturbance occurring on a per-mile basis, relative to the allowed vehicle width. The overall result would be approximately 3 fewer miles of motorized trail and approximately one-half mile less of non-motnon-motorized trails under Alternative F as compared to Alternative B. However, Alternative F would have more miles of motorized and non-motnon-motorized trails as compared to Alternatives C and D. Trailhead accessibility and weed management costs would be the same as those found under Alternatives B, C, and D.

Summary and Comparison of Effects

Table 3-152 represents the collective summary of differences between the action alternatives, assigns a ranking for the 3 primary indicators used in assessing a weed management situation, and compares relative costs.

Risk of Exposure focuses on the vectors most likely to facilitate weed movement (roads/trails, skid trails), degree of ground disturbance, the proximity of mapped weed populations, and environmental vulnerability. Activities generating the highest risk of exposure and posing the greatest threat of exacerbating the invasive species situation become the highest priority for weed management. ***Ability to Detect and Monitor Weed Populations*** and ***Ability to Treat Established Infestations*** refer to the ability and access to detect, monitor, and treat weed infestations.

The projected cost of treatment for the high and moderate priority activity groups are included as a fourth item. These costs combine treatment cost by access type and acres to be treated.

Comparisons between indicators are relative and not numerically scaled. The letter “M” represents the alternative with the middle value. Pluses indicate a positive or beneficial outcome and negatives represent a more challenging situation from a management perspective, or a greater expense.

Table 3-152. Final summary of action alternative comparisons for invasive plants, by indicator

Indicators	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F
Risk of Exposure	M	-	--	++	+
Ability to Detect and Monitor Weed Populations	++	M	+	--	-
Ability to Treat Established Infestations	++	M	+	--	-
Estimated Cost of Treatment	--	M	--	++	+
Overall Ranking for Invasive Species Management	1	3	4	2	

Note: Comparisons between indicators and alternatives are relative, not numerical. The letter "M" represents the action alternative with the middle value; pluses indicate a positive or beneficial outcome; negatives represent a more challenging situation from a management perspective, or a greater expense.

All action alternatives would generate a higher risk of exposure to invasive species (including focus species of concern) than Alternative A (No Action) in the short and the long term for the road/trail construction/realignment/reconstruction, vegetation/fuels management, conversion of closed roads for use by motorized vehicles, and construction of new recreation facilities activities. Risk would, however, be reduced through some actions, such as road decommissioning, road conversions to ML 1 or ML 2 Admin, and conversions from motorized to non-motnon-motorized use.

Additionally, the exposure risk of each action alternative is reduced through inclusion of design features based on Forest Plan standards to minimize or avoid the introduction and spread of noxious weeds. Design Features IS-1 through IS-10 require weed pretreatment and treatment effectiveness monitoring be conducted in areas of high risk for introduction and spread, that off-road equipment (e.g., skidders) is cleaned, and that seed mixes, organic matter, and other materials brought into the project area are weed free. Effectiveness monitoring would be required annually for 3 years following completion of project-associated activities. These features would minimize the potential for noxious weed introduction, dispersal, or establishment. In addition, Design Features FH-5, FH-10, FH-24, and TH-5g would also be expected to decrease the potential for noxious weed introduction or spread because they require applying approved seed and/or mulch to disturbed areas following road activities and landing reclamation activities. Descriptions of weed treatment options, features of the various methodologies and chemicals, standard operating procedures for herbicide application, and laws and regulations governing chemical use are detailed in the nonnative/noxious weed technical report (project record).

Any of the weeds surrounding the Becker project area may be transported into the project area through the vectors described in the *Analysis Process and Indicators* section above. These vectors include roads and trails, motorized and non-motnon-motorized use, equipment used for vegetation management activities, and even Forest Service personnel and vehicles. Generally, the more acres to be disturbed, the more vulnerable lands are to invasion of new weed species or additional introductions of those species already present.

No vectors (e.g., roads or trails) entering the project area from beyond the boundaries would be created or closed. Therefore, the opportunity for weed movement into (or out of) the project area from the 5-mile buffer zone would be the same for each action alternative.

Susceptibility models based on vegetation cover types and precipitation zones having a high frequency of invasion and presence were generated during the Interior Columbia Basin Ecosystem Project (USDA Forest Service and USDI BLM 2000) for 5 weed species (spotted knapweed, rush skeletonweed, leafy spurge, diffuse knapweed, and yellow star-thistle) of potential concern in the interior northwest. The susceptibility modeling provided mixed results for the project area (described in nonnative/noxious weed technical report, available in the project record). The project area was characterized as susceptible to rush skeletonweed and leafy spurge; however, of these 2, only rush skeletonweed is known to be present in either the project area or the surrounding 5-mile buffer. The models also considered the project area not susceptible to spotted knapweed, which—along with rush skeletonweed—actually exhibits the greatest presence and poses the greatest threat to the lands within the project area boundary. The project area was not characterized as susceptible to diffuse knapweed, which is present inside the project area and also in the buffer. The area is not categorized as being susceptible to yellow star-thistle, and this species has not been identified there. (Dalmation toadflax occupies about 1,000 acres within the project area, but was not a modeled focus species.) **Due to the lack of consistency in modeling results, projected susceptibility did not play a role in the final ranking of alternatives.**

Of the action alternatives, Alternative B receives the most favorable ranking for overall weed management when combining the indicators and cost. Although cost is relatively high in comparison to the other alternatives (based on the construction and maintenance of the most road and trail miles), Alternative B retains access for detection, treatment, and monitoring. With the most ML 2 Admin roads, this alternative decreases risk by limiting exposure and also maintains the lower cost-per-acre treatment options.

Alternatives C and D carry the most risk for exposure relative to skid trails, temporary roads, and full public access. Although Alternative D represents the most new ground disturbance in terms of vegetation management (thinning, activity fuels only, temporary roads, ground-based logging and landings), which opens areas for weed colonization, this alternative provides slightly better access while the project is being implemented. The additional skid trails would be costlier to access and treat, should that be needed; however, the overall costs of Alternatives C and D would be lower than Alternative B because those alternatives have fewer motorized and non-motnon-motorized trail miles to manage.

Alternative E carries the least risk for exposure to weeds due to road decommissioning, road conversions to non-motnon-motorized trails, the lack of a new motorized trailhead, and the fewest miles of skid trails. However, detection, monitoring, and treatment access would be more time-consuming and costly per acre for the decommissioned and ML 1 roads and non-motnon-motorized trails. Overall, projected weed management costs are lowest because fewer activity acres are proposed.

Alternative F receives the same overall ranking as Alternative E. Although it has a higher risk of exposure than Alternative E, it maintains a higher degree of motorized access and, therefore, lower projected weed treatment cost per acre. Costs would also be lower compared

to Alternatives B, C, and D because management for invasive species would need to occur on fewer acres.

3.12.4.2 Cumulative Effects

Alternative A

Because this alternative would have no additional or new direct or indirect effects for noxious weeds in the Becker project area, no cumulative effects would occur.

Action Alternatives

A 5-mile buffer around the Becker project area was used to analyze cumulative effects for invasive species. The distance of 5 miles was chosen because it encompasses populations most likely to generate effects in the project area in the future. All or at least a portion of all types of past, present, and foreseeable activities described below fall within the 5-mile buffer considered for invasive species.

Appendix B of the EIS outlines the past, ongoing, and foreseeable actions evaluated for inclusion in this analysis. Past management actions have been considered in describing the existing conditions of noxious weeds in the analysis area. Vegetation management activities, road and trail use and related activities (including culvert work and maintenance), authorized and unauthorized recreation activities, recreation facilities construction and use, fire (prescribed and wildfire) and fire suppression, activities authorized under SUPs, livestock grazing, mining, and the use of private land have all contributed to the current conditions. The assumptions used for each of the 3 primary indicators provide discussion on how the proposed actions function as vectors for weeds.

Many of these activities are ongoing or occurring at new locations within the buffer zone. Any and all of these actions may involve ground-disturbing activities in areas occupied by invasive plant species and would possess the potential to cumulatively contribute to the existing weed populations inside the Becker project area boundary through spread of existing populations or introduction from the outside. Although policy dictates that weed prevention is incorporated into all ongoing Forest Service actions, it is not possible to prevent all movement of weed seed or propagules across boundaries, especially when moved by natural means (e.g., wind, water, wildlife).

Reasonably foreseeable vegetation/fuels projects outside the Becker project area boundary include the Rocky Road Reoffer and the Lowman WUI Corridor. These projects would involve ground-disturbing activities and have the potential to cumulatively impact noxious weed conditions in the Becker project area through weed introduction or spread from the buffer zone, especially along travel corridors. As with activities proposed under the Becker action alternatives, however, noxious weed project design features would also be required during implementation of future Forest Service projects. The application of design features as part of new project proposals would be expected to minimize exposure risk for the introduction and spread of noxious weeds (as is expected with the current project).

Among the action alternatives for this project, differences exist regarding risk of exposure and the ability to detect, monitor, and treat infestations. Although Alternative E carries the lowest long-term risk for cumulative effects of weeds in terms of introduction or spread

along transportation corridors, it also carries a reduced ability to detect, monitor, and treat potential weed infestations emanating from the surrounding buffer area. Alternative D carries the highest risk collectively for vectors and the most ground disturbance, but retains the opportunity for access and treatment. Alternative C would be similar to Alternative D in terms of potential cumulative effects. Alternative F is similar to but not as favorable as Alternative E in terms of reduced vulnerability to weed infestation in the buffer zone, but it retains a greater ability to detect, treat, and monitor weeds. As far as vulnerability to invasion from the buffer zone, Alternative B lies in the middle. Although Alternative B has more road and trail mileage than the other alternatives, the retention of the ability to detect, treat, and monitor weeds, along with the decrease in full public accessibility, may make it the alternative most capable of maintaining or achieving weed-free status in the long term.

Both ongoing and future activities in and around the Becker project area have the potential for invasive species' introduction or spread inside the boundaries. Under any alternative, maintaining a strong weed management program across the Forest is the best defense against additional invasive species' introduction or spread. Thus, while current Forest weed management programs would likely not totally avoid the introduction of new populations and/or spread of existing noxious weeds in the project area, the weed management program in conjunction with design features would be anticipated to reduce the risk of exposure to invasive species and to contain and/or eradicate any newly occurring weed populations.

3.13 CLIMATE CHANGE

The following changes were made between the DEIS and FEIS:

General edits were completed to improve clarity and readability of the section.

3.13.1 Affected Environment

Resiliency is the ability of a system to absorb disturbances while retaining its basic structure and function. Resiliency is also the capacity of that system to adapt to stress and change. Landscape patches in a condition where disturbance and its effects operate similarly to historical conditions are considered more resilient than those departing from historical conditions (Millar et al. 2007, Peterson et al. 2011). The underlying philosophy in the 2010 Forest Plan is that vegetative conditions within desired levels allow natural disturbance processes to operate characteristically, which contributes to ecosystem resilience.

Historically, vegetation in the nonlethal fire regime was made up primarily of the large tree size class, dominated by ponderosa pine in the overstory and by openings in the understory with generally small (<1 acre) groups of smaller tree size classes (USDA Forest Service 2010a, Appendix A, Table A-1, p. A-3). Stands would be multistoried but primarily in groups that were discontinuous. Small amounts of Douglas-fir would be present.

The primary bark beetle would have been the western bark beetle, generally attacking the older ponderosa pine either singly or in small groups. Douglas-fir and dwarf-mistletoe would have been present, but fire would have helped prune dense brooms, reducing the overall level of dwarf-mistletoe plants in stands.

Frequent low-intensity fire and endemic levels of bark beetles and dwarf-mistletoe kept these forests relatively open, minimized Douglas-fir composition, and limited fuel buildup. Moderate-to-high intensity fires and occasional outbreaks of bark beetles occurred in some areas of heavier fuels or denser tree groups, as well as in moister areas where lodgepole pine, Douglas-fir, and subalpine fir were more prevalent. These types of disturbances were generally limited to small areas, such as steep northerly slopes, within the project area.

The mixed1 fire regime, like the nonlethal fire regime, historically comprised extensive areas of large tree size classes, primarily of ponderosa pine and Douglas-fir. A variety of size and species mixes of overstory and understory groups would have been present within or surrounding large tree patches. Due to the variety of nonlethal to mixed fire that would have occurred historically, groups would have been distinct from each other in some cases; in other cases, they would have been more continuous. Stand structure would have been diverse, with various-sized overstory groups containing large ponderosa pine and Douglas-fir occurring along with different-sized understory groups and openings. Western bark beetle mortality groups would have been larger, due to more extensive multistoried groups. Dwarf-mistletoe would have been more common, due to both the greater amount of Douglas-fir and less frequent fire.

Current vegetative conditions within the project area reflect past management activities such as mining, timber harvest, and fire suppression. Timber harvest from the 1960s through the 1990s resulted in a variety of plantations dominated by ponderosa pine. Due to past

commercial removal, large and legacy ponderosa pines are uncommon. Although large Douglas-fir trees were also removed, those that were infested with dwarf-mistletoe—making them undesirable as a commercial product—were left in many areas.

Because of fire suppression, the vertical and horizontal continuity of fuel loadings has increased, primarily as a result of high stand densities. In the absence of fire, climax species such as Douglas-fir in the nonlethal fire regime and subalpine fir in the mixed1 fire regime increased.

Higher stand densities have also increased levels of bark beetle activity across the project area. Western bark beetle-endemic populations have become sporadic epidemic populations in stands dominated or co-dominated by ponderosa pine. Small cyclic populations of bark beetles endemic to Douglas-fir have increased to become fairly long-term epidemic outbreaks. Larger and older Douglas-fir trees often die due to stress from dwarf-mistletoe infections. As a result, dead fuel loadings and continuity have increased because of higher levels of insect and disease mortality. This level of mortality, in combination with ladder fuels and increased stand densities, makes many of these stands more susceptible to lethal fire.

3.13.2 Environmental Effects

3.13.2.1 Direct and Indirect Effects

Alternative A—No Action

Alternative A would have no direct effects on the vegetative conditions that make forested vegetation more resilient to disturbances, including climate change. Over time, conditions (including species composition) would trend away from desired levels, and stand density would increase. Higher stand densities would lead to increased levels of bark beetle and dwarf-mistletoe and potentially higher-than-endemic levels of mortality from those factors.

The extent of snags, CWD, and subsequent surface fuel loadings would increase. Ladder fuels would be relatively continuous across the project area, increasing the risk of large-scale lethal fire similar to that which has occurred in recent years within and outside the project area. Resilience to insects, disease, wildfire, and climate change would decline. Early seral species, including ponderosa pine and Douglas-fir, would decline both from lack of regeneration and from mortality due to high levels of bark beetle and dwarf-mistletoe. Stand patterns within plantations would reflect past practices of homogenous spacing of the planted species. High densities developing both from growth of the planted trees and from natural regeneration would continue.

Eventually, bark beetles and dwarf-mistletoe increase mortality, which may create large openings; however, overall heterogeneity would be relatively low. As a result, Alternative A would continue to develop vegetative conditions that could respond uncharacteristically and undesirably to disturbances, including climate change.

All Action Alternatives

Silvicultural prescriptions applied under all action alternatives would be designed to move vegetative and fuel conditions toward desired levels. These treatments would, in turn,

increase tree vigor and reduce epidemic insect outbreaks and uncharacteristically high levels of dwarf-mistletoe.

The intent of the prescriptions would not be to eradicate disease and eliminate all potential for endemic insect levels, since these types of disturbance agents contribute to critical functional components such as snags and CWD. Instead, the treatments would create conditions within desired levels to provide for and sustain functions such as wildlife habitat and ecological processes such as fire. Fuel treatments, both natural and activity (i.e., fuels created by mechanical treatments), would be administered at levels that meet desired conditions for live and dead vegetative components.

Except for the harvest system in Alternative F, proposed vegetation treatments for Alternatives B, C, and F are the same. The total number of acres proposed for treatment under these alternatives is 13,428. Alternative D is identical to Alternative B, except that it includes 182 additional acres of treatment (13,610 total). The treatment units and acres in Alternative E are the same as those in Alternatives B, C, and F; however, Alternative E differs from the other alternatives due to an 18-inch diameter at breast height (dbh) upper limit on harvested trees and the use of yarding methods (feller-buncher and helicopter) on some acres.

Stands and landscapes are most resilient to disturbances, including those associated with climate change, the closer they are to desired conditions. Departures from desired species composition indicate lower levels of earlier seral species and higher levels of late seral to climax species. Seral species, in particular ponderosa pine, are generally more tolerant of warmer temperatures and lower amounts of precipitation, both of which are changes predicted to occur with climate change in the Intermountain Region.

High stand densities increase the water stress of individual plants. Across the Forest, the majority of annual precipitation occurs as snowfall. Summer rainfall is sporadic and often associated with wet monsoonal thunderstorms. The amount and duration of precipitation vary widely from year to year, however, and seasonal droughts are not uncommon (Hanson and Weltzin 2000). The stress on plants caused by drought is expected to increase with lower precipitation and higher temperatures. In addition to mortality caused directly by drought, drought-stressed plants are more vulnerable to mortality from insects and disease.

Alternatives B, C, and F

In comparison to Alternative A, Alternatives B, C, and F would move vegetative conditions closer to desired levels. Alternatives B, C, and F would increase the species composition of desirable early seral species, including ponderosa pine in the nonlethal fire regime and Douglas-fir in the mixed1 fire regime. Stand densities would decrease, which would, in turn, develop larger-canopied, more vigorous individual trees better able to withstand drought. Structural conditions and fuel loadings more consistent with the historical fire regimes would develop, improving resilience to disturbances. Treatments would promote structural conditions of groups and clumps that would allow some mortality to produce snags and CWD; however, in contrast to Alternative A, snags and CWD would be lower and more widely distributed spatially and temporally.

Alternatives B, C, and F would develop more spatial heterogeneity in the plantations than exists now. Over time, stand patterns more indicative of historical conditions would develop.

As a result, Alternatives B, C, and F would produce vegetative conditions within plantations that could respond more characteristically to disturbance regimes, including climate change, than would Alternative A.

The effects of Alternative F to vegetative conditions would be the same as those described for Alternatives B, C, and F, even though some acres would be subjected to different yarding methods (feller-buncher and helicopter).

Alternative D

Under Alternative D, an additional 182 acres would be treated. Effects would be the same as those described for Alternatives B, C, and F on the acres in common as well as the additional acres proposed for treatment.

Alternative E

Alternative E would treat the same number of acres, with the same methods, as would Alternatives B, C, and F; however, under this alternative, no trees greater than or equal to 18 inches dbh would be removed. Post treatment, the species composition of trees over this size limit would be the same as that for Alternative A. Treatments to smaller trees would increase the ponderosa pine and Douglas-fir species compositions: over time, the species composition of trees 18 inches dbh and greater would have a higher component of ponderosa pine and Douglas-fir as smaller trees moved into this larger class.

Large Douglas-fir with high levels of dwarf-mistletoe would remain, increasing the levels of dwarf-mistletoe within stands as compared to Alternatives B, C, D, and F, although the level of dwarf-mistletoe would be less than that found with Alternative A. Stand densities would be lower than those found under Alternative A and, although resilience of the overstory in the short term would be lower than that found in the other action alternatives, resiliency would improve over time. Effects within the plantations would be similar to those of the other action alternatives, although no changes would occur to trees with an 18 inches dbh and greater. Only a small proportion of the plantations contain these larger trees, however.

3.13.2.2 Cumulative Effects

Since the 1960s, approximately 108,880 acres of vegetation management activities have occurred outside the project area and within the analysis area for cumulative effects. These activities include reforestation (17,610 acres), timber stand improvement (7,330 acres), and other types of vegetation management (83,944). An ongoing project within the cumulative effects area is the Rock Creek Timber Sale, which lies northwest of the project area on the Lowman Ranger District. Fire suppression similar to what has occurred in the past would continue into the future.

Effects from older vegetation management activities (1960–1990) outside the project area would be similar to those that contributed to existing conditions within the project area. Effects from more recent and future treatments (2000 and forward) would be similar to the types of restorative actions described for this project.

Alternative A

Older untreated and undisturbed vegetation within and adjacent to the project area and within the analysis area for cumulative effects would continue to advance successionally, trending away from desired conditions. Areas of ongoing treatment (i.e., Rock Creek Timber Sale) would have reduced density, altered species composition, and increased heterogeneity.

However, the 2 treatment areas are small within the cumulative effects area and would do little to contribute overall to resilience of the larger area, so the risk of epidemic insect outbreaks spreading across large contiguous areas would increase. Disturbances such as insect epidemics, stand-replacing wildfire, and climate change could produce uncharacteristic effects across large portions of the area, which would further reduce the ability of the landscape to move toward desired conditions in the event of a disturbance.

Alternative B, C, D, and F

Within the cumulative effects analysis area, Alternatives B, C, and F would produce a greater diversity of heterogeneous conditions more consistent with the historical fire regimes than would Alternative A. The treated areas, in combination with the Rock Creek Timber Sale, would develop stand species composition, structural conditions, and insect and disease patterns that would break up the current continuity. Alternatives B, C, and F would produce a greater variety of groups and openings made up of diverse species, including early seral species. Therefore, if the cumulative effects area experienced disturbance, including wildfire and climate change, the treated areas would be more resilient and contribute to biodiversity within the landscape.

Cumulative effects of Alternative D would be the same as those for Alternatives B, C, and F on all acres, including the additional 182.

Alternative E

Over time, the cumulative effects of Alternative E would be similar to those for Alternatives B, C, and F. Initially, because of the 18-inch dbh retention limit, the overstory would be more similar to acres within the cumulative effects area that had not been recently treated. But over time, species composition of early seral species would increase due to proposed treatments below the 18-inch dbh retention limit. Overall stand density would be less than for untreated areas. In combination, resilience would increase compared to untreated areas.

3.14 MINERAL RESOURCES

The following changes were made between the DEIS and FEIS:

General edits were completed to improve clarity and readability of the section.

3.14.1 Analysis Scale, Data Sources, and Methodology

3.14.1.1 Analysis Scale

The following spatial and temporal scales are used to analyze minerals effects for the Project. Spatially, direct, indirect, and cumulative effects are tracked at the project area, as well as known mining activities and claims adjacent to the project area. This scale was chosen because the area is likely to be affected by proposed management activities for the project. Temporally, temporary (0–3 years), short-term (3–15 years), and long-term (15+ years) timeframes are used to depict effects to indicators.

Within or adjacent to the Becker project boundary, 49 sections were assessed for the presence of mining claims/projects.[34] Sections outside the project area were included if access routes were to go through the area. The following sections, identified by township and range, were analyzed:

- T.8N. R.8E—7 sections
- T.8N. R.7E—25 sections
- T.8N. R.6E—1 section
- T.7N. R.8E—2 sections
- T.7N. R.7E—12 sections
- T.7N. R.6E—2 sections

3.14.1.2 Data Sources

Data sources included field survey data, results of previous analysis in and near the Becker project area, and the Bureau of Land Management LR-2000 mining claim database.

3.14.1.3 Analysis Methodology

To complete the analysis, researchers evaluated current mining claims through the Bureau of Land Management's LR-2000 database, followed by a detailed search of project files in Idaho City. If it was identified that certain claims or projects could be impacted, a field evaluation was then conducted.

[34] The affected environment was assessed using legal descriptions compatible with the LR-2000 mining claim database.

3.14.2 Analysis Indicators

Mining claims or mining projects in the project area are indicators of concern for mineral resources. Assessment of the following factors was important for understanding how these resources would be affected by proposed activities under the various alternatives:

- Motorized access to mining claims and projects: Decommissioning of roads or seasonal closures that could impact motorized access to known mining claims and projects; culvert replacement that would impact short-term access to mining claims
- Disruption or displacement of mining proponents; project activities such as timber harvest, prescribed fire, or culvert replacements that could temporarily disrupt or displace mining proponents from their project sites
- Overlap of mine claims and proposed facilities in the project area

3.14.3 Affected Environment

The majority of mining activity, both past and present, exists along the Crooked River in the southern portion of the project area and just outside that area to the east on Banner Creek, Pikes Fork, and the Banner Mine Complex.

Current activities consist primarily of placer mining for gold along these river corridors. Placer mining is accomplished without the aid of earth-moving equipment (e.g., pick, shovel, and gold pan). Most mining is a secondary activity for weekend campers. Suction dredging is not allowed in this area. Intermittent surface and underground exploration has occurred in the recent past and is ongoing within the Banner Mine Complex, both on Forest and private lands. The Forest Service has received no plans for further development.

Historically, the Banner Mine Complex was a high-producing silver mine for the upper Boise Basin. Prospectors radiating out from the Boise Basin discovered placers on Crooked River in the summer of 1863. These were traced to a quartz lode on July 6, 1864, and the Banner Mine was located on August 8. A rush from Idaho City followed 2 weeks later. After a decade of arrastra production, G.W. Craft installed a mill in 1874, and capital from Elmira, New York, helped to further develop the district in 1878. Stamp mill reproduction at Banner continued for more than 10 years, with a considerable spurt in activity there from 1882 to 1884, ending in a $400,000 mine sale in 1884. Production totaled close to $3,000,000 worth of silver before the district shut down in 1921. (Idaho Historical Society 1985)

Evidence of past activities can be seen today throughout the Banner Mine Complex. Structures and waste dumps are present, and timber has been removed in the past to support construction. Below are discussions of the current status of the 3 indicators:

- Motorized access—Currently, motorized access is being maintained to known mining claims within the project area and adjacent assessed areas. During project design and external scoping, researchers identified the specific roads and locations where ongoing minerals activities occur and/or multiple mining claims exist; these include NFS roads 393, X384C, and X025M1. Culvert replacements on NFS road 312 that could also affect short-term access to mining claims were identified.
- Disruption or displacement—Activities such as road use and maintenance, trail use and maintenance, recreation activities, and fire suppression are ongoing within the analysis area. These activities could temporarily disrupt or displace mining proponents.
- Overlap—Mining claims and Forest Service facilities do not overlap in or adjacent to the project area.

In general, mining claim density is low throughout much of the project area. Few mining claims exist in the northern portion of the area, and the majority of claims exist along the Crooked River in the southern portion of the project area and just outside that area to the east on Banner Creek, Pikes Fork, and the Banner Mine Complex.

3.14.4 Environmental Effects

3.14.4.1 Direct and Indirect Effects

Alternative A—No Action

Implementing Alternative A (No Action) would have no direct or indirect effects on current mineral resources given that this alternative would maintain the existing access and opportunities within the analysis area. No change to the amount, duration, and/or frequency of minor disruptions and/or displacement of mining proponents by other uses in the analysis area would be expected with implementation of the No Action Alternative.

Mineral development in the analysis area would be maintained at the current level. Existing dispersed recreation uses, including camping, hunting, scenic driving, and fuelwood gathering, would likely continue in the project area. NFS roads and NFS trails open to motorized use in the analysis area, as illustrated on the Idaho City Ranger District's MVUMs, would remain open for designated use by season and be maintained accordingly to accommodate that use. No overlap of mining claims and Forest Service facilities would occur.

All Action Alternatives

For 2 indicators, the effects to mineral resources would be the same for all action alternatives. Because mining claims and Forest Service facilities do not overlap in or adjacent to the project area, no direct or indirect effects would occur under the action alternatives for this indicator.

Motorized Access

Up to 23 culvert treatments could occur throughout the project area; however, no culvert removals would result in long-term loss of access to existing claims, only short-term loss of access. Each culvert replacement would affect vehicle traffic from roughly 2 hours to 2–3 weeks, depending on the size and complexity of the replacement. Except for one replacement, all complex (2–3 weeks for implementation) culvert replacements have alternate routes for access.

The one exception is the Banner Creek culvert on NFS road 312 (T.8N. R.8E. S32), which would affect access to Graham, Jackson Peak Lookout, and the Trapper Flats area. Numerous claims are located past this culvert, but no alternate routes exist around the work site. No current or proposed plans of operations would be impacted by this culvert replacement. In addition, no notices of intent have been submitted in the past 2 years within the area that would be impacted by the action alternatives.

Three locations were identified where Design Feature MG-2 maintains access to areas with either road decommissioning or road status differing from the preliminary project design:

- NFS road 393—A portion of this road is scheduled for road realignment/decommissioning. The road plan was designed to maintain motorized access to 2 claims identified in this area.
- NFS road X384C—This unauthorized road has been the primary access to the Hell or High Water mining project. Under all alternatives, this unauthorized road would be converted to ML 2, Administrative Use Only, gated at the beginning and decommissioned 0.4 miles from the gate (distance to the main project area).
- NFS road X025M1—Under all alternatives, 0.36 miles of unauthorized road would be converted to ML 2, Administrative Use Only, and gated. This unauthorized road has been primarily used by the Idaho Department of Transportation as a disposal site, but it also leads to claims adjacent to Lamar Creek.

In addition to physical changes to roads that could affect access to mining claims, seasonal designation changes to roads were analyzed. No access issues were identified as a result of roads changed from open year-round to open seasonally (mid-June to mid-September).

Disruption or Displacement

The majority of mining activity within or adjacent to the project area consists of small-scale activity such as gold panning or using a non-motnon-motorized sluice. Most of this activity occurs on weekends or holidays, a conclusion supported by the lack of notices of intent submitted to the Idaho City Ranger District and by routine field inspections completed by the Forest Minerals Administrator.

All alternatives would likely result in short-term disruption or temporary displacement of mining proponents during project implementation due to noise, dust, and smoke from timber harvest (including helicopter logging) and prescribed fire in the analysis area. Although effects from noise, dust, and smoke would not stop claimants from their mining activities, temporary area closures would affect such opportunities. Given the limited mining activity and lack of major mining projects, however, disturbance to mining proponents would likely

be consistent with impacts to other NFS users and could range from several hours to several weeks.

Disturbance to mining proponents could also occur with log haul activities on NFS roads. However, Design Feature TH-3, which prohibits log hauls on weekends, major holidays, and the opening days of deer, elk, and turkey hunting seasons, would mitigate most conflicts between log haul operations and mining proponents when mining activity would be highest. If timber harvest or prescribed fire activities were anticipated to impact specific mining locations for more than 1 week, specific provisions could be addressed through Design Feature MG-1, submission of a notice of intent or plan of operations for mining activity. Additionally, prescribed fire operations occur in the spring and fall, which is outside the peak season for mining activities in this area.

Alternatives B, C, D, and F

Alternatives B, C, D, and F would likely result in additional short-term disruption and displacement from what is discussed above for all action alternatives to several mining claimants along Pikes Fork and Banner Creek, due to the proposed motor vehicle trail and trailhead at the junction of NFS roads 312 and 385.

The new trail would likely increase motor vehicle traffic, including ATV and UTV use, contributing to increased noise and dust. More use would also likely occur at dispersed campsites and the developed trailhead in the vicinity the motorized trail. Some of these campsites would be located within mining claims. Mine claimants could be temporarily displaced from access to campsites near their claims. Although this displacement would inconvenience mine claimants, it is unlikely they would be barred from accessing their claims.

The proposed motor vehicle trailhead is located within the boundary of federal unpatented mining claim IMC 212527. Based on field evaluations, some casual use (gold panning and non-motnon-motorized sluice) prospecting has occurred in Pikes Fork near the proposed location. The claimant has yet to submit a notice of intent or plan of operations for mining activity on this claim. A search of project files at the Idaho City Ranger District found no past plans of operation or notices of intent on record for this area.

The proposed trailhead would have minimal effect on the mining claimant's ability to develop this claim. Additional measures would be required for the claimant to work within the trailhead footprint. But given the footprint of the trailhead (roughly 0.5 acres) and the size of the mining claim (20 acres), the majority of the claim is available for immediate prospecting and development. Gold-bearing material would be evenly distributed throughout the claim, given the known composition and depositional history of the area. Neither past activities on this claim nor other supporting evidence suggests that this area of the proposed trailhead has higher mineral potential than the rest of the claim.

The Forest Service's right to manage surface resources on unpatented mining claims is authorized under section 4(b) of the Surface Resources Act, 30 USC 612(b) (1994). The Surface Resources Act authorizes the Forest Service to manage and dispose of resources found on the surface of unpatented mining claims, provided that uses of the surface by the United States, its licensees, or its permittees do not endanger or materially interfere with prospecting, mining, or processing operations or uses reasonably incident thereto. Barring

any evidence that this proposed trailhead endangers or materially interferes with established prospecting, mining, or processing operations or reasonably related uses, approval of this surface management action would be appropriate.

A certified mineral examiner (CME) should review all proposed plans of operation within the footprint of the proposed trailhead to determine whether unnecessary or unreasonable resource damage would occur. If the CME determines that the proposed plans are the next logical level of development, the CME should prepare a formal Surface Use Determination Report to be used in processing and approving the specific plan of operations. By locating these facilities, the responsible official would accept the risk that mineral development is possible and could impact the facilities. Given the lack of any recent, substantial placer-mining operations in this area, however, it is unlikely that profitable concentrations of gold-bearing material exist. Risk of mineral development would be minimal.

3.14.4.2 Cumulative Effects

Alternative A

No cumulative effects would be associated with this alternative because no direct or indirect effects would occur to mineral resources with implementation of Alternative A.

All Action Alternatives

Past Activities

Table B.1 in Appendix B identifies past activities considered in this analysis of cumulative effects. The impacts of past activities have contributed to the existing conditions for mineral resources in the analysis area; therefore, these impacts are included in the affected environment discussion (section 3.14.3).

Present and Ongoing Activities

Table B.1 in Appendix B identifies present and ongoing activities considered for this cumulative effects analysis. Ongoing activities are those such as road use and maintenance, trail use and maintenance, recreation, and fire suppression that would likely continue within the analysis area.

Minor disruptions and/or displacement to mining proponents in the analysis area could occur with ongoing activities related to recreation use, road and trail maintenance, and fire suppression, if they occur. Minor access disruptions could also occur during scheduled maintenance of NFS roads and trails in the analysis area, as has happened historically. In addition, to mitigate public health risks, safety risks, and hazards, areas could be temporarily closed to Forest users during fire suppression activities.

Reasonably Foreseeable Activities

Table B.1 in Appendix B identifies reasonably foreseeable activities considered for this cumulative effects analysis. No reasonably foreseeable activities are anticipated that would differ from present and ongoing activities, and no plans of operation are under review in the analysis area. Access disruptions could occur during scheduled maintenance of NFS roads and trails, as has happened historically. In addition, to mitigate public health risks, safety

risks, and hazards, areas could be temporarily closed to Forest users during fire suppression activities.

The cumulative effects of these activities would not "endanger or materially interfere with prospecting, mining or processing operations, or uses reasonably incident thereto" (FSH 2809.15; 36 CFR 228.8; 30 USC 601, et seq.).

Alternatives B, C, D, and F

Reasonably Foreseeable Activities

As with present and ongoing activities, however, road use and maintenance, trail use and maintenance, recreation, and fire suppression would likely continue within the analysis area.

Minor access disruptions could occur during scheduled maintenance of NFS roads and trails in the analysis area, as has happened historically. In addition, to mitigate public health risks, safety risks, and hazards, areas could be temporarily closed to Forest users during fire suppression activities.

3.15 SCENIC ENVIRONMENT

The following changes were made between the DEIS and FEIS:

General edits were completed to improve clarity and readability of the section.

3.15.1 Analysis Scale, Data Sources, and Methodology

3.15.1.1 Analysis Scale

The scenery analysis includes the area within the project boundary. Although some proposed actions may be visible from points or areas outside the project boundary, a visual resource analysis only considers the proposed action(s) that must meet the inventoried or mapped VQO. Exceptions can occur, but if a project meets an inventoried VQO from the foreground distance zone (within the project area) it will usually, by extension, meet that VQO from further distance zones, which may include areas outside the project boundary.

The temporal limits or duration of visual impacts, defined as the permitted amount of time for a management activity to create a reduction in form, line, color, or texture contrast to meet a specific VQO, are as follows:

- **Retention (R)—**Immediately post-project[35]
- **Partial Retention (PR)**—Within 1 year[36]
- **Modification (M)**—Within 1 year or meet other Regional/Forest or project/area guidelines
- **Maximum Modification (MM)**—Within 5 years

3.15.1.2 Data Sources

The project-level scenery analysis was produced using combined management direction provided by the Forest Plan (USDA Forest Service 2010a) and the Forest Service Visual Management System Handbook (USDA Forest Service 1973, 1974, 1995). In addition, project information was derived from site visits on June 16–18, 2014, various IDT planning meetings during the planning period, and GIS analysis.

[35] Relevant Boise Forest Plan Guideline (SCGU02): The duration of visual impacts from ground-disturbing and vegetation removal activities, to allow for herbaceous vegetation recovery of ground cover, may extend to 3 years in fgR (Foreground/Retention). Consider the timely initiation of reseeding in areas where natural recovery is questionable.

[36] Because this Forest Plan guideline is permitted/identified in a highly restrictive VQO (i.e., R), it is therefore hereby assumed that this guideline will also apply to the less restrictive VQOs of PR and M.

3.15.2 Analysis Process/Indicators

3.15.2.1 Scenery Resource Indicators

- Indicator 1—Skid trail and temporary road development/location
- Indicator 2—Landing development/location
- Indicator 3—Slash treatments and locations
- Indicator 4—Vegetative removal patterns/density
- Indicator 5—Prescribed fire and fireline development
- Indicator 6—Trail development density

3.15.2.2 Visual/Scenery Resource Analysis Process

The National Forest Visual Management System (VMS) has been used by the Forest Service since the early 1970s and provides the basis for describing acceptable degrees of landscape alteration on the Forest. This system describes a range of desired conditions but, more importantly, it provides ways to assess the potential visual effects of various proposals, relative to prescribed management objectives found within the current Forest Plan. Natural landscape features and viewer sensitivity (physical numbers and concern for the environment) help establish visual management objectives for any given area. All public lands within the Forest were first inventoried in the early 1980s. Since that time, the VMS has been routinely used to evaluate proposed activities and determine visual compatibility.

The visual analysis for a proposal on public lands starts with a description of the physical attributes comprising affected and surrounding landscape characteristics. This overall impression is created by a unique combination of visual features, which includes the land, existing vegetation, water, rock outcrops, and topography. In addition to physical landscape features, perceptual factors also help determine how visitors or highway travelers might perceive a proposed site alteration.

A proposed activity's attributes can then be assessed by the same method, and a comparison can be drawn between the existing environment and the proposed management activity. The degree of landscape alteration can be evaluated and a comparison made as to whether or not a proposal is consistent with inventoried VQOs and direction provided in the Forest Plan. Inclusive in this analysis is a project-level review of the adopted VQOs in order to ensure that VQO mapping, completed at a Forest scale, is accurate for the site. These planning guidelines and the management direction are provided to ensure Forest scenic values are protected and not compromised. All new proposals must remain consistent with the VQOs of the proposed areas of impact.

VQOs are identified using a combination of overlay data, including distance zones, sensitivity levels, and landscape variety class (each defined below). VQOs used on the Forest can be defined as follows (Figure 3-111):

- **Preservation (P)—**Reserved for Wilderness or Wilderness study areas, this VQO is not present in the project area.
- **Retention (R)—**Provides for ***management activities that are not visually evident to the casual Forest visitor***. Activities may only repeat form, line, color, and texture, which are frequently found within the characteristic landscape. Changes in size, intensity, or patterns should not be evident.
- **Partial Retention (PR)—**Provides for ***management activities that remain visually subordinate*** to the characteristic landscape. Activities may repeat form, line, color, or texture common to the characteristic landscape, but changes in their qualities (e.g., size, amount, intensity, direction, pattern) remain visually subordinate.
- **Modification (M)—Management activities may visually dominate the original characteristic landscape**. Activities typically introducing facilities such as buildings, signs, or roads should borrow naturally established form, line, color, and texture so completely, and at such scale, that the visual characteristics are compatible with the natural surroundings.
- **Maximum Modification (MM)—**Represents the lowest level VQO within the VMS.

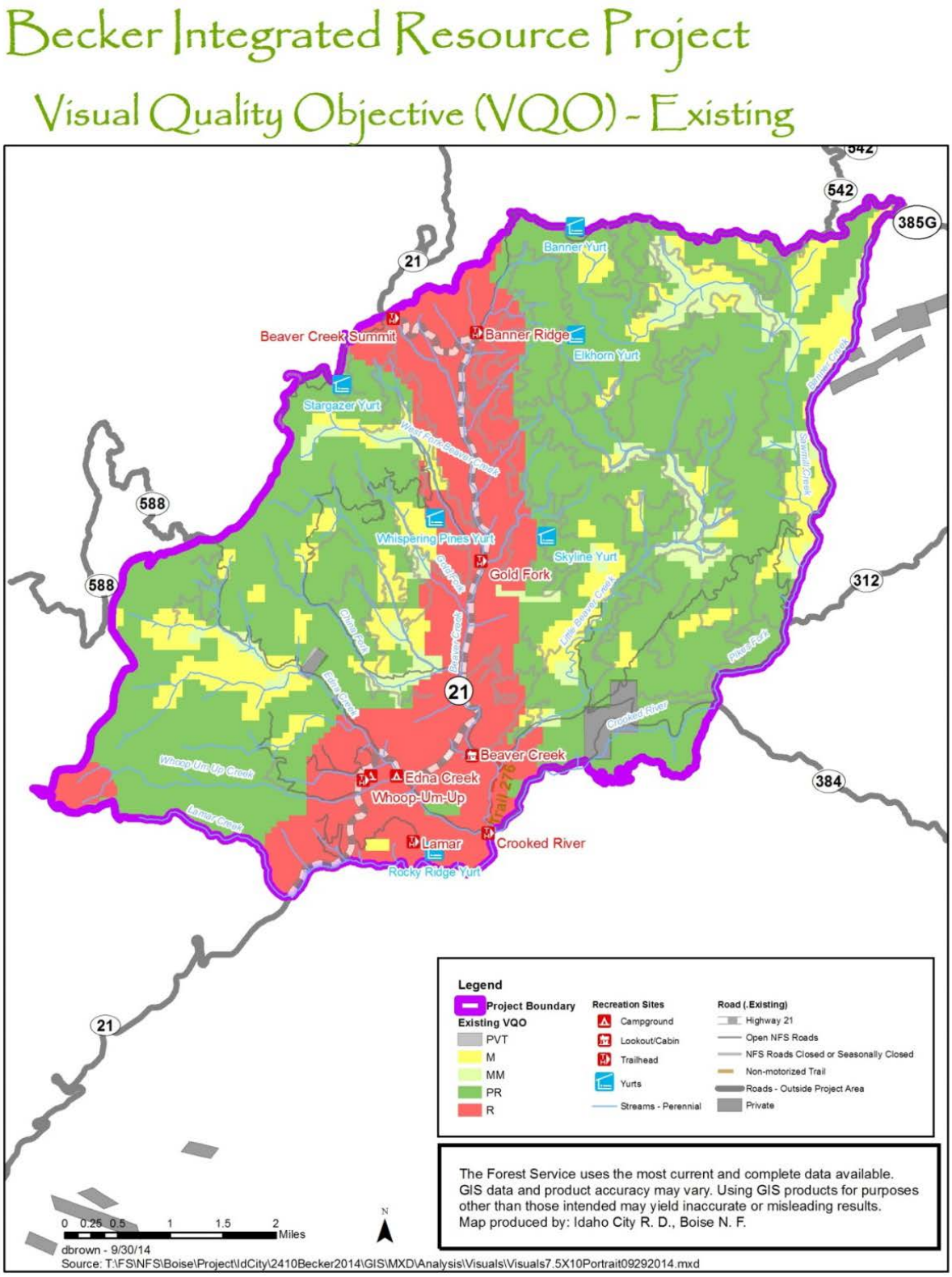

Figure 3-111. Mapped/adopted project area Visual Quality Objectives (VQOs)

3.15.2.3 Other Scenery Resource Considerations

Viewing Distance and Travel Routes/Use Areas

Distance zones are divisions of a particular viewed landscape and are used to describe the part of a characteristic landscape under inventory or evaluation. The 3 distance zones are 1) foreground (up to 0.5 miles from the observer), 2) middleground (between 0.5 and 3 miles from the observer), and 3) background (further than 3 miles from the observer). Management activities potentially visible within the project area are all located within the foreground or middleground distance zones. Although background views may occur, visual mitigations will be developed/reviewed from the applicable foreground or middleground distance zones, where they potentially have a greater impact.

Primary travel routes include State Highway 21 (Ponderosa Pine Scenic Byway) and all NFS roads and trails (summer and winter, motorized and non-motnon-motorized) within the project area.

The project area includes 6 yurts (Stargaze, Banner Ridge, Elkhorn, Skyline, Rocky Ridge, and Whispering Pines), 2 campgrounds (Edna Creek and Whoop-Um-Up), 4 existing trailheads (Banner Ridge, Gold Fork, Whoop-Um-Up, Lamar), 2 proposed trailheads (385/312 and Beaver Creek Summit), and the Beaver Creek rental cabin (Figure 3-112).

Figure 3-112. Typical project area recreation sites (Skyline Yurt, Beaver Creek rental cabin, Gold Fork Trailhead)

Viewer Sensitivity

People recreate within the project area and also use it to access other recreational opportunities; therefore, users would likely display a mid level or high level of sensitivity to the landscape character, equating to a Sensitivity Level of 1 (highest) or 2 (mid level) out of 3, as inventoried, mapped, and adopted in the Forest Plan (USDA Forest Service 2010a).

3.15.3 Affected Environment

A scenic-quality inventory is contingent upon establishing a physical, "on the ground" frame of reference. A frame of reference is developed by defining and mapping landscape character types, which are broad areas possessing distinguishing general physical characteristics unique or common to each particular physiographic unit. Each character type's physical characteristics are compared in terms of visual variety and attractiveness, both of which are

evaluated through the following classifications, or landscape variety classes: A (Distinctive), B (Common), and C (Minimal).

The Forest lies entirely within the Southern Batholith character type. This character type covers southcentral Idaho and is characterized by mountains of moderate-to-high relief and cascading streams with mature drainage systems. Common elevations range from 2,000 to 8,000 feet, with rare exceptions to 10,000 feet.

The Idaho City Ranger District is located in the eastern portion of this character type, and visual appearance is variable on NFS lands within the Ranger District. The rivers and streams are generally characterized by fast-moving, high-gradient water. Small waterfalls, pools, and islands are usually part of the visual character of water features. Streambed features are often visible due to clear water, except during runoff periods.

Landforms here appear rolling to mountainous, with strong stream-cut drainages. The vegetative patterns are reflected as a mosaic of brush/grass south slopes, timbered north slopes, and well-defined riparian areas and meadows. Vegetation primarily comprises conifers with shrub/grass types and aspen patches in wet, south-facing areas and mixed types in the riparian areas.

Natural features can be defined within any landscape in terms of 4 dominance elements: form, line, color, and texture. All 4 dominance elements are usually present within, but exert differing degrees of visual influence upon, the landscape scene. Within the proposed project area, the landscape character can be described as follows:

- **Form**—The project area is primarily situated within the valley of the Beaver Creek drainage, which drains to the Crooked River. Slopes within the project area range from narrow segments of flat, lowland riparian areas to moderate-to-steep mountainsides. Travelers will see large conifer stands and some limited aspen stands interspersed by open meadows. Landforms are generally dictated by the narrow viewsheds afforded by the steep drainages present. Strong valley bottom and ridgeline features are dominant.
- **Line**—The project area lies within a dominant river valley formed by Beaver Creek and its tributaries. The valley bottom is framed by adjacent mountains on each side of the drainage. Views toward the mountains and ridgelines show continuous conifer stands interspersed with occasional meadows. Travelers along NFS roads within the project area have either very confined corridor views of the forest along the road or, where limited breaks in vegetation are present, views of the adjacent dominant ridgeline along either side of the road.
- **Color**—The predominant vegetation is mostly coniferous, with varying shades of dark green throughout the year. Aspen and riparian vegetation occur in the lower elevations of the project area and provide lighter shades of green while leafed-out in the spring and summer and brown, red, and white bark colors during the fall and winter. Surrounding meadows are typically sage green to earthtone colors of tan or brown, with periods of more intense green during the spring. In the winter, these features would most likely display snow.

- **Texture**—Texture is directly related to viewing distance from identified affected priority travel routes and use areas (see Viewing Distance and Travel Routes/Use Areas above). A foreground viewing situation is usually considered to be from 0 to 0.25, or 0 to 0.5 miles to the observer. At these viewing distances, a high degree of individual detail is obvious, such as individual trees, branches, leaves or needles, flowers, and grasses. A middleground view is usually defined as a viewing distance from the foreground out 3 to 5 miles from the observer. Individual tree forms can still be discernible in very sparse or open landscapes. More often, vegetation becomes obscured and texture is characterized by masses of trees in stands of uniform tree cover.

3.15.4 Environmental Effects

3.15.4.1 Direct and Indirect Effects

Alternative A

Alternative A has no direct effects on the landscape character associated with the project area. No foreseeable change to the future landscape character would occur; therefore, the future scenic integrity of the project area would not change from the current conditions.

Potential indirect effects to the landscape character of the project area, if Alternative A is selected and no vegetative treatment occurs, would be loss of vegetation and land scarring associated with an increased risk of collapsed stands from insect and disease attacks or catastrophic wildfire, which would be beyond expected disturbance levels for this ecological system. This alternative could have a long-term major adverse effect and be more damaging to the scenic integrity of the project area because of the risk associated within the natural ecosystem fire regime. Because of the unnatural fuel buildup, an unmanaged wildfire could burn hotter and destroy native plants, permanently changing the vegetation composition of the forest and resulting in scenery with a negative appearance for up to 10 years and a different type of scenic expression thereafter. This change could potential decrease the ability of the forestlands to meet the established VQOs.

All Action Alternatives

Indicator 1—Skid Trail and Temporary Road Development

Skid trails and temporary roads (in tandem) are typically developed to haul timber and slash from the point of creation to a landing or haul road. Design Features SE-8, TH-5, TH-6, TH-7, and IS-3 (section 2.4.7) for skid trail and temporary road development would ensure their developments meet mapped VQOs where applicable.

Alternatives B, C, and D propose more skid trails than Alternatives E and F, which include helicopter logging. Alternatives E and F propose so few skid trails that their potential visual resource impacts would be minor, thus meeting or exceeding mapped VQOs.

Temporary road construction for all alternatives is confined to the south side of the project area near the Lamar Trailhead (not visible from State Highway 21), the west side of the project area outside of the sensitive foreground viewing distance of State Highway 21, and a few limited entry roads directly off State Highway 21 near Banner Ridge trailhead.

Alternatives B, C, and D propose constructing 3 temporary roads connecting to State Highway 21; Alternatives E and F propose one.

Potential scenery impacts from temporary roads and skid trails include the creation of an uncharacteristic linear feature visible on the landscape from travel routes and use areas that could potentially visually dominate a particular viewshed. Design Features SE-8, TH-5, TH-6, TH-7, and IS-3 were developed to mitigate the potential linear visual effects of these features. Wherever practicable, temporary roads and skid trails should be located so as not to be visible from primary travel routes and use areas. Although this restriction may extend the overall length of these features in order to ensure their routes remain outside of a particular viewshed, the net result, from a visual resource perspective, would be limited evidence of management activities.

Temporary roads and skid trails would be reclaimed after the project to ensure their impacts meet VQO restoration timelines, typically within 3 years post-project, as identified in the VQO guidance above (SCGU02; USDA Forest Service 2010a).

Indicator 2—Landing Development

Landings and staging or stockpile areas are typically developed for various logging systems staging/mobilization and as transfer sites to which materials are hauled from their point of origin and from which the same materials are hauled offsite.

Proposed design features for landings would ensure they meet mapped or adopted VQOs where applicable. Alternatives B, C, and D propose more landings than Alternatives E and F, which include helicopter logging. Alternatives E and F propose so few landings that their potential visual resource impacts would be minor, thus meeting or exceeding mapped VQOs.

The size, quantity, and location of landings can adversely affect scenic resources. Design Features SE-8, FH-6, FH-10, and FH-18 (section 2.4.7) were developed to mitigate these impacts.

Indicator 3—Slash Treatments

This indicator is qualitative (versus quantitative) because the overall quantity of the area treated matters less than the location in which the treatment is to occur and its relative visibility from travel routes and use areas (evaluated on a site- or area-specific basis). Various proposed slash treatments may affect scenic resources due to the potential visibility of this management action from project travel routes and use areas. Potential slash treatment options for this project include piling and burning or lopping and scattering the slash. Each treatment option includes design features developed to mitigate individual and collective effects on the scenery resource. Lopping and scattering slash is inherently more difficult to manage from a scenery resource perspective than piling and burning due to its potential to cover and affect a larger area, thereby potentially increasing visibility and requiring more intensive management. Design Feature SE-2 was incorporated to ensure this treatment option meets project VQOs where applicable. Therefore, slash treatments under all the action alternatives would not affect the scenic resources and would meet established VQOs.

Indicator 4—Vegetation Removal Pattern/Density

This indicator is qualitative (versus quantitative) because the overall quantity of the area treated matters less than the location in which the treatment occurs and the relative visibility of vegetation removal from travel routes and use areas (evaluated on a site- or area-specific basis). In addition, design features and careful placement can reduce the effects so that they appear natural in the characteristic landscape over time. Proposed vegetation treatments do not differ substantially enough between alternatives to require analyzing them individually. The additional treatment units on the south side of the project area for Alternatives C, D, E, and F (relative to B) include a couple of units off State Highway 21 and a couple of units off the Lamar Trailhead road.

Alternative E, however, proposes an 18-inch dbh limit, although effects to scenic resources should not differ enough to require a separate analysis. Rather, the remaining larger trees will further bolster visual screening potential. Conversely, the proposed removal of trees greater than 18 inches dbh is mitigated scenically through Design Feature SE-5, which requires retaining smaller screening vegetation in areas of the longest view duration (use areas) in order to ensure VQOs are met.

Other potential impacts include removing vegetation density, including openings and developed clearings, and stump visibility. The following design features were added to ensure that project VQOs would be met: IS-3, SE-3, SE-4, SE-6, SE-7, SE-9, and VM-7. With the addition of these design features, vegetation removal under the action alternatives would not affect scenic resources.

Indicator 5—Prescribed Fire/Firelines Development

This indicator is qualitative (versus quantitative) because the overall quantity of the area treated matters less than the location in which the treatment is to occur and the relative visibility of fire lines from travel routes and use areas (evaluated on a site- or area-specific basis). Fire on the landscape and its effects, natural or prescribed, does not necessarily negatively affect scenic resources because fire is a natural component of the characteristic landscape ecosystem. Fire's effects on the landscape, while dramatic, represent a natural part of the successional/regenerative system of the forest landscape in this area (SCGU17; USDA Forest Service 2010a). The additional acreage of broadcast burning proposed under Alternatives C, D, and E is consistent with the effects described above and does not require further analysis.

Fireline development/construction has the greatest potential to affect scenic resources; however, fireline development sensitive to the scenery resource is built into this project for all alternatives (except for the No Action Alternative, for which a fire line would not be developed). Additionally, the following design features were developed to ensure minimal scenery resource impact (VQOs would be met, where applicable) with respect to prescribed burning for all alternatives: SE-11 and RM-9.

Indicator 6—Trail Development Density

Proposed motorized and non-motnon-motorized trails and summer/winter trails can affect viewsheds and visitor experience/scenic quality. They can also be the very travel corridors from which visitor experience and scenic impacts are measured; as a result, their relative

density and type (e.g., motorized versus non-motnon-motorized) can negatively impact scenic resources.

Alternatives B, C, D, and F propose similar trail actions. The differences (relative to the scenery resource) are relatively minor route alignment changes that do not affect the overall project area route density. Proposed versus existing trail route densities are similar, when considered from an overall viewshed/scenery impact perspective. Trail density would continue to meet VQO thresholds under all action alternatives.

The ATV trails proposed in Alternatives B, C, D, and F would be developed at a smaller scale to accommodate ATVs (UTVs for Alternatives D and F only) instead of general vehicle traffic, which would reduce site impacts slightly; however, no differences exist between the effects of the ATV trail proposed under Alternatives B and C and the UTV trail proposed under Alternatives D and F. Alternative E does not propose a new ATV trail. The effects from trails to scenic resources, however, are expected to be similar for all alternatives.

Feature placement and development can affect scenic resources because roads linking to and crossing the trail system can create multiple opportunities for sightlines and road development visual impacts, such as the development of linear features, presence of erosion, and reduced screening. However, feature placement and development remain consistent with VQOs under all action alternatives.

Alternatives B, C, D, and F include a proposed motorized trailhead. The low development level and location (directly off/adjacent to NFS roads 385/312) would meet the mapped VQO of **Partial Retention**. Establishing a formal developed trailhead parking area should help mitigate some of the dispersed roadside parking impacts currently occurring in this area.

Winter trail development is the same under all alternatives; however, Alternatives C, E, and F propose a seasonal motorized closure area. Because the physical effect of winter use (other than trail development) is ephemeral in the sense of compacted versus noncompacted snow in season, the scenic measure is outside the temporal guidelines used to measure scenery impacts, which typically change over a 1-year to 3-year window. Therefore, the relative winter trail development impacts between action alternatives are considered negligible from a scenery resource perspective. Otherwise, winter trail development would also be used for spring, summer, and fall trails, as described above.

Design Features RM-4 and RM-8 were developed to ensure trail development standards would remain consistent with project VQOs.

3.15.4.2 Cumulative Effects

Existing developments within the project area have contributed to a landscape where some of the mapped or adopted VQOs require updating (see associated Nonsignificant Forest Plan Amendment in Appendix I). Reasonably foreseeable future actions that could affect scenic quality include ongoing highway and recreation site maintenance activities and continued recreational mining in the area. However, impacts from these activities are expected to remain reasonably similar to past and present impacts already analyzed for this project and are not, therefore, expected to critically affect the visual resource beyond the existing condition.

No other proposals or decisions have been identified that would affect the visual resource in the project area.

Considering the existing development level within the project area, mitigation measures and BMPs for potential and foreseeable developments and likely ongoing maintenance activities, and the minimal effect on the visual resource associated with the proposed project, cumulative effects on the visual resource associated with this project are not expected to exceed the existing or proposed VQOs, as described by these alternatives.

3.16 SOCIOECONOMICS

The following changes were made between the DEIS and FEIS:

General edits were completed to improve clarity and readability of the section.

3.16.1 Analysis Scale, Data Sources, and Methodology

3.16.1.1 Analysis Scale

The analysis area for direct, indirect, and cumulative effects comprises 4 counties in Idaho (Adams, Boise, Gem, and Valley) and 2 in Oregon (Union and Baker) (Figure 3-113). Boise County represents the main economic focus; the county's economic effect ripples throughout southwestern Idaho and northeastern Oregon. Because Boise County lacks lumber mills, the analysis area was expanded to include counties representing rural areas benefiting from the direct and indirect effects of timber products on employment and spending. (Ada and Canyon counties were not used for the timber analysis because their large populations result in a minor effect on the project activities.) To determine the appraised commercial value of each alternative, Emmett, Idaho, was used as the appraisal point. Forest Service Handbook direction (FSH 2409.18) requires forest products be appraised at the "most advantageous" location. The appraisal point is most advantageous when the total transportation costs, including road construction and road maintenance costs, are lower than the costs at other possible appraisal points. Commercial volume was based on stand exam data modeled in FVS. During field evaluation, actual acres and volume were reduced by 35% due to harvest system limits, species composition, and terrain. The appraised value of commercial material may change depending on actual cruised volume, potential purchasers, and location of milling facilities.

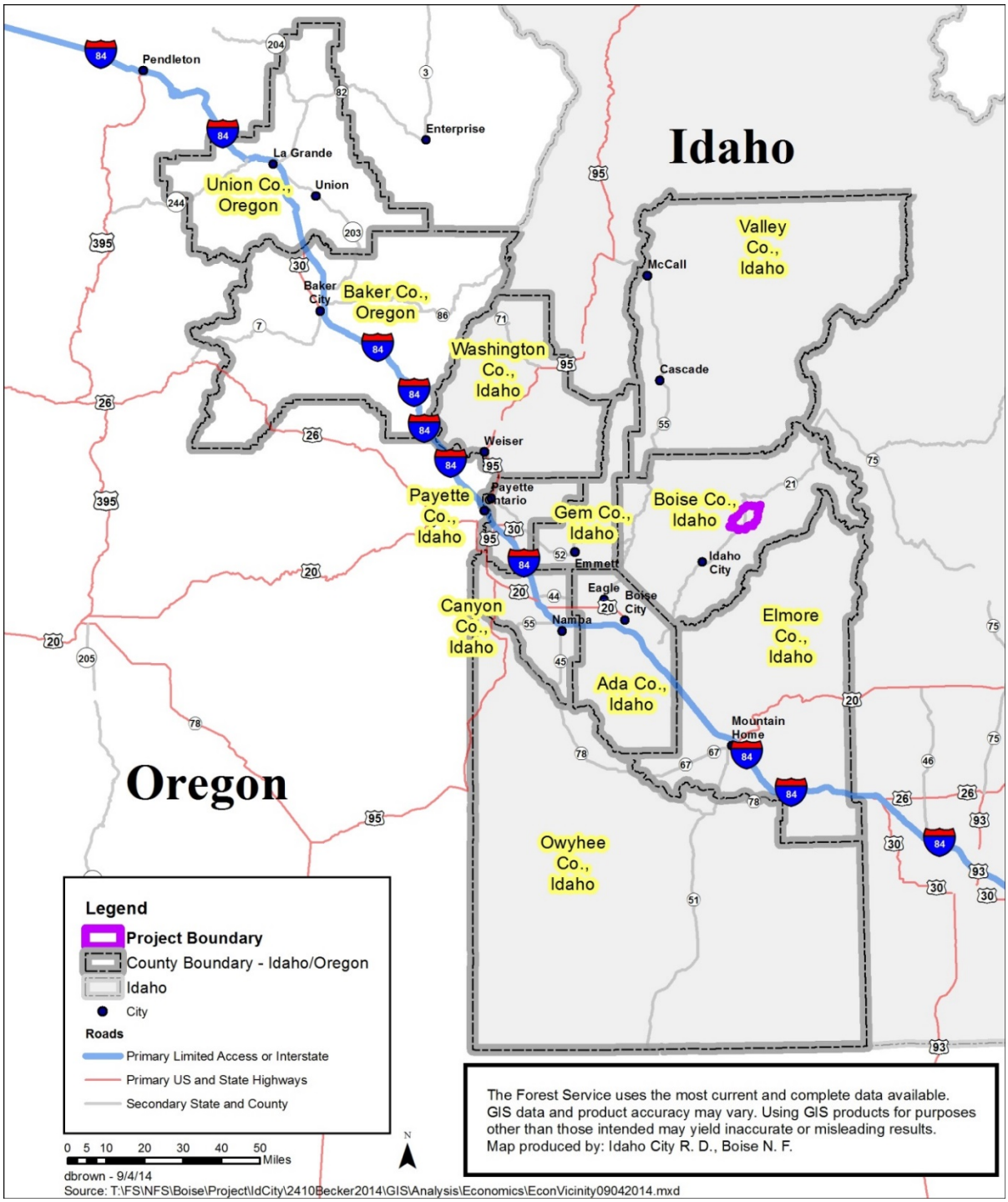

Figure 3-113. Becker Integrated Resource Project vicinity and socioeconomic analysis area

3.16.1.2 Data Sources

Data sources include specific GIS data (roads, harvest methods, vegetation, and landings); FSM and FSH direction; stand data modeled using FVS; Forest Service appraisal spreadsheets, worksheets, LogCost and HaulCost programs, the Transaction Evidence Appraisal (TEA) system, and field surveys. All spatial information and data were evaluated using the Esri software ArcGIS version 10.1.

IMPLAN, an impact analysis database and modeling system, assesses the economic significance of various programs and activities at national, regional, and forest levels. The Forest Service developed IMPLAN to estimate the economic consequences of Agency decisions and proposed actions and also to describe the current economic contributions of natural resource management on National Forests and National Grasslands.

The NFSUM program provides science-based estimates of the volume and characteristics of recreational visitation to the NFS, as well as the benefits of recreation.

3.16.1.3 Analysis Process/Indicators

Indicator: Trend/value—This indicator was used to evaluate the trend of recreational activities between alternatives. The increase/decrease of these activities determines the effect of the revenue generated in the surrounding communities.

Indicator: Volume harvested—This indicator was used to evaluate the potential volume harvested for each alternative. The estimate of volume harvested effects the projected revenue generated from individual alternatives. When comparing alternatives, the unit of measure for volume was MMBF.

Indicator: Jobs supported—This indicator was used to estimate the potential for direct and indirect job creation and support. Potential job creation and support is displayed as jobs per year between commercial treatments (MMBF harvested), by alternative.

Indicator: Restoration costs—This indicator was used to evaluate the estimated costs associated with specific restoration. This value can then be compared to the appraised value indicator to determine which restoration activities to fund through wood product receipts and further identify any additional funding needs within the project area.

3.16.2 Affected Environment

The project area is relatively small compared to the effects analysis area and accounts for only 2.2% of NFS land within the Forest available for recreation or harvest. The project area is, however, one of the more popular areas on the Idaho City Ranger District, based on the recreational activities it provides and its close proximity to Boise and easy access from State Highway 21.

Boise County has a population of 6,800 people, with the following landownerships:

- Private—20%
- Federal—73% (of which 70% is NFS land)
- State—7%

The Economic Profile System Human Dimensions Toolkit (EPS-HDT) model indicates that Boise County's main commodities are forestry, construction, retail trade, recreation, education, and public administration. Horseshoe Bend is the largest community, followed by Idaho City, Garden Valley, and Lowman (EPS-HDT model is available in the project record).

Timber sales and associated actions and outdoor recreation activities have a major impact on Boise County and the communities within southwestern Idaho and northeastern Oregon. These activities are directly linked to the revenue and employment upon which these communities rely. According to the U.S. Bureau of Labor Statistics (2013), the unemployment rate for Boise County in 2013 was 6.4%, compared to the national rate of 7.3% at the time.

The 2003 *Southwest Idaho Ecogroup Land and Resource Management Plan's Final Environmental Impact Statement* [FEIS] (USDA Forest Service 2003b, Chapters 2 and 3) includes a comprehensive socioeconomic analysis of the effects of timber harvest on the communities in southwestern Idaho, including effects on noncommodity resources. The socioeconomic analysis of the Forest Plan amendments associated with the Wildlife Conservation Strategy is discussed in the 2010 FEIS (USDA Forest Service 2010b).

No legal or policy mandate requires revenues generated by an individual NFS timber sale to exceed the cost to implement the project. However, when the Forest Service's expense to prepare and administer a sale exceeds the revenue returned to the Federal Treasury, a timber sale is considered "below cost."

Several noncommodity values and amenities occur within and adjacent to the project area, including recreation and visual quality. Although assigning these amenities a monetary value is difficult, this economic assessment includes each amenity as a trend over time and with respect to the role it plays in the local economy.

The project area offers several quality recreational activities. Due to model limitations, displaying the effects of the proposed activities on Boise County is difficult. Data are displayed at the national, state, and Forest levels, which generate ripple effects back to Boise County. The analysis illustrates the importance of recreation to Boise County in 2 ways: via displaying the number of Forest visitors (Table 3-153) and also the revenue generated from these visitors' participation in recreational activities (Table 3-154).

Table 3-153 displays the number of Forest visits in 2009 where individuals participated in various activities (activities in bold are available within the project area boundary). According to a 2009 NVUM survey (available in the project record) conducted for the Forest, 51% of the users passing through the Forest stated recreation was their main purpose. The average length of stay was between 1 and 5 days, with 82% of the visitors staying at a Forest Service campground/undeveloped site or renting a cabin managed by the Forest Service. For summer use, 2 developed campgrounds managed by the Forest Service are

available; 1 rental cabin, also managed by the Forest Service, is available year-round within the project area.

Table 3-153. Boise National Forest visits by type, 2009 (bolded activities are available within the Becker project area)

Activity	Percent of Visits Participating[a]	Average Days of Activity per Visit	Visits with Participation in Activity (thousands)	Activity Days (thousands)
Developed Camping	12.6	2.6	95	251
Primitive Camping	3.3	3.2	32	102
Backpacking	4.0	5.1	40	207
Resort Use	2.3	4.5	18	82
Picnicking	5.5	2.2	40	90
Viewing of Natural Features	12.2	2.6	108	279
Historic Sites Visitation	0.2	4.1	1	6
Nature Center Activities	2.1	2.6	12	33
Nature Study	1.1	1.6	10	16
Relaxation	21.9	2.9	117	509
Fishing	14.0	2.7	125	343
Hunting	11.9	2.6	112	287
Off-highway Vehide Use	2.8	1.6	28	44
Driving for Pleasure	16.5	1.9	150	285
Snowmobiling	3.1	1.0	23	23
Motorized Water Activities	0.02	2.4	2	4
Other Motorized Activities	0.1	2.0	0	1
Hiking/Walking	23.9	2.4	202	487
Horseback Riding	1.4	1.0	14	14
Bicycling	3.0	3.5	19	65
Non-motorized Water Activities	4.0	2.1	27	56
Downhill Skiing	32.4	1.3	284	365
Cross-country Skiing	22.8	1.2	221	274
Other Non-motorized	4.3	2.5	28	71
Gathering of Forest Products	8.8	3.6	74	269
Wildlife Viewing	12.5	2.6	110	290
Motorized Trail Activity	6.6	2.0	63	124
Some Other Activity	0.2	1.9	1	2

[a] Only visitors within the 75% Market Area were included. The 75% Market Area is the approximate distance zone from which approximately 75% of the visits originated.

Table 3-154. Boise National Forest visitor spending in 2009

Spending Category	Total Spending—Nonlocal Visits ($thousands)	Total Spending—Local Visits ($thousands	Total Spending ($thousands)	% Local
Lodging	$7,996	$10,460	$18,456	57
Restaurant	$5,149	$8,637	$13,786	63
Groceries	$7,253	$12,122	$19,375	63
Gas and Oil	$9,940	$17,788	$27,728	64
Other Transportation	$148	$172	$320	54
Activities	$3,027	$5,709	$8,736	65
Admissions/Fees	$3,656	$6,692	$10,348	65
Souvenirs	$2,627	$5,128	$7,755	66

Approximately 75% of visitors travel at least 75 miles to visit a national forest (NVUM report, available in the project record). The project boundary is approximately 60 miles from Boise, 65 miles from Meridian, 75 miles from Nampa, and 83 miles from Caldwell. Table 3-154 represents total spending for local visitors and nonlocal visitors traveling to or through the Forest in 2009. Over one-half of the money spent on recreation was provided by local residents who had traveled less than 50 miles.

The project area includes yurts managed by the State of Idaho, along with groomed and ungroomed cross-country ski trails that also serve as summer mountain bike trails. Yurt usage between 2009 and 2013 displays an upward trend (Table 3-155). Current (2013) data trends show an increase over the last 2 years in visitor usage, with the nonwinter seasons exhibiting the greatest growth. Table 3-156 displays the Park N' Ski pass sales for Banner Ridge, Gold Fork, Whoop-Um-Up, and Beaver Creek trailheads. Pass sales appear to remain level over the 5-year period, with snow levels the greatest limiting factor.

According to the 2011 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation (fishing, hunting, and wildlife-watching activities), participation in hunting has increased by 32%, with a corresponding expenditure increase of 41%. Fishing has increased by 28% participation and 12% in dollars spent since 2006 (USFWS 2011d; Table 3-157). Although wildlife watching has decreased by 13%, expenditures for wildlife watching have increased by over 90%. Table 3-158 displays hunting and fishing licenses sold within Idaho and dollars generated from their sales. Even though tag numbers and revenue have fluctuated, these activities are an important part of the Idaho culture and should continue to provide income to the businesses of Boise County (USFWS 2011d).

Table 3-155. Idaho Department of Parks and Recreation yurt rental program, 2009–2013

Month	Days Occupied					Days Available					% Occupied				
	2009	2010	2011	2012	2013	2009	2010	2011	2012	2013	2009	2010	2011	2012	2013
Jan.	130	124	131	141	112	155	155	168	164	170	84	80	78	86	66
Feb.	92	117	139	143	139	140	140	157	159	151	64	84	88	90	92
March	53	93	120	141	122	155	154	175	166	166	34	60	68	85	73
April	26	18	42	45	34	150	150	172	180	175	17	12	24	25	19
May	20	22	14	34	47	155	155	171	170	172	13	14	8	20	27
June	22	31	43	103	82	150	143	154	150	164	15	22	28	69	50
July	40	38	83	126	103	155	138	135	161	163	26	28	61	78	63
August	60	23	62	73	97	155	140	148	90	163	39	16	42	81	60
Sept.	22	25	61	8	71	150	116	157	112	170	15	22	39	7	42
October	22	29	99	0	89	155	139	172	183	171	14	21	58	0	52
Nov.	26	39	68	0	83	150	140	166	166	171	17	28	41	0	48
Dec.	93	100	125	30	128	155	146	177	172	176	60	68	71	17	73

Note: Data for 2012 were affected by fire closures.

Table 3-156. Park N' Ski pass sales, 2009–2013

	2009	2010	2011	2012	2013
Temporary	501	659	756	596	593
Annual	408	502	558	388	432
Total	909	1,161	1,314	984	1,025

Table 3-157. Hunting, fishing, and wildlife viewing in Idaho

Activity	Number of Participants		Change (%)	Expenditures		Change (%)
	2006	2011		2006	2011	
Hunting	310,000	408,000	+32	$449,014	$634,625	+41
Fishing	573,000	736,000	+28	$577,226	$644,396	+12
Wildlife Watching	1,084,000	940,000	–13	$449,921	$857,119	+90

Table 3-158. Idaho hunting/fishing licenses sold and revenue

	Licenses Sold			Revenue		
Type	2011	2012	2013	2011	2012	2013
Hunting	946,859	978,693	958,761	$23,898,310	$22,468,600	$20,808,219
Fishing	567,308	590,421	589,249	$10,230,220	$11,071,385	$11,145,028

Source: USDI FWS 2013.

Table 3-159 displays OHV registrations for years 2007 through 2011 within 4 counties near/surrounding the Forest and the project area. Registration varies by county and appears to remain level between 2009 and 2011; however, overall usage on the Forest seems to be trending upward. A popular activity, OHV use is allowed on open roads within the project area. According to a recent study conducted by the University of Idaho cataloguing the counties most frequented by OHV users, Boise County ranked number 3; the majority of the OHV users traveling to Boise County were Treasure Valley (Ada County) residents (Anderson and Taylor 2014). Ada County ranks first in Idaho in the number of out-of-county trips, and Ada and Canyon counties rank in the top 4 in OHV and associated purchases.

In 2012, Idaho's OHV users spent $434 million on purchases and trips, with 75% of the trip expenditures made in the home county, as compared to 25% spent in the destination county. Due to this disparity, the destination county typically failed to capture the bulk of any trip expenditures. For example, in 2012 Ada County OHV owners/residents spent $28 million in Ada County, as compared to $5.5 million in destination counties. As stated earlier, the majority of OHV users traveling to Boise County originate in the Treasure Valley.

In 2012, OHV users traveling to Boise County spent approximately $400,000 per year compared to $900,000 by in-county residents (Table 3-160; Anderson and Taylor 2014).

Table 3-159. Idaho off-highway vehicle (OHV) registrations by county, 2007–2011

	Type of Vehicl	2007	2008	2009	2010	2011
Boise County	All-terrain vehicle (ATV)	770	772	854	744	728
	Utility terrain vehicle (UTV)	28	41	62	71	84
	Motorcycle	230	262	235	212	225
	Total	3,035	3,083	3,160	3,037	3,048
Ada County						
	ATV	13,014	12,921	12,802	12,568	12,338
	UTV	243	405	569	746	889
	Motorcycle	10,079	10,053	8,888	8,556	8,397
	Total	23,336	23,379	22,259	21,870	21,624
Canyon County						
	ATV	9,545	9,898	9,646	9,562	9,392
	UTV	183	271	372	444	580
	Motorcycle	3,869	4,007	3,358	3,248	3,215
	Total	13,597	14,176	13,376	13,254	13,187
Elmore County						
	ATV	1,488	1,618	1,650	1,624	1,619
	UTV	22	38	61	73	92
	Motorcycle	618	698	617	582	515
	Total	2,128	2,354	2,328	2,279	2,226

Table 3-160. Boise County Off-highway vehicle (OHV) trips and trip expenditures, 2012

OHV Trips (thousands)			OHV Trip Expenditures by Households ($ millions)			
			Home County, Trip Expenditures	Out-of-County Households, Trip Expenditures		
Households within Boise County	Out-of-County Households	Total		At Home	At Destination	Total
10	44	54	0.5	0.5	0.4	1.4

Within the project area, one snowmobile trailhead provides access to approximately 8 miles of groomed trails that, in turn, access additional miles in the surrounding area. Several other trailheads are located outside the project boundary and lead to surrounding communities, providing additional opportunities. Specific data pertaining to snowmobile use are not available for Boise County, so a comparison study from Valley County is presented here. According to the Valley County study, snowmobile recreation is a high-expenditure sport where snowmobile users spend an average of $316 per person per trip, or $106 per person per day, with lodging accounting for 80% of the expense (Larsen et al. 2006). The majority of snowmobile recreationists traveling to Valley County are Idaho residents from the Treasure Valley (Ada County), while 20% come from Washington State and another 20% from various locations. Single-day visitors account for 35% of the users, while 65% spend multiple days. Due to the difference in Boise County accommodations as compared to Valley County, the potential exists for Boise County users to spend more money on food and supplies as compared to lodging; single-day visits would likely reach or exceed the 65% level, as the majority of visitors would be from the Treasure Valley. Snowmobile designations for Boise County between 2009 and 2011 remained constant at approximately 1,200 per year. Due to poor snow conditions in 2012 and 2013, designations dropped below 1,000 those years. These designations are important because a portion of the registration fees provides funds for trail grooming (Larsen et al. 2006).

In 2009, the Forest completed an economic profile for select communities affected by recreation and forest products. Table 3-161, Table 3-162, Table 3-163, and Table 3-164 profile various Boise County communities and the overall importance of recreation and timber products to these communities. The largest categories affecting jobs are Arts, Entertainment, and Recreation; Accommodation and Food Services; and Retail Trade; followed by Forestry, Sawmills, Logging, Hunting, and Fishing. The jobs dependent on these areas range from 15% to 36.7% of total jobs and contribute between 12.3% and 34.7% of the total earnings. Table 3-165 and Table 3-166 represent similar communities identified in Oregon and the importance of timber and timber byproducts to these communities; here, the forest products industry provides between 9.8% and 42.8% of the jobs available and contributes between 8.6% and 45.5% of the earnings (Economic Modeling Specialist, Inc. 2009).

Table 3-161. Economic profile of Lowman, Idaho: jobs and labor income by industry, 2009

Industry	Jobs	Percent of Total Jobs	Earnings	Percent of Total Earnings
Agriculture, Forestry, Fishing, and Hunting	1	0.2	$4,000	0.2
Retail Trade	1	0.8	$10,000	0.4
Arts, Entertainment, and Recreation	5	4.3	$74,000	2.8
Accommodation and Food Services	11	9.7	$235,000	8.9
Total	**17**	**15.0**	**$323,000**	**12.3**

Table 3-162. Economic profile of Crouch–Garden Valley, Idaho: jobs and labor income by industry, 2009

Industry	Jobs	Percentage of Total Jobs	Earnings	Percentage of Total Earnings
Agriculture, Forestry, Fishing, and Hunting	18	2.5	$546,000	3.3
Logging	8	1.1	$305,000	1.8
Sawmills	21	3.0	$648,000	3.9
Retail Trade	48	6.8	$745,000	4.5
Arts, Entertainment, and Recreation	82	11.5	$1,437,000	8.6
Accommodation and Food Services	40	5.6	$499,000	3.0
Total	**217**	**30.5**	**$4,180,000**	**25.1**

Table 3-163. Economic profile of Horseshoe Bend, Idaho: jobs and labor income by industry, 2009

Industry	Jobs	Percentage of Total Jobs	Earnings	Percentage of Total Earnings
Agriculture, Forestry, Fishing, and Hunting	66	8.6	$2,200	13.6
Logging	27	3.5	$1,037	6.4
Retail Trade	72	9.4	$950	5.9
Arts, Entertainment, and Recreation	53	6.9	$748	4.6
Accommodation and Food Services	64	8.3	$684	4.2
Total	**282**	**36.7**	**$5,619**	**34.7**

Table 3-164. Economic profile of Idaho City, Idaho: jobs and labor income by industry, 2009

Industry	Jobs	Percentage of Total Jobs	Earnings	Percentage of Total Earnings
Agriculture, Forestry, Fishing, and Hunting	40	4.1	$1,302	6.6
Sawmills	2	0.2	$52	0.3
Retail Trade	71	7.3	$568	2.9
Arts, Entertainment, and Recreation	160	16.4	$2,494	12.6
Accommodation and Food Services	58	6.0	$620	3.1
Total	**331**	**34.0**	**$5,036**	**25.5**

Table 3-165. Economic profile of Elgin, Oregon: jobs and labor income by industry, 2009

Industry	Jobs	Percentage of Total Jobs	Earnings	Percentage of Total Earnings
Agriculture, Forestry, Fishing, and Hunting	59	6.0	$1,045	3.6
Sawmills	134	13.6	$4,593	15.9
Logging	7	0.7	$304	1.1
Softwood Veneer and Plywood	221	22.5	$7,168	24.9
Total	**421**	**42.8**	**$13,110**	**45.5**

Table 3-166. Economic profile of La Grande, Oregon: jobs and labor income by industry, 2009

Industry	Jobs	Percentage of Total Jobs	Earnings	Percentage of Total Earnings
Agriculture, Forestry, Fishing, and Hunting	1,018	8.2	$19,226	5.9
Sawmills	30	0.2	$1,896	0.6
Logging	73	0.6	$3,192	1.0
Softwood Veneer and Plywood	103	0.8	$3,690	1.1
Total	**1,224**	**9.8%**	**$28,004**	**8.6**

3.16.3 Environmental Effects

3.16.3.1 Direct and Indirect Effects

Alternative A

Under Alternative A, no new vegetation, transportation, recreation, or aquatic habitat restoration management activities would be implemented. No wood products would be removed or submerchantable trees thinned. Existing ongoing activities, such as road maintenance, public fuelwood gathering, mining, and motorized travel consistent with the MVUM would continue. Wildfire suppression would also continue, as consistent with Forest Plan direction (USDA Forest Service 2010a).

Existing recreational activities would continue. Yurt access would remain at current levels because no changes would occur to the current transportation system. Lastly, to help provide a non-motorized winter experience, the existing 7,491-acre motorized winter closure would be incorporated under this alternative.

Alternative A would not increase employment opportunities or revenue generated in Boise County or in surrounding areas. No expenses would be incurred for sale preparation, contract administration, thinning operations, prescribed burning activities, culvert replacement/AOP, or road decommissioning. Trends concerning summer and winter recreation use and visual quality would continue their current trajectories as seen in Table 3-153, Table 3-154, Table 3-155, Table 3-156, Table 3-157, Table 3-158, Table 3-159, and Table 3-160.

Table 3-167 represents the restoration items anticipating completion within the project area. Utilizing IMPLAN, these items were used to determine the number of project area jobs supported, by alternative. Given the incurred cost for this NEPA analysis, Alternative A would be considered "below cost" by approximately $576,000 (Table 3-168).

Table 3-167. Restoration activities, Becker project area

Restoration Item	Alternative A[a]	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F
Noxious weed control	X	X	X	X	X	X
Road maintenance	X	X	X	X	X	X
Realignment of National Forest System (NFS) roads 393 and 362D		X	X	X	X	X
Road decommissioning—NFS roads		X	X	X	X	X
Road decommissioning—Unauthorized roads		X	X	X	X	X
Road conversion to non-motorized trail		X	X	X	X	X
Road conversion to motorized trail 50 inches or less		X	X			
Road conversion to motorized trail 60 inches or less				X		X
New motorized trail construction		X	X	X		X
New motorized trailhead construction		X	X	X		X
Noncommercial thinning of plantations		X	X	X	X	X
Thinning of noncommercial trees following commercial harvest		X	X	X	X	X
Thinning of noncommercial trees outside commercial harvest units		X	X	X	X	X
Activity fuels treatment—Underburn plantations		X	X	X	X	X
Activity fuels treatment—Underburn natural areas		X	X	X	X	X
AOP culvert—NFS roads		X	X	X	X	X
Total Cost for Restoration Actions	**$194,773**	**$5,508,053**	**$5,509,965**	**$5,611,214**	**$5,432,543**	**$5,538,194**

[a] The Alternative A figure represents current spending.

Table 3-168. Summary of financial assessment by alternative

Action	Alternative A ($)	Alternative B ($)	Alternative C ($)	Alternative D ($)	Alternative E ($)	Alternative F ($)
Commercial Cost						
Net Volume (million board feet) Large Sale	0	5.5	5.5	5.5	3.3	5.5
Net Volume (million board feet) Small Sales	0	2.9	2.9	3.2	2.9	2.9
Potential Net Value (PNV)						
Large Sales	$0	+$770,634	+$770,634	+$806,144	+$20,832	+$357,529
Small Sales	$0	+305,370	+305,370	+$328,910	+$359,668	+305,370
Subtotal	**$0**	**+$1,076,004**	**+$1,076,004**	**+$1,135,054**	**+$380,500**	**+$662,899**
Projected NEPA Cost	–$576,000	–$576,000	–$576,000	–$576,000	–$576,000	–$576,000
Projected Sale Preparation Cost	$0	–$182,900	–$182,900	–$182,900	–$182,900	–$182,900
Projected Contract Administration	$0	–$81,300	–$81,300	–$81,300	–$81,300	–$81,300
Subtotal	–$576,000	+$840,200	+$840,200	+$840,200	+$840,200	+$840,200
Net Revenue (PNV—Costs)	**–$576,000**	**+$235,804**	**+$235,804**	**+$294,854**	**–$459,700**	**–$177,301**

Note: Alternative E, Sale 1, was appraised at -$312,147. This value was increased to +$20,832 (base rates), the minimum at which the Forest Service can advertise commercial wood products.

Effects Common to All Action Alternatives

AOP culvert replacement would typically close roads for 2–3 weeks per culvert for completing construction workand is part of the restoration projects associated with implementation activities. The estimated cost for replacing all culverts is $2,300,000 and would require several seasons to complete. Road closures would require forest users to use alternate routes to access NFS lands, including yurts, hiking trails, and the Beaver Creek cabin. Coordination would be needed to reduce user conflicts resulting from the road closures and to reduce impacts on both recreation and commercial harvest. Design Feature RE-10 would require notification of various users through timely press releases, on-the-ground signage showing travel restrictions and alternative travel routes, and rental information updates on the reservation systems for rental cabins and yurts.

Information concerning yurt or area closures would be posted in periodicals, on the Forest and State of Idaho web sites, and/or on onsite kiosks (Design Features FF-2 and RE-10). Cautionary signage would be placed on primary access routes along State Highway 21 prior to implementing any prescribed burn or timber sale activity. These notifications would inform the public of proposed activities. Burning could impact the yurt rental program for 1–2 weeks in the spring and fall, and timber removal could impact the yurt program for up to 4 weeks (Table 3-155). Implementation of prescribed burning would have the greatest impact on multiple yurts, while timber sale activities would only affect the Stargaze Yurt and the majority of the roads and trails north of Beaver Creek to the project boundary. These closures would not affect the entire area at one time and would be removed when the area is deemed safe for public entry. Estimated revenue loss to the IDPR yurt rental program during prescribed burning could range from $485 to $970 per yurt, assuming 100% rental capacity, and from $485 to $1,940 during timber harvest (IDPR 2015).

Alternative B

Given the potential net value (PNV) and estimated Forest Service costs, this alternative would be considered "above cost" by approximately $235,804 (Table 3-168). Alternative B directly affects the indicator associated with volume harvested and jobs supported by removing an estimated 5.5 MMBF of wood products for the large sale and generating a PNV of approximately $770,634 (Table 3-168). Additional small sales would remove an estimated 2.9 MMBF of wood products and generate a PNV of approximately $305,370 (Table 3-168). The value of the wood products and work associated with implementing restoration items under this alternative would help sustain economies in Boise County and adjacent areas (Table 3-161, Table 3-162, Table 3-163, Table 3-164, Table 3-165, Table 3-166). Monetary value does not include timber volume in RCAs or LSP areas, because volume harvested acres from these areas does not count toward the forest ASQ (FSH 2409.13). Commercial harvest includes using 5.8 miles of temporary roads, which would reduce skidding costs and allow more acres to be treated through conventional ground-based logging, resulting in lower operating costs compared to helicopter logging.

Economic impacts are expressed in terms of annual full or part-time jobs supported by the project (jobs are not necessarily "new" jobs created in the region), as well as annual labor income associated with those jobs. Total restoration costs would be $5,508,053 (Table 3-167) and would be broken out between 1–6 years and 7–15 years. Commercial harvesting and

processing would account for a relatively greater percentage of the economic impacts, compared to Forest Service–funded activities associated with roads, trails, and restoration (Table 3-167. Restoration activities). The majority of activities associated with commercial harvest and recreation would occur within the first 6 years, thus reducing economic impacts for the remaining 9 years. The average annual full and part-time jobs and labor income supported by the project are approximately 25 and $709,412 for the first 6 years, and 5 and $142,275 for the remaining 9 years (Table 3-169). Forest Service–funded projects (Table 3-170) would continue throughout the life of the project and beyond. However, no new jobs or positions would be created with this funding, so it will not be addressed further. Cost for burning should not extend beyond the 15-year timeline.

Restoration costs (Table 3-170) exceed the PNV (revenue generated from timber sale receipts and available for funding restoration items) by about $4,432,049. Therefore, supplemental funding would be necessary to fund some restoration items. Stewardship contracts referenced (FSH 2409.19, Chapter 60) could be used to help offset the cost of some restoration activities by trading goods for services. Additional funding could be supplemented by retained receipts from other stewardship projects, appropriated funding, or grants. Because the project area has no wildland–urban interface (WUI), competition for appropriated funding could be limited.

Access to the Elkhorn Yurt is by foot traffic only, although all remaining yurts have vehicle access with the last 300 feet being foot traffic only. Access to the Stargaze Yurt is open year-round to motorized vehicles within 300 feet when road conditions allow. Access to the Skyline Yurt is restricted by a seasonal road closure from September 15 through June 15. Under this alternative, summer access to the Stargaze and Skyline Yurts would be restricted by converting the access roads to ML 2—Administrative Use Only and removing the seasonal closure and open road status. According to the use data provided by IDPR, fall, spring, and summer use of the yurts continues to increase (Table 3-155). This alternative could reduce use to these 2 yurts by limiting vehicle access and subsequently reduce revenue associated with the rental program. During project implementation for prescribed fire and commercial harvest, area closures could also be implemented to provide for public safety (Design Feature RE-10). Estimated revenue loss to the IDPR yurt rental program during burning could range from $485 to $970 per yurt, assuming 100% rental capacity, and from $485 to $1,940 during timber harvest. Alternative B would change access to the Stargaze and Skyline Yurts to non-motorized trails in the summer season, which may impact the number of nights these yurts are rented and the income generated during this season. Changing vehicle access may reduce rental income by $65–$75 per night.

With increasing trends in ATV/UTV use, a seasonal 23.3-mile motorized trail designated for vehicles <50 inches wide and a new trailhead are proposed under this alternative. ATV/UTV use is occurring on undesignated routes and trails within the project area. Developing this trail could help alleviate unauthorized use, reduce conflicts between different classes of motorized vehicles, and minimize effects to resources such as soil, water, and wildlife. This new trail could also attract new visitors to Boise County, resulting in increased revenue (Table 3-159 and Table 3-160).

This alternative recommends proposes a reduction in miles of road open to public motorized use from 86.9 miles to 58.3 miles and decommissioning 30.9 miles of ML 1, ML 2, and unauthorized roads that are causing resource damage, which would permanently reduce road access within the project area. Associated actions would spend federal dollars to create or

maintain 3–5 jobs to complete the restoration activities (Table 3-171). Future restoration activities would have a minimal impact, as the roads proposed for decommissioning are causing resource damage or are located in areas not suited for forest product removal or general use. Changing the ML and closing roads would maintain a transportation system for future land management activities. The impact on recreation could be greater because some of the roads once open for OHV use, fuelwood gathering, camping, and other recreational activities would be closed to public motorized use. Approximately 21 miles of the roads proposed for closing or decommissioning would be converted to non-motorized trails and would be available for foot traffic, bicycles, horses, and skiing, which would reduce some of the impact on recreation.

An existing winter motorized closure totaling 7,491 acres is in effect north of Beaver Creek and east of State Highway 21 up to the dividing boundary between the Lowman and the Idaho City ranger districts. Because this is a winter closure and commercial activity is prohibited between December 15 and April 15 and other nonwinter activities are limited to the summer months, no effect with the proposed project or current winter recreation activities should exist.

Alternative C

Given the PNV and estimated Forest Service costs, this alternative would be considered "above cost" by approximately $235,804 (Table 3-168). Alternative C directly affects the indicator associated with volume harvested and jobs supported by removing an estimated 5.5 MMBF of wood products for the large sale and generating a PNV of approximately $770,634 (Table 3-168). Additional small sales would remove an estimated 2.9 MMBF of wood products and generate a PNV of approximately $305,370 (Table 3-168). The value of the wood products and work associated with implementing restoration items under this alternative would help sustain economies in Boise County and adjacent areas (Table 3-161 through Table 3-166). Monetary value does not include timber volume in RCAs or LSP areas, because volume harvested acres from these areas does not count toward the forest ASQ (FSH 2409.13). Commercial harvest includes using 5.8 miles of temporary roads. These roads would decrease skidding costs and allow more acres to be treated by conventional ground-based logging, resulting in lower operating costs compared to helicopter logging.

Economic impacts are expressed in terms of annual full or part-time jobs supported by the project, as well as annual labor income associated with those jobs. Total cost for restoration is $5,509,965 (Table 3-167) and is broken out between 1–6 years and 7–15 years. Commercial harvesting and processing accounts for a relatively greater percentage of the economic impacts, compared to Forest Service–funded activities associated with roads, trails, and restoration (Table 3-169). The majority of activities associated with commercial harvest and recreation would occur within the first 6 years, thus reducing the economic impact for the remaining 9 years. The average annual full and part-time jobs and labor income supported by the project are approximately 25 and $709,412 for the first 6 years, and 5 and $142,275 for the remaining 9 years (Table 3-169). Forest Service–funded projects (Table 3-170) would be ongoing throughout the life of the project and beyond. However, no new jobs or positions would be created with this funding, so it will not be addressed further. Cost for burning should not extend beyond the 15-year timeline.

The cost for all restoration items exceeds the PNV by about $4,433,961 (Table 3-170). Therefore, supplemental funding would be necessary to fund some restoration items. Stewardship contracts (FSH 2409.19, Chapter 60) could be used to help offset the cost of some restoration activities by trading goods for services. Additional funding could be supplemented by retained receipts from other stewardship projects, appropriated funding, or grants. Because the project area has no WUI, competition for appropriated funding could be limited.

Access to the Elkhorn Yurt is by foot traffic only, although all remaining yurts have vehicle access with the last 300 feet being foot traffic only. Access to the Stargaze Yurt is currently open year-round to motorized vehicles within 300 feet when road conditions allow. Access to the Skyline Yurt is restricted by a seasonal road closure from September 15 through June 15. Under this alternative, summer access to the Stargaze and Skyline Yurts would be closed seasonally to motorized vehicles, requiring renters to hike in from State Highway 21. According to the use data provided by IDPR, fall, spring, and summer use of the yurts continues to increase (Table 3-155). This alternative could reduce use by limiting vehicle access and subsequently reduce rental program revenue. During project implementation, area closures could also be implemented during prescribed fire and commercial harvest to provide for public safety (Design Feature RE-10). Estimated revenue loss to the IDPR yurt rental program during burning could range from $485 to $970 per yurt, assuming 100% rental capacity, and from $485 to $1,940 during timber harvest. Alternative C would maintain motorized access but only seasonally between June 16 and September 14 to the Stargaze Yurt, which may impact the number of nights this yurt is rented and the income generated during the summer season. Changing when the yurt can be accessed by vehicle may reduce rental income by $65–$75 per night.

A seasonal 22-mile motorized trail designated for vehicles <50 inches wide and a new trailhead are proposed under this alternative. ATV/UTV use is occurring on undesignated routes and trails within the project area. Developing this trail could help alleviate unauthorized use, reduce conflicts between different classes of motorized vehicles, and minimize effects to resources such as soil, water, and wildlife. Adding this trail could attract new visitors to Boise County, resulting in increased revenue (Table 3-159 and Table 3-160).

This alternative proposes a reduction in miles of road open to public motorized use from 86.9 miles to 62.8 miles and decommissioning 30.9 miles of ML 1, ML 2, and unauthorized roads that are causing resource damage, thus permanently reducing road access within the project area. Associated actions would spend federal dollars to create or maintain 3–5 jobs to complete the restoration activities (Table 3-171). The impact on future restoration activities would be minimal, because the roads proposed for decommissioning are causing resource damage or are located in areas not suited for forest product removal. Changing the ML and closing roads would maintain a transportation system for future land management activities. The impact on recreation could be greater because some of the roads that were once open for OHV use, fuelwood gathering, camping, and other recreational activities would be closed to public motorized use. Approximately 21 miles of the roads proposed for closing or decommissioning would be converted to non-motorized trails and would be available for foot traffic, bicycles, horses, and skiing, which would reduce some of the impact.

A winter motorized closure totaling 10,800 acres is proposed under this alternative. The closure area includes the 7,491 acres north of Beaver Creek and east of State Highway 21 up

to the dividing boundary between the Lowman and Idaho City ranger districts. The additional 3,300 acres west of State Highway 21 proposed under this alternative uses natural features, such as ridges and drainages, to create a non-motorized buffer to maintain the value for non-motorized users along maintained ski trails throughout the project area. This closure would be implemented around the ski trails to reduce the possibility of mixed use on these trails and create a buffer from motorized use. Because this is a winter closure and commercial activity is prohibited between December 15 and April 15 and other nonwinter activities are limited to the summer months, winter recreation should not be affected by this closure.

Alternative D

This alternative was developed to maximize the timber economic benefit. Given the PNV and estimated Forest Service costs, this alternative would be considered "above cost" by approximately $294,854 (Table 3-168). Alternative D directly affects the indicator associated with volume harvested and jobs supported by removing an estimated 5.5 MMBF of wood products for the large sale and generating a PNV of approximately $806,144 (Table 3-168). Additional small sales would remove an estimated 3.2 MMBF of wood products and generate a PNV of approximately $328,910 (Table 3-168). The value of the wood products and work associated with implementing restoration items under this alternative would help sustain economies in Boise County and adjacent areas (Table 3-161 through Table 3-166). Monetary value does not include timber volume in RCAs or LSP areas, because volume harvested acres from these areas does not count toward the forest ASQ (FSH 2409.13). Commercial harvest includes using 6.5 miles of temporary roads, which would decrease skidding costs and allow more acres to be treated by conventional ground-based logging, resulting in lower operating costs compared to helicopter logging.

Economic impacts are expressed in terms of annual full or part-time jobs supported by the project, as well as annual labor income associated with those jobs. Total cost for restoration items is $5,611,214 (Table 3-167) and is broken out between 1–6 years and 7–15 years. Commercial harvesting and processing accounts for a relatively greater percentage of the economic impacts, compared to Forest Service–funded activities associated with roads, trails, and restoration (Table 3-169). The majority of activities associated with commercial harvest and recreation would occur within the first 6 years, thus reducing the economic impact for the remaining 9 years. The average annual full and part-time jobs and labor income supported by the project are approximately 26 and $744,327 for the first 6 years, and 5 and $145,040 for the remaining 9 years (Table 3-169). Forest Service–funded projects (Table 3-170) would be ongoing throughout the life of the project and beyond. However, no new jobs or positions would be created with this funding, so it will not be addressed further. Costs for burning should not extend beyond the 15-year timeline.

The cost of all restoration items exceeds the PNV by about $4,476,160 (Table 3-170). Therefore, supplemental funding would be necessary to fund some restoration items. Stewardship contracts (FSH 2409.19, Chapter 60) could be used to help offset the cost of some restoration activities by trading goods for services. Additional funding could be supplemented by retained receipts from other stewardship projects, appropriated funding, or grants. Because the project area has no WUI, competition for appropriated funding could be limited.

Access to the Elkhorn Yurt is by foot traffic only, although all remaining yurts have vehicle access with the last 300 feet being foot traffic only. Access to the Stargaze Yurt is currently open year-round to motorized vehicles within 300 feet when road conditions allow. Access to the Skyline Yurt is restricted by a seasonal road closure from September 15 through June 15. Under this alternative, summer access to the Stargaze Yurt would remain open to motorized vehicles during the snow-free season and the seasonal closure to the Skyline Yurt would be removed, allowing vehicle traffic during the snow-free season. According to the use data provided by IDPR, fall, spring, and summer use of the yurts continues to increase (Table 3-155). This alternative could increase use by removing vehicle restrictions and subsequently increase revenue associated with the rental program. During project implementation, area closures could also be implemented during prescribed fire and commercial harvest to provide for public safety (Design Feature RE-10). Estimated revenue loss to the IDPR yurt rental program during burning could range from $485 to $970 per yurt, assuming 100% rental capacity, and from $485 to $1,940 during timber harvest. Because existing access to the yurts would be maintained, no lost revenue from rental fees is anticipated.

A seasonal 22-mile motorized trail designated for vehicles <60 inches wide and construction of a new trailhead are proposed under this alternative. ATV/UTV use is occurring on undesignated routes and trails within the project area. Developing this trail could help alleviate unauthorized use, reduce conflicts between different classes of motorized vehicles, and minimize effects to resources such as soil, water, and wildlife. Adding this trail could attract new visitors to Boise County, resulting in increased revenue (Table 3-159 and Table 3-160).

This alternative proposes the reduction in miles of road open to public motorized use from 86.9 miles to 62.8 miles and decommissioning 30.9 miles of ML 1, ML 2, and unauthorized roads that are causing resource damage, thus permanently reducing road access within the project area. Associated actions would spend federal dollars to create or maintain 3–5 jobs to complete the restoration activities (Table 3-169). The impact on future restoration activities would be minimal, because the roads proposed for decommissioning are causing resource damage or are located in areas not suited for forest product removal. Changing the ML and closing roads would maintain a transportation system for future land management activities. The impact on recreation could be greater, as some of the roads once open for OHV use, fuelwood gathering, camping, and other recreational activities would be closed to public motorized use. Approximately 18 miles of the roads proposed for closing or decommissioning would be converted to non-motorized trails and would be available for foot traffic, bicycles, horses, and skiing, which would reduce some of the impact.

A winter motorized closure totaling 10,800 acres is proposed under this alternative. The closure area includes the 7,491 acres north of Beaver Creek and east of State Highway 21 up to the dividing boundary between the Lowman and Idaho City ranger districts. The additional 3,300 acres west of State Highway 21 uses natural features, such as ridges and drainages, to create a non-motorized buffer to maintain the value for non-motorized users along maintained ski trails throughout the project boundary. Because this is a winter closure and commercial activity is prohibited between December 15 and April 15 and other nonwinter activities are limited to the summer months, winter recreation should not be affected by this closure.

Alternative E

Given the PNV and estimated Forest Service costs, this alternative would be considered "below cost" by approximately $459,700 (Table 3-168). Alternative E imposes an 18-inch diameter at breast height (dbh) limit for all species, thus reducing the overall volume available for harvest. Although the overall volume is reduced, the alternative directly affects the indicator associated with volume harvested and jobs supported by removing an estimated 3.3 MMBF of wood products for the large sale and generating a PNV of approximately $20,832 (Table 3-168). Additional small sales would remove an estimated 2.9 MMBF of wood products and generate a PNV of approximately $359,668 (Table 3-168). The value of the wood products and work associated with implementing restoration items under this alternative would help sustain economies in Boise County and adjacent areas (Table 3-161, Table 3-162, Table 3-163, Table 3-164, Table 3-165, and Table 3-166). Monetary value does not include timber volume in RCAs or LSP areas, because volume harvested acres from these areas does not count toward the forest ASQ (FSH 2409.13). Commercial harvest includes using 1.5 miles of temporary roads, which is 4.3 fewer miles than under Alternatives B and C and 5.0 fewer miles than under Alternative D. Reducing miles of temporary road shifts the logging system on 940 acres to helicopter logging, resulting in higher operating costs. To reduce the impact on NFS roads used as non-motorized trails, commercial treatments surrounding non-motorized trails would also be treated using helicopter logging. Use of helicopter logging would allow the road to remain in a trail-like setting and not change the quality of user experience. However, the overall value of commercial products decreases substantially under this alternative.

Economic impacts are expressed in terms of annual full or part-time jobs supported by the project, as well as annual labor income associated with those jobs. Total cost for restoration is $5,432,543 (Table 3-167) and is broken out between 1–6 years and 7–15 years. Commercial harvesting and processing accounts for a relatively greater percentage of the economic impacts, compared to Forest Service–funded activities associated with roads, trails, and restoration (Table 3-169). The majority of activities associated with commercial harvest and recreation would occur within the first 6 years, thus reducing the economic impact for the remaining 9 years. The average annual full and part-time jobs and labor income supported by the project are approximately 20 and $546,962 for the first 6 years, and 5 and $142,102 for the remaining 9 years (Table 3-169). Forest Service–funded projects (Table 3-170) would be ongoing throughout the life of the project and beyond. However, no new jobs or positions would be created with this funding, so it will not be addressed further. Costs for burning should not extend beyond the 15-year timeline.

The cost of all restoration items exceeds the PNV by about $5,052,043 (Table 3-170). Therefore, supplemental funding would be necessary to fund some restoration items. Stewardship contracts (FSH 2409.19, Chapter 60) could be used to help offset the cost of some restoration activities by trading goods for services. Additional funding could be supplemented by retained receipts from other stewardship projects, appropriated funding, or grants. Because the project area has no WUI, competition for appropriated funding could be limited.

Access to the Elkhorn Yurt is by foot traffic only, although all remaining yurts have vehicle access with the last 300 feet being foot traffic only. Access to the Stargaze Yurt is currently open year-round to motorized vehicles within 300 feet when road conditions allow. Access to

the Skyline Yurt is restricted by a seasonal road closure from September 15 through June 15. Under this alternative, summer access to the Stargaze and Skyline Yurts would be restricted by making the access roads administrative use only, requiring users to hike in from State Highway 21. According to the use data provided by IDPR, fall, spring, and summer use of the yurts continues to increase (Table 3-155). This alternative could reduce use to these 2 yurts by limiting vehicle access and subsequently reduce revenue associated with the rental program. During project implementation, area closures could also be implemented during prescribed fire and commercial harvest to provide for public safety (Design Feature RE-10). Estimated revenue loss to the IDPR yurt rental program during burning could range from $485 to $970 per yurt, assuming 100% rental capacity, and from $485 to $1,940 during timber harvest. Alternative E would change access to the Stargaze and Skyline Yurts to non-motorized trails in the summer season, which may affect the number of nights these yurts are rented and the income generated during this season. In addition, this alternative would apply a seasonal closure for mechanized equipment (e.g., wagons, carts, bicycles) on all routes north of Beaver Creek Cabin and east of State Highway 21 from May 1 to June 15. The mechanized equipment seasonal closure may reduce the number of nights the Elkhorn and Skyline Yurts are rented and the income generated. Changing vehicle access may reduce rental income by $65–$75 per night.

This alternative does not include designating a seasonal motorized trail or constructing a corresponding proposed trailhead.

This alternative proposes a reduction in miles of road open to public motorized use from 86.9 miles to 58.3 miles and decommissioning 32.9 miles of ML 1, ML 2, and unauthorized roads that are causing resource damage, thus permanently reducing road access within the project area. Associated actions would spend federal dollars to create or maintain 3–5 jobs to complete the restoration activities (Table 3-171). The impact on future restoration activities would be minimal, because the roads proposed for decommissioning are causing resource damage or are located in areas not suited for forest product removal. Changing the ML and closing roads would maintain a transportation system for future land management activities. The impact on recreation could be greater because some of the roads once open for OHV use, fuelwood gathering, camping, and other recreational activities would be closed to public motorized use. Approximately 26 miles of the roads proposed for closing or decommissioning would be converted to non-motorized trails and would be available for foot traffic, bicycles, horses, and skiing, which would reduce some of the impact.

A winter motorized closure totaling 10,800 acres is proposed under this alternative. The closure area includes the 7,491 acres north of Beaver Creek and east of State Highway 21 up to the dividing boundary between the Lowman and Idaho City ranger districts. The additional 3,300 acres west of State Highway 21 uses natural features, such as ridges and drainages, to create a non-motorized buffer to maintain the value for non-motorized users along maintained ski trails throughout the project boundary. Because this is a winter closure and commercial activity is prohibited between December 15 and April 15 and other nonwinter activities are limited to the summer months, winter recreation should not be affected by this closure.

This alternative also proposes an 8,576-acre seasonal closure for all mechanized equipment east of State Highway 21 and north of Beaver Creek to the dividing boundary between the Idaho City and Lowman ranger districts. The closure would be implemented between May 1

and June 15 to address big game calving concerns. The Skyline and Elkhorn Yurts could still be rented and associated trails could still be used by nonmechanized equipment only. Due to a potential loss of users in a timeframe when IDPR data show an increase in use (Table 3-155), the yurts could lose an estimated revenue of $65–$75 per day during the restricted timeframe.

Alternative F

Given the PNV and estimated Forest Service costs, this alternative would be considered "below cost" by approximately $177,300 (Table 3-168). This alternative is a modified version of Alternative E and incorporates 307 acres of helicopter logging along NFS roads currently being used as non-motorized trails. Helicopter logging would allow the road to remain in a trail-like setting and would not change the quality of user experience. Alternative F directly affects the indicator associated with volume harvested and jobs supported by removing an estimated 5.5 MMBF of wood products for the large sale and generating a PNV of approximately $357,529 (Table 3-168). Additional small sales would remove an estimated 2.9 MMBF of wood products and generate a PNV of approximately $305,370 (Table 3-168). The value of the wood products and work associated with implementing restoration items under this alternative would help sustain economies in Boise County and adjacent areas (Table 3-161, Table 3-162, Table 3-163, Table 3-164, Table 3-165, Table 3-166). Monetary value does not include timber volume in RCAs or LSP areas, because volume harvested acres from these areas does not count toward the forest ASQ (FSH 2409.13). Commercial harvest includes using 4.3 miles of temporary roads. Reducing miles of temporary roads shifts the logging system on 307 acres to helicopter logging, resulting in higher operating costs. The overall value of commercial products decreases substantially under this alternative.

Economic impacts are expressed in terms of annual full or part-time jobs supported by the project, as well as annual labor income associated with those jobs. Total cost for restoration is $5,538,194 (Table 3-167) and is broken out between 1–6 years and 7–15 years. Commercial harvesting and processing accounts for a relatively greater percentage of the economic impacts, compared to Forest Service–funded activities associated with roads, trails, and restoration (Table 3-169). The majority of activities associated with commercial harvest and recreation would occur within the first 6 years, thus reducing the economic impact for the remaining 9 years. The average annual full and part-time jobs and labor income supported by the project are approximately 25 and $709,507 for the first 6 years, and 5 and $142,206 for the remaining 9 years (Table 3-169). Forest Service–funded projects (Table 3-170) would be ongoing throughout the life of the project and beyond. However, no new jobs or positions would be created with this funding, so it will not be addressed further. Costs for burning should not extend beyond the 15-year timeline.

The cost of all restoration items exceeds the PNV by about $5,052,043 (Table 3-170). Therefore, supplemental funding would be necessary to fund some restoration items. Stewardship contracts (FSH 2409.19, Chapter 60) could be used to help offset the cost of some restoration activities by trading goods for services. Additional funding could be supplemented by retained receipts from other stewardship projects, appropriated funding, or grants. Because the project area has no WUI, competition for appropriated funding could be limited.

Access to the Elkhorn Yurt is by foot traffic only, although all remaining yurts have vehicle access with the last 300 feet being foot traffic only. Access to the Stargaze Yurt is currently open year-round to motorized vehicles within 300 feet when road conditions allow. Access to the Skyline Yurt is restricted by a seasonal road closure from September 15 through June 15. Under this alternative, summer access to the Stargaze and Skyline Yurts would be accessible by vehicles between June 16 and September 14. According to use data provided by IDPR, fall, spring, and summer use of the yurts continues to increase (Table 3-155). This alternative could reduce use to these 2 yurts by limiting vehicle access and subsequently reduce revenue associated with the rental program. During project implementation, area closures could also be implemented during prescribed fire and commercial harvest to provide for public safety (Design Feature RE-10). Estimated revenue loss to the IDPR yurt rental program during burning could range from $485 to $970 per yurt, assuming 100% rental capacity, and from $485 to $1,940 during timber harvest. Alternative F would change motorized access to the Stargaze and Skyline Yurts to seasonal between June 16 and September 14, which may impact the number of nights these yurts are rented and the income generated during this season. Changing vehicle access could reduce rental income by $65–$75 per night.

A 18.8-mile motorized trail designated for vehicles <60 inches wide and construction of a new trailhead are proposed under this alternative. ATV/UTV use is occurring on undesignated routes and trails within the project area. Developing this trail could help alleviate unauthorized use, reduce conflicts between different classes of motorized vehicles, and minimize effects to resources such as soil, water, and wildlife. This new trail could also attract new visitors to Boise County, resulting in increased revenue (Table 3-159 and Table 3-160).

This alternative proposes a reduction in miles of road open to public motorized use from 86.9 miles to 62.8 miles and decommissioning 31.7 miles of ML 1, ML 2, and unauthorized roads that are causing resource damage, thus permanently reducing road access within the project area. Associated actions would spend federal dollars to create or maintain 3–5 jobs to complete the restoration activities (Table 3-170). The impact on future restoration activities would be minimal, because the roads proposed for decommissioning are causing resource damage or are located in areas not suited for forest product removal. Changing the ML and closing roads would maintain a transportation system for future land management activities. The impact on recreation could be greater, because some of the roads once open for OHV use, fuelwood gathering, camping, and other recreational activities would be closed to public motorized use. Approximately 21 miles of the roads proposed for closing or decommissioning would be converted to non-motorized trails and be available for foot traffic, bicycles, horses, and skiing, which would reduce some of the impact.

A winter motorized closure totaling 10,800 acres is proposed under this alternative. The closure area includes the 7,491 acres north of Beaver Creek and east of State Highway 21 up to the dividing boundary between the Lowman and Idaho City ranger districts. The additional 3,300 acres proposed west of State Highway 21 under this alternative uses natural features, such as ridges and drainages, to create a non-motorized buffer to maintain the value for non-motorized users along maintained ski trails throughout the project area. Because this is a winter closure and commercial activity is prohibited between December 15 and April 15 and other nonwinter activities are limited to the summer months, winter recreation should not be affected by this closure.

Table 3-169. Average annual full and part-time jobs and labor income supported by restoration activities

	Alternative A		Alternative B		Alternative C		Alternative D		Alternative E		Alternative F	
	Employment	Income	Employment	Income	Employment	Income	Employment	Income	Employment	Income	Employment	Income
1–6 years												
Commercial Forest Products	0	$0	22	$644,830	22	$644,830	23	$677,334	17	$496,317	22	$644,830
Other Project Activities			3	$60,098	3	$60,098	3	$62,419	3	$45,987	3	$60,077
Forest Service Implementation and Monitoring	0	$0	0.1	$4,483	0.1	$4,483	0.1	$4,574	0.1	$4,658	0.1	$4,600
Total	**0**	**$0**	**25.1**	**$709,412**	**25.1**	**$709,412**	**26.1**	**$744,327**	**20.1**	**$546,962**	**25.1**	**$709,507**
7–15 years												
Commercial Forest Products	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0
Other Project Activities			5	$136,235	5	$136,235	5	$138,908	5	$135,787	5	$136,051
Forest Service Implementation and Monitoring	0	$0	0.2	$6,040	0.2	$6,040	0.2	$6,132	0.2	$6,314	0.2	$6,155
Total	**0**	**$0**	**5.2**	**$142,275**	**5.2**	**$142,275**	**5.2**	**$145,040**	**5.2**	**$142,102**	**5.2**	**$142,206**

Note: This table represents Idaho and Oregon as shown in Figure 3-113.

Table 3-170. Summary of supplemental funding needs by alternative

Action	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F
Potential Net Value (PNV)	$0	+$1,076,004	+$1,076,004	+$1,135,054	+$380,500	+$662,899
Estimated Restoration Costs	$0	–$5,508,053	–$5,509,965	–$5,611,214	–$5,432,543	–$5,538,194
Supplemental Funding	**$0**	**–$4,432,049**	**–$4,433,961**	**–$4,476,160**	**–$5,052,043**	**–$4,875,295**

Table 3-171. Reoccurring cost estimates and associated jobs

	Trail Maintenance	Burning	Road Maintenance	Noxious Weeds	Ski Trail Grooming	Snowmobile Trail Grooming	Yurt Rental
Cost	$15,700	$808,000–$873,000	$110,750	$46,500	$44,100	$7,900	$105,000
Jobs	4±	12±	4±	2±	1±	1±	2±

3.16.3.2 Cumulative Effects

Alternative A

No cumulative effects would be associated with this alternative because there would be no direct or indirect effects to the economic resources with implementation of Alternative A.

Action Alternatives

Appendix B identifies the past, present and ongoing, and reasonably foreseeable activities considered for this cumulative effects analysis. No past activities in the analysis area, when combined with any alternative, would cumulatively impact the financial assessment or revenue generated by these alternatives. No past activities have been identified that would cumulatively impact the level of jobs or economic activity in Boise County or surrounding communities.

Ongoing activities, such as road use and maintenance, trail use and maintenance, livestock grazing, fire suppression, and recreation, would be expected to continue within the analysis area. These activities would have no cumulative impact on the financial assessment or revenue generated by these alternatives. No present/ongoing activities have been identified that would cumulatively impact the level of jobs or economic activity in Boise County or surrounding communities.

No reasonably foreseeable projects or activities within the analysis area would cumulatively impact future activities. This project is anticipated to have a cumulative impact on the financial assessment and revenue generated by these alternatives and impact the level of jobs or economic activity in Boise County and surrounding communities.

3.16.3.3 Conclusions about Effects of Alternatives

Given that levels of treatment and commercial harvest and processing activity do not differ substantially across Alternatives B, C, D, and F, the estimated impacts for those alternatives are approximately the same: an average of 15–16 full and part-time jobs and $400,000–$420,000 in labor income supported per year, over the 15-year period of the project (Table 3-169). Commercial harvesting and processing accounts for a relatively greater percentage of the economic impacts, compared to Forest Service–funded activities associated with roads, trails, culverts, and restoration. Estimated job and labor income impacts are greater for the first 6 years of the project (approximately 20 to 26 jobs per year; $547,000–$744,000 labor income supported per year), during which time commercial harvest occurs. Impacts are lower during the last 9 years of the project, after commercial harvesting has been completed, but treatment continues (5 to 6 jobs per year; $142,000–$145,000 in labor income supported per year) (Table 3-169). Estimated impacts are slightly lower for Alternative E as a result of reduced harvest volumes, averaging approximately 12 jobs and $340,000 in labor income supported annually over 15 years (Table 3-169). Approximately 20 jobs per year and $547,000 in labor income per year are supported during the first 6 years, followed by 5 jobs and $142,000 per year during the last 9 years of the project. Impact results for the final 9 years are similar across all action alternatives (Table 3-172).

Table 3-172. Jobs supported and maintained within the Becker project analysis area

	Alt. A	Alt. B	Alt. C	Alt. D	Alt. E	Alt. F
Jobs Supported	N/A	30.3	30.3	31.3	25.3	30.3
Revenue	N/A	$851,687	$851,687	$889,367	$689,064	$851,713
Jobs Maintained	26	26	26	26	26	26
Total Jobs	26	56.3	56.3	57.6	51.3	56.3

The anticipated financial assessments in Table 3-168 vary slightly between Alternatives B, C, and D, which utilize ground-based harvest systems. Alternatives E and F would require helicopter logging, which would lower the anticipated sale value. No commercial value would be proposed under Alternative A. Net revenue for all alternatives is a combination of the anticipated NEPA cost, sale preparation cost, and contract administration cost. The net revenue for Alternative A is "below cost." Alternatives B and C are considered "above cost" by approximately $235,804; Alternative D is above cost by $284,854. Alternative E is below cost at $459,700, and Alternative F is below cost by $177,300. Sale volumes are the same for Alternatives B, C, and F and are estimated at 8.4 MMBF. Alternative D is slightly higher at 8.7 MMBF, and Alternative E is at 6.2 MMBF due to proposed diameter limits (Table 3-173). The sale value for each of Alternatives B and C is an estimated $1,076,004; Alternative D is slightly higher at $1,125,054; Alternative E is drastically lower at $380,500 due to helicopter logging; and Alternative F is $662,900, also because of helicopter logging (Table 3-173). Constructing temporary roads for timber harvest would decrease logging costs by utilizing ground-based harvest systems. Alternatives B and C propose constructing 5.8 miles of temporary roads; Alternative D proposes 6.5 miles; Alternative E proposes only 1.5 miles; and Alternative F proposes 4.3 miles to protect recreation experiences (Table 3-173). Proposed restoration activities are similar across all alternatives, with the estimated sale value the greatest factor affecting the need for supplemental funding. Alternative B would require an additional $4,432,049 to complete all restoration activities; Alternative C would require $4,433,961; Alternative D would require $4,486,160; Alternative E would require $5,052,043; and Alternative F would require $4,875,294 (Table 3-173).

Table 3-173. Financial assessment, Becker Integrated Resource Project

	Alt. A	Alt. B	Alt. C	Alt. D	Alt. E	Alt. F
Large Sale Volume (million board feet)	0	5.5	5.5	5.5	3.3	5.5
Small Sale Volume (million board feet)	0	2.9	2.9	3.2	2.9	2.9
Large Sale Value	$0	$770,634	$770,634	$806,114	$20,832	$357,529
Small Sale Value	$0	$305,370	$305,370	$328,910	$359,668	$305,370
Total Value	$0	$1,076,004	$1,076,004	$1,125,054	$380,500	$662,899
Net Revenue	–$576,000	$235,804	$235,804	$284,854	–$459,700	–$177,300
Supplemental Funding Needs	0	$4,432,049	$4,433,961	$4,486,160	$5,052,043	$4,875,294
Temporary Road (miles)	0	5.8	5.8	6.5	1.5	4.3

For the action alternatives, impacts upon recreation are similarwith respect to yurt access, proposed closure areas, new ATV/UTV trail construction, and road decommissioning and closings. Alternative A would allow continued operation of the yurt system and corresponding trail system in partnership with IDPR. No new recreational facilities are proposed.

All alternatives except A and E propose an OHV trail and corresponding trailhead. Alternatives B and C would incorporate a trail width of <50 inches, and Alternatives D and F would allow for vehicles <60 inches (Table 3-174). Alternative B has the longest trail route, with a proposed 23.3 miles (Table 3-174). To reduce trail user conflicts, Alternatives C and D reduce the proposed trail route to 22 miles; Alternative F proposes 18.8 miles and eliminates new construction in RCAs (Table 3-174).

Table 3-174. Off-highway vehicle trail, Becker project area

	Alt A	Alt B	Alt C	Alt D	Alt E	Alt F
Width Restriction (inches)	N/A	<50	<50	<60	N/A	<60
Miles		23.3	22	22		18.8

Proposed road actions may have a negative effect on use of the Skyline and Stargaze yurts by eliminating vehicle access, requiring individuals to hike in, or they may actually increase use by removing vehicle restrictions on closed roads (Table 3-175). Under Alternatives B and E, road access would be converted to ML 2—Administrative Use Only, requiring renters to hike in to the yurts (Table 3-175). Alternatives C and F propose seasonal closures, with vehicles allowed between June 16 and September 14 (Table 3-175). Alternative D would remove the seasonal closure and would be the only alternative with no access restrictions (Table 3-175). Refer to section 3.7 for detailed discuss.

Table 3-175. Yurt access, Becker project area

Access Restrictions	Alt. A	Alt. B	Alt. C	Alt. D	Alt. E	Alt. F
Administrative Use Only		X			X	
Seasonal Restrictions June 16–September 14	X		X			X
No Restrictions				X		

Alternatives A through F would incorporate a winter non-motorized closure up to 10,800 acres (Table 3-176)—Alternatives A and B propose the existing 7,491 acres; the remaining alternatives propose closing an additional 3,309 acres to preserve a non-motorized experience around designated ski trails. Because this would be a winter closure and proposed activities are prohibited between December 15 and April 15, winter recreation activities should not be affected. Alternative E would impose a seasonal closure to mechanized equipment to protect big game calving between May 1 and June 15 on 8,576 acres east of State Highway 21 and north of Beaver Creek (Table 3-176). This alternative could have the greatest economic impact on the yurt rental program, by eliminating mechanized access to the Skyline and Elkhorn Yurts during the closure period.

Table 3-176. Seasonal closures, Becker project area

Closure Type	Alt. A	Alt. B	Alt. C	Alt. D	Alt. E	Alt. F
Winter		X	X	X	X	X
Spring					X	
Acres	7,491	7,491	10,800	10,800	19,376	10,800

Transportation system changes proposed under Alternatives B through F are similar and would reduce the miles of road open to public motorized use between 24.1 and 28.6 miles (Table 3-177). Some roads would be closed to the public but open for administrative use only. About 30–33 miles of NFS road and unauthorized roads would be decommissioned and permanently removed from the system (Table 3-177). Depending on the alternative, between 18 and 26 miles of these closed or decommissioned roads would be converted to trails (Table 3-177).

Table 3-177. Road actions (miles), Becker project area

Action	Alt. A	Alt. B	Alt. C	Alt. D	Alt. E	Alt. F
Reduction in Open Roads ML 1	0	28.6	24.1	24.1	28.6	24.1
Administrative Use Only	0	+24.8	+20.3	+20.3	+24.8	+20.3
Decommission	0	30.9	30.9	30.9	32.9	31.7
Convert to trails	0	21	21	18	26	21

3.17 CULTURAL RESOURCES

The following changes were made between the Draft EIS and FEIS:

Table 3-178 was updated to accurately reflect the number of known historic properties and treatments within management activity areas by alternative.

3.17.1 Analysis Scale, Data Sources, and Methodology

The area of potential effect (APE) for this project is defined as the project boundary. Section 106 of the NHPA requires federal agencies to consider the effects of their activities and programs on historic properties within the APE.

Existing information from cultural resource records, historic archives, maps, and GIS spatial data was reviewed to provide specific information about historic properties, or the likelihood that unidentified properties might exist in noninventoried areas. When considering effects of alternatives, the specific location of a historic property is the unit of spatial analysis.

An intuitive-complete survey (using 30-meter transects) was conducted in the project area in 2008, 2014, and 2015.

3.17.2 Analysis Indicators

The analysis indicator for cultural resources is whether or not historic properties are protected. Historic properties are significant cultural resources included in, or eligible for inclusion in, the National Register of Historic Places (NRHP).

3.17.3 Affected Environment

Cultural themes for the project area include Mining, Ethnic Heritage, Timber Industry, Forest Service History, and the CCC. Mining and timber have been important industries in this management area. In the 1860s, placer miners on Crooked River discovered enough silver in their gold "diggings" to prompt exploration for a lode source. In 1864, these miners discovered a silver ledge on Banner Ridge. The miners, many of them Chinese, established 2 towns in the area named Banner and Eureka. The Banner Mining District was a thriving enterprise until the early 1920s, producing over $3,000,000 in silver. In 1903, the Barber Lumber Company established field quarters at Barber Flat in anticipation of driving logs down Crooked River and the North Fork Boise River. In 1923, the Forest developed Barber Flat into an administrative site. In the 1930s, the CCC built new buildings on this site and at Beaver Creek Guard Station (established in 1912).

The historical record and previous cultural resources inventory document the cultural sensitivity of lands included in the project area. Approximately 980 acres have been intensively surveyed for cultural resources. Surveys focused on areas of high probability (i.e., drainages, springs, ridges, saddles, and areas with slopes less than 25%). These surveys documented 35 archeological sites within the project area, 23 of which are eligible or potentially eligible for listing in the NRHP; 12 are not eligible for listing in the NRHP.

3.17.4 Environmental Effects

Direct and indirect effects to historic properties from project activities are determined by applying NHPA's criteria of effect. NHPA defines an Adverse Effect as one that diminishes the integrity of a historic or prehistoric site's location, design, setting, materials, workmanship, feeling, or association. Adverse effects include physical destruction, damage, or alteration to all or part of a site, and/or the introduction of visual, audible, or atmospheric elements out of character with the site or that alter its setting (36 CFR 800.5[a][2][i–vii]). Effects criteria are only applied to those sites determined eligible for the NRHP.

If an undertaking will not alter the characteristics of a historic property eligible for listing on the NRHP, then a No Adverse Effect determination may be reached. No Adverse Effect determinations are applied when the Forest Service, in consultation with the SHPO, determines that the effects neither meet the criteria of adverse effect nor modify the undertaking or impose conditions to avoid adverse effects. Should the Forest Service determine that an activity will have an adverse effect on a historic property and the SHPO concurs, the agency and the SHPO will stipulate measures to resolve or mitigate the effect(s).

3.17.4.1 Direct and Indirect Effects

Few differences exist between the alternatives in terms of the magnitude, intensity, or duration of effects to historic properties in the project area (Table 3-178). In 4 alternatives (B, C, D, and F), ongoing potentially adverse effects to 1 historic property, from dispersed recreation, would be mitigated. Historic properties will be protected through avoidance and monitoring of project activities (see Design Features CR-1 and CR-2). If historic properties are protected or avoided, it is likely that the implementation of any action alternative would result in No Adverse Effect to historic properties and thus result in a No Adverse Effect determination.

Table 3-178. Known historic properties and treatments within management activity areas by alternative

Treatment Description	Alt. A	Alt. B	Alt. C	Alt. D	Alt. E	Alt. F
Project area	15	15	15	15	15	15
Vegetation treatments (including temporary road construction and landings)	0	8	8	8	8	8
Fuels treatments	0	9	9	9	9	9
Transportation system and recreation activities (including trailheads)	0	3	3	3	2	4
Aquatic organism passage treatments	0	0	0	0	0	0

Alternative A—No Action

This No Action Alternative is a required alternative that provides a baseline against which impacts of the action alternatives can be measured and compared. Under this alternative, no new management activities would occur, although all other ongoing activities (e.g., recreational activities, public fuelwood gathering, livestock grazing, motorized travel) would continue. Suppression of wildfires within the project area would also continue as needed.

Under Alternative A, no historic properties are within the APE. Implementing Alternative A would likely result in No Effect to historic properties.

Action Alternatives

Under all action alternatives, historic properties would be protected through avoidance and monitoring of project activities (see Design Features CR-1 and CR-2). If historic properties are protected or avoided, it is likely that implementing any action alternative would result in No Effect or No Adverse Eeffect to historic properties and thus result in a No Adverse Effect determination.

3.17.4.2 Cumulative Effects

Cultural resources inventories have identified past and ongoing adverse effects to historic properties within and adjacent to the project area from mining, logging, road construction, recreation, and special uses. Prohibited activities such as artifact collection and vandalism have also damaged and destroyed sites. Since the 1970s, however, when implementing regulations for Section 106, the Forest Service has worked to avoid or minimize impacts to cultural resources from activities on NFS lands.

Alternative A—No Action

Because no action would occur under this alternative, cumulative effects to cultural resources would be unlikely.

Action Alternatives

The Forest Service has evaluated the proposed management activities and anticipates no adverse effects to historic properties from implementing the action alternatives. Historic properties would be avoided and monitored during project implementation. Therefore, no cumulative adverse effects to historic properties would occur.

3.18 RESOURCE COMMITMENTS

The following changes were made between the DEIS and FEIS:

General edits were completed to improve clarity and readability of the section.

This section contains disclosures that are required by federal law, regulation, or policy and generally apply to all of the preceding resource area effects sections in this chapter.

3.18.1 Unavoidable Adverse Effects

The Forest Plan, as amended in 2010, established management emphasis and direction for implementing activities on NFS lands during the planning period (USDA Forest Service 2010a). Activities proposed under Alternatives B, C, D, E, or F are consistent with the management direction in the Forest Plan. By applying the Forest-wide, MPC, and Management Area standards and guidelines found in Chapter 3 of the Forest Plan, adverse effects from these proposed activities would be limited in extent and duration. The design features found in Chapter 2, section 2.4.7, provide additional mitigation to minimize or avoid adverse effects; however, some unavoidable effects would result from implementing activities as proposed under Alternatives B, C, D, E, or F. These potential effects are described by resource are disclosed earlier in this chapter.

3.18.2 Relationship of Short-term Uses and Long-term Productivity

Long-term productivity refers to the capability of the land to provide resource outputs for a period of time beyond the planning period. One of the purposes of a forest plan, as established by federal regulation (36 CFR 219.1(b)), is to provide direction needed to manage NFS lands to sustain the multiple use of renewable forest resources in perpetuity while maintaining the long-term health and productivity of the land. Management requirements are contained in Forest-wide and Management Area standards and guidelines and would be met under Alternatives B, C, D, E, or F (refer to Forest Plan consistency determination, sections 1.8.6.1 and 1.8.6.2). Meeting these requirements ensures that the long-term productivity of the land is not impaired by short-term uses.

A key Forest Plan standard that directly pertains to the maintenance of long-term soil productivity pertains to requirements for TSRC. TSRC occurs when a management activity converts a productive site to an essentially nonproductive site for a period of more than 50 years. Examples include authorized or unauthorized roads, inadequately restored haul roads, permanently designated skid roads and log landing areas, parking lots, mine dumps or excavations, dedicated recreation trails, skid trails, developed campgrounds, other dedicated facilities, and some long-term stock driveways. Forest Plan standards require the assessed activity area encompassing these types of activities to stay below 5% TSRC for the total acreage. Refer to the Glossary for the definition of “activity area.”

Alternative A would have no temporary, short-term, or long-term direct, indirect, or cumulative effects on TSRC. Assuming the travel management restrictions prohibiting unauthorized motor vehicle use off designated routes would be enforced, no new travel routes, or extensions of existing routes thus no change in TSRC would be expected. It is

likely that livestock would continue to trail along existing, unauthorized routes within the project area, so these features would not fully recover through natural recovery. Alternative A would maintain the existing TSRC of 4.7%.

Under Alternative B (Proposed Action), there would be an interim increase of 1.6% in TSRC from the construction and use of log landings, skid trails, and a proposed 5.8 miles of temporary road to facilitate commercial timber harvest. These temporary, direct effects are addressed through project Design Features FH-6 and TH-5 (section 2.4.7), which require these disturbances be reclaimed when no longer needed for timber harvest, essentially alleviating the increased TSRC. Constructing 1.2 miles of new road and reconstructing/relocating 4.8 miles of NFS roads would increase TSRC over the existing conditions by 0.12% within the activity area; however, this increase would be reduced by decommissioning roughly 30.9 miles of existing system (22.8 miles) and nonsystem routes (8.1 miles). Proposed trailheads would be located in areas already identified as exhibiting existing TSRC from dispersed recreation. Construction of the trailheads would slightly increase TSRC, as the disturbance footprint would be slightly greater than the existing disturbance. As a result, at the conclusion of implementing all activities under Alternative B, the TSRC would be an estimated 4.0%, complying with Forest Plan Standard SWST03 (USDA Forest Service 2010a).

Under Alternative C, there would be an interim increase of 1.6% in TSRC from the construction and use of log landings, skid trails, and an estimated 5.8 miles of temporary road to facilitate commercial timber harvest. These temporary, direct effects are addressed through project Design Features FH-6 and TH-5 (section 2.4.7), which require these disturbances be reclaimed when no longer needed for timber harvest, essentially alleviating the increased TSRC. Constructing 1.2 miles of new road and reconstructing/relocating 4.8 miles of NFS roads would increase TSRC over the existing conditions by 0.12% within the activity area; however, there would be a net decrease in TSRC after decommissioning roughly 30.9 miles of existing system (22.8 miles) and nonsystem routes (8.1 miles). Proposed trailheads would be located in areas already identified as existing TSRC from dispersed recreation. Construction of the trailheads would slightly increase TSRC, as the disturbance footprint would be slightly greater than the existing disturbance. As a result, at the conclusion of implementing all activities under Alternative C, the TSRC would be an estimated 4.0%, complying with Forest Plan Standard SWST03.

Under Alternative D, there would be an interim increase of 1.7% in TSRC from the construction and use of log landings, skid trails, and an estimated 6.5 miles of temporary road to facilitate commercial timber harvest. These temporary, direct effects are addressed through project Design Features FH-6 and TH-5 (section 2.4.7), which require these disturbances be reclaimed when no longer needed for timber harvest, essentially alleviating the increased TSRC. Constructing 1.2 miles of new road and reconstructing/relocating 4.8 miles of NFS roads would increase TSRC over the existing conditions by 0.12% within the activity area; however, there would be a net decrease in TSRC after decommissioning roughly 30.9 miles of existing system (22.8 miles) and nonsystem routes (8.1 miles). Proposed trailheads would be located in areas already identified as existing TSRC from dispersed recreation. Construction of the trailheads would slightly increase TSRC, as the disturbance footprint would be slightly greater than the existing disturbance. As a result, at the conclusion of

implementing all activities under Alternative D, the TSRC would be an estimated 4.0%, complying with Forest Plan Standard SWST03.

Under Alternative E, there would be an interim increase of 1.1% in TSRC from the construction and use of log landings, skid trails, and an estimated 1.5 miles of temporary road to facilitate commercial timber harvest. These temporary, direct effects are addressed through project Design Features FH-6 and TH-5 (section 2.4.7), which require these disturbances be reclaimed when no longer needed for timber harvest, essentially alleviating the increased TSRC. Constructing 1.2 miles of new road and reconstructing/relocating 4.8 miles of NFS roads would increase TSRC over the existing conditions by 0.12% within the activity area; however, there would be a net decrease in TSRC after decommissioning roughly 32.9 miles of existing system (24.8 miles) and nonsystem routes (8.1 miles). Proposed trailhead construction would be located in an area already identified as existing TSRC from dispersed recreation. Construction of the trailhead would slightly increase TSRC, as the disturbance footprint would be slightly greater than the existing disturbance. Under Alternative E there would be only 1 trailhead constructed, as opposed to the 2 included in all other action alternatives. As a result, at the conclusion of implementing all activities under Alternative E, the TSRC would be an estimated 3.8%, complying with Forest Plan Standard SWST03.

Under Alternative F, there would be an interim increase of 1.4% in TSRC from the construction and use of log landings, skid trails, and an estimated 4.3 miles of temporary road to facilitate commercial timber harvest. These temporary, direct effects are addressed through project Design Features FH-6 and TH-5 (section 2.4.7), which require these disturbances be reclaimed when no longer needed for timber harvest, essentially alleviating the increased TSRC. Constructing 1.2 miles of new road and reconstructing/relocating 4.8 miles of NFS roads would increase TSRC over the existing conditions by 0.12% within the activity area; however, there would be a net decrease in TSRC after decommissioning roughly 31.7 miles of existing system (23.6 miles) and nonsystem routes (8.1 miles). Proposed trailheads would be located in areas already identified as existing TSRC from dispersed recreation. Construction of the trailheads would slightly increase TSRC, as the disturbance footprint would be slightly greater than the existing disturbance. As a result, at the conclusion of implementing all activities under Alternative F, the TSRC would be an estimated 3.9%, complying with Forest Plan Standard SWST03.

3.18.3 Irreversible and Irretrievable Commitment of Resources

Irreversible and irretrievable commitments of resources are defined in the Environmental Policy and Procedures, Forest Service Handbook 1909.15.

An “irreversible” commitment of resources indicates the consumption or destruction of nonrenewable resources such as fossil fuels, minerals, or cultural resources, or the degradation of resources such as soil productivity, that can be renewed only over long periods of time. Irreversible commitments represent the loss of future options.

An “irretrievable” commitment of resources results in foregone opportunities and represents a tradeoff in the use and management of Forest resources. Irretrievable commitments of resources include expenditure of funds, loss of production, or restrictions on resource use. For example, some or all wildlife habitat in a specific area may be irretrievably lost while an area serves as a concentrated winter sports site. The lost habitat function is irretrievable for

that period of time, but the action is not irreversible; if the use changes in the project area, the area may once again provide wildlife habitat.

Alternative A proposes no new activities; therefore, no irreversible or irretrievable commitments would result. Alternatives B, C, D, E, or F would result in an irreversible commitment of fossil fuel energy resources used by equipment needed to implement proposed vegetation and road management activities.

All alternatives would also result in irretrievable commitments as a result of expenditure of funds to plan and—in the case of Alternatives B, C, D, E, or F—implement these proposed activities (see section 3.16, "Socioeconomics"). Commitments would also be made in the short and long terms under Alternatives B, C, D, E, or F as a result of effects on soil resources. Management activities can impact soils in a variety of ways, including DD and TSRC. Refer to section 3.10 for detailed effects disclosures for DD and TSRC.

DD occurs when activities detrimentally alter the natural soil characteristics, resulting in the immediate and/or prolonged degradation of onsite resources or vegetation productivity. This impact is associated with unacceptable levels of soil displacement, soil compaction, soil puddling, or severely burned soils. As also discussed under a previous paragraph in this section, TSRC occurs when a management activity converts a productive site to an essentially nonproductive site for a period of more than 50 years. Examples include authorized or unauthorized roads, inadequately restored haul roads, permanently designated skid roads and log landing areas, parking lots, mining dumps or excavations, dedicated recreation trails, skid trails, developed campgrounds, other dedicated facilities, and some long-term stock driveways.

Under Alternative A, there would be no increase in DD within any activity area, and this alternative would be consistent with Forest Plan Standard SWST02. DD for activity areas would continue to range from 0% to 5% (Appendix D).

Implementing activities described under Alternatives B and C results in identical effects to DD and would increase DD in each of the activity areas in the temporary and short term (0–15 years) (Appendix D, Table D-1). DD is not predicted to exceed 15% in any of the timber harvest activity areas; 14 of the 75 units or activity areas are estimated to reach 13% DD immediately following timber harvest activities (Appendix D). For each timber harvest unit, a time lag exists between sequentially implemented treatments. Using prescribed fire to treat activity fuels occurs 1–3 years after timber harvest, and some of the initial DD increase from timber harvest would recover to disturbed conditions as skid trails are actively reclaimed. Following prescribed fire implementation, the same 14 units would approach 13% to 15% DD. Within 5 years of project implementation, DD in all 75 activity units would range from 0 to 11.5% (Appendix D). Additional recovery of DD in each activity unit is anticipated between 5 and 10 years following project implementation (Appendix D). The estimated increases in DD at the completion of project activities would be less than 15% for all activity areas, and implementing the treatments would comply with Forest Plan Standard SWST02.

Implementing activities described under Alternative D would increase DD in each of the activity areas in the temporary and short term (0–15 years) (Appendix D, Table D-1). DD is not predicted to exceed 15% in any of the timber harvest activity areas; 14 of the 70 units or activity areas are estimated to reach 13% DD immediately following timber harvest activities (Appendix D). For each timber harvest unit, a time lag exists between sequentially

implemented treatments. Using prescribed fire to treat activity fuels occurs 1–3 years after timber harvest, and some of the initial DD increase from timber harvest would recover to disturbed conditions as skid trails are actively reclaimed. Following prescribed fire implementation, the same 14 units would approach 13% to 15% DD. Within 5 years of project implementation, DD in all 75 activity units would range from 0 to 11.5% (Appendix D). Additional recovery of DD in each activity unit is anticipated between 5 and 10 years following project implementation (Appendix D). The estimated increases in DD at the completion of project activities would be less than 15% for all activity areas, and implementing the treatments would comply with Forest Plan Standard SWST02.

Implementing activities described under Alternatives E and F results in identical effects to DD and would increase DD in each of the activity areas in the temporary and short term (0–15 years) (Appendix D, Table D-1). DD is not predicted to exceed 15% in any of the timber harvest activity areas; 14 of the 78 units or activity areas are estimated to reach 13% DD immediately following timber harvest activities (Appendix D). For each timber harvest unit, a time lag exists between sequentially implemented treatments. Using prescribed fire to treat activity fuels occurs 1–3 years after timber harvest, and some of the initial DD increase from timber harvest would recover to disturbed conditions as skid trails are actively reclaimed. Following prescribed fire implementation, the same 14 units would approach 13% to 15% DD. Within 5 years of project implementation, DD in all 75 activity units would range from 0 to 11.5% (Appendix D). Additional recovery of DD in each activity unit is anticipated between 5 and 10 years following project implementation (Appendix D). The estimated increases in DD at the completion of project activities would be less than 15% for all activity areas, and implementing the treatments would comply with Forest Plan Standard SWST02.

Refer to section 3.10 for discussions concerning TSRC by alternative.

3.18.4 Energy Requirements and Conservation Potential

Energy is consumed in the administration of NFS natural resources. The main activities proposed under Alternatives B, C, D, E, and F that would consume energy are restoration activities including mechanical vegetation treatments and prescribed fire; road construction and reconstruction; and administrative activities of the Forest Service and other regulatory agencies.

Alternative A does not propose any new activities that would result in increases in energy consumption over those currently occurring.

Several opportunities exist under all action alternatives to provide for energy conservation. For example, agency personnel involved with this project are committed to carpooling and combining trips to save fuel and wear and tear on the Forest Service fleet of vehicles. Using teleconferencing and other electronic communication options, rather than scheduling meetings at a single location, would save energy spent on travel. The agency would also work with contractors involved with the project to suggest opportunities to use more energy-efficient equipment for activities such as vegetation management, road construction and reconstruction, or road maintenance.

3.18.5 Consultation with Other Federal or State Agency or Local Government

Contact, review, and public involvement with other federal and state agencies indicate no major conflicts between the activities proposed under Alternatives B, C, D, E, or F and the goals and objectives of other federal, State, or local governmental entities. Refer to section 1.8 for a more detailed discussion concerning "Regulatory Requirements and Required Coordination"

Chapter 2, section 2.4.9, also identifies other federal, State, or local approvals/permits potentially applicable to all action alternatives. Finally, as described in section 1.1, the proposed restoration activities under the action alternatives have been designed to further the achievement of goals and objectives in the Forest Plan, as amended in 2010. The Wildlife Conservation Strategy integrated into the Forest Plan in 2010 has been designed to complement the IDFG's *Idaho CWCS* (IDFG 2005).

3.18.6 Consultation with Tribal Governments

EO 13175 (65 FR 67249–67252, 2000) requires regular and meaningful consultation between federal and tribal government officials on federal policies that have tribal implications.

As described in Chapter 1 (section 1.10) and Chapter 4 of this FEIS, regular notification and, as requested, consultation with potentially affected tribes has occurred throughout the planning process for this project. The tribal notification and subsequent consultation processes completed have not identified any adverse effects to tribal interests or rights associated with this project.

3.18.7 Best Available Science

The conclusions summarized in this FEIS are based on a review of the project record, which considers relevant scientific information and responsible opposing views where raised by internal or external sources, and the acknowledgement of incomplete or unavailable information, scientific uncertainty, and/or risk where pertinent to the decision being made.

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CHAPTER 4 CONSULTATION AND COORDINATION

4.1 SUMMARY OF SCOPING AND PUBLIC INVOLVEMENT TO DATE

The Ranger District encouraged extensive public involvement throughout the planning process leading to this document. This project has been listed on the Forest Service's SOPA since January 2006. In May 2014, the District initiated public scoping on the Becker Integrated Resource Project. The Proposed Action was posted on the Forest Service web site[37] on the project's web page on May 1, 2014. The scoping package was mailed to 138 individuals, agencies, and/or groups on May 2, 2014. Additionally, a scoping email bulletin was sent to 57 individuals on May 7, 2014, and a press release was printed in the *Idaho Statesman* on May 7, 2014. Public meetings were held on May 20, 2014, in Idaho City and on May 21, 2014, in Boise. A total of 23 parties responded to the May 2014 scoping effort. The project record contains all comments received during the scoping period, along with the Forest Service's responses to the comments.

A NOI to prepare an EIS was published in the Federal Register on August 8, 2014 (FR Vol. 79, No. 153). The NOI described the Proposed Action and invited comments for 30 days following publication. Public notification that the Forest Service would prepare an EIS for the project, publication of the NOI, and request for additional public comment was mailed to 68 individuals, agencies, and/or groups and emailed to 93 individuals on August 11, 2014. A total of 64 parties responded to the NOI comment period. The project record contains all comments received during this public involvement period and the Forest Service responses.

A NOA of the Draft EIS for this project was published in the Federal Register on September 25, 2015 (FR Vol. 80, No. 186; NOA for EIS No. 20150272) and a legal notice was also published on September 25, 2015, in the *Idaho Statesman* (the newspaper of record) announcing release of the Draft EIS. A summary of the Draft EIS outlining the alternatives and associated environmental analysis was mailed to 46 individuals, agencies, and/or groups on September 21, 2015. The Draft EIS in its entirety was mailed to 12 individuals, agencies, and/or groups. The Draft EIS was also published to the project's web page on September 21, 2015. Email notifications of the Draft EIS availability were sent on September 22, 2015, to 255 individuals, agencies, and/or groups. Comment letters, phone calls, and/or emails were received from 42 interested parties. Appendix K contains all comments received and the Forest Service responses.

4.2 TRIBAL CONSULTATION

The federal government's trust responsibility to federal recognized tribes compels agencies to conduct their activities consistent with rights legally accruing to a tribe or tribes by virtue of inherent rights and sovereign authority, unextinguished aboriginal title, treaty, statute, judicial decisions, EO or agreement, all of which give rise to legally enforceable remedies. In carrying out their trust responsibilities, the Forest Service must assess proposed actions to determine potential impacts on treaty rights, treaty resources, or other unextinguished tribal rights and interests. Where potential impacts exist, the agencies must consult with affected

[37] http://www.fs.fed.us/nepa/fs-usda-pop.php/?project=18922

tribes and explicitly address those impacts in planning documents and final decisions. Consultation with the tribes is essential in carrying out that trust responsibility.

The intergovernmental consultation process serves as the primary means for the federal agencies to carry out their trust obligations. Consultation is not a single event, but instead is a process leading to a decision—for example, the ROD for this EIS. Consultation means different things to different tribes. It can be either a formal process of negotiation, cooperation, and policy-level decision making between tribal governments and the federal government, or a more informal process. Tribal rights and interests are discussed and considered or incorporated into the decision. Consultation can be viewed as an ongoing relationship between an agency(ies) and a tribe(s), characterized by consensus-seeking approaches to reach mutual understanding and resolve issues. It may concern issues and actions that could affect the government's trust responsibilities, or other tribal interests.

Consultation minimally serves 5 purposes, to

- identify and clarify issues;
- provide for an exchange of existing information and identify where information is needed;
- identify and serve as a process for conflict resolution;
- provide an opportunity to discuss and explain the decision; and
- fulfill the core of the federal trust obligation.

Legal requirements for federal agencies to consult with sovereign Indian tribes have their basis in federal law, court interpretations, and EOs.

Two federally recognized tribes have received notification about the Becker Integrated Resource Project: the Shoshone–Bannock and the Shoshone–Paiute tribes. Shoshone–Paiute tribal representatives were presented with the project proposal at Wings and Roots meetings occurring on April 1, 2012, December 12, 2013, April 13, 2014, September 11, 2014, and November 13, 2014. Tribal council of the Shoshone–Bannock Tribes were mailed and emailed the project proposal on May 2, 2014. A letter was sent to the Shoshone–Bannock Tribes on August 12, 2014, to notify the tribal council that the Forest Service would prepare an EIS for the project, of the NOI's publication in the Federal Register, and to request comments. The Shoshone–Bannock Tribes were sent a letter requesting comment and a DEIS on September 21, 2015. The tribal notification and/or consultation processes described above did not result in the identification of any potential impacts to treaty rights, treaty resources, or other unextinguished tribal rights and interests. Some tribal representatives identified beneficial effects to resources as a result of proposed restoration of vegetation, wildlife habitat, soil, and water resources; these potentially beneficial effects are consistent with those identified during the 2010 Forest Plan amendment process.

4.3 AGENCIES, ORGANIZATIONS, AND INDIVIDUALS CONTACTED AND/OR CONSULTED DURING THE PLANNING PROCESS

Agencies

Advisory Council on Historic Preservation
Boise County Commissioners
Bureau of Land Management
Chief of Naval Operations, Energy and Environmental Readiness Division
City of Idaho City
City of Placerville
Federal Aviation Administration
Idaho Dept. of Agriculture
Idaho Dept. of Environmental Quality
Idaho Dept. of Fish and Game
Idaho Dept. of Lands
Idaho Dept. of Parks and Recreation
Idaho Dept. of Water Resources
Idaho Mining Association
Idaho Outfitter & Guides Association
National Agricultural Library
Natural Resources Conservation Service
NOAA Fisheries Service NW Region
Northwest Power Planning Council
U.S. Army Corps of Engineers
U.S. Coast Guard
U.S. DOE Office of NEPA Policy & Compliance
U.S. Environmental Protection Agency
U.S. Fish and Wildlife Service
USDA Animal and Plant Health Inspection Service
USDI Office of Environmental Policy & Compliance
West Central Highlands RC & D

Organizations

Advocates for the West
Alliance for the Wild Rockies
American Forest Resource Council
Backcountry Horsemen
Blue Ribbon Coalition
Boise Building
Boise Cascade
Boise Ridge Riders
Boise Valley Fly Fishermen
Center for Biological Diversity
Fly Fishers of Idaho
Golden Eagle Audubon
Idaho ATV Association
Idaho Cattle Association
Idaho Conservation League
Idaho Rangeland Resource Commission
Idaho Rivers United
Idaho Sporting Congress
Idaho State Snowmobile Association
Idaho Whitewater Association
Idaho Wildlife Federation
Idaho Woolgrowers Assn.
National Wild Turkey Federation
Northern Utah Prospectors Assn.
Pinnacle Peak Sawtooth Lodge
Rocky Mountain Elk Foundation
Sierra Club
Southwest Idaho Mountain Bike Association
The Lands Council
The Nature Conservancy
The Wilderness Society
Treasure Valley Backcountry Horsemen
Treasure Valley Trail Machine Association
Trout Unlimited
Western Watersheds Projects
Wildlands Defense
Wild West Institute
Winter Wildlands

Companies/Individuals

Senator James E. Risch
Senator Mike Crapo
Congressional Representative Mike Simpson
Congressional Representative RaulLabrador
Idaho City Mayor's Office
Randy Harrison
Bill and Betty Carter
Terry Applegate
Joel Sales

Bob Bartimoccia
Scott Cambron
Mike Gillespie
Dave Haskins
Steve Jensen
Geri Perkins
Duane Tribelcock
John Inama
Allen Lake
Sam Roeber
Sandy Nye
Greg Auch
Dennie Young
Bogus Creek Outfitters
Mike Mahler
William Calderwood
Jim & Karen Sayko
Whit Whitham
Kevin Bell
Wendall Worthington
Lois Harpham
Warren Smith
James McDonald
Darl Allred
Dick Weilmunster
Frank Billue
Roger Tipton
Harvey Richards, Jr.
Idaho World
Linda Hyde
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Mary Ellen McMurtie
Frank Shirts Jr.
Louie Lewis
Ric and Marj Holmes
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James H. Langston Revocable Trust
Banner Property LLC
Forest Fleischman
Cumo Molybdenum Corp. Inc.
Gary, Keith, and Thelma Toll
Justin V. Toll
Scott L. Burch
Curtis R. Toll
Jesse and Diane Wilson
Donna and Jack Curtis
Richard Alan Hamilton
Patrick Smith
Richard E. Barnett
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Bev and Michael Graham
Ray and Brandi Hubbard
Nola Ann McCafferty
Marialuz Staisiunas
Ryan Driver
Michael J. Weaver
Jeff and Senteney Hoard
Dennis Day
Lourae Young
Christine, John, Michael, Timothy Curran
Donald E. McKee
James and Marilyn Hodgson
Shane and Lisa Willie
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[38] Email subscribers through the project web page provide only an email address to subscribe; therefore names of the individuals may not be available.

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Appendices

Becker Integrated Resource Project

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Appendix A:

Road Tables by Alternative

Becker Integrated Resource Project

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Table 1 lists the existing National Forest System (NFS) roads within the Project area along with the associated Operational Maintenance Level (ML) and the current motor vehicle use status.

Tables 2 through 5 list road segments where the proposed changes to road management vary across the action alternatives. Road segments with actions that differ from the Proposed Action, Alt B, are high/lighted in BOLD under the applicable action alternatives. All other road segments that are NOT listed in Tables 2 through 5 have the same proposed road management actions across all of the action alternatives as shown in Table 6 for Alternative B.

Table 2 shows the differences in motorized use for roads that provide access to the Skyline and Stargaze Yurts. Seasonal means the road is open to all motorized vehicles from June 16 – September 15. Open means the road is open yearlong to all motorized vehicles. Closed means the road is closed yearlong to all public motorized use, but administrative use is permitted.

Table 3 shows the differences for three road segments where non-motorized trail would be authorized on the existing roadway. Seasonal means the road is open to all motorized vehicles from June 16 – September 15. Closed means the road is closed yearlong to all motorized use, but still would be authorized as a non-motorized trail and could be re-opened for future forest management activities if necessary. Convert means that the road segment would be converted from a road to a non-motorized trail. After conversion, those road segments would no longer be a part of the Forest road inventory.

Table 4 shows the differences for six road segments which would either be converted to a motorized trail or would otherwise be decommissioned. Closed means the road is closed yearlong to all motorized use. Convert means that the road segment would be converted from a road to a motorized trail. After conversion, those road segments would no longer be a part of the Forest road inventory. Under Alternatives B and C, the motorized trail would permit use seasonally for vehicles 50 inches wide and less. For Alternatives D and F, the motorized trail would permit use seasonally for vehicles 60 inches wide and less. Alternative E does NOT designate any motorized trail. Decomm means that those road segments would be decommissioned as there would not be a motorized trail designated and those road segments would no longer be a part of the Forest road inventory.

Table 5 shows the differences for seventeen road segments where a motorized trail would be co-located on the roadway. No means the road is closed yearlong to all motorized use as these segments are ML1 roads and no motorized trail would be designated. Yes means that a motorized trail would be co-located on the road, permitting use by non-highway legal vehicles, but prohibiting all other motorized use. Under Alternatives B and C, the motorized trail would permit use seasonally for vehicles 50 inches wide and less. For Alternatives D and F, the motorized trail would permit use seasonally for vehicles 60 inches wide and less. Alternative E does NOT designate any motorized trail.

Table 6 lists the existing NFS roads within the Project area along with the treatments and motor vehicle use status as proposed under Alternative B.

Table 7 lists the existing NFS roads within the Project area along with the treatments and motor vehicle use status as proposed under Alternative C.

Table 8 lists the existing NFS roads within the Project area along with the treatments and motor vehicle use status as proposed under Alternative D.

Table 9 lists the existing NFS roads within the Project area along with the treatments and motor vehicle use status as proposed under Alternative E.

Table 10 lists the existing NFS roads within the Project area along with the treatments and motor vehicle use status as proposed under Alternative F.

Table 11 lists the unauthorized roads that would be added to the NFS transportation system under all of the action alternatives. These roads were identified in the Becker TAP as needed for future forest management and they would be included in the Minimum Road System for the Becker project area.

Table 12 lists the permanent new roads that would be constructed and added to the NFS transportation system under all of the action alternatives. These roads were identified in the Becker TAP as needed for future forest management and they would be included in the Minimum Road System for the Becker Project area.

Table 13 lists the temporary roads that would be constructed under each of the action alternatives. These roads would be constructed to the minimum standard required to accommodate hauling and the associated harvesting equipment. Following use, they would be returned to a natural state or a single track non-motorized trail.

The haul roads listed in Table 14 are the routes that would be needed for removing forest products under each of the action alternatives. Specifications for the performance of maintenance and specified road work for each road are included in the timber sale contract. The level of work required to prepare the roads for haul falls within the following categories:

- Maintenance—Basic road maintenance using a road grader to smooth out the driving surface and the cleaning of culvert inlet and outlets with a backhoe as needed to maintain proper function. A water truck applies water as needed to provide for good compaction of the graded surface and to control dust. This work applies to roads which are already open to vehicular traffic and are typically maintained annually by the Forest Service road maintenance crew.
- Light—Includes basic road maintenance tasks in addition to removal of vegetation, mainly brush, as needed from the roadbed and road shoulders, installation of drainage features such as drain dips and relief culverts, removal of earthen barriers and waterbars, and occasional road template re-shaping and widening. This work applies to roads which have limited vehicular traffic and are not typically maintained on a regular basis and to roads which have been closed to vehicular traffic for years but require some work to re-open them for use.
- Heavy—These roads are typically overgrown with brush and small trees which needed to be removed, require excavation work to regain road width, installation of drainage features such as drain dips and relief culverts, and removal of earthen barriers and waterbars.
- Construct—These road segments are associated with the relocation of roads. The work includes clearing within the road right of way, construction of a slash filter windrow at the toe of the road fill, excavation to establish the roadbed, installation of

culverts and drain dips, and application of grass seed mix with straw mulch to establish vegetative growth on the new slopes.

In addition to the road work to prepare roads for use, recurrent maintenance takes place during the hauling period and final maintenance occurs at the conclusion of use of the roads.

- Recurrent maintenance—This is basic road surface maintenance related to the number of truck trips on a particular road segment as well as addressing road drainage needs. Maintenance cycles are typically based on once per 60 truck trips, however they vary based on the composition of the road surface and weather patterns.
- Final maintenance—At the conclusion of hauling operations final maintenance specifications are implemented. Roads to remain open to motorized use would receive a final maintenance pass including surface blade work and cleaning of all drainage features. For roads which would be put back to a ML 1 status post haul, the roadbed would be lightly ripped to break up surface compaction, waterbars installed, roadbed seeded with a grass seed mix, and the entrance would be blocked with an earthen barrier, boulders, or gate.

Some road numbers are listed more than once in the tables because different treatments, uses, or operational maintenance levels may be proposed for portions of the same road.

Table 1. Alternative A—Existing National Forest System roads within the project area

Road Number	Length (miles)	Operational Maintenance Level	Alternative A—Motor Vehicle Use Status
025LL	0.79	2	Road Open to All Vehicles, Yearlong
025LM	0.72	2	Road Open to All Vehicles, Yearlong
025M	1.63	2	Road Open to All Vehicles, Yearlong
025N	2.04	2	Road Open to All Vehicles, Yearlong
025N1	0.22	1	Road Closed to All Vehicles
025N2	0.28	1	Road Closed to All Vehicles
025O	0.58	2	Road Open to All Vehicles, Yearlong
025O1	0.44	2	Road Open to All Vehicles, Yearlong
025O2	0.46	2	Road Open to All Vehicles, Yearlong
025O3	0.12	2	Road Open to All Vehicles, Yearlong
025P	2.07	1	Road Closed to All Vehicles
025PA	0.94	1	Road Closed to All Vehicles
025Q	0.30	3	Road Open to All Vehicles, Yearlong
025Q1	0.09	3	Road Open to All Vehicles, Yearlong
312	1.18	3	Road Open to All Vehicles, Yearlong
336	5.50	1	Road Closed to All Vehicles
336	1.70	2	Road Open to All Vehicles, Yearlong
336B	3.92	2	Road Open to All Vehicles, Yearlong
336B1	0.43	1	Road Closed to All Vehicles
336B2	0.18	1	Road Closed to All Vehicles
336B3	0.44	1	Road Closed to All Vehicles
336B4	0.47	1	Road Closed to All Vehicles
336B5	0.29	1	Road Closed to All Vehicles
336B6	0.13	1	Road Closed to All Vehicles
336B7	1.09	1	Road Closed to All Vehicles
336B8	0.34	1	Road Closed to All Vehicles
336C	2.39	2	Road Open to All Vehicles, 06/16–09/14
336D	2.33	1	Road Closed to All Vehicles
351	3.62	2	Road Open to All Vehicles, Yearlong
351A	1.25	1	Road Closed to All Vehicles
351A1	0.56	1	Road Closed to All Vehicles
351B2	0.53	1	Road Closed to All Vehicles
362	3.08	2	Road Open to All Vehicles, Yearlong
362	7.49	2	Road Open to All Vehicles, 06/16–09/14
362A	0.13	2	Road Open to All Vehicles, Yearlong
362A	0.09	1	Road Closed to All Vehicles
362B	0.82	2	Road Open to All Vehicles, Yearlong
362B1	0.88	1	Road Closed to All Vehicles

Road Number	Length (miles)	Operational Maintenance Level	Alternative A—Motor Vehicle Use Status
362B2	0.82	1	Road Closed to All Vehicles
362C	3.82	1	Road Closed to All Vehicles
362C1	1.70	1	Road Closed to All Vehicles
362D	1.77	1	Road Closed to All Vehicles
362D1	1.69	2	Road Open to All Vehicles, 06/16–09/14
362D2	0.84	1	Road Closed to All Vehicles
362D3	0.15	1	Road Closed to All Vehicles
362D4	0.91	1	Road Closed to All Vehicles
362D5	0.80	1	Road Closed to All Vehicles
362D6	0.48	1	Road Closed to All Vehicles
362E	1.14	1	Road Closed to All Vehicles
362E1	1.08	1	Road Closed to All Vehicles
362E2	0.80	1	Road Closed to All Vehicles
362E3	2.37	1	Road Closed to All Vehicles
362F	6.44	2	Road Open to All Vehicles, 06/16–09/14
362F	1.02	1	Road Closed to All Vehicles
362F1	0.75	1	Road Closed to All Vehicles
362F2	0.48	1	Road Closed to All Vehicles
362F3	0.38	1	Road Closed to All Vehicles
362F4	0.73	2	Road Open to All Vehicles, 06/16–09/14
362F5	0.53	1	Road Closed to All Vehicles
362G	3.82	2	Road Open to All Vehicles, 06/16–09/14
362G1	3.90	1	Road Closed to All Vehicles
362G2	1.11	2	Road Open to All Vehicles, 06/16–09/14
362G3	2.18	2	Road Open to All Vehicles, 06/16–09/14
362G4	0.30	2	Road Open to All Vehicles, 06/16–09/14
362G5	0.38	2	Road Open to All Vehicles, 06/16–09/14
362G6	2.96	1	Road Closed to All Vehicles
362G7	0.60	1	Road Closed to All Vehicles
362G8	0.90	1	Road Closed to All Vehicles
362G9	0.70	1	Road Closed to All Vehicles
362G9	0.35	2	Road Open to All Vehicles, 06/16–09/14
384	4.31	3	Road Open to All Vehicles, Yearlong
384A	0.21	3	Road Open to All Vehicles, Yearlong
385	10.83	2	Road Open to All Vehicles, Yearlong
385A	1.50	1	Road Closed to All Vehicles
385B	2.81	1	Road Closed to All Vehicles
385C	0.62	1	Road Closed to All Vehicles
385D	1.64	1	Road Closed to All Vehicles
385E	2.17	2	Road Open to All Vehicles, Yearlong

Road Number	Length (miles)	Operational Maintenance Level	Alternative A—Motor Vehicle Use Status
385F	1.15	2	Road Open to All Vehicles, Yearlong
393	8.60	2	Road Open to All Vehicles, Yearlong
393A	2.42	1	Road Closed to All Vehicles
393A1	0.88	1	Road Closed to All Vehicles
393A2	0.45	1	Road Closed to All Vehicles
393B	1.99	1	Road Closed to All Vehicles
393B1	0.43	1	Road Closed to All Vehicles
393C	1.24	1	Road Closed to All Vehicles
393D	1.09	1	Road Closed to All Vehicles
393D1	0.46	1	Road Closed to All Vehicles
393E	0.80	1	Road Closed to All Vehicles
393F	0.45	1	Road Closed to All Vehicles
393G	0.11	1	Road Closed to All Vehicles
393G1	0.24	1	Road Closed to All Vehicles
393H	0.36	1	Road Closed to All Vehicles
393I	0.55	1	Road Closed to All Vehicles
393J	0.26	2	Road Open to All Vehicles, Yearlong
393K	0.18	2	Road Open to All Vehicles, Yearlong
393L	1.43	1	Road Closed to All Vehicles
393M	0.56	1	Road Closed to All Vehicles
394	0.12	2	Road Open to All Vehicles, Yearlong
394	3.21	1	Road Closed to All Vehicles
394A	1.14	1	Road Closed to All Vehicles
394B	1.85	2	Road Open to All Vehicles, Yearlong
394B	0.16	1	Road Closed to All Vehicles
394B1	0.39	1	Road Closed to All Vehicles
394B2	0.39	2	Road Open to All Vehicles, Yearlong
394B3	0.18	1	Road Closed to All Vehicles
394BA	0.63	1	Road Closed to All Vehicles
394C	1.02	1	Road Closed to All Vehicles

Table 2. Motorized Access to Skyline and Stargaze Yurts

Road Number (segment no.)	Length (miles)	Alt A	Alt B	Alt C	Alt D	Alt E	Alt F
362F(1)	2.38	Seasonal	Closed	**Seasonal**	**Open**	Closed	**Seasonal**
394	0.12	Open	Closed	**Seasonal**	**Open**	Closed	**Seasonal**
394B	1.85	Open	Closed	**Seasonal**	**Open**	Closed	**Seasonal**
394B(1)	0.16	Closed	Closed	**Seasonal**	**Open**	Closed	**Seasonal**

Table 3. Non-Motorized Trail on NFS Roads

Road Number (segment no.)	Length (miles)	Alt A	Alt B	Alt C	Alt D	Alt E	Alt F
362G6(2)	1.89	Closed	Closed	Closed	Closed	**Convert**	**Convert**
362G9	0.70	Closed	Closed	Closed	Closed	**Convert**	**Convert**
362G9(1)	0.35	Seasonal	Closed	Closed	Closed	**Convert**	**Convert**

Table 4. Conversion of NFS Roads to Motorized Trail

Road Number (segment no.)	Length (miles)	Alt A	Alt B	Alt C	Alt D	Alt E	Alt F
336B1	0.43	Closed	Convert	Convert	Convert	**Decomm**	Convert
336B4	0.47	Closed	Convert	Convert	Convert	**Decomm**	Convert
336B6	0.13	Closed	Convert	Convert	Convert	**Decomm**	Convert
336D(2)	0.16	Closed	Convert	Convert	Convert	**Decomm**	Convert
336D(4)	0.06	Closed	Convert	Convert	Convert	**Decomm**	Convert
362E2	0.80	Closed	Convert	Convert	Convert	**Decomm**	**Decomm**

Table 5. Motorized Trail Segments Co-located on NFS Roads

Road Number (segment no.)	Length (miles)	Alt A	Alt B	Alt C	Alt D	Alt E	Alt F
336(2)	1.39	No	Yes	Yes	Yes	**No**	Yes
336(4)	1.59	No	Yes	Yes	Yes	**No**	Yes
336(4)	0.01	No	Yes	Yes	Yes	**No**	Yes
336B(1)	0.12	No	Yes	Yes	Yes	**No**	Yes
336B(2)	2.31	No	Yes	Yes	Yes	**No**	Yes
336B(3)	0.43	No	Yes	Yes	Yes	**No**	Yes
336B(4)	1.06	No	Yes	Yes	Yes	**No**	Yes
362C(1)	0.37	No	Yes	Yes	Yes	**No**	No
362C(2)	1.01	No	Yes	Yes	Yes	**No**	Yes
362C(3)	1.84	No	Yes	Yes	Yes	**No**	Yes
362C(4)	0.6	No	Yes	Yes	Yes	**No**	Yes
362E3(2)	0.98	No	Yes	Yes	Yes	**No**	No
362G(2)	1.63	No	Yes	Yes	Yes	**No**	Yes
362G(4)	0.76	No	Yes	Yes	Yes	**No**	No
362G1(1)	2.76	No	Yes	Yes	Yes	**No**	Yes
362G2(1)	0.03	No	Yes	Yes	Yes	**No**	Yes
362G2(2)	1.08	No	Yes	Yes	Yes	**No**	Yes

Table 6. Alternative B—National Forest System road treatments and motor vehicle use

Road Number	Length (miles)	Alt B—Road Treatment	Operational Maintenance Level	Alternative B—Motor Vehicle Use Status
025LL	0.79	No Change	2	Road Open to All Vehicles, Yearlong
025LM	0.72	No Change	2	Road Open to All Vehicles, Yearlong
025M	1.26	No Change	2	Road Open to All Vehicles, Yearlong
025M	0.37	Close—ML 2 Admin	2A	Road Closed to Public Motorized Use, Yearlong
025N	2.04	Close—ML 2 Admin	2A	Road Closed to Public Motorized Use, Yearlong
025N1	0.22	Decommission		None
025N2	0.28	Decommission		None
025O	0.29	No Change	2	Road Open to All Vehicles, Yearlong
025O	0.29	Decommission		None
025O1	0.44	No Change	2	Road Open to All Vehicles, Yearlong
025O2	0.46	Convert to non-motorized trail		None
025O3	0.12	Decommission		None
025P	1.21	No Change	1	Road Closed to All Vehicles
025P	0.7	Convert to non-motorized trail		None
025P	0.10	Change to ML 2 Admin	2A	Road Closed to Public Motorized Use, Yearlong
025PA	0.94	No Change	1	Road Closed to All Vehicles
025Q	0.30	No Change	3	Road Open to All Vehicles, Yearlong
025Q1	0.09	No Change	3	Road Open to All Vehicles, Yearlong
312	1.18	No Change	3	Road Open to All Vehicles, Yearlong
336	2.99	Co-locate motorized trail	1	Trail Open to Vehicles <50 inches in Width, 06/16–09/14
336	1.70	No Change	2	Road Open to All Vehicles, Yearlong
336	2.51	No Change	1	Road Closed to All Vehicles
336B	3.92	Close—ML 2 Admin Co-locate motorized trail	2A	Trail Open to Vehicles <50 inches in Width, 06/16–09/14
336B1	0.43	Convert to motorized trail		Trail Open to Vehicles <50 inches in Width, 06/16–09/14
336B2	0.18	Decommission		None
336B3	0.44	Decommission		None
336B4	0.47	Convert to motorized trail		Trail Open to Vehicles <50 inches in Width, 06/16–09/14
336B5	0.29	Decommission		None
336B6	0.13	Convert to motorized trail		Trail Open to Vehicles <50 inches in Width, 06/16–09/14
336B7	1.09	Decommission		None
336B8	0.34	No Change	1	Road Closed to All Vehicles
336C	2.39	No Change	2	Road Open to All Vehicles, 06/16–09/14
336D	0.22	Convert to motorized trail		Trail Open to Vehicles <50 inches in Width, 06/16–09/14

Road Number	Length (miles)	Alt B—Road Treatment	Operational Maintenance Level	Alternative B—Motor Vehicle Use Status
336D	2.11	Decommission		None
351	3.62	No Change	2	Road Open to All Vehicles, Yearlong
351A	1.25	No Change	1	Road Closed to All Vehicles
351A1	0.56	No Change	1	Road Closed to All Vehicles
351B2	0.53	Decommission		None
362	3.08	No Change	2	Road Open to All Vehicles, Yearlong
362	7.49	No Change	2	Road Open to All Vehicles, 06/16–09/14
362A	0.13	No Change	2	Road Open to All Vehicles, Yearlong
362A	0.09	Change to ML 2 Admin	2A	Road Closed to Public Motorized Use, Yearlong
362B	0.82	No Change	2	Road Open to All Vehicles, Yearlong
362B1	0.88	Decommission		None
362B2	0.82	Decommission		None
362C	3.82	Co-locate motorized trail	1	Trail Open to Vehicles <50 inches in Width, 06/16–09/14
362C1	1.70	Decommission		None
362D	0.77	Convert to non-motorized trail		None
362D	1.00	Change to ML 2 Admin	2A	Road Closed to Public Motorized Use, Yearlong
362D1	0.93	Decommission		None
362D1	0.76	Close—ML 2 Admin	2A	Road Closed to Public Motorized Use, Yearlong
362D2	0.60	No Change	1	Road Closed to All Vehicles
362D2	0.24	Decommission		None
362D3	0.15	No Change	1	Road Closed to All Vehicles
362D4	0.91	Decommission		None
362D5	0.49	Convert to non-motorized trail		None
362D5	0.31	Decommission		None
362D6	0.28	Decommission		None
362D6	0.20	Change to ML 2 Admin	2A	Road Closed to Public Motorized Use, Yearlong
362E	1.14	No Change	1	Road Closed to All Vehicles
362E1	1.08	No Change	1	Road Closed to All Vehicles
362E2	0.80	Convert to motorized trail		Trail Open to Vehicles <50 inches in Width, 06/16–09/14
362E3	1.39	No Change	1	Road Closed to All Vehicles
362E3	0.98	Co-locate motorized trail	1	Trail Open to Vehicles <50 inches in Width, 06/16–09/14
362F	6.44	Close—ML 2 Admin	2A	Road Closed to Public Motorized Use, Yearlong
362F	1.02	No Change	1	Road Closed to All Vehicles
362F1	0.75	Convert to non-motorized trail		None

Road Number	Length (miles)	Alt B—Road Treatment	Operational Maintenance Level	Alternative B—Motor Vehicle Use Status
362F2	0.48	Decommission		None
362F3	0.38	Convert to non-motorized trail		None
362F4	0.73	Convert to non-motorized trail		None
362F5	0.53	No Change	1	Road Closed to All Vehicles
362G	1.43	Close—ML 2 Admin	2A	Road Closed to Public Motorized Use, Yearlong
362G	2.39	Close—ML 2 Admin Co-locate motorized trail	2A	Trail Open to Vehicles <50 inches in Width, 06/16–09/14
362G1	2.76	Co-locate motorized trail	1	Trail Open to Vehicles <50 inches in Width, 06/16–09/14
362G1	1.14	No Change	1	Road Closed to All Vehicles
362G2	1.08	Close—ML 1	1	Road Closed to All Vehicles
362G2	0.03	Close—ML 1 Co-locate motorized trail	1	Trail Open to Vehicles <50 inches in Width, 06/16–09/14
362G3	2.18	Close—ML 1 Co-locate motorized trail	1	Trail Open to Vehicles <50 inches in Width, 06/16–09/14
362G4	0.30	Close—ML 1	1	Road Closed to All Vehicles
362G5	0.38	Close—ML 1	1	Road Closed to All Vehicles
362G6	2.20	No Change	1	Road Closed to All Vehicles
362G6	0.76	Convert to non-motorized trail		None
362G7	0.60	No Change	1	Road Closed to All Vehicles
362G8	0.90	No Change	1	Road Closed to All Vehicles
362G9	0.70	No Change	1	Road Closed to All Vehicles
362G9	0.35	Close—ML 1	1	Road Closed to All Vehicles
384	4.31	No Change	3	Road Open to All Vehicles, Yearlong
384A	0.21	No Change	3	Road Open to All Vehicles, Yearlong
385	10.83	No Change	2	Road Open to All Vehicles, Yearlong
385A	1.50	No Change	1	Road Closed to All Vehicles
385B	1.95	No Change	1	Road Closed to All Vehicles
385B	0.86	Change to ML 2 Admin	2A	Road Closed to Public Motorized Use, Yearlong
385C	0.62	Change to ML 2 Admin	2A	Road Closed to Public Motorized Use, Yearlong
385D	1.64	No Change	1	Road Closed to All Vehicles
385E	2.17	Close—ML 1	1	Road Closed to All Vehicles
385F	1.15	Close—ML 1	1	Road Closed to All Vehicles
393	7.02	No Change	2	Road Open to All Vehicles, Yearlong
393	0.48	Close—ML 2 Admin	2A	Road Closed to Public Motorized Use, Yearlong
393	1.10	Decommission		None
393A	2.42	No Change	1	Road Closed to All Vehicles
393A1	0.88	Decommission		None

Road Number	Length (miles)	Alt B—Road Treatment	Operational Maintenance Level	Alternative B—Motor Vehicle Use Status
393A2	0.45	Decommission		None
393B	0.29	Reconst ML 1 to ML 2	2	Road Open to All Vehicles, Yearlong
393B	1.70	Decommission		None
393B1	0.43	Decommission		None
393C	1.01	Reconst ML 1 to ML 2	2	Road Open to All Vehicles, Yearlong
393C	0.23	Decommission		None
393D	1.09	No Change	1	Road Closed to All Vehicles
393D1	0.46	Decommission		None
393E	0.80	Decommission		None
393F	0.45	Decommission		None
393G	0.11	Decommission		None
393G1	0.24	Decommission		None
393H	0.36	Decommission		None
393I	0.47	Reconst ML 1 to ML 2	2	Road Open to All Vehicles, Yearlong
393I	0.08	Decommission		None
393J	0.26	Close—ML 1	1	Road Closed to All Vehicles
393K	0.18	Decommission		None
393L	1.43	Decommission		None
393M	0.56	Decommission		None
394	0.12	Close—ML 2 Admin	2A	Road Closed to Public Motorized Use, Yearlong
394	3.21	No Change	1	Road Closed to All Vehicles
394A	1.14	No Change	1	Road Closed to All Vehicles
394B	1.85	Close—ML 2 Admin	2A	Road Closed to Public Motorized Use, Yearlong
394B	0.16	Change to ML 2 Admin	2A	Road Closed to Public Motorized Use, Yearlong
394B1	0.39	No Change	1	Road Closed to All Vehicles
394B2	0.39	Close—ML 1	1	Road Closed to All Vehicles
394B3	0.18	Decommission		None
394BA	0.63	No Change	1	Road Closed to All Vehicles
394C	1.02	Decommission		None

Table 7.Alternative C—National Forest System road treatments and motor vehicle use

Road Number	Length (miles)	Alt C—Road Treatment	Operational Maintenance Level	Alternative C—Motor Vehicle Use Status
025LL	0.79	No Change	2	Road Open to All Vehicles, Yearlong
025LM	0.72	No Change	2	Road Open to All Vehicles, Yearlong
025M	1.26	No Change	2	Road Open to All Vehicles, Yearlong
025M	0.37	Close—ML 2 Admin	2A	Road Closed to Public Motorized Use, Yearlong
025N	2.04	Close—ML 2 Admin	2A	Road Closed to Public Motorized Use, Yearlong
025N1	0.22	Decommission		None
025N2	0.28	Decommission		None
025O	0.29	No Change	2	Road Open to All Vehicles, Yearlong
025O	0.29	Decommission		None
025O1	0.44	No Change	2	Road Open to All Vehicles, Yearlong
025O2	0.46	Convert to non-motorized trail		None
025O3	0.12	Decommission		None
025P	1.21	No Change	1	Road Closed to All Vehicles
025P	0.76	Convert to non-motorized trail		None
025P	0.10	Change to ML 2 Admin	2A	Road Closed to Public Motorized Use, Yearlong
025PA	0.94	No Change	1	Road Closed to All Vehicles
025Q	0.30	No Change	3	Road Open to All Vehicles, Yearlong
025Q1	0.09	No Change	3	Road Open to All Vehicles, Yearlong
312	1.18	No Change	3	Road Open to All Vehicles, Yearlong
336	2.99	Co-locate motorized trail	1	Trail Open to Vehicles <50 inches in Width, 06/16–09/14
336	1.70	No Change	2	Road Open to All Vehicles, Yearlong
336	2.51	No Change	1	Road Closed to All Vehicles
336B	3.92	Close—ML 2 Admin Co-locate motorized trail	2A	Trail Open to Vehicles <50 inches in Width, 06/16–09/14
336B1	0.43	Convert to motorized trail		Trail Open to Vehicles <50 inches in Width, 06/16–09/14
336B2	0.18	Decommission		None
336B3	0.44	Decommission		None
336B4	0.47	Convert to motorized trail		Trail Open to Vehicles <50 inches in Width, 06/16–09/14
336B5	0.29	Decommission		None
336B6	0.13	Convert to motorized trail		Trail Open to Vehicles <50 inches in Width, 06/16–09/14
336B7	1.09	Decommission		None
336B8	0.34	No Change	1	Road Closed to All Vehicles
336C	2.39	No Change	2	Road Open to All Vehicles, 06/16–09/14
336D	0.22	Convert to motorized trail		Trail Open to Vehicles <50 inches in Width, 06/16–09/14

Road Number	Length (miles)	Alt C—Road Treatment	Operational Maintenance Level	Alternative C—Motor Vehicle Use Status
336D	2.11	Decommission		None
351	3.62	No Change	2	Road Open to All Vehicles, Yearlong
351A	1.25	No Change	1	Road Closed to All Vehicles
351A1	0.56	No Change	1	Road Closed to All Vehicles
351B2	0.53	Decommission		None
362	3.08	No Change	2	Road Open to All Vehicles, Yearlong
362	7.49	No Change	2	Road Open to All Vehicles, 06/16–09/14
362A	0.13	No Change	2	Road Open to All Vehicles, Yearlong
362A	0.09	Change to ML 2 Admin	2A	Road Closed to Public Motorized Use, Yearlong
362B	0.82	No Change	2	Road Open to All Vehicles, Yearlong
362B1	0.88	Decommission		None
362B2	0.82	Decommission		None
362C	3.82	Co-locate motorized trail	1	Trail Open to Vehicles <50 inches in Width, 06/16–09/14
362C1	1.70	Decommission		None
362D	0.77	Convert to non-motorized trail		None
362D	1.00	Change to ML 2 Admin	2A	Road Closed to Public Motorized Use, Yearlong
362D1	0.93	Decommission		None
362D1	0.76	Close—ML 2 Admin	2A	Road Closed to Public Motorized Use, Yearlong
362D2	0.60	No Change	1	Road Closed to All Vehicles
362D2	0.24	Decommission		None
362D3	0.15	No Change	1	Road Closed to All Vehicles
362D4	0.91	Decommission		None
362D5	0.49	Convert to non-motorized trail		None
362D5	0.31	Decommission		None
362D6	0.28	Decommission		None
362D6	0.20	Change to ML 2 Admin	2A	Road Closed to Public Motorized Use, Yearlong
362E	1.14	No Change	1	Road Closed to All Vehicles
362E1	1.08	No Change	1	Road Closed to All Vehicles
362E2	0.80	Convert to motorized trail		Trail Open to Vehicles <50 inches in Width, 06/16–09/14
362E3	1.39	No Change	1	Road Closed to All Vehicles
362E3	0.98	Co-locate motorized trail	1	Trail Open to Vehicles <50 inches in Width, 06/16–09/14
362F	4.06	Close—ML 2 Admin	2A	Road Closed to Public Motorized Use, Yearlong
362F	2.38	No Change	2	Road Open to All Vehicles, 06/16–09/14
362F	1.02	No Change	1	Road Closed to All Vehicles

Road Number	Length (miles)	Alt C—Road Treatment	Operational Maintenance Level	Alternative C—Motor Vehicle Use Status
362F1	0.75	Convert to non-motorized trail		None
362F2	0.48	Decommission		None
362F3	0.38	Convert to non-motorized trail		None
362F4	0.73	Convert to non-motorized trail		None
362F5	0.53	No Change	1	Road Closed to All Vehicles
362G	1.43	Close—ML 2 Admin	2A	Road Closed to Public Motorized Use, Yearlong
362G	2.39	Close—ML 2 Admin Co-locate motorized trail	2A	Trail Open to Vehicles <50 inches in Width, 06/16–09/14
362G1	2.76	Co-locate motorized trail	1	Trail Open to Vehicles <50 inches in Width, 06/16–09/14
362G1	1.14	No Change	1	Road Closed to All Vehicles
362G2	1.11	Close—ML 1 Co-locate motorized trail	1	Trail Open to Vehicles <50 inches in Width, 06/16–09/14
362G3	2.18	Close—ML 1	1	Road Closed to All Vehicles
362G4	0.30	Close—ML 1	1	Road Closed to All Vehicles
362G5	0.38	Close—ML 1	1	Road Closed to All Vehicles
362G6	2.20	No Change	1	Road Closed to All Vehicles
362G6	0.76	Convert to non-motorized trail		None
362G7	0.60	No Change	1	Road Closed to All Vehicles
362G8	0.90	No Change	1	Road Closed to All Vehicles
362G9	0.70	No Change	1	Road Closed to All Vehicles
362G9	0.35	Close—ML 1	1	Road Closed to All Vehicles
384	4.31	No Change	3	Road Open to All Vehicles, Yearlong
384A	0.21	No Change	3	Road Open to All Vehicles, Yearlong
385	10.83	No Change	2	Road Open to All Vehicles, Yearlong
385A	1.50	No Change	1	Road Closed to All Vehicles
385B	1.95	No Change	1	Road Closed to All Vehicles
385B	0.86	Change to ML 2 Admin	2A	Road Closed to Public Motorized Use, Yearlong
385C	0.62	Change to ML 2 Admin	2A	Road Closed to Public Motorized Use, Yearlong
385D	1.64	No Change	1	Road Closed to All Vehicles
385E	2.17	Close—ML 1	1	Road Closed to All Vehicles
385F	1.15	Close—ML 1	1	Road Closed to All Vehicles
393	7.02	No Change	2	Road Open to All Vehicles, Yearlong
393	0.48	Close—ML 2 Admin	2A	Road Closed to Public Motorized Use, Yearlong
393	1.10	Decommission		None
393A	2.42	No Change	1	Road Closed to All Vehicles
393A1	0.88	Decommission		None

Road Number	Length (miles)	Alt C—Road Treatment	Operational Maintenance Level	Alternative C—Motor Vehicle Use Status
393A2	0.45	Decommission		None
393B	0.29	Reconst ML 1 to ML 2	2	Road Open to All Vehicles, Yearlong
393B	1.70	Decommission		None
393B1	0.43	Decommission		None
393C	1.01	Reconst ML 1 to ML 2	2	Road Open to All Vehicles, Yearlong
393C	0.23	Decommission		None
393D	1.09	No Change	1	Road Closed to All Vehicles
393D1	0.46	Decommission		None
393E	0.80	Decommission		None
393F	0.45	Decommission		None
393G	0.11	Decommission		None
393G1	0.24	Decommission		None
393H	0.36	Decommission		None
393I	0.47	Reconst ML 1 to ML 2	2	Road Open to All Vehicles, Yearlong
393I	0.08	Decommission		None
393J	0.26	Close—ML 1	1	Road Closed to All Vehicles
393K	0.18	Decommission		None
393L	1.43	Decommission		None
393M	0.56	Decommission		None
394	0.12	Seasonally Open	2	Road Open to All Vehicles, 06/16–09/14
394	3.21	No Change	1	Road Closed to All Vehicles
394A	1.14	No Change	1	Road Closed to All Vehicles
394B	1.85	Seasonally Open	2	Road Open to All Vehicles, 06/16–09/14
394B	0.16	Reconst ML 1 to ML 2	2	Road Open to All Vehicles, 06/16–09/14
394B1	0.39	No Change	1	Road Closed to All Vehicles
394B2	0.39	Close—ML 1	1	Road Closed to All Vehicles
394B3	0.18	Decommission		None
394BA	0.63	No Change	1	Road Closed to All Vehicles
394C	1.02	Decommission		None

Table 8. Alternative D—National Forest System road treatments and motor vehicle use

Road Number	Length (miles)	Alt D—Road Treatment	Operational Maintenance Level	Alternative D—Motor Vehicle Use Status
025LL	0.79	No Change	2	Road Open to All Vehicles, Yearlong
025LM	0.72	No Change	2	Road Open to All Vehicles, Yearlong
025M	1.26	No Change	2	Road Open to All Vehicles, Yearlong
025M	0.37	Close—ML 2 Admin	2A	Road Closed to Public Motorized Use, Yearlong
025N	2.04	Close—ML 2 Admin	2A	Road Closed to Public Motorized Use, Yearlong
025N1	0.22	Decommission		None
025N2	0.28	Decommission		None
025O	0.29	No Change	2	Road Open to All Vehicles, Yearlong
025O	0.29	Decommission		None
025O1	0.44	No Change	2	Road Open to All Vehicles, Yearlong
025O2	0.46	Convert to non-motorized trail		None
025O3	0.12	Decommission		None
025P	1.21	No Change	1	Road Closed to All Vehicles
025P	0.76	Convert to non-motorized trail		None
025P	0.10	Change to ML 2 Admin	2A	Road Closed to Public Motorized Use, Yearlong
025PA	0.94	No Change	1	Road Closed to All Vehicles
025Q	0.30	No Change	3	Road Open to All Vehicles, Yearlong
025Q1	0.09	No Change	3	Road Open to All Vehicles, Yearlong
312	1.18	No Change	3	Road Open to All Vehicles, Yearlong
336	2.99	Co-locate motorized trail	1	Trail Open to Vehicles <60 inches in Width, 06/16–09/14
336	1.70	No Change	2	Road Open to All Vehicles, Yearlong
336	2.51	No Change	1	Road Closed to All Vehicles
336B	3.92	Close—ML 2 Admin Co-locate motorized trail	2A	Trail Open to Vehicles <60 inches in Width, 06/16–09/14
336B1	0.43	Convert to motorized trail		Trail Open to Vehicles <60 inches in Width, 06/16–09/14
336B2	0.18	Decommission		None
336B3	0.44	Decommission		None
336B4	0.47	Convert to motorized trail		Trail Open to Vehicles <60 inches in Width, 06/16–09/14
336B5	0.29	Decommission		None
336B6	0.13	Convert to motorized trail		Trail Open to Vehicles <60 inches in Width, 06/16–09/14
336B7	1.09	Decommission		None
336B8	0.34	No Change	1	Road Closed to All Vehicles
336C	2.39	No Change	2	Road Open to All Vehicles, 06/16–09/14

Road Number	Length (miles)	Alt D—Road Treatment	Operational Maintenance Level	Alternative D—Motor Vehicle Use Status
336D	0.22	Convert to motorized trail		Trail Open to Vehicles <60 inches in Width, 06/16–09/14
336D	2.11	Decommission		None
351	3.62	No Change	2	Road Open to All Vehicles, Yearlong
351A	1.25	No Change	1	Road Closed to All Vehicles
351A1	0.56	No Change	1	Road Closed to All Vehicles
351B2	0.53	Decommission		None
362	3.08	No Change	2	Road Open to All Vehicles, Yearlong
362	7.49	No Change	2	Road Open to All Vehicles, 06/16–09/14
362A	0.13	No Change	2	Road Open to All Vehicles, Yearlong
362A	0.09	Change to ML 2 Admin	2A	Road Closed to Public Motorized Use, Yearlong
362B	0.82	No Change	2	Road Open to All Vehicles, Yearlong
362B1	0.88	Decommission		None
362B2	0.82	Decommission		None
362C	3.82	Co-locate motorized trail	1	Trail Open to Vehicles <60 inches in Width, 06/16–09/14
362C1	1.70	Decommission		None
362D	0.77	Convert to non-motorized trail		None
362D	1.00	Change to ML 2 Admin	2A	Road Closed to Public Motorized Use, Yearlong
362D1	0.93	Decommission		None
362D1	0.76	Close—ML 2 Admin	2A	Road Closed to Public Motorized Use, Yearlong
362D2	0.60	No Change	1	Road Closed to All Vehicles
362D2	0.24	Decommission		None
362D3	0.15	No Change	1	Road Closed to All Vehicles
362D4	0.91	Decommission		None
362D5	0.49	Convert to non-motorized trail		None
362D5	0.31	Decommission		None
362D6	0.28	Decommission		None
362D6	0.20	Change to ML 2 Admin	2A	Road Closed to Public Motorized Use, Yearlong
362E	1.14	No Change	1	Road Closed to All Vehicles
362E1	1.08	No Change	1	Road Closed to All Vehicles
362E2	0.80	Convert to motorized trail		Trail Open to Vehicles <60 inches in Width, 06/16–09/14
362E3	1.39	No Change	1	Road Closed to All Vehicles
362E3	0.98	Co-locate motorized trail	1	Trail Open to Vehicles <60 inches in Width, 06/16–09/14
362F	4.06	Close—ML 2 Admin	2A	Road Closed to Public Motorized Use, Yearlong

Road Number	Length (miles)	Alt D—Road Treatment	Operational Maintenance Level	Alternative D—Motor Vehicle Use Status
362F	2.38	Open Yearlong	2	Road Open to All Vehicles, Yearlong
362F	1.02	No Change	1	Road Closed to All Vehicles
362F1	0.75	Convert to non-motorized trail		None
362F2	0.48	Decommission		None
362F3	0.38	Convert to non-motorized trail		None
362F4	0.73	Convert to non-motorized trail		None
362F5	0.53	No Change	1	Road Closed to All Vehicles
362G	1.43	Close—ML 2 Admin	2A	Road Closed to Public Motorized Use, Yearlong
362G	2.39	Close—ML 2 Admin Co-locate motorized trail	2A	Trail Open to Vehicles <60 inches in Width, 06/16–09/14
362G1	2.76	Co-locate motorized trail	1	Trail Open to Vehicles <60 inches in Width, 06/16–09/14
362G1	1.14	No Change	1	Road Closed to All Vehicles
362G2	1.11	Close—ML 1 Co-locate motorized trail	1	Trail Open to Vehicles <60 inches in Width, 06/16–09/14
362G3	2.18	Close—ML 1	1	Road Closed to All Vehicles
362G4	0.30	Close—ML 1	1	Road Closed to All Vehicles
362G5	0.38	Close—ML 1	1	Road Closed to All Vehicles
362G6	2.20	No Change	1	Road Closed to All Vehicles
362G6	0.76	Convert to non-motorized trail		None
362G7	0.60	No Change	1	Road Closed to All Vehicles
362G8	0.90	No Change	1	Road Closed to All Vehicles
362G9	0.70	No Change	1	Road Closed to All Vehicles
362G9	0.35	Close—ML 1	1	Road Closed to All Vehicles
384	4.31	No Change	3	Road Open to All Vehicles, Yearlong
384A	0.21	No Change	3	Road Open to All Vehicles, Yearlong
385	10.83	No Change	2	Road Open to All Vehicles, Yearlong
385A	1.50	No Change	1	Road Closed to All Vehicles
385B	1.95	No Change	1	Road Closed to All Vehicles
385B	0.86	Change to ML 2 Admin	2A	Road Closed to Public Motorized Use, Yearlong
385C	0.62	Change to ML 2 Admin	2A	Road Closed to Public Motorized Use, Yearlong
385D	1.64	No Change	1	Road Closed to All Vehicles
385E	2.17	Close—ML 1	1	Road Closed to All Vehicles
385F	1.15	Close—ML 1	1	Road Closed to All Vehicles
393	7.02	No Change	2	Road Open to All Vehicles, Yearlong

Road Number	Length (miles)	Alt D—Road Treatment	Operational Maintenance Level	Alternative D—Motor Vehicle Use Status
393	0.48	Close—ML 2 Admin	2A	Road Closed to Public Motorized Use, Yearlong
393	1.10	Decommission		None
393A	2.42	No Change	1	Road Closed to All Vehicles
393A1	0.88	Decommission		None
393A2	0.45	Decommission		None
393B	0.29	Reconst ML 1 to ML 2	2	Road Open to All Vehicles, Yearlong
393B	1.70	Decommission		None
393B1	0.43	Decommission		None
393C	1.01	Reconst ML 1 to ML 2	2	Road Open to All Vehicles, Yearlong
393C	0.23	Decommission		None
393D	1.09	No Change	1	Road Closed to All Vehicles
393D1	0.46	Decommission		None
393E	0.80	Decommission		None
393F	0.45	Decommission		None
393G	0.11	Decommission		None
393G1	0.24	Decommission		None
393H	0.36	Decommission		None
393I	0.47	Reconst ML 1 to ML 2	2	Road Open to All Vehicles, Yearlong
393I	0.08	Decommission		None
393J	0.26	Close—ML 1	1	Road Closed to All Vehicles
393K	0.18	Decommission		None
393L	1.43	Decommission		None
393M	0.56	Decommission		None
394	0.12	No Change	2	Road Open to All Vehicles, Yearlong
394	3.21	No Change	1	Road Closed to All Vehicles
394A	1.14	No Change	1	Road Closed to All Vehicles
394B	1.85	No Change	2	Road Open to All Vehicles, Yearlong
394B	0.16	Reconst ML 1 to ML 2	2	Road Open to All Vehicles, Yearlong
394B1	0.39	No Change	1	Road Closed to All Vehicles
394B2	0.39	Close—ML 1	1	Road Closed to All Vehicles
394B3	0.18	Decommission		None
394BA	0.63	No Change	1	Road Closed to All Vehicles
394C	1.02	Decommission		None

Table 9. Alternative E—National Forest System road treatments and motor vehicle use

Road Number	Length (miles)	Alt E—Road Treatment	Operational Maintenance Level	Alternative E—Motor Vehicle Use Status
025LL	0.79	No Change	2	Road Open to All Vehicles, Yearlong
025LM	0.72	No Change	2	Road Open to All Vehicles, Yearlong
025M	1.26	No Change	2	Road Open to All Vehicles, Yearlong
025M	0.37	Close—ML 2 Admin	2A	Road Closed to Public Motorized Use, Yearlong
025N	2.04	Close—ML 2 Admin	2A	Road Closed to Public Motorized Use, Yearlong
025N1	0.22	Decommission		None
025N2	0.28	Decommission		None
025O	0.29	No Change	2	Road Open to All Vehicles, Yearlong
025O	0.29	Decommission		None
025O1	0.44	No Change	2	Road Open to All Vehicles, Yearlong
025O2	0.46	Convert to non-motorized trail		None
025O3	0.12	Decommission		None
025P	1.21	No Change	1	Road Closed to All Vehicles
025P	0.76	Convert to non-motorized trail		None
025P	0.10	Change to ML 2 Admin	2A	Road Closed to Public Motorized Use, Yearlong
025PA	0.94	No Change	1	Road Closed to All Vehicles
025Q	0.30	No Change	3	Road Open to All Vehicles, Yearlong
025Q1	0.09	No Change	3	Road Open to All Vehicles, Yearlong
312	1.18	No Change	3	Road Open to All Vehicles, Yearlong
336	1.70	No Change	2	Road Open to All Vehicles, Yearlong
336	5.50	No Change	1	Road Closed to All Vehicles
336B	3.92	Close—ML 2 Admin	2A	Road Closed to Public Motorized Use, Yearlong
336B1	0.43	Decommission		None
336B2	0.18	Decommission		None
336B3	0.44	Decommission		None
336B4	0.47	Decommission		None
336B5	0.29	Decommission		None
336B6	0.13	Decommission		None
336B7	1.09	Decommission		None
336B8	0.34	No Change	1	Road Closed to All Vehicles
336C	2.39	No Change	2	Road Open to All Vehicles, 06/16–09/14
336D	2.33	Decommission		None
351	3.62	No Change	2	Road Open to All Vehicles, Yearlong
351A	1.25	No Change	1	Road Closed to All Vehicles
351A1	0.56	No Change	1	Road Closed to All Vehicles

Road Number	Length (miles)	Alt E—Road Treatment	Operational Maintenance Level	Alternative E—Motor Vehicle Use Status
351B2	0.53	Decommission		None
362	3.08	No Change	2	Road Open to All Vehicles, Yearlong
362	7.49	No Change	2	Road Open to All Vehicles, 06/16–09/14
362A	0.13	No Change	2	Road Open to All Vehicles, Yearlong
362A	0.09	Change to ML 2 Admin	2A	Road Closed to Public Motorized Use, Yearlong
362B	0.82	No Change	2	Road Open to All Vehicles, Yearlong
362B1	0.88	Decommission		None
362B2	0.82	Decommission		None
362C	3.82	No Change	1	Road Closed to All Vehicles
362C1	1.70	Decommission		None
362D	0.77	Convert to non-motorized trail		None
362D	1.00	Change to ML 2 Admin	2A	Road Closed to Public Motorized Use, Yearlong
362D1	0.93	Decommission		None
362D1	0.76	Close—ML 2 Admin	2A	Road Closed to Public Motorized Use, Yearlong
362D2	0.60	No Change	1	Road Closed to All Vehicles
362D2	0.24	Decommission		None
362D3	0.15	No Change	1	Road Closed to All Vehicles
362D4	0.91	Decommission		None
362D5	0.49	Convert to non-motorized trail		None
362D5	0.31	Decommission		None
362D6	0.28	Decommission		None
362D6	0.20	Change to ML 2 Admin	2A	Road Closed to Public Motorized Use, Yearlong
362E	1.14	No Change	1	Road Closed to All Vehicles
362E1	1.08	No Change	1	Road Closed to All Vehicles
362E2	0.80	Decommission		None
362E3	2.37	No Change	1	Road Closed to All Vehicles
362F	6.44	Close—ML 2 Admin	2A	Road Closed to Public Motorized Use, Yearlong
362F	1.02	No Change	1	Road Closed to All Vehicles
362F1	0.75	Convert to non-motorized trail		None
362F2	0.48	Decommission		None
362F3	0.38	Convert to non-motorized trail		None
362F4	0.73	Convert to non-motorized trail		None
362F5	0.53	No Change	1	Road Closed to All Vehicles
362G	3.82	Close—ML 2 Admin	2A	Road Closed to Public Motorized Use, Yearlong

Road Number	Length (miles)	Alt E—Road Treatment	Operational Maintenance Level	Alternative E—Motor Vehicle Use Status
362G1	3.90	No Change	1	Road Closed to All Vehicles
362G2	1.11	Close—ML 1	1	Road Closed to All Vehicles
362G3	2.18	Close—ML 1	1	Road Closed to All Vehicles
362G4	0.30	Close—ML 1	1	Road Closed to All Vehicles
362G5	0.38	Close—ML 1	1	Road Closed to All Vehicles
362G6	0.31	No Change	1	Road Closed to All Vehicles
362G6	2.65	Convert to non-motorized trail		None
362G7	0.60	No Change	1	Road Closed to All Vehicles
362G8	0.90	No Change	1	Road Closed to All Vehicles
362G9	1.05	Convert to non-motorized trail		None
384	4.31	No Change	3	Road Open to All Vehicles, Yearlong
384A	0.21	No Change	3	Road Open to All Vehicles, Yearlong
385	10.83	No Change	2	Road Open to All Vehicles, Yearlong
385A	1.50	No Change	1	Road Closed to All Vehicles
385B	1.95	No Change	1	Road Closed to All Vehicles
385B	0.86	Change to ML 2 Admin	2A	Road Closed to Public Motorized Use, Yearlong
385C	0.62	Change to ML 2 Admin	2A	Road Closed to Public Motorized Use, Yearlong
385D	1.64	No Change	1	Road Closed to All Vehicles
385E	2.17	Close—ML 1	1	Road Closed to All Vehicles
385F	1.15	Close—ML 1	1	Road Closed to All Vehicles
393	7.02	No Change	2	Road Open to All Vehicles, Yearlong
393	0.48	Close—ML 2 Admin	2A	Road Closed to Public Motorized Use, Yearlong
393	1.10	Decommission		None
393A	2.42	No Change	1	Road Closed to All Vehicles
393A1	0.88	Decommission		None
393A2	0.45	Decommission		None
393B	0.29	Reconst ML 1 to ML 2	2	Road Open to All Vehicles, Yearlong
393B	1.70	Decommission		None
393B1	0.43	Decommission		None
393C	1.01	Reconst ML 1 to ML 2	2	Road Open to All Vehicles, Yearlong
393C	0.23	Decommission		None
393D	1.09	No Change	1	Road Closed to All Vehicles
393D1	0.46	Decommission		None
393E	0.80	Decommission		None
393F	0.45	Decommission		None
393G	0.11	Decommission		None

Road Number	Length (miles)	Alt E—Road Treatment	Operational Maintenance Level	Alternative E—Motor Vehicle Use Status
393G1	0.24	Decommission		None
393H	0.36	Decommission		None
393I	0.47	Reconst ML 1 to ML 2	2	Road Open to All Vehicles, Yearlong
393I	0.08	Decommission		None
393J	0.26	Close—ML 1	1	Road Closed to All Vehicles
393K	0.18	Decommission		None
393L	1.43	Decommission		None
393M	0.56	Decommission		None
394	0.12	Close—ML 2 Admin	2A	Road Closed to Public Motorized Use, Yearlong
394	3.21	No Change	1	Road Closed to All Vehicles
394A	1.14	No Change	1	Road Closed to All Vehicles
394B	1.85	Close—ML 2 Admin	2A	Road Closed to Public Motorized Use, Yearlong
394B	0.16	Change to ML 2 Admin	2A	Road Closed to Public Motorized Use, Yearlong
394B1	0.39	No Change	1	Road Closed to All Vehicles
394B2	0.39	Close—ML 1	1	Road Closed to All Vehicles
394B3	0.18	Decommission		None
394BA	0.63	No Change	1	Road Closed to All Vehicles
394C	1.02	Decommission		None

Table 10. Alternative F—National Forest System road treatments and motor vehicle use

Road Number	Length (miles)	Alt F—Road Treatment	Operational Maintenance Level	Alternative F—Motor Vehicle Use Status
025LL	0.79	No Change	2	Road Open to All Vehicles, Yearlong
025LM	0.72	No Change	2	Road Open to All Vehicles, Yearlong
025M	1.26	No Change	2	Road Open to All Vehicles, Yearlong
025M	0.37	Close—ML 2 Admin	2A	Road Closed to Public Motorized Use, Yearlong
025N	2.04	Close—ML 2 Admin	2A	Road Closed to Public Motorized Use, Yearlong
025N1	0.22	Decommission		None
025N2	0.28	Decommission		None
025O	0.29	No Change	2	Road Open to All Vehicles, Yearlong
025O	0.29	Decommission		None
025O1	0.44	No Change	2	Road Open to All Vehicles, Yearlong
025O2	0.46	Convert to non-motorized trail		None
025O3	0.12	Decommission		None
025P	1.21	No Change	1	Road Closed to All Vehicles
025P	0.76	Convert to non-motorized trail		None
025P	0.10	Change to ML 2 Admin	2A	Road Closed to Public Motorized Use, Yearlong
025PA	0.94	No Change	1	Road Closed to All Vehicles
025Q	0.30	No Change	3	Road Open to All Vehicles, Yearlong
025Q1	0.09	No Change	3	Road Open to All Vehicles, Yearlong
312	1.18	No Change	3	Road Open to All Vehicles, Yearlong
336	2.99	Co-locate motorized trail	1	Trail Open to Vehicles ≤60 inches in Width, 06/16–09/14
336	1.70	No Change	2	Road Open to All Vehicles, Yearlong
336	2.51	No Change	1	Road Closed to All Vehicles
336B	3.92	Close—ML 2 Admin Co-locate motorized trail	2A	Trail Open to Vehicles ≤60 inches in Width, 06/16–09/14
336B1	0.43	Convert to motorized trail		Trail Open to Vehicles ≤60 inches in Width, 06/16–09/14
336B2	0.18	Decommission		None
336B3	0.44	Decommission		None
336B4	0.47	Convert to motorized trail		Trail Open to Vehicles ≤60 inches in Width, 06/16–09/14
336B5	0.29	Decommission		None
336B6	0.13	Convert to motorized trail		Trail Open to Vehicles ≤60 inches in Width, 06/16–09/14
336B7	1.09	Decommission		None
336B8	0.34	No Change	1	Road Closed to All Vehicles

Road Number	Length (miles)	Alt F—Road Treatment	Operational Maintenance Level	Alternative F—Motor Vehicle Use Status
336C	2.39	No Change	2	Road Open to All Vehicles, 06/16–09/14
336D	0.22	Convert to motorized trail		Trail Open to Vehicles ≤60 inches in Width, 06/16–09/14
336D	2.11	Decommission		None
351	3.62	No Change	2	Road Open to All Vehicles, Yearlong
351A	1.25	No Change	1	Road Closed to All Vehicles
351A1	0.56	No Change	1	Road Closed to All Vehicles
351B2	0.53	Decommission		None
362	3.08	No Change	2	Road Open to All Vehicles, Yearlong
362	7.49	No Change	2	Road Open to All Vehicles, 06/16–09/14
362A	0.13	No Change	2	Road Open to All Vehicles, Yearlong
362A	0.09	Change to ML 2 Admin	2A	Road Closed to Public Motorized Use, Yearlong
362B	0.82	No Change	2	Road Open to All Vehicles, Yearlong
362B1	0.88	Decommission		None
362B2	0.82	Decommission		None
362C	0.37	No Change	1	Road Closed to All Vehicles
362C	3.45	Co-locate motorized trail	1	Trail Open to Vehicles ≤60 inches in Width, 06/16–09/14
362C1	1.70	Decommission		None
362D	0.77	Convert to non-motorized trail		None
362D	1.00	Change to ML 2 Admin	2A	Road Closed to Public Motorized Use, Yearlong
362D1	0.93	Decommission		None
362D1	0.76	Close—ML 2 Admin	2A	Road Closed to Public Motorized Use, Yearlong
362D2	0.60	No Change	1	Road Closed to All Vehicles
362D2	0.24	Decommission		None
362D3	0.15	No Change	1	Road Closed to All Vehicles
362D4	0.91	Decommission		None
362D5	0.49	Convert to non-motorized trail		None
362D5	0.31	Decommission		None
362D6	0.28	Decommission		None
362D6	0.20	Change to ML 2 Admin	2A	Road Closed to Public Motorized Use, Yearlong
362E	1.14	No Change	1	Road Closed to All Vehicles
362E1	1.08	No Change	1	Road Closed to All Vehicles
362E2	0.80	Decommission		None
362E3	2.37	No Change	1	Road Closed to All Vehicles
362F	4.06	Close—ML 2 Admin	2A	Road Closed to Public Motorized Use, Yearlong

Road Number	Length (miles)	Alt F—Road Treatment	Operational Maintenance Level	Alternative F—Motor Vehicle Use Status
362F	2.38	No Change	2	Road Open to All Vehicles, 06/16–09/14
362F	1.02	No Change	1	Road Closed to All Vehicles
362F1	0.75	Convert to non-motorized trail		None
362F2	0.48	Decommission		None
362F3	0.38	Convert to non-motorized trail		None
362F4	0.73	Convert to non-motorized trail		None
362F5	0.53	No Change	1	Road Closed to All Vehicles
362G	2.19	Close—ML 2 Admin	2A	Road Closed to Public Motorized Use, Yearlong
362G	1.63	Close—ML 2 Admin Co-locate motorized trail	2A	Trail Open to Vehicles ≤60 inches in Width, 06/16–09/14
362G1	2.76	Co-locate motorized trail	1	Trail Open to Vehicles ≤60 inches in Width, 06/16–09/14
362G1	1.14	No Change	1	Road Closed to All Vehicles
362G2	1.11	Close—ML 1 Co-locate motorized trail	1	Trail Open to Vehicles ≤60 inches in Width, 06/16–09/14
362G3	2.18	Close—ML 1	1	Road Closed to All Vehicles
362G4	0.30	Close—ML 1	1	Road Closed to All Vehicles
362G5	0.38	Close—ML 1	1	Road Closed to All Vehicles
362G6	0.31	No Change	1	Road Closed to All Vehicles
362G6	2.65	Convert to non-motorized trail		None
362G7	0.60	No Change	1	Road Closed to All Vehicles
362G8	0.90	No Change	1	Road Closed to All Vehicles
362G9	1.05	Convert to non-motorized trail		None
384	4.31	No Change	3	Road Open to All Vehicles, Yearlong
384A	0.21	No Change	3	Road Open to All Vehicles, Yearlong
385	10.83	No Change	2	Road Open to All Vehicles, Yearlong
385A	1.50	No Change	1	Road Closed to All Vehicles
385B	1.95	No Change	1	Road Closed to All Vehicles
385B	0.86	Change to ML 2 Admin	2A	Road Closed to Public Motorized Use, Yearlong
385C	0.62	Change to ML 2 Admin	2A	Road Closed to Public Motorized Use, Yearlong
385D	1.64	No Change	1	Road Closed to All Vehicles
385E	2.17	Close—ML 1	1	Road Closed to All Vehicles
385F	1.15	Close—ML 1	1	Road Closed to All Vehicles
393	7.02	No Change	2	Road Open to All Vehicles, Yearlong
393	0.48	Close—ML 2 Admin	2A	Road Closed to Public Motorized Use, Yearlong

Road Number	Length (miles)	Alt F—Road Treatment	Operational Maintenance Level	Alternative F—Motor Vehicle Use Status
393	1.10	Decommission		None
393A	2.42	No Change	1	Road Closed to All Vehicles
393A1	0.88	Decommission		None
393A2	0.45	Decommission		None
393B	0.29	Reconst ML 1 to ML 2	2	Road Open to All Vehicles, Yearlong
393B	1.70	Decommission		None
393B1	0.43	Decommission		None
393C	1.01	Reconst ML 1 to ML 2	2	Road Open to All Vehicles, Yearlong
393C	0.23	Decommission		None
393D	1.09	No Change	1	Road Closed to All Vehicles
393D1	0.46	Decommission		None
393E	0.80	Decommission		None
393F	0.45	Decommission		None
393G	0.11	Decommission		None
393G1	0.24	Decommission		None
393H	0.36	Decommission		None
393I	0.47	Reconst ML 1 to ML 2	2	Road Open to All Vehicles, Yearlong
393I	0.08	Decommission		None
393J	0.26	Close—ML 1	1	Road Closed to All Vehicles
393K	0.18	Decommission		None
393L	1.43	Decommission		None
393M	0.56	Decommission		None
394	0.12	Seasonally Open	2	Road Open to All Vehicles, 06/16–09/14
394	3.21	No Change	1	Road Closed to All Vehicles
394A	1.14	No Change	1	Road Closed to All Vehicles
394B	1.85	Seasonally Open	2	Road Open to All Vehicles, 06/16–09/14
394B	0.16	Reconst ML 1 to ML 2	2	Road Open to All Vehicles, 06/16–09/14
394B1	0.39	No Change	1	Road Closed to All Vehicles
394B2	0.39	Close—ML 1	1	Road Closed to All Vehicles
394B3	0.18	Decommission		None
394BA	0.63	No Change	1	Road Closed to All Vehicles
394C	1.02	Decommission		None

Table 11. Unauthorized roads added to the National Forest System transportation system and motor vehicle use

UA Road Number	Length (miles)	Operational Maintenance Level	Motor Vehicle Use Status
X025M1	0.30	2A	Road Closed to Public Motorized Use, Yearlong
X025M2	0.05	2A	Road Closed to Public Motorized Use, Yearlong
X362F2	0.11	2A	Road Closed to Public Motorized Use, Yearlong
X362F3	0.08	2A	Road Closed to Public Motorized Use, Yearlong
X384C	0.37	2A	Road Closed to Public Motorized Use, Yearlong
X385	0.17	2A	Road Closed to Public Motorized Use, Yearlong
X385B6	0.08	2A	Road Closed to Public Motorized Use, Yearlong
X393A4	0.24	2A	Road Closed to Public Motorized Use, Yearlong
X393A4-1	0.09	2A	Road Closed to Public Motorized Use, Yearlong
X393A5	0.29	2A	Road Closed to Public Motorized Use, Yearlong
X394B	0.14	2A	Road Closed to Public Motorized Use, Yearlong
X393B2	0.32	2	Road Open to All Vehicles, Yearlong
X025Q1	0.54	1	Road Closed to All Vehicles
X393A1	1.50	1	Road Closed to All Vehicles
X394A1	0.32	1	Road Closed to All Vehicles
Total	4.60		

Table 12. New constructed roads added to the National Forest System transportation system and motor vehicle use

New Construction Segment No.	Length (miles)	Operational Maintenance Level	Motor Vehicle Use Status
1	0.54	2	Road Open to All Vehicles, Yearlong
2	0.62	2	Road Open to All Vehicles, Yearlong
3	0.03	2A	Road Closed to Public Motorized Use, Yearlong
Total	1.19		

Table 13. Temporary road construction to facilitate the removal of forest products

Temporary Road Name	Length (miles)	Existing Road Template	Used in Alt B	Used in Alt C	Used in Alt D	Used in Alt E	Used in Alt F
Temp1	0.16	No	X	X	X	X	X
Temp2	0.48	No	X	X	X	X	X
Temp3	0.40	No	X	X	X		X
Temp7	0.25	No	X	X	X	X	X
Temp8	0.79	No	X	X	X		X
Temp10	0.79	Yes	X	X	X		
Temp11	0.12	Yes	X	X	X	X	X
Temp12	0.30	Yes	X	X	X		
Temp13	0.17	Yes	X	X	X		
Temp14	0.39	No	X	X	X		X
Temp15	0.43	No	X	X	X		X
Temp16	0.12	No	X	X	X		X
Temp17	0.10	Yes	X	X	X		X
Temp18	0.34	Yes	X	X	X		X
Temp19	0.33	Yes	X	X	X		X
Temp20	0.16	Yes	X	X	X	X	X
Temp21	0.20	No	X	X	X		
Temp22	0.09	Yes			X		
Temp23	0.17	Yes			X		
Temp24	0.31	Yes			X		
Temp25	0.17	Yes			X		
Temp26	0.29	Yes	X	X	X	X	X
	Total	Miles Used	5.82	5.82	6.56	1.46	4.36

Table 14. Haul roads by alternative

Haul Road Number	Length (miles)	Level of Work to Prepare for Haul	Miles Used in Alt B	Miles Used in Alt C	Miles Used in Alt D	Miles Used in Alt E	Miles Used in Alt F
025M	1.26	Light			1.26		
025N	2.04	Light	2.04	2.04	2.04	2.04	2.04
025N1	0.22	Light	0.22	0.22	0.22	0.22	0.22
025O	0.29	Light	0.29	0.29	0.29	0.29	0.29
025O1	0.44	Light	0.44	0.44	0.44	0.44	0.44
025P	0.88	Light	0.88	0.88	0.88	0.88	0.88
336B	1.17	Heavy	1.17	1.17	1.17	1.17	1.17

Haul Road Number	Length (miles)	Level of Work to Prepare for Haul	Miles Used in Alt B	Miles Used in Alt C	Miles Used in Alt D	Miles Used in Alt E	Miles Used in Alt F
336B7	0.62	Heavy	0.62	0.62	0.62	0.62	0.62
351	3.62	Light	3.62	3.62	3.62	3.62	3.62
351B2	0.53	Light	0.53	0.53	0.53	0.53	0.53
362	10.57	Maintenance	10.57	10.57	10.57	10.57	10.57
362B	0.82	Maintenance	0.82	0.82	0.82	0.82	0.82
362B1	0.50	Heavy	0.50	0.50	0.50	0.50	0.50
362D	1.01	Light	1.01	1.01	1.01	1.01	1.01
362D1	1.70	Light	1.70	1.70	1.70	1.70	1.70
362D2	0.04	Light	0.04	0.04	0.04	0.04	0.04
362D6	0.20	Light	0.20	0.20	0.20	0.20	0.20
362F	4.51	Heavy	4.51	4.51	4.51	4.51	4.51
362G	3.83	Light	3.83	3.83	3.83	3.83	3.83
362G5	0.38	Heavy	0.38	0.38	0.38	0.38	0.38
362G6	1.89	Heavy	1.89	1.89	1.89	0.00	0.00
362G9	0.42	Heavy	0.42	0.42	0.42	0.35	0.35
384	3.17	Maintenance	3.17	3.17	3.17	3.17	3.17
385B	0.36	Heavy	0.36	0.36	0.36	0.00	0.00
393	3.12	Light	3.12	3.12	3.12	3.12	3.12
393A	2.42	Heavy	2.42	2.42	2.42	2.42	2.42
393B	0.66	Heavy	0.66	0.66	0.66	0.66	0.66
393C	1.01	Heavy	1.01	1.01	1.01	1.01	1.01
393D	1.09	Heavy	1.09	1.09	1.09	1.09	1.09
393I	0.47	Heavy	0.47	0.47	0.47	0.47	0.47
394	3.30	Heavy	3.30	3.30	3.30	3.30	3.30
394B	2.01	Heavy	2.01	2.01	2.01	2.01	2.01
394B1	0.39	Heavy	0.39	0.39	0.39	0.39	0.39
New Construct 1	0.54	Construct	0.54	0.54	0.54	0.54	0.54
New Construct 2	0.62	Construct	0.62	0.62	0.62	0.62	0.62
New Construct 3	0.03	Construct	0.03	0.03	0.03	0.03	0.03
X025Q1	0.54	Heavy	0.54	0.54	0.54	0.54	0.54
X384C	0.37	Heavy	0.37	0.37	0.37	0.37	0.37
X393A1	1.50	Heavy	1.50	1.50	1.50	1.50	1.50
X393B2	0.32	Heavy	0.32	0.32	0.32	0.32	0.32
		Totals	57.60	57.60	58.86	55.28	55.28

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Appendix B:

Cumulative Effects:

Past, Present, and Reasonably Foreseeable Activities

Becker Integrated Resource Project

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Past, present/ongoing, and reasonably foreseeable activities within the cumulative effects area were compiled for the interdisciplinary team to consider in their cumulative effects analysis Figure 1 This area represents a meaningful scale for fire regime patch and pattern as well as recent wildfire disturbances. Additionally, the extent of this cumulative effects area was chosen to compile activities because it was large enough to incorporate the majority of resource area's cumulative effects analysis areas. Each resource specialist defined the cumulative effects analysis area in their technical report. Figure 2 and Figure 3 illustrate the past, present/ongoing, and reasonably foreseeable activities. Table 1 identifies the past, present/ongoing, and reasonably foreseeable activities and the activities considered in each resource analysis.

The past projects considered by resource specialists were assumed to have contributed to the existing conditions for the analyzed resource indicators. Although the incremental impacts of each past activity are not known, the existing resource conditions are representative of those past activities.

Some of the activities listed in the table may be outside the cumulative impact areas analyzed by individual resources areas and, therefore, may not be considered in every resource-specific analysis. Conversely, some resource area's cumulative impact analysis areas may extend well past the project area boundary and/or thee boundary used to compile e list below and, thereby, additional activities may be specified in the resource technical reports

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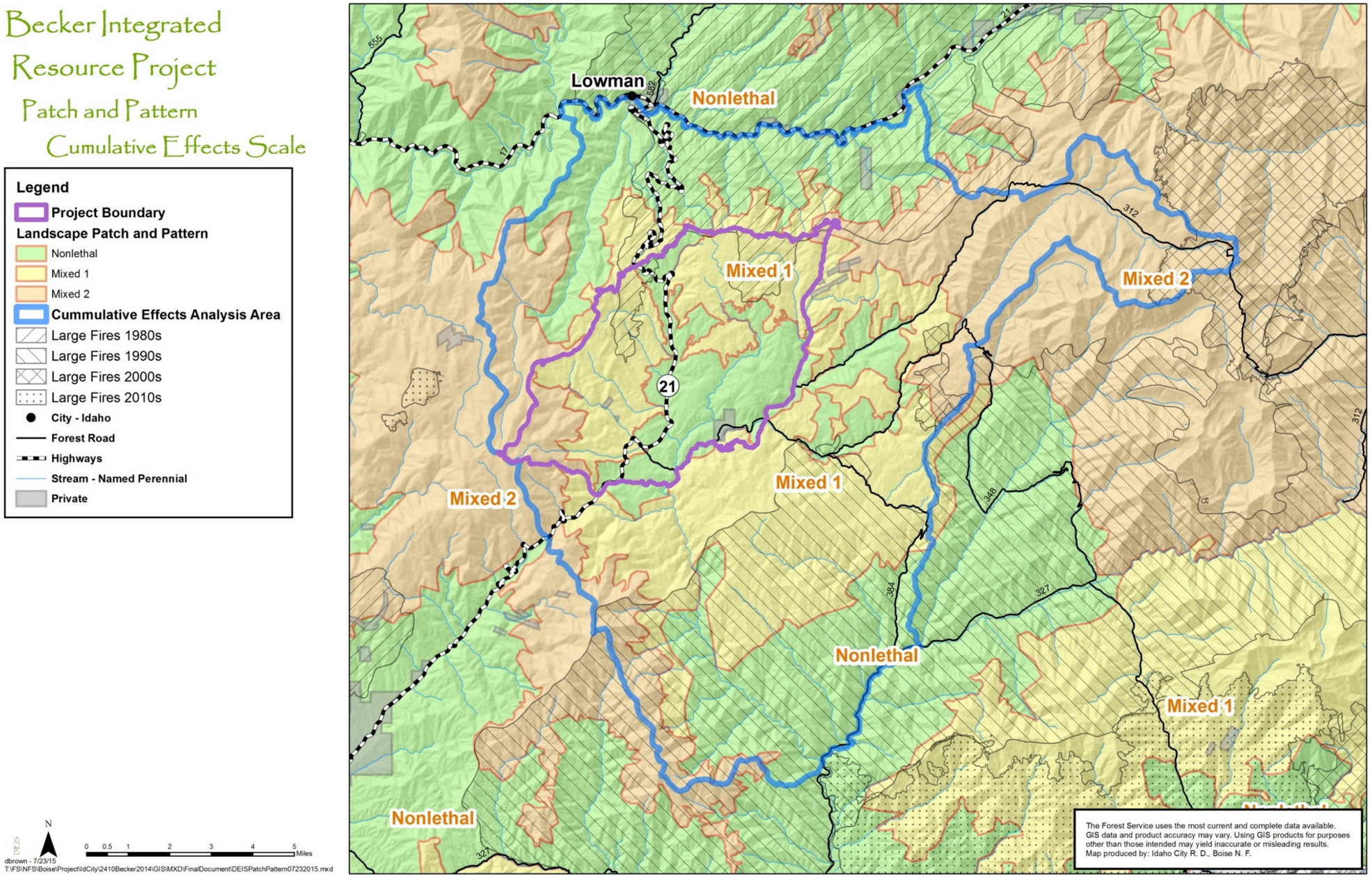

Figure 1. Map of cumulative effects analysis area, landscape patch and pattern fire regimes, and historic large wildfires

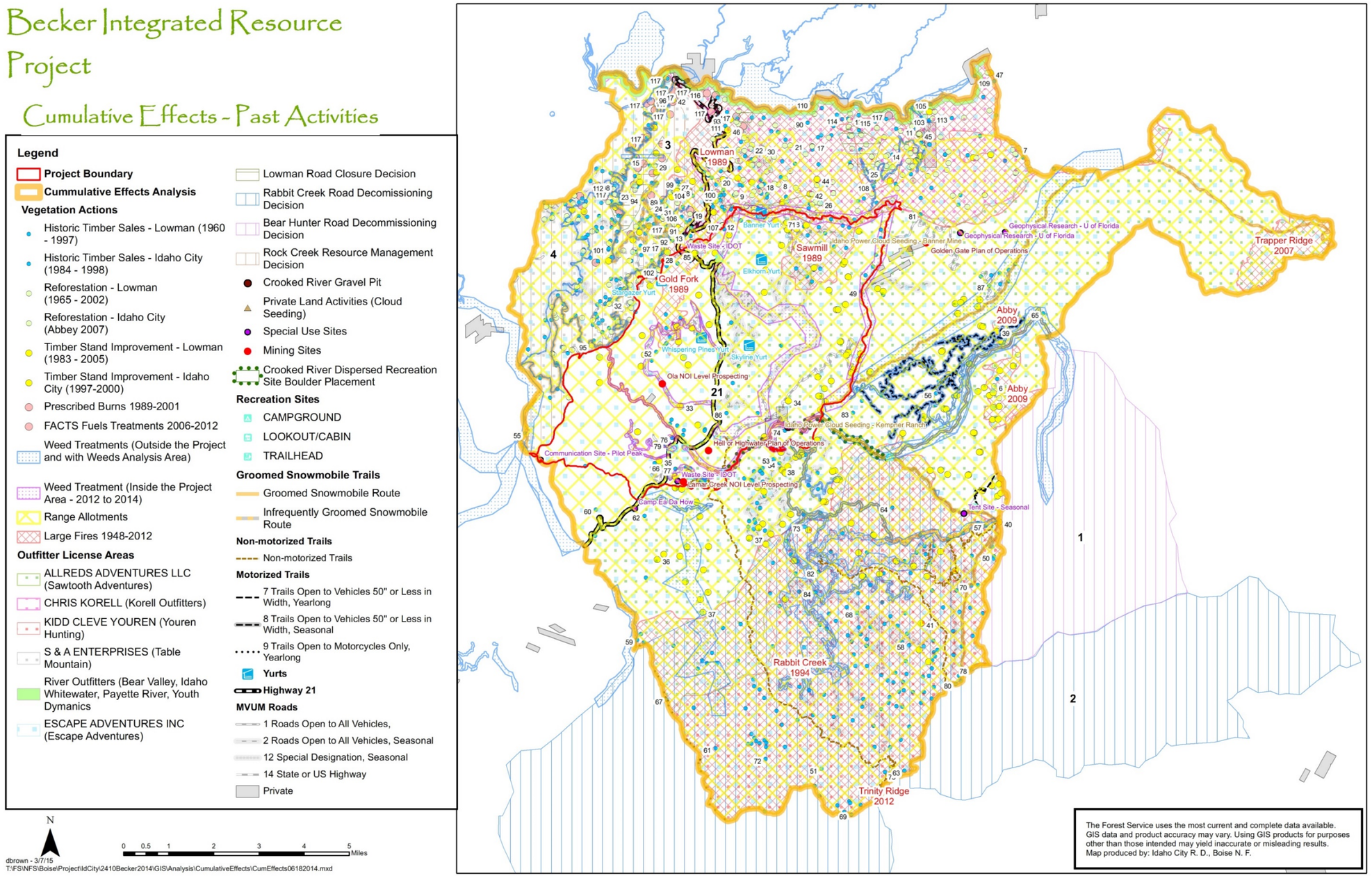

Figure 2. Map of the past activities within the Becker cumulative effects area

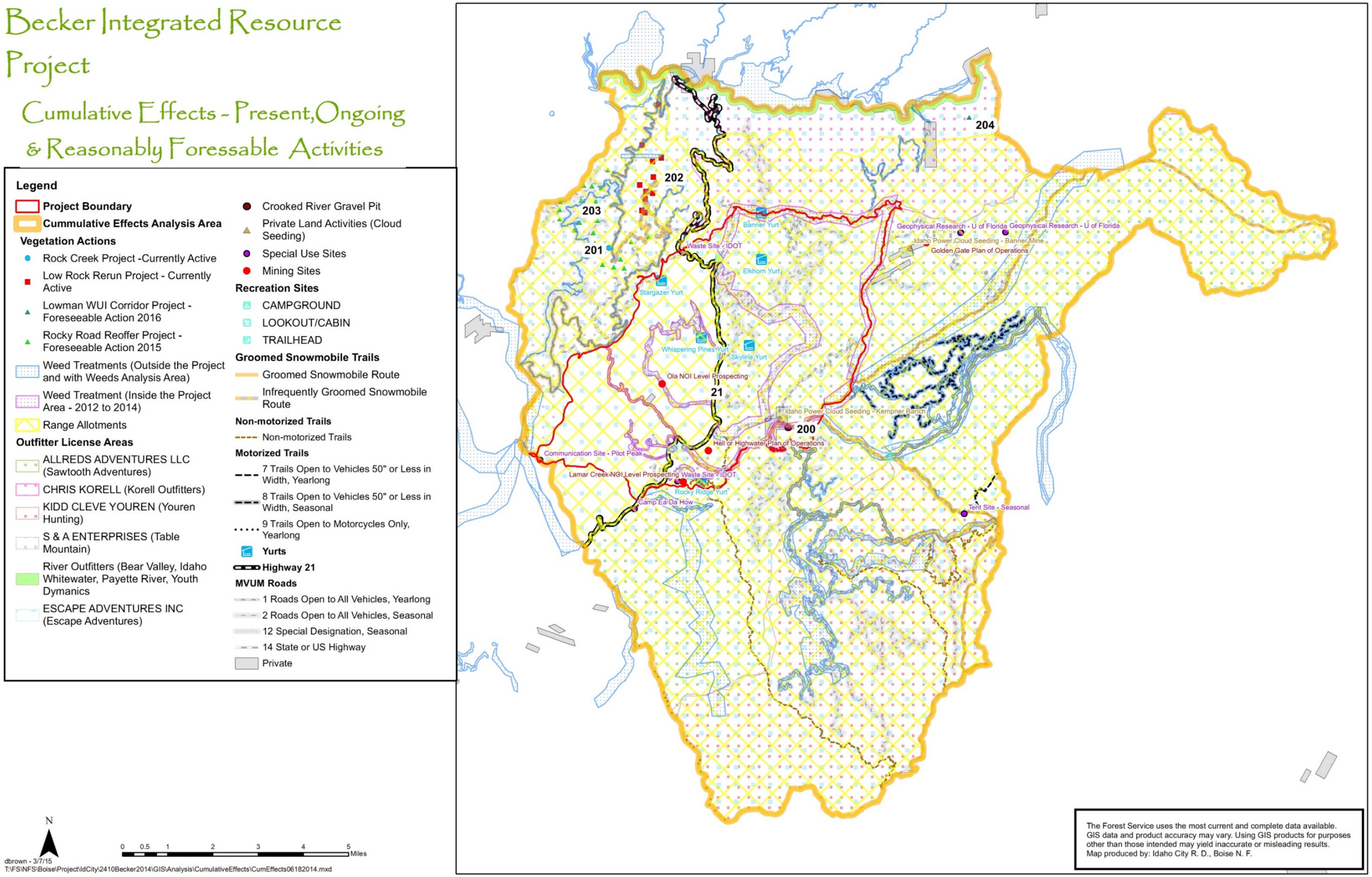

Figure 3. Map of present/ongoing and reasonably foreseeable activities in the Becker cumulative effects area

Table 1. Table of past, present/ongoing and reasonably foreseeable activities within the Becker cumulative effects analysis area and identification of activities considered in resource analyses

Map Index Number		Project/Activity	Date	In Project Area?	Area (acres)	Agency/ Ownership	Silv.	Fire/ Fuels	Air Quality	Wildlife	Hydro	Fish	Soils	Botany	Inv. Species Plants	Range	Eng./ Trans.	Rec	Minerals	Cultural	Social Econ	Visuals	Climate Change
	PAST ACTIVITIES																						
	Past Transportation Management Activities																						
Road System		Road Construction/ Maintenance	Pre-2014	Yes/No	161 miles (PA) 147 (Cum Effects area)	USFS, ITD	X			X	X	X	X	X	X	X	X	X		X		X	
Trail System		Trail Construction/ Maintenance	Pre-2014	Yes	60 miles 3 miles	USFS, IDPR	X			X	X	X	X	X	X	X		X				X	
Road System		Road Construction/ Maintenance	Pre-2014	No	308 miles	USFS, ITD	X			X				X	X	X		X					
Trail System		Trail Construction/ Maintenance	Pre-2014	No	25 miles (motorized) 26 miles (Non-motorized)	USFS	X			X				X	X	X		X					
1		Bear Hunter Road Decommissioning Project	2001	No	14,464	USFS	X			X				X	X	X							
2		Rabbit Creek Road Decommissioning Project	2002	No	59,165	USFS	X			X				X	X	X							
3		Lowman RD Road Closure Decision	1991	No	1,258	USFS	X			X					X								
4		Rock Creek Resource Management Decision - Road Closures	2004	No	10,868	USFS	X			X					X								
5 not displayed on map		Miscellaneous Seasonal Road Closures in Rock Creek and Kirkham watersheds (no decision documented)	Pre- 1991	No	UNK	USFS	X			X					X								
	Past Reforestation Activities																						
6		Abbey Creek Planting (Idaho City RD)	2007	No	229	USFS	X			X				X	X	X							X
7		Jackson (Lowman RD)	1999	No	91	USFS	X			X				X	X								X
8		Steep (Lowman RD)	2002	No	236	USFS	X			X				X	X								X
9		Smokey (Lowman RD)	2002	No	276	USFS	X			X				X	X								X
10		Enchanted Valley (Lowman RD)	2000	No	32	USFS	X			X				X	X								X
11		Archie (Lowman RD)	2000	No	102	USFS	X			X				X	X								X
12		Summit (Lowman RD)	2000	No	12	USFS	X			X				X	X								X
13		Rock (Lowman RD)	2000	No	8	USFS	X			X				X	X								X
14		Archie (Lowman RD)	1996	No	120	USFS	X			X				X	X								X
13		Rock (Lowman RD)	1995	No	154	USFS	X			X				X	X								X
16		Kirkham (Lowman RD)	1995	No	278	USFS	X			X				X	X								X
17		Huckleberry (Lowman RD)	1995	No	851	USFS	X			X				X	X								X
18		Lowman (Lowman RD)	1995	No	164	USFS	X			X				X	X								X
9		Smokey (Lowman RD)	1995	No	516	USFS	X			X				X	X								X
8		Steep (Lowman RD)	1995	No	208	USFS	X			X				X	X								X
12		Summit (Lowman RD)	1995	No	36	USFS	X			X				X	X								X
9		Smokey (Lowman RD)	1994	No	133	USFS	X			X				X	X								X

Map Index Number		Project/Activity	Date	In Project Area?	Area (acres)	Agency/ Ownership	Silv.	Fire/ Fuels	Air Quality	Wildlife	Hydro	Fish	Soils	Botany	Inv. Species Plants	Range	Eng./ Trans.	Rec	Minerals	Cultural	Social Econ	Visuals	Climate Change
10		Enchanted Valley (Lowman RD)	1994	No	97	USFS	X			X				X	X								X
7		Jackson (Lowman RD)	1994	No	90	USFS	X			X				X	X								X
7		Jackson (Lowman RD)	1994	No	75	USFS	X			X				X	X								X
11		Archie (Lowman RD)	1994	No	371	USFS	X			X				X	X								X
17		Huckleberry (Lowman RD)	1994	No	745	USFS	X			X				X	X								X
16		Kirkham (Lowman RD)	1994	No	29	USFS	X			X				X	X								X
8		Steep (Lowman RD)	1994	No	418	USFS	X			X				X	X								X
12		Summit (Lowman RD)	1994	No	49	USFS	X			X				X	X								X
7		Jackson (Lowman RD)	1993	No	1168	USFS	X			X				X	X								X
9		Smokey (Lowman RD)	1993	No	40	USFS	X			X				X	X								X
11		Archie (Lowman RD)	1993	No	32	USFS	X			X				X	X								X
17		Huckleberry (Lowman RD)	1993	No	12	USFS	X			X				X	X								X
18		Banner (Lowman RD)	1993	No	143	USFS	X			X				X	X								X
8		Steep (Lowman RD)	1992	No	685	USFS	X			X				X	X								X
9		Smokey (Lowman RD)	1992	No	395	USFS	X			X				X	X								X
11		Archie (Lowman RD)	1992	No	1024	USFS	X			X				X	X								X
16		Kirkham (Lowman RD)	1992	No	97	USFS	X			X				X	X								X
17		Huckleberry (Lowman RD)	1992	No	994	USFS	X			X				X	X								X
13		Rock (Lowman RD)	1992	No	166	USFS	X			X				X	X								X
12		Sumt_14 (Lowman RD)	1992	No	95	USFS	X			X				X	X								X
17		Huckleberry (Lowman RD)	1991	No	990	USFS	X			X				X	X								X
16		Kirkham (Lowman RD)	1991	No	376	USFS	X			X				X	X								X
9		Smokey (Lowman RD)	1991	No	609	USFS	X			X				X	X								X
8		Steep 24 (Lowman RD)	1991	No	357	USFS	X			X				X	X								X
19		Road Fork (Lowman RD)	1991	No	230	USFS	X			X				X	X								X
16		Kirkham (Lowman RD)	1990	No	157	USFS	X			X				X	X								X
10		Lowman (Lowman RD)	1990	No	355	USFS	X			X				X	X								X
13		Rock 424/101 (Lowman RD)	1989	No	11	USFS	X			X				X	X								X
13		Rock 424/102 (Lowman RD)	1989	No	9	USFS	X			X				X	X								X
20		Wagon Road 422/311 (Lowman RD)	1989	No	28	USFS	X			X				X	X								X
13		Rock 424/523 (Lowman RD)	1989	No	5	USFS	X			X				X	X								X
13		Rock 424/103 (Lowman RD)	1989	No	11	USFS	X			X				X	X								X
20		Wagon road 422/310 (Lowman RD)	1989	No	16	USFS	X			X				X	X								X

Map Index Number		Project/Activity	Date	In Project Area?	Area (acres)	Agency/ Ownership	Silv.	Fire/ Fuels	Air Quality	Wildlife	Hydro	Fish	Soils	Botany	Inv. Species Plants	Range	Eng./ Trans.	Rec	Minerals	Cultural	Social Econ	Visuals	Climate Change
13		Rock 424/505 (Lowman RD)	1989	No	11	USFS	X			X				X	X								X
21		Steep Creek (Lowman RD)	1988	No	383	USFS	X			X				X	X								X
22		Highway 21 (Lowman RD)	1987	No	247	USFS	X			X				X	X								X
23		Rock Creek Blowdown (Lowman RD)	1987	No	417	USFS	X			X				X	X								X
24		Miller Creek (Lowman RD)	1985	No	29	USFS	X			X				X	X								X
25		Kirkham Burn (Lowman RD)	1984	No	302	USFS	X			X				X	X								X
26		Archie Creek (Lowman RD)	1984	No	61	USFS	X			X				X	X								X
27		Rock Creek (Lowman RD)	1983	No	644	USFS	X			X				X	X								X
27		Rock Creek (Lowman RD)	1981	No	543	USFS	X			X				X	X								X
28		Rock Creek East (Lowman RD)	1980	No	186	USFS	X			X				X	X								X
25		Kirkham Burn (Lowman RD)	1979	No	571	USFS	X			X				X	X								X
27		Rock Creek (Lowman RD)	1977	No	139	USFS	X			X				X	X								X
26		Archie Creek (Lowman RD)	1977	No	36	USFS	X			X				X	X								X
27		Rock Creek (Lowman RD)	1977	No	51	USFS	X			X				X	X								X
29		Upper Road Fork (Lowman RD)	1976	No	84	USFS	X			X				X	X								X
30		Archie Creek West (Lowman RD)	1975	No	52	USFS	X			X				X	X								X
26		Archie Creek (Lowman RD)	1973	No	94	USFS	X			X				X	X								X
31		Rock Creek East (Lowman RD)	1972	No	185	USFS	X			X				X	X								X
32		Rock Creek Planting (Lowman RD)	1965	No	250	USFS	X			X				X	X								X
	Past Timber Stand Improvement Activities																						
33		Beaver Creek (Idaho City RD)	1997	Yes	490	USFS	X			X	X	X	X	X	X	X						X	
34		Kempner (Idaho City RD)	1997	Yes	103	USFS	X			X	X	X	X	X	X	X						X	
35		Edna Creek (Idaho City RD)	1997	Yes	283	USFS	X			X	X	X	X	X	X	X						X	
36		Lamar Creek (Idaho City RD)	1997	No	220	USFS	X			X				X	X	X							X
37		Sunset Creek (Idaho City RD)	1997	No	393	USFS	X			X				X	X	X							X
33		Beaver Creek (Idaho City RD)	1998	Yes	149	USFS	X			X	X	X	X	X	X	X						X	
34		Kempner (Idaho City RD)	1998	Yes	326	USFS	X			X	X	X	X	X	X	X						X	

Map Index Number		Project/Activity	Date	In Project Area?	Area (acres)	Agency/ Ownership	Silv.	Fire/ Fuels	Air Quality	Wildlife	Hydro	Fish	Soils	Botany	Inv. Species Plants	Range	Eng./ Trans.	Rec	Minerals	Cultural	Social Econ	Visuals	Climate Change
38		So Long Eddie (Idaho City RD)	1998	No	157	USFS	X			X				X	X	X							X
36		Lamar Creek (Idaho City RD)	1998	Yes	85	USFS	X			X	X	X	X	X	X	X						X	
37		Crooked River (Idaho City RD)	1998	No	162	USFS	X			X				X	X	X							X
38		Gotch Creek (Idaho City RD)	1999	Yes	641	USFS	X			X	X	X	X	X	X	X						X	
39		Pikes Fork (Idaho City RD)	1999	No	287	USFS	X			X				X	X	X							X
37		Crooked River (Idaho City RD)	1999	No	932	USFS	X			X				X	X	X							X
37		Crooked River (Idaho City RD)	1999	No	286	USFS	X			X				X	X	X							X
40		Abby Creek (Idaho City RD)	1999	No	585	USFS	X			X				X	X	X							X
41		Big Owl - WREN Sapling Tree in (Idaho City RD)	2000	No	1858	USFS	X			X				X	X	X							X
42		Rock TSI (Lowman RD)	2005	No	365	USFS	X			X				X	X								X
43		2001 CL (Lowman RD)	2001	No	9	USFS	X			X				X	X								X
44		in 1998 (Lowman RD)	1998	No	1149	USFS	X			X				X	X								X
45		Archie Creek (Lowman RD)	1988	No	93	USFS	X			X				X	X								X
46		Highway 21 (Lowman RD)	1986	No	573	USFS	X			X				X	X								X
45		Archie Creek (Lowman RD)	1985	No	216	USFS	X			X				X	X								X
47		Payette Slope (Lowman RD)	1984	No	2	USFS	X			X				X	X								X
48		Lower Road Fork (Lowman RD)	1983	No	39	USFS	X			X				X	X								X
	Past Vegetation Management Activities																						
49		Banner City (Idaho City RD)	1990s	Yes	224	USFS	X			X	X	X	X	X	X	X						X	
50		Bear Creek (Idaho City RD)	1990s	No	6823	USFS	X			X				X	X	X							X
51		Blind Camp (Idaho City RD)	1990s	No	1974	USFS	X			X				X	X	X							X
52		China Fork SSTS (Idaho City RD)	1990s	Yes	32	USFS	X			X	X	X	X	X	X	X						X	
53		CROOKED WILLOW ((Idaho City RD)	1990s	No	389	USFS	X			X				X	X	X							X
54		So Long Eddie (Idaho City RD)	1990s	No	313	USFS	X			X				X	X	X							X
55		Jack-Wil Salvage (Idaho City RD)	1990s	No	3854	USFS	X			X				X	X	X							X
56		Lazy H (Idaho City RD)	1990s	No	134	USFS	X			X				X	X	X							X
57		Little Owl Cone (Idaho City RD)	1980s	No	10	USFS	X			X				X	X	X							X
58		Lost Overwood (Idaho City RD)	1990s	No	155	USFS	X			X				X	X	X							X
59		Mid Lamar (Idaho City RD)	1990s	No	59	USFS	X			X				X	X	X							X
60		Mores Salvage (Idaho City RD)	1990s	No	6136	USFS	X			X				X	X	X							X

Map Index Number		Project/Activity	Date	In Project Area?	Area (acres)	Agency/ Ownership	Silv.	Fire/ Fuels	Air Quality	Wildlife	Hydro	Fish	Soils	Botany	Inv. Species Plants	Range	Eng./ Trans.	Rec	Minerals	Cultural	Social Econ	Visuals	Climate Change
61		Sandy (Idaho City RD)	1990s	No	3772	USFS	X			X				X	X	X							X
62		Sunset-Pilot Salvage (Idaho City RD)	1990s	Yes	23826	USFS	X			X	X	X	X	X	X	X							
63		Wren Salvage (Idaho City RD)	1990s	No	253	USFS	X			X				X	X	X							X
64		Big Owl (Idaho City RD)	1990s	No	6528	USFS	X			X				X	X	X							X
65		Crooked Bear (Idaho City RD)	1990s	No	56	USFS	X			X				X	X	X							X
66		Edna Salvage (Idaho City RD)	1990s	Yes	85	USFS	X			X	X	X	X	X	X	X						X	
67		German Creek (Idaho City RD)	1990s	No	127	USFS	X			X				X	X	X							X
68		Hidden Cabin (Idaho City RD)	1980s	No	964	USFS	X			X				X	X	X							X
69		Hungarian (Idaho City RD)	1980s	No	157	USFS	X			X				X	X	X							X
70		Little Owl SSTS (Idaho City RD)	1980s	No	79	USFS	X			X				X	X	X							X
71		Sawmill (Idaho City RD)	1990s	Yes	517	USFS	X			X	X	X	X	X	X	X						X	
72		Ski Creek (Idaho City RD)	1990s	No	2198	USFS	X			X				X	X	X							X
73		Big Tree (Idaho City RD)	1990s	No	1501	USFS	X			X				X	X	X							X
74		Crooked Pike Salvage (Idaho City RD)	1990s	Yes	22048	USFS	X			X	X	X	X	X	X	X						X	
75		Fire Don (Idaho City RD)	1990s	No	1	USFS	X			X				X	X	X							X
76		Highway 21 LP (Idaho City RD)	1990s	Yes	76	USFS	X			X	X	X	X	X	X	X						X	
77		Lamar LP S & S II (Idaho City RD)	1980s	Yes	37	USFS	X			X	X	X	X	X	X	X						X	
78		North Fork Lodgepole (Idaho City RD)	1980s	No	6	USFS	X			X				X	X	X					X		X
79		Whoop Um Up Ski Loop (Idaho City RD)	1980s	Yes	33	USFS	X			X	X	X	X	X	X	X					X	X	
80		Wren Creek II (Idaho City RD)	1990s	No	4	USFS	X			X				X	X	X					X		X
81		Banner Ridge S & S (Idaho City RD)	1980s	Yes	130	USFS	X			X	X	X	X	X	X	X					X	X	
82		Crooked River (Idaho City RD)	1990s	No	10138	USFS	X			X				X	X	X					X		X
83		Eureka (Idaho City RD)	1990s	No	76	USFS	X			X				X	X	X					X		X
84		Five Corners (Idaho City RD)	1990s	No	248	USFS	X			X				X	X	X					X		X
85		Goldfork Salvage (Idaho City RD)	1990s	Yes	482	USFS	X			X	X	X	X	X	X	X					X	X	
86		Little Beaver (Idaho City RD)	1980s	Yes	1526	USFS	X			X	X	X	X	X	X	X					X	X	
87		Nixon Rock (Idaho City RD)	1980s	No	178	USFS	X			X				X	X						X		X
88		Wagon SS (Lowman RD)	1986	No	30	USFS	X			X				X	X						X		X

Map Index Number		Project/Activity	Date	In Project Area?	Area (acres)	Agency/ Ownership	Silv.	Fire/ Fuels	Air Quality	Wildlife	Hydro	Fish	Soils	Botany	Inv. Species Plants	Range	Eng./ Trans.	Rec	Minerals	Cultural	Social Econ	Visuals	Climate Change
89		Upper Road (Lowman RD)	1970	No	154	USFS	X			X				X	X						X		X
90		Steep Huckle (Lowman RD)	1986	No	977	USFS	X			X				X	X						X		X
91		South Rock SS (Lowman RD)	1980	No	368	USFS	X			X				X	X						X		X
92		S. Lowman SS (Lowman RD)	1989	No	344	USFS	X			X				X	X						X		X
93		Smokey Road (Lowman RD)	1990	No	2690	USFS	X			X				X	X						X		X
94		Rocky II (Lowman RD)	1993	No	43	USFS	X			X				X	X						X		X
95		Rock Creek (Lowman RD)	1965	No	625	USFS	X			X				X	X						X		X
96		Rock Creek Road (Lowman RD)	1975	No	394	USFS	X			X				X	X						X		X
97		Rock Creek East (Lowman RD)	1971	No	272	USFS	X			X				X	X						X		X
98		Rock Creek Blowdown (Lowman RD)	1986	No	420	USFS	X			X				X	X						X		X
99		Road SSTS (Lowman RD)	1986	No	48	USFS	X			X				X	X						X		X
100		Road Fork (Lowman RD)	1960	No	706	USFS	X			X				X	X						X		X
95		Rock Creek (Lowman RD)	1965	No	4	USFS	X			X				X	X						X		X
101		Quartzmill (Lowman RD)	1970	No	661	USFS	X			X				X	X						X		X
102		Nor Rock (Lowman RD)	1992	No	311	USFS	X			X				X	X						X		X
103		Meadow SS (Lowman RD)	1997	No	9	USFS	X			X				X	X						X		X
104		Lowman South (Lowman RD)	1992	No	8734	USFS	X			X				X	X						X		X
105		Lowman Nor (Lowman RD)	1993	No	8115	USFS	X			X				X	X						X		X
106		Lower Road (Lowman RD)	1978	No	426	USFS	X			X				X	X						X		X
107		Low Wagon Rd (Lowman RD)	1975	No	160	USFS	X			X				X	X						X		X
108		Little Arch (Lowman RD)	1993	No	27	USFS	X			X				X	X						X		X
109		Jackson Creek (Lowman RD)	1990	No	2599	USFS	X			X				X	X						X		X
110		Highway Comb SSTS (Lowman RD)	1994	No	387	USFS	X			X				X	X						X		X
111		Highway 21 (Lowman RD)	1985	No	1116	USFS	X			X				X	X						X		X
112		High Quartz (Lowman RD)	1978	No	312	USFS	X			X				X	X						X		X
113		East Archie (Lowman RD)	1990	No	3142	USFS	X			X				X	X						X		X
114		Berry Steep (Lowman RD)	1990	No	3494	USFS	X			X				X	X						X		X
115		Arch Emma SS (Lowman RD)	1990	No	1244	USFS	X			X				X	X						X		X
	Past Prescribed Fire Activities																						
116		Rx Burns 1989-2001	1989-2001	No	145	USFS		X						X	X								
117		FACTS Fuel Activities 2005-2012	2005-2012	No	1223	USFS		X						X	X								

Map Index Number		Project/Activity	Date	In Project Area?	Area (acres)	Agency/ Ownership	Silv.	Fire/ Fuels	Air Quality	Wildlife	Hydro	Fish	Soils	Botany	Inv. Species Plants	Range	Eng./ Trans.	Rec	Minerals	Cultural	Social Econ	Visuals	Climate Change
	Past Large Wildfire Activity																						
not labeled on map[1]		Unnamed Fire	1939	No	226	USFS	X							X	X								
not labeled on map[1]		Unnamed Fire	1948	No	12	USFS	X							X	X								
not labeled on map[1]		Unnamed Fire	1949	No	322	USFS	X							X	X								
not labeled on map[1]		Unnamed Fire	1977	No	1054	USFS	X							X	X								
labeled on map		Gold Fork	1989	Yes	828	USFS	X				X	X	X	X	X	X						X	
labeled on map		Sawmill	1989	Yes	1254	USFS	X				X	X	X	X	X	X						X	
labeled on map		Lowman	1989	No	12,820	USFS	X			X	X	X	X	X	X	X							
labeled on map		Rabbit Creek	1994	No	24,499	USFS	X			X				X	X	X							
labeled on map		Trapper Ridge	2007	No	1,199	USFS	X			X				X	X	X							
labeled on map		Abby	2009	No	885	USFS	X			X				X	X	X							
labeled on map		Trinity Ridge	2012	No	<1	USFS	X							X	X	X							
not labeled on map		More Fire	2015	Yes	8	USFS	X							X	X	X							
	Past Range Management Activities																						
not labeled on map		Sheep Grazing - Boise Basin & Nor Fork Allotments	pre-2013	Yes/No	95,900	USFS	X				X	X	X	X	X	X						X	
	Past Noxious Weed Management Activities																						
not labeled on map		Becker Project Area by Boise County Cooperative Noxious Weed treatment Calendar year 2012-2013; Multiple species, No Overlap Counted	FY2012-13	Yes	279 acres (Project Area) 2846 acres (Cum Effects Area						X	X	X	X	X	X		X			X	X	
not labeled on map		Weed treatments within 5 miles of Becker Project Area boundary	FY2012-13	No	2846						X	X		X	X	X		X					

[1] Not labeled on Map because this fire area was burned over again.

Map Index Number		Project/Activity	Date	In Project Area?	Area (acres)	Agency/ Ownership	Silv.	Fire/ Fuels	Air Quality	Wildlife	Hydro	Fish	Soils	Botany	Inv. Species Plants	Range	Eng./ Trans.	Rec	Minerals	Cultural	Social Econ	Visuals	Climate Change
	Past Recreation Activities																						
not labeled on map		Campground construction/ maintenance (Kirkham Hot springs, Edna Creek, Willow Creek, Whoop Um UP)	Pre-2014	Yes/No	6 sites	USFS				X	X	X		X	X	X		X				X	
not labeled on map		Trailhead Construction and maintenance (Banner Ridge, Gold Fork, Whoop Um UP, Lamar, Crooked River, and Bear Sumt)	Pre-2014	Yes/No	6 sites	USFS	X			X	X	X	X	X	X	X		X			X	X	
Trail System		Non Motorized Trail Construction (NFS Trails 158,264,275,290, 700, 701, 702, 703, 04, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 716, 171, 718, 719, 720, 22, 723, 724, 725, 726, 727, 728, 729, 730)	Pre-2014	Yes/No	3 miles (NFS Trail) 32.4 miles (Unauthorized Trails)	USFS	X			X		X	X	X	X	X		X			X	X	
Trail System		Motorized trail construction/maintenance (NFS Trails 166, 288, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577)	Pre-2014	Yes/No	60 miles	USFS	X			X		X	X	X	X	X		X			X	X	
not labeled on map		Beaver Creek Cabin Construction and Maintenance	Pre-2014	Yes	1 site	USFS	X				X	X	X	X	X	X		X			X	X	
not labeled on map		IDPR Yurt Construction/Maintenance	Pre-2014	Yes/No	6 sites	USFS/State of Idaho	X			X		X	X	X	X	X		X			X	X	
not labeled on map		Crooked River Dispersed Recreation Site Boulder Placement Project	UNK	Yes/No	UNK	USFS	X					X	X		X	X		X			X	X	
not labeled on map		Boise County Snow grooming (over snow motorized trails)	Pre-2014	Yes/No	80 miles	USFS/Oer	X					X						X			X	X	
not labeled on map		IDPR Snow grooming (over snow non-motorized trails)	Pre-2014	Yes/No	29.2 miles	USFS	X					X						X			X	X	
not displayed on map		Fuelwood Gathering	Pre-2014	Yes/No	UNK	USFS	X			X	X	X	X		X			X			X	X	
not displayed on map		Christmas Tree Cutting	Pre-2014	Yes/No	UNK	USFS	X					X			X			X			X	X	
not displayed on map		Dispersed Recreation and Hunting	Pre-2014	Yes/No	Yes/No	USFS				X	X	X	X		X			X	X		X	X	
	Past Special Use Management Activities																						
labeled on map		University of Florida Geo Physical Research	2013	No	2 sites	USFS								X	X			X					
labeled on map		Wall Tent Temp Shelter SUP	2011	No	1 sites	USFS									X			X					

Map Index Number		Project/Activity	Date	In Project Area?	Area (acres)	Agency/ Ownership	Silv.	Fire/ Fuels	Air Quality	Wildlife	Hydro	Fish	Soils	Botany	Inv. Species Plants	Range	Eng./ Trans.	Rec	Minerals	Cultural	Social Econ	Visuals	Climate Change
labeled on map		ITD Waste Sites (NFS Rd 025M and Banner Summit)	Pre-2014	Yes	2 sites	USFS						X			X			X				X	
not labeled on map		Escape Adventures	Pre-2014	Yes/No	100,857	USFS						X			X			X					
not labeled on map		Allred Adventures LLC	Pre-2014	Yes/No	67,488	USFS						X			X			X					
not labeled on map		Korell Outfitter and Guide	Pre-2014	No	11,413	USFS									X			X					
not labeled on map		Youren Outfitter and Guide	Pre-2014	No	21,216	USFS									X			X					
not labeled on map		S&A Enterprises Outfitter and Guide	Pre-2014	No	11,387	USFS									X			X					
labeled on map		Camp Ed Da How	Pre-2014	No	1 site	USFS									X			X					
not labeled on map (Payette River)		South Fork Payette River Outfitters and Guides (Bear Valley, Idaho Whitewater, Cascade Raft, and You Dynacs)	Pre-2014	No	1,019	USFS									X			X					
labeled on map		Pilot Peak Communication Site (ID Power SUP)	Pre-2014	Yes	1 site	USFS						X			X			X				X	
	Past Minerals Management/Rehabilitation Activities																						
labeled on map		Banner Mine Complex (Primarily Underground Silver mining)	Pre-2014 (1865-1921, 1960s)	No	400	USFS, Private					X			X	X			X	X				
not displayed on map		Placer mining throughout Project Area	Pre-2014	Yes/No	UNK	USFS					X	X	X	X	X			X	X			X	
labeled on map		Lamar Creek NOI Level Prospecting (Located off of NFS RD 025M)	Pre-2014	Yes	0.1	USFS					X	X	X	X	X			X	X			X	
labeled on map		Ola NOI level prospecting (Located off of NFS Rd 393)	Ongoing	Yes	0.1	USFS					X	X	X	X	X			X	X			X	
labeled on map		Hell or High Water Placer Plan of Operations	2008	Yes	3.5	USFS					X	X	X	X	X			X	X			X	
	Past Private Land Management Activities Residences/Cabins/Ranches																						
labeled on map		Idaho Power Cloud Seeding on Private Lands at Kempner Ranch	Pre-2014	Yes	1 site	Private	X				X	X											
labeled on map		Idaho Power Cloud Seeding on Private Lands near Banner Mine Site	Pre-2014	No	1 site	Private	X				X	X											

Map Index Number		Project/Activity	Date	In Project Area?	Area (acres)	Agency/ Ownership	Silv.	Fire/ Fuels	Air Quality	Wildlife	Hydro	Fish	Soils	Botany	Inv. Species Plants	Range	Eng./ Trans.	Rec	Minerals	Cultural	Social Econ	Visuals	Climate Change
	PRESENT/ONGOING ACTIVITIES																						
	Present/Ongoing Transportation Management Activities																						
Road System		Road Construction/Maintenance	Ongoing	Yes/No	161 miles (PA) 147 miles (Cum Effects area)	USFS, ITD	X			X	X	X	X	X	X	X	X	X	X		X		
Trail System		Trail Construction/Maintenance	Ongoing	Yes/No	3 miles (NFS Trail) 32.4 miles (Unauthorized Trails)	USFS, IDPR	X			X	X	X	X	X	X	X		X			X		
		IDT HWY 21 Resurfacing and Culvert Replacements	Ongoing	Yes/No	20 miles	State of Idaho						X		X	X			X			X		
200		Crooked River Gravel Pit	Ongoing	Yes	1 site	USFS						X		X	X			X			X		
	Present/Ongoing Vegetation Management Activities (Harvest, Refor, TSI)																						
201		Rock Creek Timber Sale	Ongoing	No	10,868	USFS	X			X				X	X								X
202		Low Rock Rerun 2014	2014	No	277	USFS	X								X								
	Present/Ongoing Prescribed Fire Management Activities																						
201		Rock Creek Timber Sale	Ongoing	No	10,868	USFS	X		X	X				X	X								X
202		Low Rock Rerun 2014	2014	No	277	USFS	X		X						X								
	Present/Ongoing Fire Suppression																						
not displayed on map		Wildfire Suppression	As Needed				X		X				X	X	X	X		X	X			X	X
	Present/Ongoing Range Management Activities																						
not labeled on map		Sheep Grazing - Boise Basin & Nor Fork Allotments	Ongoing	Yes/No	95,900	USFS	X				X	X	X	X	X			X				X	
	Present/Ongoing Noxious Weed Management Activities																						
not labeled on map		Becker Project Area by Boise County Cooperative Noxious Weed treatment Multiple species,	Ongoing	Yes/No	279	USFS					X	X	X	X	X	X		X			X		
not labeled on map		Weed treatments within 5 of Becker Project Area boundary -	Ongoing	No	2846	USFS					X	X		X	X	X		X					
	Present/Ongoing Recreation Activities																						
not labeled on map		IDPR Yurts Maintenance	Ongoing	Yes/No	6 sites	USFS/ IDPR				X		X			X			X				X	

Map Index Number		Project/Activity	Date	In Project Area?	Area (acres)	Agency/ Ownership	Silv.	Fire/ Fuels	Air Quality	Wildlife	Hydro	Fish	Soils	Botany	Inv. Species Plants	Range	Eng./ Trans.	Rec	Minerals	Cultural	Social Econ	Visuals	Climate Change
Trail system		IDPR Park and Ski Grooming and Trail Maintenance	Ongoing	Yes	41 miles	USFS				X		X						X				X	
not labeled on map		Boise County 8A Snowmobile Grooming	Ongoing	Yes/No	80 miles	USFS				X		X						X			X	X	
not labeled on map		Campground maintenance (Kirkham Hot springs, Edna Creek, Willow Creek, Whoop Um UP	Ongoing	Yes/No	6 sites	USFS						X		X	X			X				X	
not labeled on map		Trailhead maintenance (Banner Ridge, Gold Fork, Whoop Um UP, Lamar, Crooked River, Bear Sumt	Ongoing	Yes/No	6 sites	USFS						X			X			X				X	
Trail system		Non Motorized Trail Maintenance (NFS Trails 158,264,275,290, 700, 701, 702, 703, 704, 705, 706,707, 708, 709, 710, 711, 712,713,714, 716, 171, 718, 719, 720, 722, 723,724, 725, 726, 727, 728, 729, 730)	Ongoing	Yes/No	3 miles (NFS Trail) 32.4 miles (Unauthorized Trails)	USFS	X			X	X	X		X	X	X		X				X	
Trail system		Motorized trail maintenance (NFS Trails 166, 288, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576 ,577)	Ongoing	Yes/No	60 miles	U	X			X		X		X	X	X		X				X	
not labeled on map		Beaver Creek Cabin Maintenance	Ongoing	Yes	1 site	USFS						X			X			X				X	
not displayed on map		Fuelwood Gathering	Ongoing	Yes/No	UNK	USFS	X			X	X	X	X		X			X			X	X	
not displayed on map		Christmas Tree Program	Ongoing	Yes/No	UNK	USFS	X					X			X			X			X	X	
not displayed on map		Dispersed Recreation and Hunting	Ongoing	Yes/No	UNK	USFS				X	X	X	X		X		X	X	X		X	X	
	Present/Ongoing Special Use Management Activities																						
not labeled on map		Escape Adventures	Ongoing	Yes/No	100,857	USFS				X		X			X			X					
not labeled on map		Allred Adventures LLC	Ongoing	Yes/No	67,488	USFS				X		X			X			X					
not labeled on map		Korell Outfitter and Guide	Ongoing	No	11,413	USFS				X					X			X					
not labeled on map		Youren Outfitter and Guide	Ongoing	No	21,216	USFS				X					X			X					

Map Index Number		Project/Activity	Date	In Project Area?	Area (acres)	Agency/ Ownership	Silv.	Fire/ Fuels	Air Quality	Wildlife	Hydro	Fish	Soils	Botany	Inv. Species Plants	Range	Eng./ Trans.	Rec	Minerals	Cultural	Social Econ	Visuals	Climate Change
not labeled on map		S&A Enterprises Outfitter and Guide	Pre-2014	No	11,387	USFS									X			X					
not labeled on map (Payette River)		South Fork Payette River Outfitters and Guides (Bear Valley, Idaho Whitewater, Cascade Raft, and Youth Dynamics)	Pre-2014	No		USFS									X			X					
labeled on map		Camp Ed Da How	Ongoing	No	1 site	USFS									X			X					
labeled on map		ITD Waste Sites (NFS Rd 025M and Banner Summit)	Pre-2014	Yes	2 sites	USFS	?					X		X	X			X				X	
labeled on map		Pilot Peak Communication Site (ID Power SUP)	Ongoing	Yes	1 site	USFS						X		X	X			X				X	
	Present/Ongoing Mineral Management/Rehabilitation Activities																						
labeled on map		Golden Gate Plan of Operations (Underground mining at old Banner Mine Site)	Ongoing	No	5	USFS					X			X	X			X	X				
labeled on map		Lamar Creek NOI Level Prospecting (Located off of NFS RD 025M)	Ongoing	Yes	0.1	USFS					X	X	X	X	X			X	X			X	
labeled on map		Crooked River Placer (Numerous claims and casual use placer mining)	Ongoing	Yes	Unk	USFS					X	X	X	X	X			X	X			X	
labeled on map		Ola NOI level prospecting (Located off of NFS Rd 393)	Ongoing	Yes	0.1	USFS					X	X	X	X	X			X	X			X	
labeled on map		Hell or High Water Plan of Operation (Underground mining)	Ongoing	Yes	0.1	USFS					X	X	X	X	X			X	X			X	
	Present/Ongoing Private Land Management Activities Residences/Cabins/Ranches																						
labeled on map		Idaho Power Cloud Seeding on Private Lands at Kempner Ranch	Ongoing	Yes	1 site	Private					X	X		X									
labeled on map		Idaho Power Cloud Seeding on Private Lands near Banner ne Site	Ongoing	No	1 site	Private					X	X		X									
	REASONABLY FORESEEABLE ACTIVITIES																						
	Reasonably Foreseeable Vegetation Management Activities (Harvest, Refor, TSI)																						
203		Rocky Road (reoffer) 2015	2015	No	741	USFS			X	X				X	X								X
204		Lowman WUI Corridor	2016	No	2023	USFS			X					X	X								
	Reasonably Foreseeable Prescribed Fire Activities																						
203		Rocky Road (reoffer) 2015	2015	No	741	USFS			X	X				X	X								X

Map Index Number		Project/Activity	Date	In Project Area?	Area (acres)	Agency/ Ownership	Silv.	Fire/ Fuels	Air Quality	Wildlife	Hydro	Fish	Soils	Botany	Inv. Species Plants	Range	Eng./ Trans.	Rec	Minerals	Cultural	Social Econ	Visuals	Climate Change
204		Lowman WUI Corridor	2016	No	2023	USFS			X					X	X								
	Reasonably Foreseeable Noxious Weed Management Activities																						
Not displayed on Map		Sawtooth and Boise National Forests Invasive Species Treatment EIS	FY2015-2016	Yes	19371	USFS					X	X		X	X	X		X					

Appendix C:

Riparian Conservation Area Tables and Schematics

Becker Integrated Resource Project

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Riparian Conservation Areas (RCAs) incorporate riparian areas along streams as well as wetlands and floodplains associated with stream systems and ponds, lakes, and reservoirs. Aquatic and riparian systems may be affected by adjacent land management activities. RCAs provide both linkage and transitional habitat between hillslopes and upland terrestrial habitats and the aquatic habitats within the stream channels. The 2010 Forest Plan outlines criteria to aid interdisciplinary teams (IDT) in delineating RCAs for perennial and intermittent streams, ponds, lakes, reservoirs, and wetlands (USDA Forest Service 2010, Appendix B, pp. B 32–41*)*. The objective of RCA delineation is to provide boundaries around streams for which management activities must consider and maintain riparian processes and functions important to overall stream and aquatic habitat functionality. Individual management activities may affect riparian process and functions in different ways and magnitudes depending on the type of activity and its proximity to the stream channel, as well as the characteristics of the stream channel at that location. Riparian functions and processes important to properly functioning riparian areas identified in the Forest Plan include:

- Stream shading
- Large woody debris recruitment
- Fine organic litter
- Bank stabilization
- Sediment control
- Nutrients and other dissolved materials
- Riparian microclimate and productivity
- Wildlife habitat
- Windthrow
- Importance of small streams
- Importance of hillslope steepness

For the Becker Project, RCAs have been identified by the IDT using Option 2 as described in the Forest Plan (USDA Forest Service 2010, Appendix B, pp. B-32 through B-41), which uses site potential tree heights (SPTHs) based on the dominant Potential Vegetation Group (PVG) in the stand (Table 1). Option 2 indicates that one SPTH is the RCA buffer distance for intermittent stream channels (as well as ponds, lakes, reservoirs, and wetlands) and two SPTHs is the RCA buffer distance for perennial stream channels. Because the project area contains a wide array of PVGs, the dominant PVG based on the most recent vegetation data is used to delineate RCAs. Table 2 displays the delineated RCAs for the project area and overall acreage associated with each.

Table 1. Site potential tree height distances by Potential Vegetation Group

Potential Vegetation Group	Age	1 Site Tree Height (feet)	2 Site Tree Heights (feet)
1—Dry Ponderosa Pine/Xeric Douglas-fir	200	110	220
2—Warm Dry Douglas-fir/Moist Ponderosa Pine	200	120	240
3—Cool Moist Douglas-fir	200	120	240
4—Cool Dry Douglas-fir	200	100	200
5—Dry Grand Fir	200	110	220
6—Cool Moist Grand Fir	200	130	260
7—Cool Dry Subalpine Fir	200	100	200
8—Cool Moist Subalpine Fir	200	100	200
9—Hydric Subalpine Fir	200	100	200
10—Persistent Lodgepole Pine	[a]	80	160
11—High Elevation Subalpine Fir	200	70	140

Source: USDA Forest Service 2010
[a]In PVG 10 individual trees and stands normally do not achieve an average of 200 years. However, mature lodgepole pine site trees can achieve an average height of approximately 80 feet.

Table 2. Acres of Riparian Conservation Areas within the project area by subwatershed

Subwatershed	Acres
Middle Crooked	4,518
Pikes Fork	1,046
Total	5,564

Proposed management actions associated with the Becker Project have been evaluated with consideration of riparian functions and processes. Distances from streams at which activities may occur have been delineated for each activity proposed to occur within RCAs based on anticipated effects related to site conditions, surveys, modeling results, existing research, and professional judgment. Specifically, vegetation management activities associated with *Purpose and Need 1* (thinning, thinning with product removal, and burning) are proposed within RCA buffers at various distances from the stream channel. Transportation management activities associated with *Purpose and Need 2* (road realignment and road decommissioning—both authorized and unauthorized) are proposed at several locations within RCAs. Recreation management activities associated with *Purpose and Need 3* (including motorized and non-motorized trail designation, and trail-head construction are proposed within RCAs. See Table 3 and Table 4 for a complete list of activities and the distances at which they may occur and Figure 1 for a graphical illustration.

Analysis of effects to RCA functions and processes as a result of implementing the proposed actions with the distances assigned in Table 3 and Table 4 and represented in Figure 2, Figure 3, Figure 4, Figure 5, and Figure 6 are discussed in the hydrology and fisheries resource sections of the draft environmental impact statement for the Becker Integrated Resource Project.

Table 3. Perennial streams (both inside and outside plantations)

Distance from Edge of Stream	Activity
0–50 feet	No non-commercial thinning treatment; backing fire allowed
50–75 feet	Non-commercial thinning allowed with 8-inch diameter limit; pile burning allowed; no broadcast burn ignitions; backing fire allowed
75 feet to 1 site potential tree height	Non-commercial thinning allowed with 8-inch diameter limit; pile burning allowed; broadcast burn ignitions allowed
1 site potential tree height to 2 site potential tree heights	Non-commercial thinning and commercial thinning allowed but no associated equipment allowed off of existing roads

Table 4. Intermittent streams (both inside and outside plantations)

Distance from Edge of Stream	Activity
0–15 feet	No non-commercial thinning treatment; backing fire allowed
15–50 feet	Non-commercial thinning allowed with 8-inch diameter limit; lop and scatter only; no pile burning allowed; no broadcast burn ignitions; backing fire allowed
50–75 feet	Non-commercial thinning allowed with 8-inch diameter limit; pile burning allowed; no broadcast burn ignitions; backing fire allowed
75 feet to 1 site potential tree height	Non-commercial thinning allowed with 8-inch diameter limit; pile burning allowed; broadcast burn ignitions allowed

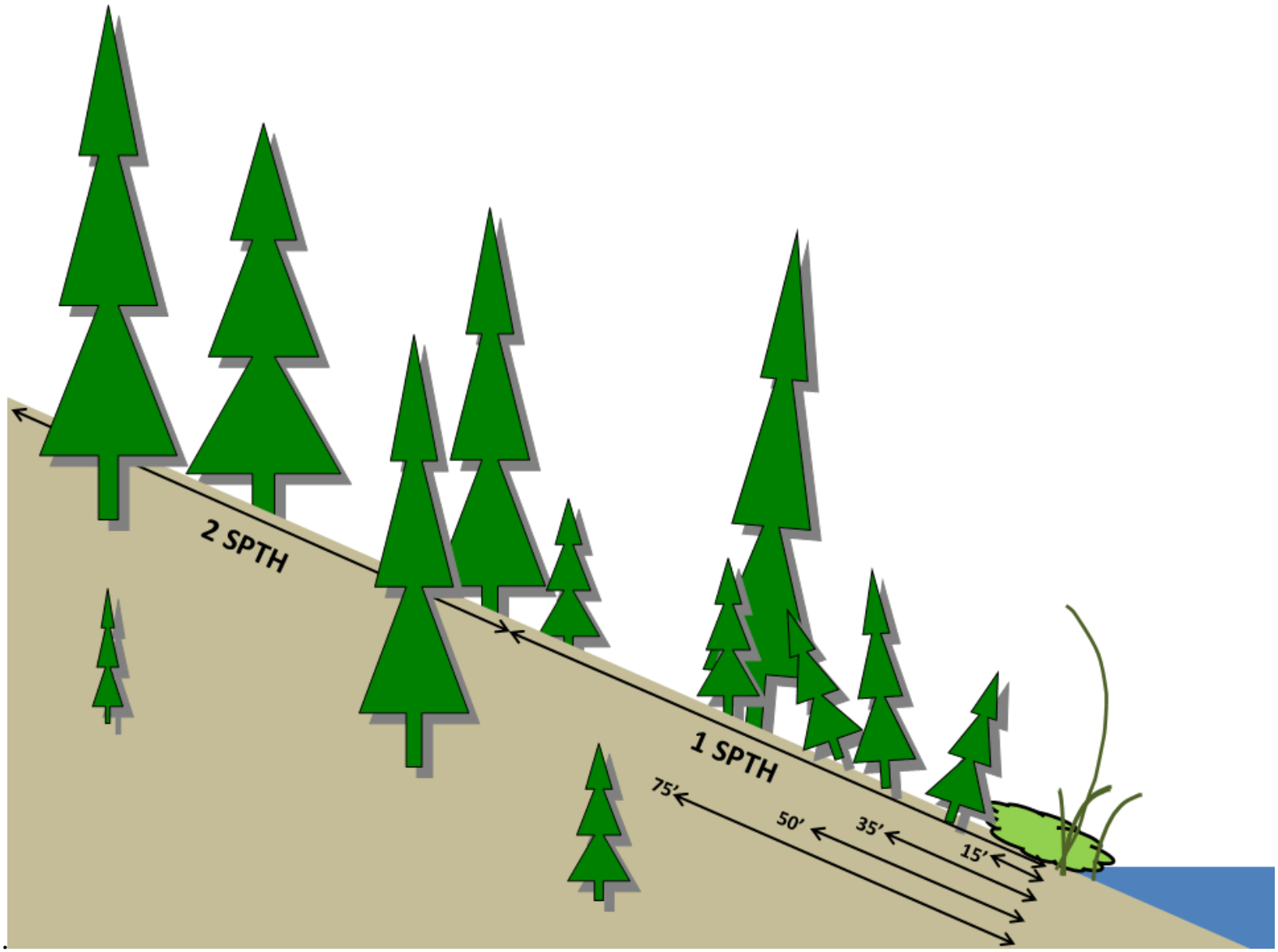

Figure 1. Cross-sectional view of treatment distances from streams described in Table 3, Table 4

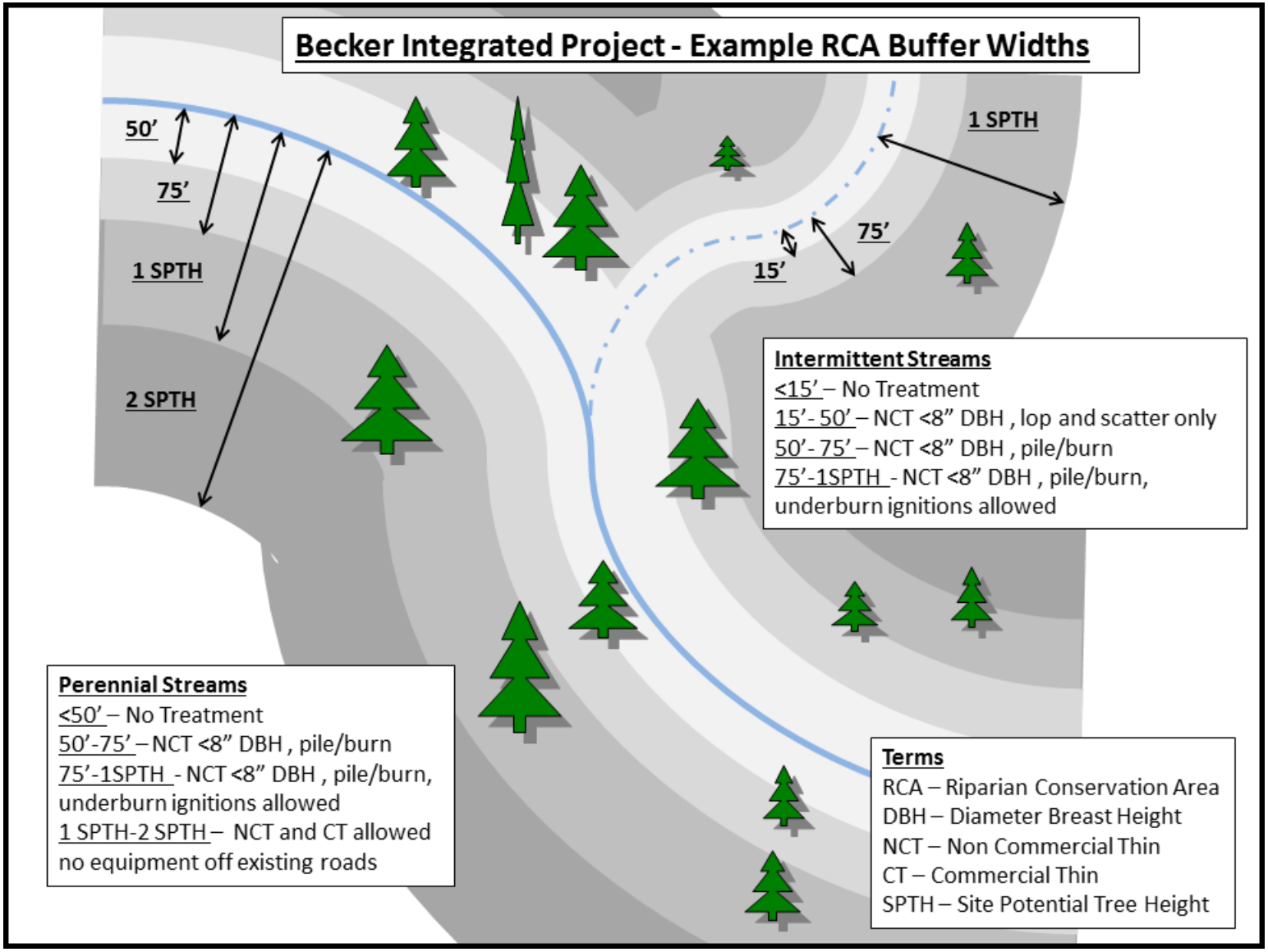

Figure 2. Plan view of Riparian Conservation Area treatment distances for all vegetation and fuels treatments on both perennial and intermittent streams

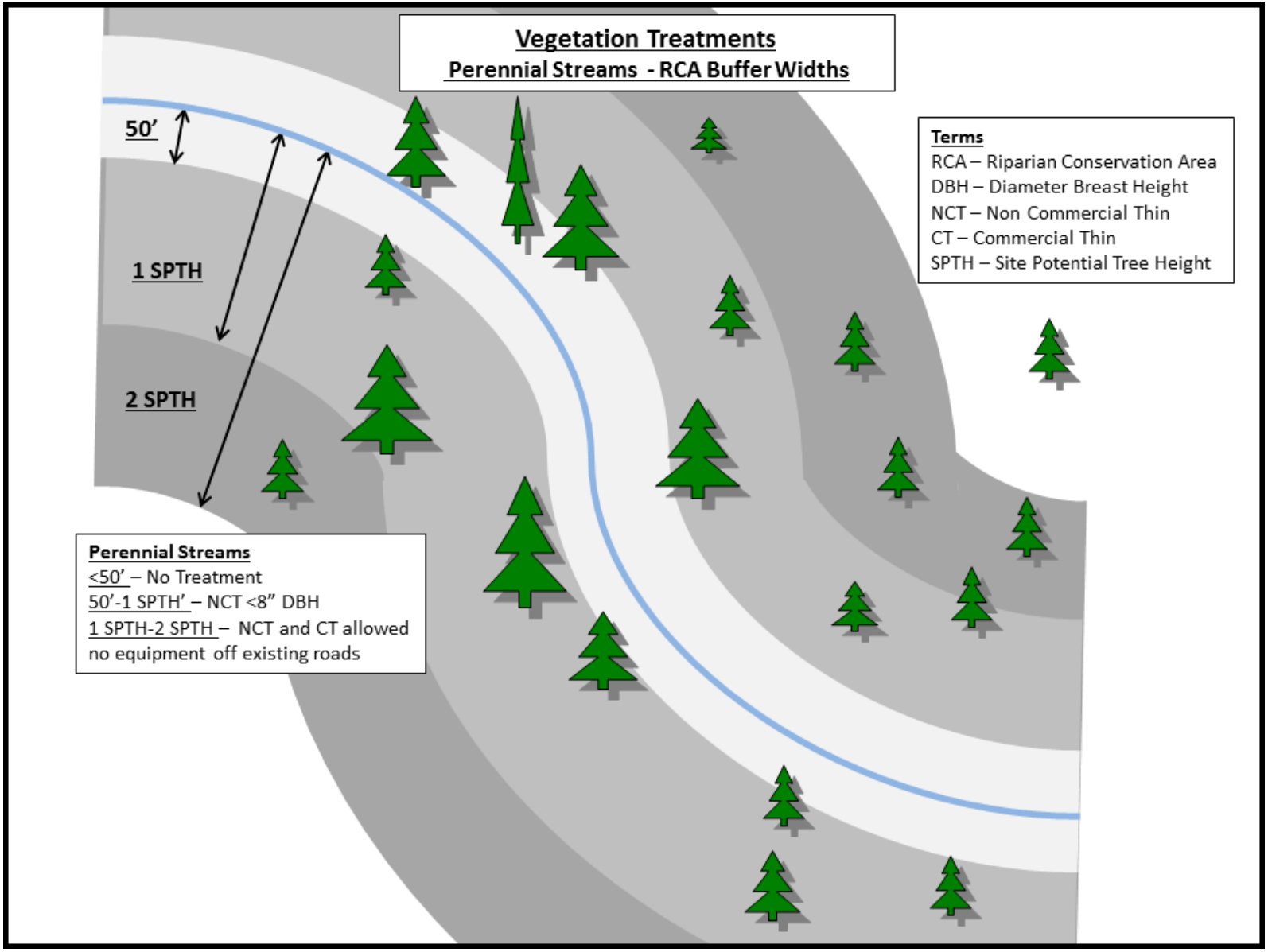

Figure 3. Plan view of Riparian Conservation Area treatment distances for all vegetation treatments along perennial streams

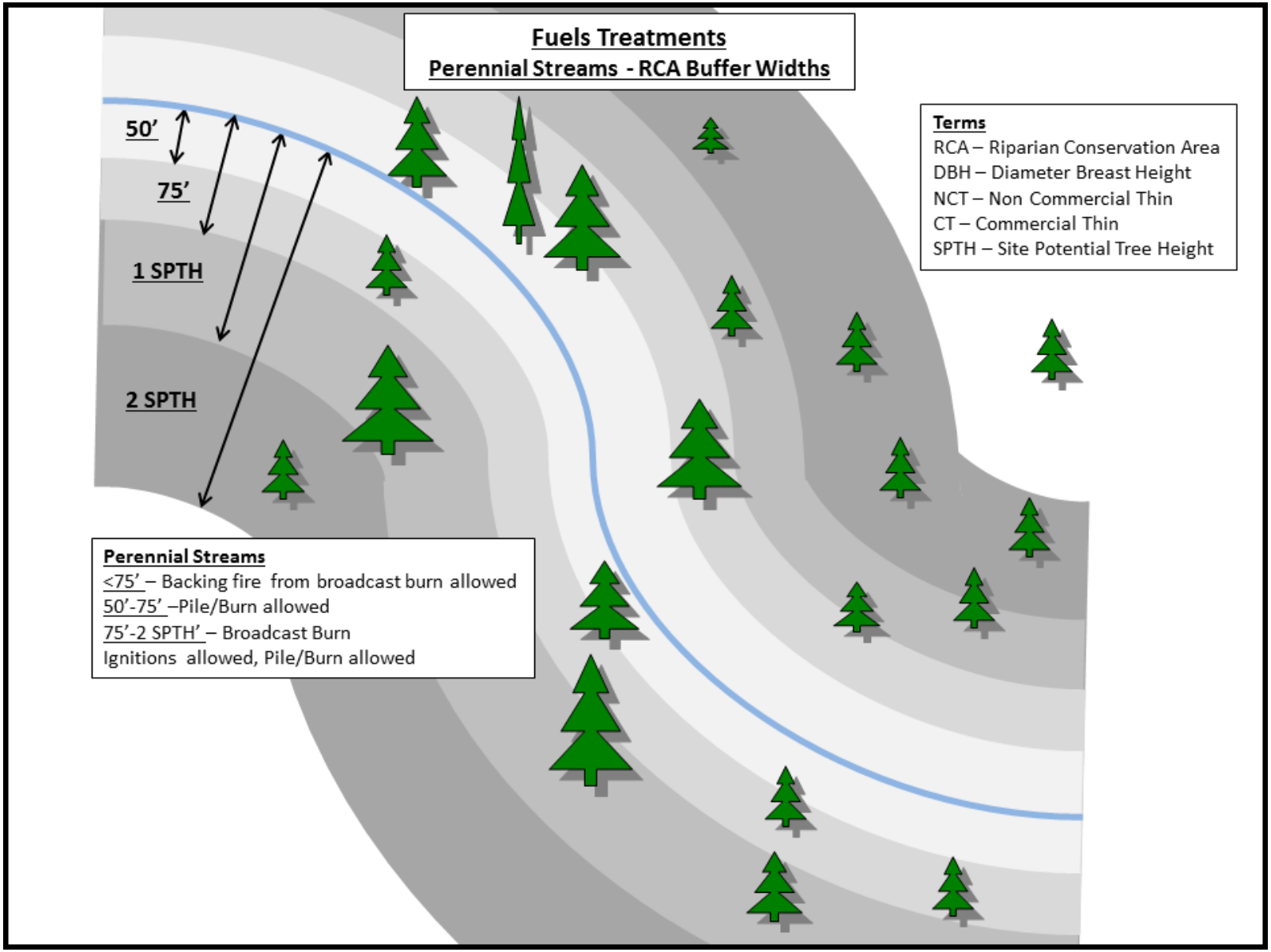

Figure 4. Plan view of Riparian Conservation Area treatment distances for all fuels treatments along perennial streams

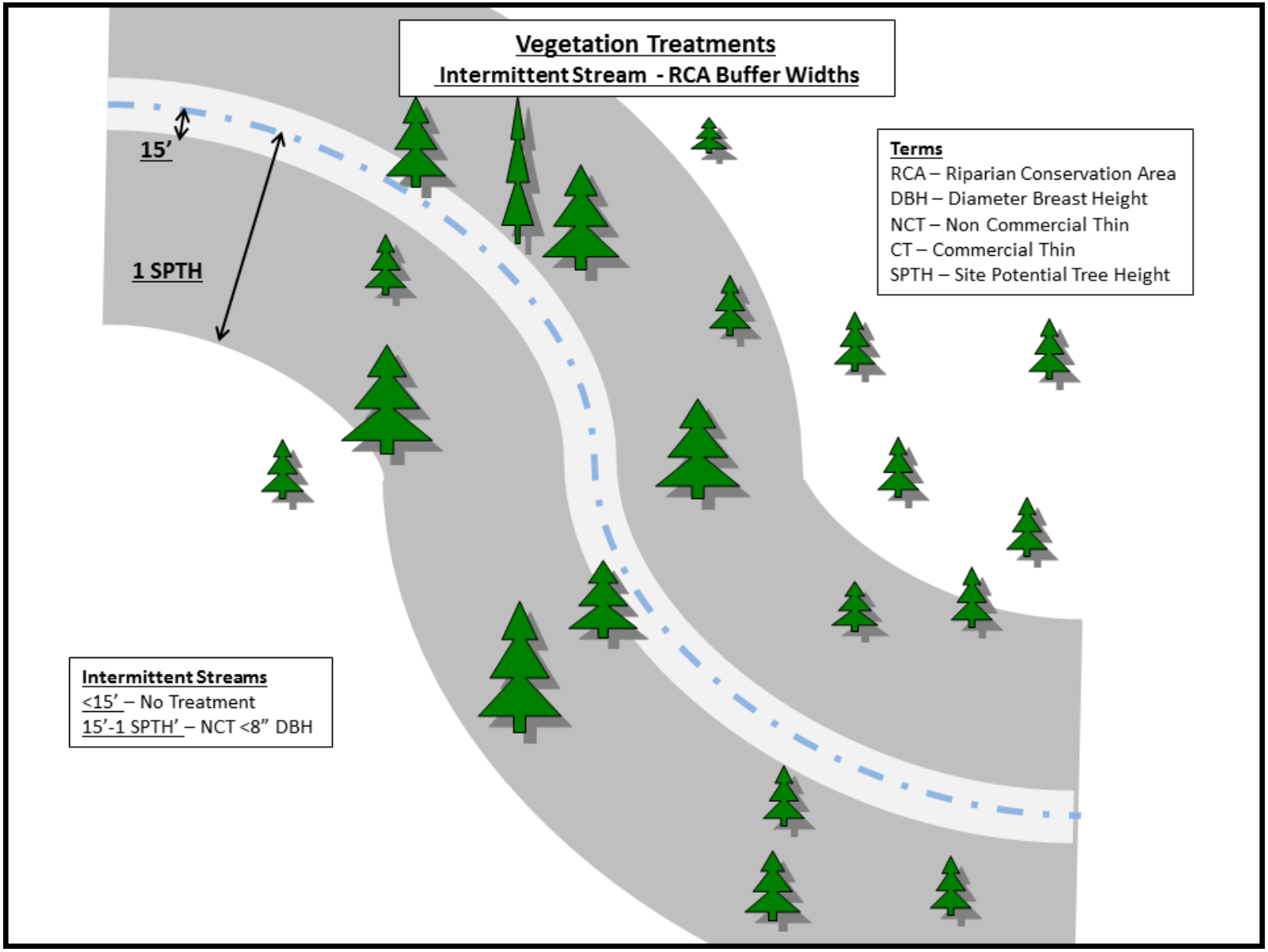

Figure 5. Plan view of Riparian Conservation Area treatment distances for all vegetation treatments along intermittent streams

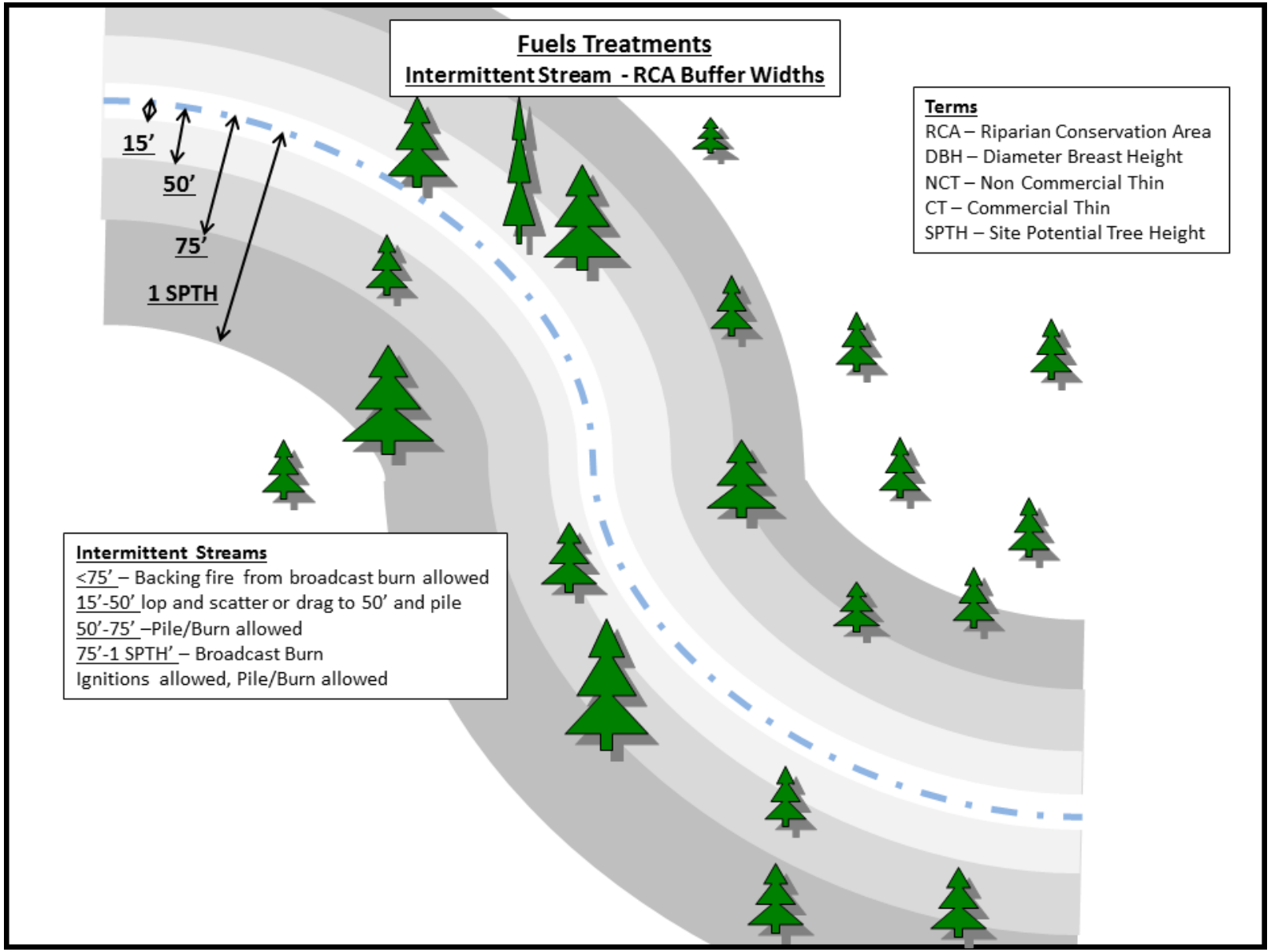

Figure 6. Plan view of Riparian Conservation Area treatment distances for all fuels treatments along intermittent streams

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Appendix D:

Analysis for Detrimental Soil Disturbance and Total Soil Resource Commitment

Becker Integrated Resource Project

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Detrimental Disturbance (USDA Forest Service 2010a, p. GL-10)

Detrimental soil disturbance (DD) is the alteration of natural soil characteristics resulting in immediate or prolonged loss of soil productivity and soil-hydrologic conditions. At least 85 percent of an activity area should be in a non-detrimentally disturbed condition. Stated another way, no more than 15 percent of an activity area should have detrimentally disturbed soil after the management activities are completed. DD can occur where soil has been displaced, compacted, puddled, or severely burned. Determination of DD excludes existing or planned classified transportation facilities, dedicated trails and landings, mining dumps or excavations, parking areas, developed campgrounds, and other dedicated facilities. However, the impacts of these actions are considered total soil resource commitment (TSRC—Section 1.10.2 and Attachment C). DD is represented by any or all of the four characteristics described below.

1. *Detrimental Soil Displacement*. Areas of 1 meter (m) by 1 m or larger exhibiting detrimentally displaced soil as described below:
    a. The loss of either 5 cm or half of humus-enriched top soil (A horizon), whichever is less
    b. The exceeding of the soil-loss tolerance value for the specific soil type
2. *Detrimental Soil Compaction*. Soil compaction is generally evaluated from 5–30 centimeters (cm) below the mineral soil surface. Specific depths for measurement depend upon soil type and management activities. Detrimental soil compaction is increased soil density (weight per unit volume) and strength that hampers root growth, reduces soil aeration, and inhibits water movement. Measurements of potential detrimental soil compaction may be qualitative or quantitative. Refer to the Region 4 Soil Management Manual for methods related to measuring and determining soil compaction (R4 FSM 2500-2011-1, March 14, 2011).
3. *Detrimental Soil Puddling*. Puddling is generally evaluated at the mineral soil surface. Visual indicators of detrimental puddling include clearly identifiable ruts with berms in mineral soil or in an O horizon of an organic soil. Detrimental puddling may occur in conjunction with detrimental compaction. The guidelines for soil compaction are to be used when this occurs. Detrimentally puddled soils are not always detrimentally compacted. Infiltration and permeability are affected by detrimental soil puddling. Puddling can also alter local groundwater hydrology and wetland function, and provide conduits for runoff.
4. *Severely Burned Soil*. Severely burned soil applies to prescribed fire and natural fires that are managed for resource benefits. Severely burned soils are identified by ratings of fire severity and the effects to the soil. A severely burned soil is generally soil that is within a High Fire Severity burn as defined by the Forest Service Burned Area Emergency Rehabilitation Program (FSH 2509.13 and Debano et al. 1998). An example of a High Fire Severity rating is provided below. Soil humus losses, structural changes, hydrophobic characteristics, and sterilization are potential effects of severely burned soil.

Example of High Fire Severity Rating—High soil heating or deep ground char occurs where the duff is completely consumed and the top of the mineral soil is visibly reddish or orange on severely burned sites. Color of the soil below 1 cm is darker or charred from organic material that has heated or burned. The char layer can extend to a depth of 10 cm or more. Logs can be consumed or deeply charred, and deep ground char can occur under slash concentrations or under burned logs. Soil textures in the surface layers are changed, and fusion evidenced by clinkers can be observed locally. All shrub stems are consumed and only the charred remains of large stubs may be visible. Soil temperatures at 1 cm are greater than 250 °C. Lethal temperatures for soil organisms occur down to depths of 9 to 16 cm.

Standards for detrimentally disturbed soils are to be applied to existing or planned activities that are available for multiple uses. These standards do not apply to areas with dedicated uses such as mines, ski areas, campgrounds, and administrative sites.

Activity Area (USDA Forest Service 2010a, p. GL 1)

Activity Area - The smallest logical land area where the effect being analyzed or monitored is expected to occur. The area may vary in size depending on the effect being analyzed or monitored because some effects are quite localized and some occur across landscapes. *Activity areas* are to be specifically described when used in planning and project implementation documents.

Detrimental Disturbance – The *activity area* is the specific area where proposed actions may have detrimental soil impacts such as harvest units within a timber sale area, an individual pasture unit within a grazing allotment, or a burn block within a prescribed burn project area. Existing designated uses, such as classified roads and trails, developed campgrounds, and buildings, are not considered detrimental disturbance within an *activity area*. See the definition for detrimental disturbance for more information.

Becker Integrated Resource Project - Detrimental Soil Disturbance Analysis

At any time, soil conditions across landscapes lie somewhere within the spectrum of:

undisturbed <-> disturbed <-> detrimentally disturbed (DD) <-> total soil resource commitment (TSRC).

The “undisturbed” and “disturbed” categories best represent the majority of soil conditions for forested and non-forested settings. Either through natural processes or land management activities, the “disturbed” soils have not had their physical and biological properties impacted to a level where soil quality impairs productivity.

For this analysis, the *activity area* used to assess potential detrimental disturbance impacts to soils is defined as the individual forested stand delineated for proposed commercial timber harvest, and the prescribed fire areas delineated for natural or activity fuels treatments. These particular areas are delineated for DD analysis to capture the planned activities having the greatest likelihood to detrimentally impair soil quality. This delineation is consistent with the Forest Plan (USDA Forest Service 2010a, p. GL 1).

The effects to soils from the suite of activities proposed in the Becker Integrated Resource Project range across the soil disturbance spectrum (Figure 1). Noncommercial thinning is not represented in Figure 1as this activity is accomplished with hand tools without the use of mechanized, ground-based equipment. Although no direct ground disturbance is expected

from noncommercial thinning, varying levels of soil erosion due to loss of surface soil cover can result from the subsequent implementation of prescribed fire to treat increased fuel accumulations.

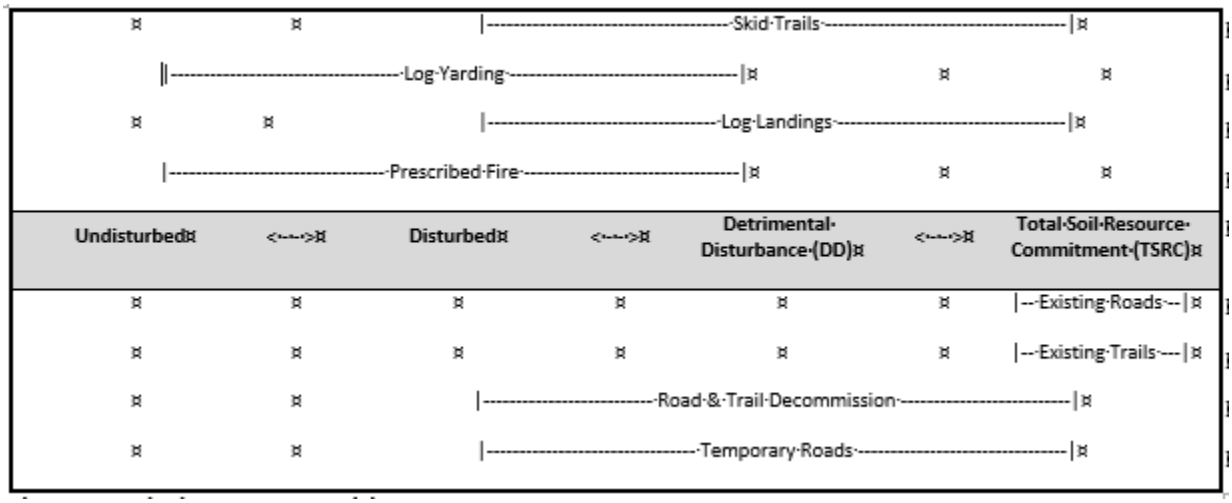

Figure 1. Soil Disturbance by Activity

Detrimental disturbance associated with travel routes is primarily the result of decommissioning activities. Initially these route features are classified as total soil resource commitment (TSRC), and when decommissioned, the objective is to convert them to a physically "disturbed" condition to support the chemical and biological processes important for soil development. Ultimately, there will be fragmented segments or sections of DD which will residually ameliorate over time. These DD segments and their rate of recovery are difficult to quantify without intensive, expensive post-treatment monitoring over multiple years.

Effects Analysis

The dominant land type map unit underlying each activity area was defined in the GIS, and local bio-physical attributes (vegetation, near-surface and surface soils, slope, and aspect) were used to identify the dominant soil family and the inherent soil capabilities and limitations (Attachment A).

Direct effects of DD from timber harvest and prescribed fire were estimated using the soil erosion component of the BOISED sediment prediction model (Reinig et al. 1991). Soil erosion calculated by BOISED incorrectly assumes 100 percent of an activity area is "disturbed". Using professional judgment based on personal experience using BOISED and knowledge of effects from land management activities on soil and water resources, and in consultation with other watershed specialists, actual "disturbance" is generally less than 50 percent and detrimental impacts range from 0 to 30 percent (Reeves et al. 2011). To address the differences in disturbance between modeled and expected outcomes, coefficients were incorporated so soil erosion estimates were 50 percent or less of each activity area. Some DD recovers in the temporary time frame, and with active restoration and passive recovery the majority of the direct effects ameliorate over short term (up to 15 years) (Froehlich et al 1983, Cerise et al 2013).

Existing conditions as well as direct/indirect and cumulative effects of proposed activities on DD were estimated for each of the individual treatment units (i.e., activity areas) (Table 1,Table 2,Table 3, and Table 4). The existing conditions and direct effects from the proposed activities are estimates based on data analysis and professional judgment of the soils specialist. The applied professional judgment is derived from prior analysis completed for similar management activities and review of implemented projects.

Existing Conditions

Using GIS and field data collected using the Soil Health Assessment (SHA) (Freeling 2006), existing conditions for DD are estimated to range from 0 to 5 percent. These estimates were derived by evaluating locations where ground disturbing treatments proposed under the Becker Integrated Resource Project overlap residual DD from prior or ongoing activities - specifically past timber harvest, livestock grazing, and dispersed recreation/fuelwood gathering. Where residual DD from past timber harvest and other ground disturbing activities coincide with activity areas for proposed treatments, existing conditions for DD was estimated as a function log yarding methods used and time elapsed since disturbance. Detrimental disturbance from timber harvest activities implemented more than 21 years ago are considered recovered (Arnup 1998). The GIS analysis revealed limited occurrences where proposed treatment units overlap disturbances from past timber harvest. Where it occurs, harvest using tractor yarding accounts for about 2 percent of DD and harvest using skyline yarding accounts for roughly 1 percent. Effects of ongoing livestock grazing overlapping proposed treatment units are estimated at about 1 percent of DD. Impacts from dispersed recreation and fuelwood gathering are expected to occur only adjacent to travel routes open for public access and are estimated to be 1 percent or less.

Direct Effects and Indirect Effects

Direct effects for DD are presented as the percent increase of the proposed activity compared to the basic erosion rate for each activity area. Direct effects from commercial timber harvest and prescribed fire are displayed in Tables B-1 through B-4. Commercial timber harvest is estimated to cause DD ranging from 6.9 to 13.2 percent. Detrimental disturbance from prescribed fire ranges from 2.0 to 3.7 percent.

For commercial timber harvest (CTH), potential increases in soil erosion and incremental recovery from those effects are a function of yarding methods and the inherent soil properties for the dominant land type of the activity area. Detrimental soil compaction from commercial timber harvest is considered a direct effect evaluated under TSRC. The use of tracked or wheeled ground-based equipment causes higher levels of detrimental soil displacement than helicopter yarding. The recovery rate of detrimental impacts also correlates to the intensity of the disturbance. Bare ground and subsequent erosion from helicopter yarding—if it actually occurs—are temporary impacts that recover with 1 to 3 years. Disturbances from ground-based yarding generally require active restoration to control erosion (slashing and seeding) and recover at slower rates; residual impacts can exist for 15 to 20 years.

When implementing prescribed fire, timing and locations of fire ignitions are adjusted to achieve desirable burning conditions and mitigate the potential for severely burned soils. Burning large accumulations of treatment fuels can occur when duff, soil, and live fuel have adequate moisture levels to minimize soil heating thereby reducing fire residence time and impacts to soils. Fuels burning at moderate and high intensities can result in undesirable soil

impacts. This analysis includes estimates for detrimental disturbance due to severely burned soil conditions in the activity areas with increased fuel concentrations from commercial timber harvest slash and non-commercial thinning. Where mechanical treatments do not precede prescribed fire and do not change the existing fuel conditions, moderate intensity fire and low soil burn severity with minimal detrimental disturbance is expected. When burning within prescription, recovery of bare ground and localized erosion is expected to take 1 to 3 years.

Cumulative Effects

The estimates for cumulative DD in Table 1, Table 2, Table 3, and Table 4 (Year 10) consider three components: (1) continued impacts from ongoing activities (livestock grazing and dispersed recreation); (2) recovery of the residual DD from past timber harvest that currently contributes to the existing condition; and (3) active restoration and passive, natural improvement of management-related impacts from the proposed activities. The DD from proposed commercial timber harvest would recover mostly to a "disturbed" condition within 10 years. Residual detrimental impacts will occur intermittently along primary skid trails that have been restored from TSRC, and will likely exist at decreasing rates for up to 20 years until soil properties passively recover to achieve some level of productivity. Beyond the 5-year period, any cumulative DD from prescribed fire would be expected to decrease to zero. In the absence of permitted land management activities causing additional ground disturbance, detrimental disturbance will exist within some activity areas from ongoing livestock grazing and dispersed recreation.

Description of Fields in Tables B.1, B.2, and B.3.

Unit ID: Delineated area for proposed commercial timber harvest and prescribed fire (corresponds to *activity area*).

Acres: Size of unit.

Existing Condition: Percent DD, as a function of past or ongoing disturbances overlapping that specific unit.

Harvest System: Method for yarding logs as part of commercial timber harvest activities.

Direct Effect—CTH: DD impacts attributable specifically to commercial timber harvest.

Direct Effect—Year 1: Existing condition plus increase in DD from commercial timber harvest.

Direct Effect—Year 2: Existing condition plus direct effects, minus recovery in DD from active restoration of implemented commercial timber harvest treatments.

Direct Effect—Rx Fire: DD impacts attributed specifically to prescribed fire.

Direct Effect—Year 3-5: Existing condition plus a reduced level of DD associated with active restoration of implemented commercial timber harvest treatments, plus increased DD attributed specifically to prescribed fire.

Cumulative Effect—Year 5: Existing condition plus a reduced level of DD associated with active restoration of implemented commercial timber harvest treatments. Impacts from prescribed fire are expected to have recovered to pre-activity conditions.

Cumulative Effect—Year 10: Existing condition plus a reduced level of DD associated with recovery of residual existing disturbance (no decrease in impacts from livestock grazing and dispersed recreation) and active restoration and passive recovery of implemented commercial timber harvest treatments. Impacts from prescribed fire are expected to have recovered to pre-activity conditions.

Table 1. Percent Detrimental Disturbance—Alternative B (Proposed Action) and Alternative C

Unit ID	Acres	Existing DD	Harvest System	Direct Effect		Year 2	Direct Effect		Cumulative Effects	
				CTH	Year 1		Rx Fire	Year 3-5	Year 5	Year 10
0035020510A	157.0	2.0	Tractor	13.1	15.1	11.8	3.7	12.2	8.5	4.3
0035020512	48.6	0.0	Tractor	6.9	6.9	5.2	2.0	5.4	3.5	1.7
0035020514	58.2	1.0	Tractor	6.9	7.9	6.2	2.0	6.4	4.5	2.2
0035020516	19.3	1.0	Tractor	13.2	14.2	10.9	3.7	11.3	7.6	3.8
0035020517B	47.6	1.0	Tractor	6.9	7.9	6.2	2.0	6.4	4.5	2.2
0035020518	11.8	1.0	Tractor	6.9	7.9	6.2	2.0	6.4	4.5	2.2
0035020521	50.1	1.0	Tractor	6.9	7.9	6.2	2.0	6.4	4.5	2.2
0035020525	76.3	2.0	Tractor	10.6	12.6	9.9	3.0	10.3	7.3	3.6
0035020527	119.9	1.0	Tractor	10.6	11.6	8.9	3.0	9.3	6.3	3.1
0035020529	16.5	1.0	Tractor	10.6	11.6	8.9	3.0	9.3	6.3	3.1
0035020531	20.3	2.0	Tractor	10.6	12.6	9.9	3.0	10.3	7.3	3.6
0035020537A	5.9	1.0	Tractor	10.6	11.6	8.9	3.0	9.3	6.3	3.1
0035020537B	105.5	3.0	Tractor	13.2	16.2	12.9	3.7	13.3	9.6	4.8
0035020538	153.6	1.0	Tractor	10.6	11.6	8.9	3.0	9.3	6.3	3.1
0035020539B	70.7	2.0	Tractor	10.6	12.6	9.9	3.0	10.3	7.3	3.6
0035020540	25.1	2.0	Tractor	10.6	12.6	9.9	3.0	10.3	7.3	3.6
0035020541	14.5	0.0	Tractor	13.2	13.2	9.9	3.7	10.3	6.6	3.3
0035020542	28.3	0.0	Tractor	6.9	6.9	5.2	2.0	5.4	3.5	1.7
0035020545	43.9	0.0	Tractor	10.6	10.6	7.9	3.0	8.3	5.3	2.6
0035020548	56.1	0.0	Tractor	10.6	10.6	7.9	3.0	8.3	5.3	2.6
0035020551	49.0	0.0	Tractor	10.6	10.6	7.9	3.0	8.3	5.3	2.6
0035020552	100.9	0.0	Tractor	10.6	10.6	7.9	3.0	8.3	5.3	2.6
0035020553	11.9	0.0	Tractor	10.6	10.6	7.9	3.0	8.3	5.3	2.6
0035020572A	33.8	0.0	Tractor	10.6	10.6	7.9	3.0	8.3	5.3	2.6
0035020572B	71.2	0.0	Tractor	10.6	10.6	7.9	3.0	8.3	5.3	2.6
0035020574A	68.6	0.0	Tractor	10.6	10.6	7.9	3.0	8.3	5.3	2.6
0035020575A	36.1	0.0	Tractor	10.6	10.6	7.9	3.0	8.3	5.3	2.6
0035020575B	35.1	0.0	Tractor	10.6	10.6	7.9	3.0	8.3	5.3	2.6
0035020576	112.4	0.0	Tractor	10.6	10.6	7.9	3.0	8.3	5.3	2.6
0035020577	6.9	0.0	Tractor	10.6	10.6	7.9	3.0	8.3	5.3	2.6
0035020578B	21.4	1.0	Tractor	6.9	7.9	6.2	2.0	6.4	4.5	2.2
0035020583	24.6	0.0	Tractor	6.9	6.9	5.2	2.0	5.4	3.5	1.7
0035020589	80.4	0.0	PCT	0.0	0.0	0.0	2.1	2.1	0.0	0.0
0035020592	16.5	0.0	PCT	0.0	0.0	0.0	2.1	2.1	0.0	0.0
0035020597	7.6	0.0	Tractor	7.3	7.3	5.5	2.1	5.7	3.7	1.8
0035020607	33.9	0.0	Tractor	6.9	6.9	5.2	2.0	5.4	3.5	1.7
0035020609A	31.2	2.0	Tractor	10.6	12.6	9.9	3.0	10.3	7.3	3.6
0035020624	20.4	0.0	PCT	0.0	0.0	0.0	3.0	3.0	0.0	0.0
0035020634	27.1	2.0	Tractor	10.6	12.6	9.9	3.0	10.3	7.3	3.6
0035020644	34.5	0.0	Tractor	10.6	10.6	7.9	3.0	8.3	5.3	2.6

Unit ID	Acres	Existing DD	Harvest System	Direct Effect		Year 2	Direct Effect		Cumulative Effects	
				CTH	Year 1		Rx Fire	Year 3-5	Year 5	Year 10
0035020664	72.3	3.0	PCT	0.0	3.0	3.0	3.7	6.7	3.0	1.5
0035020665A	27.7	2.0	PCT	0.0	2.0	2.0	2.1	4.1	2.0	1.0
0035020665B	13.7	1.0	PCT	0.0	1.0	1.0	2.1	3.1	1.0	0.5
0035020677	98.7	0.0	PCT	0.0	0.0	0.0	3.0	3.0	0.0	0.0
0035020681	111.0	0.0	PCT	0.0	0.0	0.0	3.0	3.0	0.0	0.0
0035020688	132.5	0.0	Tractor	6.9	6.9	5.2	2.0	5.4	3.5	1.7
0035020689	88.8	0.0	Tractor	6.9	6.9	5.2	2.0	5.4	3.5	1.7
0035021019	51.2	2.0	Tractor	10.6	12.6	9.9	3.0	10.3	7.3	3.6
0035021027	10.0	2.0	Tractor	10.6	12.6	9.9	3.0	10.3	7.3	3.6
0035030506	18.7	2.0	Tractor	13.2	15.2	11.9	3.7	12.3	8.6	4.3
0035030608	103.1	2.0	PCT	0.0	2.0	2.0	3.0	5.0	2.0	1.0
0035030618	96.6	4.0	Tractor	10.6	14.6	11.9	3.0	12.3	9.3	4.6
0035030651	13.8	4.0	PCT	0.0	4.0	4.0	2.1	6.1	4.0	2.0
0035030685	26.9	4.0	Tractor	7.3	11.3	9.5	2.1	9.7	7.7	3.8
0035030688	57.0	4.0	Tractor	10.6	14.6	11.9	3.0	12.3	9.3	4.6
0035030689	17.3	4.0	PCT	0.0	4.0	4.0	2.1	6.1	4.0	2.0
0035040502	128.2	1.0	Tractor	10.6	11.6	8.9	3.0	9.3	6.3	3.1
0035040505	7.6	2.0	Tractor	10.6	12.6	9.9	3.0	10.3	7.3	3.6
0035040512A	54.9	1.0	Tractor	10.6	11.6	8.9	3.0	9.3	6.3	3.1
0035040513B	35.0	2.0	Tractor	10.6	12.6	9.9	3.0	10.3	7.3	3.6
0035040513C	5.1	1.0	Tractor	10.6	11.6	8.9	3.0	9.3	6.3	3.1
0035040514	36.1	4.0	Tractor	13.1	17.1	13.8	3.7	14.2	10.5	5.3
0035040515	22.6	4.0	Tractor	13.1	17.1	13.8	3.7	14.2	10.5	5.3
0035040516	59.3	4.0	Tractor	7.6	11.6	9.7	2.1	9.9	7.8	3.9
0035040518	36.1	4.0	Tractor	10.6	14.6	11.9	3.0	12.3	9.3	4.6
0035040520	52.5	4.0	Tractor	13.1	17.1	13.8	3.7	14.2	10.5	5.3
0035040523	23.7	4.0	Tractor	13.1	17.1	13.8	3.7	14.2	10.5	5.3
0035040526	31.9	4.0	Tractor	7.6	11.6	9.7	2.1	9.9	7.8	3.9
0035040541	59.5	5.0	Tractor	13.1	18.1	14.8	3.7	15.2	11.5	5.8
0035040542	32.5	3.0	Tractor	13.1	16.1	12.8	3.7	13.2	9.5	4.8
0035040555A	77.4	4.0	Tractor	6.9	10.9	9.2	2.0	9.4	7.5	3.7
0035040556B	53.9	1.0	Tractor	10.6	11.6	8.9	3.0	9.3	6.3	3.1
0035040611	81.2	1.0	Tractor	13.1	14.1	10.8	3.7	11.2	7.5	3.8
0035040614	33.7	5.0	Tractor	13.1	18.1	14.8	3.7	15.2	11.5	5.8
0035040704	12.6	4.0	Tractor	13.1	17.1	13.8	3.7	14.2	10.5	5.3

Table 2 Percent Detrimental Disturbance – Alternative D

Unit ID	Acres	Existing DD	Harvest System	Direct Effect		Year 2	Direct Effect		Cumulative Effects	
				CTH	Year 1		Rx Fire	Year 3-5	Year 5	Year 10
0035020510	157.0	2.0	Tractor	13.1	15.1	11.8	3.7	12.2	8.5	4.3
0035020514	58.2	1.0	Tractor	6.9	7.9	6.2	2.0	6.4	4.5	2.2
0035020516	19.3	1.0	Tractor	13.2	14.2	10.9	3.7	11.3	7.6	3.8
0035020517	47.6	1.0	Tractor	6.9	7.9	6.2	2.0	6.4	4.5	2.2
0035020518	11.8	1.0	Tractor	6.9	7.9	6.2	2.0	6.4	4.5	2.2
0035020521	50.1	1.0	Tractor	6.9	7.9	6.2	2.0	6.4	4.5	2.2
0035020525	76.3	2.0	Tractor	10.6	12.6	9.9	3.0	10.3	7.3	3.6
0035020527	119.9	1.0	Tractor	10.6	11.6	8.9	3.0	9.3	6.3	3.1
0035020529	16.5	1.0	Tractor	10.6	11.6	8.9	3.0	9.3	6.3	3.1
0035020531	20.3	2.0	Tractor	10.6	12.6	9.9	3.0	10.3	7.3	3.6
0035020532	34.5	3.0	Tractor	10.6	13.6	10.9	3.0	11.3	8.3	4.1
0035020537	111.4	4.0	Tractor	13.2	17.2	13.9	3.7	14.3	10.6	5.3
0035020538	153.6	1.0	Tractor	10.6	11.6	8.9	3.0	9.3	6.3	3.1
0035020539	70.7	2.0	Tractor	10.6	12.6	9.9	3.0	10.3	7.3	3.6
0035020540	25.1	2.0	Tractor	10.6	12.6	9.9	3.0	10.3	7.3	3.6
0035020578	21.4	2.0	Tractor	6.9	8.9	7.2	2.0	7.4	5.5	2.7
0035020609	31.2	2.0	Tractor	10.6	12.6	9.9	3.0	10.3	7.3	3.6
0035020624	20.4	0.0	PCT	0.0	0.0	0.0	3.0	3.0	0.0	0.0
0035020634	27.1	2.0	Tractor	10.6	12.6	9.9	3.0	10.3	7.3	3.6
0035020664	72.3	3.0	PCT	0.0	3.0	3.0	3.7	6.7	3.0	1.5
0035020665	16.5	3.0	PCT	0.0	3.0	3.0	2.1	5.1	3.0	1.5
0035021003	49.0	2.0	Tractor	10.6	12.6	9.9	3.0	10.3	7.3	3.6
0035021005	56.1	2.0	Tractor	10.6	12.6	9.9	3.0	10.3	7.3	3.6
0035021008	43.9	2.0	Tractor	10.6	12.6	9.9	3.0	10.3	7.3	3.6
0035021014	28.3	1.0	Tractor	6.9	7.9	6.2	2.0	6.4	4.5	2.2
0035021016	100.9	3.0	Tractor	10.6	13.6	10.9	3.0	11.3	8.3	4.1
0035021018	14.5	2.0	Tractor	13.2	15.2	11.9	3.7	12.3	8.6	4.3
0035021019	51.2	2.0	Tractor	10.6	12.6	9.9	3.0	10.3	7.3	3.6
0035021027	10.0	2.0	Tractor	10.6	12.6	9.9	3.0	10.3	7.3	3.6
0035021029	33.9	1.0	Tractor	6.9	7.9	6.2	2.0	6.4	4.5	2.2
0035021030	11.9	2.0	Tractor	10.6	12.6	9.9	3.0	10.3	7.3	3.6
0035021043	24.6	1.0	Tractor	6.9	7.9	6.2	2.0	6.4	4.5	2.2
0035021044	132.5	2.0	Tractor	6.9	8.9	7.2	2.0	7.4	5.5	2.7
0035021049	98.7	1.0	PCT	0.0	1.0	1.0	3.0	4.0	1.0	0.5
0035021052	112.4	1.0	Tractor	10.6	11.6	8.9	3.0	9.3	6.3	3.1
0035021054	88.8	1.0	Tractor	6.9	7.9	6.2	2.0	6.4	4.5	2.2
0035021055	6.9	0.0	Tractor	10.6	10.6	7.9	3.0	8.3	5.3	2.6
0035021060	20.4	0.0	PCT	0.0	0.0	0.0	3.0	3.0	0.0	0.0
0035021065	68.6	0.0	Tractor	10.6	10.6	7.9	3.0	8.3	5.3	2.6
0035021067	111.0	0.0	PCT	0.0	0.0	0.0	3.0	3.0	0.0	0.0
0035021068	80.4	2.0	PCT	0.0	2.0	2.0	2.1	4.1	2.0	1.0

Unit ID	Acres	Existing DD	Harvest System	Direct Effect		Year 2	Direct Effect		Cumulative Effects	
				CTH	Year 1		Rx Fire	Year 3-5	Year 5	Year 10
0035021076	16.5	0.0	PCT	0.0	0.0	0.0	2.1	2.1	0.0	0.0
0035021079	98.7	1.0	Tractor	10.6	11.6	8.9	3.0	9.3	6.3	3.1
0035021082	13.7	1.0	Tractor	7.3	8.3	6.5	2.1	6.7	4.7	2.3
0035021512	48.6	1.0	Tractor	6.9	7.9	6.2	2.0	6.4	4.5	2.2
0035030506	80.4	2.0	Tractor	13.2	15.2	11.9	3.7	12.3	8.6	4.3
0035030608	103.1	2.0	PCT	0.0	2.0	2.0	3.0	5.0	2.0	1.0
0035030618	96.6	4.0	Tractor	10.6	14.6	11.9	3.0	12.3	9.3	4.6
0035030651	13.8	4.0	PCT	0.0	4.0	4.0	2.1	6.1	4.0	2.0
0035030685	26.9	4.0	Tractor	7.3	11.3	9.5	2.1	9.7	7.7	3.8
0035030688	57.0	4.0	Tractor	10.6	14.6	11.9	3.0	12.3	9.3	4.6
0035030689	17.3	4.0	PCT	0.0	4.0	4.0	2.1	6.1	4.0	2.0
0035040502	128.2	1.0	Tractor	10.6	11.6	8.9	3.0	9.3	6.3	3.1
0035040503	103.1	2.0	Tractor	10.6	12.6	9.9	3.0	10.3	7.3	3.6
0035040504	13.1	3.0	Tractor	10.6	13.6	10.9	3.0	11.3	8.3	4.1
0035040505	7.6	2.0	Tractor	10.6	12.6	9.9	3.0	10.3	7.3	3.6
0035040506	15.1	2.0	Tractor	10.6	12.6	9.9	3.0	10.3	7.3	3.6
0035040507	28.2	2.0	Tractor	10.6	12.6	9.9	3.0	10.3	7.3	3.6
0035040508	19.9	2.0	Tractor	10.6	12.6	9.9	3.0	10.3	7.3	3.6
0035040509	3.2	2.0	Tractor	13.1	15.1	11.8	3.7	12.2	8.5	4.3
0035040512	54.9	1.0	Tractor	10.6	11.6	8.9	3.0	9.3	6.3	3.1
0035040513	40.1	2.0	Tractor	10.6	12.6	9.9	3.0	10.3	7.3	3.6
0035040514	36.1	4.0	Tractor	13.1	17.1	13.8	3.7	14.2	10.5	5.3
0035040515	22.6	4.0	Tractor	13.1	17.1	13.8	3.7	14.2	10.5	5.3
0035040516	59.3	4.0	Tractor	7.6	11.6	9.7	2.1	9.9	7.8	3.9
0035040518	36.1	4.0	Tractor	10.6	14.6	11.9	3.0	12.3	9.3	4.6
0035040520	52.5	4.0	Tractor	13.1	17.1	13.8	3.7	14.2	10.5	5.3
0035040523	23.7	4.0	Tractor	13.1	17.1	13.8	3.7	14.2	10.5	5.3
0035040526	31.9	4.0	Tractor	7.6	11.6	9.7	2.1	9.9	7.8	3.9
0035040541	59.5	5.0	Tractor	13.1	18.1	14.8	3.7	15.2	11.5	5.8
0035040542	32.5	3.0	Tractor	13.1	16.1	12.8	3.7	13.2	9.5	4.8
0035040555	77.4	4.0	Tractor	6.9	10.9	9.2	2.0	9.4	7.5	3.7
0035040556	53.9	1.0	Tractor	10.6	11.6	8.9	3.0	9.3	6.3	3.1
0035040611	81.2	1.0	Tractor	13.1	14.1	10.8	3.7	11.2	7.5	3.8
0035040614	33.7	5.0	Tractor	13.1	18.1	14.8	3.7	15.2	11.5	5.8
0035040704	12.6	4.0	Tractor	6.9	10.9	9.2	1.9	9.4	7.5	3.7
0035050556	7.3	2.0	Tractor	10.6	12.6	9.9	3.0	10.3	7.3	3.6
0035050558	45.7	2.0	Tractor	10.6	12.6	9.9	3.0	10.3	7.3	3.6

Table 3. Percent Detrimental Disturbance – Alternative E

Unit ID	Acres	Existing DD	Harvest	Direct Effect		Year 2	Direct Effect		Cumulative Effects	
				CTH	Year 1		Rx Fire	Year 3-5	Year 5	Year 10
0035020510	157.0	2.0	Helicopter	4.3	6.3	5.2	3.7	7.8	4.1	2.1
0035020514	58.2	1.0	Helicopter	2.3	3.3	2.7	2.0	4.1	2.1	1.1
0035020516	19.3	1.0	Tractor	13.2	14.2	10.9	3.7	11.3	7.6	3.8
0035020517	47.6	1.0	Helicopter	2.3	3.3	2.7	2.0	4.1	2.1	1.1
0035020518	11.8	1.0	Helicopter	2.3	3.3	2.7	2.0	4.1	2.1	1.1
0035020521	50.1	1.0	Helicopter	2.3	3.3	2.7	2.0	4.1	2.1	1.1
0035020525	76.3	2.0	Tractor	10.6	12.6	9.9	3.0	10.3	7.3	3.6
0035020527	119.9	1.0	Tractor	10.6	11.6	8.9	3.0	9.3	6.3	3.1
0035020529	16.5	1.0	Helicopter	3.4	4.4	3.6	3.0	5.7	2.7	1.4
0035020531	20.3	2.0	Tractor	10.6	12.6	9.9	3.0	10.3	7.3	3.6
0035020532	34.5	3.0	Tractor	10.6	13.6	10.9	3.0	11.3	8.3	4.1
0035020537	111.4	4.0	Tractor	13.2	17.2	13.9	3.7	14.3	10.6	5.3
0035020538	153.6	1.0	Helicopter	3.4	4.4	3.6	3.0	5.7	2.7	1.4
0035020539	70.7	2.0	Helicopter	3.4	5.4	4.6	3.0	6.7	3.7	1.9
0035020540	25.1	2.0	Helicopter	3.4	5.4	4.6	3.0	6.7	3.7	1.9
0035020578	21.4	2.0	Tractor	6.9	8.9	7.2	2.0	7.4	5.5	2.7
0035020609	31.2	2.0	Tractor	10.6	12.6	9.9	3.0	10.3	7.3	3.6
0035020624	20.4	0.0	PCT	0.0	0.0	0.0	3.0	3.0	0.0	0.0
0035020634	27.1	2.0	Tractor	10.6	12.6	9.9	3.0	10.3	7.3	3.6
0035020664	72.3	3.0	PCT	0.0	3.0	3.0	3.7	6.7	3.0	1.5
0035020665	41.4	3.0	PCT	0.0	3.0	3.0	2.1	5.1	3.0	1.5
0035021003	49.0	2.0	Helicopter	3.4	5.4	4.6	3.0	6.7	3.7	1.9
0035021005	56.1	2.0	Tractor	10.6	12.6	9.9	3.0	10.3	7.3	3.6
0035021008	43.9	2.0	Helicopter	3.4	5.4	4.6	3.0	6.7	3.7	1.9
0035021014	28.3	1.0	Tractor	6.9	7.9	6.2	2.0	6.4	4.5	2.2
0035021016	100.9	3.0	Tractor	10.6	13.6	10.9	3.0	11.3	8.3	4.1
0035021018	14.5	2.0	Tractor	13.2	15.2	11.9	3.7	12.3	8.6	4.3
0035021019	51.2	2.0	Tractor	10.6	12.6	9.9	3.0	10.3	7.3	3.6
0035021027	10.0	2.0	Tractor	10.6	12.6	9.9	3.0	10.3	7.3	3.6
0035021029	33.9	1.0	Helicopter	2.3	3.3	2.7	2.0	4.1	2.1	1.1
0035021030	11.9	2.0	Tractor	10.6	12.6	9.9	3.0	10.3	7.3	3.6
0035021043	24.6	1.0	Tractor	6.9	7.9	6.2	2.0	6.4	4.5	2.2
0035021044	132.5	2.0	Helicopter	2.3	4.3	3.7	2.0	5.1	3.1	1.6
0035021049	98.7	1.0	PCT	0.0	1.0	1.0	3.0	4.0	1.0	0.5
0035021052	112.4	1.0	Tractor	10.6	11.6	8.9	3.0	9.3	6.3	3.1
0035021054	88.8	1.0	Helicopter	2.3	3.3	2.7	2.0	4.1	2.1	1.1
0035021055	6.9	0.0	Helicopter	3.4	3.4	2.6	3.0	4.7	1.7	0.9
0035021060	71.2	0.0	Tractor	10.6	10.6	7.9	3.0	8.3	5.3	2.6
0035021065	68.6	0.0	Tractor	10.6	10.6	7.9	3.0	8.3	5.3	2.6
0035021067	111.0	0.0	PCT	0.0	0.0	0.0	3.0	3.0	0.0	0.0

Unit ID	Acres	Existing DD	Harvest	Direct Effect		Year 2	Direct Effect		Cumulative Effects	
				CTH	Year 1		Rx Fire	Year 3-5	Year 5	Year 10
0035021068	80.4	2.0	PCT	0.0	2.0	2.0	2.1	4.1	2.0	1.0
0035021076	16.5	0.0	PCT	0.0	0.0	0.0	2.1	2.1	0.0	0.0
0035021079	105.0	1.0	Tractor	10.6	11.6	8.9	3.0	9.3	6.3	3.1
0035021082	7.6	1.0	Tractor	7.3	8.3	6.5	2.1	6.7	4.7	2.3
0035021512	48.6	1.0	Tractor	6.9	7.9	6.2	2.0	6.4	4.5	2.2
0035030506	18.7	2.0	Tractor	13.2	15.2	11.9	3.7	12.3	8.6	4.3
0035030608	103.1	2.0	PCT	0.0	2.0	2.0	3.0	5.0	2.0	1.0
0035030618	96.6	4.0	Tractor	10.6	14.6	11.9	3.0	12.3	9.3	4.6
0035030651	13.8	4.0	PCT	0.0	4.0	4.0	2.1	6.1	4.0	2.0
0035030685	26.9	4.0	Tractor	7.3	11.3	9.5	2.1	9.7	7.7	3.8
0035030688	57.0	4.0	Tractor	10.6	14.6	11.9	3.0	12.3	9.3	4.6
0035030689	17.3	4.0	PCT	0.0	4.0	4.0	2.1	6.1	4.0	2.0
0035040502	128.2	1.0	Tractor	10.6	11.6	8.9	3.0	9.3	6.3	3.1
0035040505	7.6	2.0	Tractor	10.6	12.6	9.9	3.0	10.3	7.3	3.6
0035040512	54.9	1.0	Tractor	10.6	11.6	8.9	3.0	9.3	6.3	3.1
0035040513	40.1	2.0	Tractor	10.6	12.6	9.9	3.0	10.3	7.3	3.6
0035040514	36.1	4.0	Tractor	13.1	17.1	13.8	3.7	14.2	10.5	5.3
0035040515	22.6	4.0	Tractor	13.1	17.1	13.8	3.7	14.2	10.5	5.3
0035040516	59.3	4.0	Tractor	13.1	17.1	13.8	3.7	14.2	10.5	5.3
0035040518	36.1	4.0	Tractor	10.6	14.6	11.9	3.0	12.3	9.3	4.6
0035040520	52.5	4.0	Tractor	13.1	17.1	13.8	3.7	14.2	10.5	5.3
0035040523	23.7	4.0	Tractor	13.1	17.1	13.8	3.7	14.2	10.5	5.3
0035040526	31.9	4.0	Tractor	13.1	17.1	13.8	3.7	14.2	10.5	5.3
0035040541	59.5	5.0	Tractor	13.1	18.1	14.8	3.7	15.2	11.5	5.8
0035040542	32.5	3.0	Helicopter	4.3	7.3	6.2	3.7	8.8	5.1	2.6
0035040555	77.4	4.0	Tractor	13.1	17.1	13.8	3.7	14.2	10.5	5.3
0035040556	53.9	1.0	Helicopter	3.4	4.4	3.6	3.0	5.7	2.7	1.4
0035040611	81.2	1.0	Helicopter	4.3	5.3	4.2	3.7	6.8	3.1	1.6
0035040614	33.7	5.0	Tractor	13.1	18.1	14.8	3.7	15.2	11.5	5.8
0035040704	12.6	4.0	Tractor	13.1	17.1	13.8	3.7	14.2	10.5	5.3

Table 4. Percent Detrimental Disturbance – Alternative F

Unit ID	Acres	Existing DD	Harvest	Direct Effect		Year 2	Direct Effect		Cumulative Effects	
				CTH	Year 1		Rx Fire	Year 3-5	Year 5	Year 10
0035020510	157.0	2.0	Helicopter	4.3	6.3	5.2	3.7	7.8	4.1	2.1
0035020514	58.2	1.0	Helicopter	2.3	3.3	2.7	2.0	4.1	2.1	1.1
0035020516	19.3	1.0	Tractor	13.2	14.2	10.9	3.7	11.3	7.6	3.8
0035020517	47.6	1.0	Tractor	6.9	7.9	6.2	2.0	6.4	4.5	2.2
0035020518	11.8	1.0	Tractor	6.9	7.9	6.2	2.0	6.4	4.5	2.2
0035020521	50.1	1.0	Tractor	6.9	7.9	6.2	2.0	6.4	4.5	2.2
0035020525	76.3	2.0	Tractor	10.6	12.6	9.9	3.0	10.3	7.3	3.6
0035020527	119.9	1.0	Tractor	10.6	11.6	8.9	3.0	9.3	6.3	3.1
0035020529	16.5	1.0	Helicopter	3.4	4.4	3.6	3.0	5.7	2.7	1.4
0035020531	20.3	2.0	Tractor	10.6	12.6	9.9	3.0	10.3	7.3	3.6
0035020532	34.5	3.0	Tractor	10.6	13.6	10.9	3.0	11.3	8.3	4.1
0035020537	111.4	4.0	Tractor	13.2	17.2	13.9	3.7	14.3	10.6	5.3
0035020538	153.6	1.0	Tractor	10.6	11.6	8.9	3.0	9.3	6.3	3.1
0035020539	70.7	2.0	Tractor	10.6	12.6	9.9	3.0	10.3	7.3	3.6
0035020540	25.1	2.0	Helicopter	3.4	5.4	4.6	3.0	6.7	3.7	1.9
0035020578	21.4	2.0	Tractor	6.9	8.9	7.2	2.0	7.4	5.5	2.7
0035020609	31.2	2.0	Tractor	10.6	12.6	9.9	3.0	10.3	7.3	3.6
0035020624	20.4	0.0	PCT	0.0	0.0	0.0	3.0	3.0	0.0	0.0
0035020634	27.1	2.0	Tractor	10.6	12.6	9.9	3.0	10.3	7.3	3.6
0035020664	72.3	3.0	PCT	0.0	3.0	3.0	3.7	6.7	3.0	1.5
0035020665	41.4	3.0	PCT	0.0	3.0	3.0	2.1	5.1	3.0	1.5
0035021003	49.0	2.0	Helicopter	3.4	5.4	4.6	3.0	6.7	3.7	1.9
0035021005	56.1	2.0	Helicopter	3.4	5.4	4.6	3.0	6.7	3.7	1.9
0035021008	43.9	2.0	Helicopter	3.4	5.4	4.6	3.0	6.7	3.7	1.9
0035021014	28.3	1.0	Tractor	6.9	7.9	6.2	2.0	6.4	4.5	2.2
0035021016	100.9	3.0	Helicopter	3.4	6.4	5.6	3.0	7.7	4.7	2.4
0035021018	14.5	2.0	Tractor	13.2	15.2	11.9	3.7	12.3	8.6	4.3
0035021019	51.2	2.0	Tractor	10.6	12.6	9.9	3.0	10.3	7.3	3.6
0035021027	10.0	2.0	Tractor	10.6	12.6	9.9	3.0	10.3	7.3	3.6
0035021029	33.9	1.0	Tractor	6.9	7.9	6.2	2.0	6.4	4.5	2.2
0035021030	11.9	2.0	Tractor	10.6	12.6	9.9	3.0	10.3	7.3	3.6
0035021043	24.6	1.0	Tractor	6.9	7.9	6.2	2.0	6.4	4.5	2.2
0035021044	132.5	2.0	Tractor	6.9	8.9	7.2	2.0	7.4	5.5	2.7
0035021049	98.7	1.0	PCT	0.0	1.0	1.0	3.0	4.0	1.0	0.5
0035021052	112.4	1.0	Tractor	10.6	11.6	8.9	3.0	9.3	6.3	3.1
0035021054	88.8	1.0	Tractor	6.9	7.9	6.2	2.0	6.4	4.5	2.2
0035021055	6.9	0.0	Tractor	10.6	10.6	7.9	3.0	8.3	5.3	2.6
0035021060	71.2	0.0	Tractor	10.6	10.6	7.9	3.0	8.3	5.3	2.6
0035021065	68.6	0.0	Tractor	10.6	10.6	7.9	3.0	8.3	5.3	2.6
0035021067	111.0	0.0	PCT	0.0	0.0	0.0	3.0	3.0	0.0	0.0
0035021068	80.4	2.0	PCT	0.0	2.0	2.0	2.1	4.1	2.0	1.0

Unit ID	Acres	Existing DD	Harvest	Direct Effect		Year 2	Direct Effect		Cumulative Effects	
				CTH	Year 1		Rx Fire	Year 3-5	Year 5	Year 10
0035021076	16.5	0.0	PCT	0.0	0.0	0.0	2.1	2.1	0.0	0.0
0035021079	105.0	1.0	Tractor	10.6	11.6	8.9	3.0	9.3	6.3	3.1
0035021082	7.6	1.0	Tractor	7.3	8.3	6.5	2.1	6.7	4.7	2.3
0035021512	48.6	1.0	Tractor	6.9	7.9	6.2	2.0	6.4	4.5	2.2
0035030506	18.7	2.0	Tractor	13.2	15.2	11.9	3.7	12.3	8.6	4.3
0035030608	103.1	2.0	PCT	0.0	2.0	2.0	3.0	5.0	2.0	1.0
0035030618	96.6	4.0	Tractor	10.6	14.6	11.9	3.0	12.3	9.3	4.6
0035030651	13.8	4.0	PCT	0.0	4.0	4.0	2.1	6.1	4.0	2.0
0035030685	26.9	4.0	Tractor	7.3	11.3	9.5	2.1	9.7	7.7	3.8
0035030688	57.0	4.0	Tractor	10.6	14.6	11.9	3.0	12.3	9.3	4.6
0035030689	17.3	4.0	PCT	0.0	4.0	4.0	2.1	6.1	4.0	2.0
0035040502	128.2	1.0	Tractor	10.6	11.6	8.9	3.0	9.3	6.3	3.1
0035040505	7.6	2.0	Tractor	10.6	12.6	9.9	3.0	10.3	7.3	3.6
0035040512	54.9	1.0	Tractor	10.6	11.6	8.9	3.0	9.3	6.3	3.1
0035040513	40.1	2.0	Tractor	10.6	12.6	9.9	3.0	10.3	7.3	3.6
0035040514	36.1	4.0	Tractor	13.1	17.1	13.8	3.7	14.2	10.5	5.3
0035040515	22.6	4.0	Tractor	13.1	17.1	13.8	3.7	14.2	10.5	5.3
0035040516	59.3	4.0	Tractor	10.6	14.6	11.9	3.0	12.3	9.3	4.6
0035040518	36.1	4.0	Tractor	10.6	14.6	11.9	3.0	12.3	9.3	4.6
0035040520	52.5	4.0	Tractor	13.1	17.1	13.8	3.7	14.2	10.5	5.3
0035040523	23.7	4.0	Tractor	13.1	17.1	13.8	3.7	14.2	10.5	5.3
0035040526	31.9	4.0	Tractor	10.6	14.6	11.9	3.0	12.3	9.3	4.6
0035040541	59.5	5.0	Tractor	13.1	18.1	14.8	3.7	15.2	11.5	5.8
0035040542	32.5	3.0	Tractor	13.1	16.1	12.8	3.7	13.2	9.5	4.8
0035040555	77.4	4.0	Tractor	10.6	14.6	11.9	3.0	12.3	9.3	4.6
0035040556	53.9	1.0	Tractor	10.6	11.6	8.9	3.0	9.3	6.3	3.1
0035040611	81.2	1.0	Tractor	13.1	14.1	10.8	3.7	11.2	7.5	3.8
0035040614	33.7	5.0	Tractor	13.1	18.1	14.8	3.7	15.2	11.5	5.8
0035040704	12.6	4.0	Tractor	13.1	17.1	13.8	3.7	14.2	10.5	5.3

Total Soil Resource Commitment (TSRC) (USDA Forest Service 2010a, p. GL-50)

TSRC is the conversion of a productive site to an essentially non-productive site for a period of more than 50 years. Examples include classified or unclassified roads, inadequately restored haul roads, designated skid roads, landing areas, parking lots, mining dumps or excavations, dedicated trails (including skid trails), developed campgrounds, other dedicated facilities, and some stock driveways. Productivity on these areas ranges from 0 to 40 percent of natural.

Standards for TSRC are to be applied to existing or planned activities that are available for multiple uses. These standards do not apply to areas with dedicated uses such as mines, ski areas, campgrounds, and administrative sites.

Activity Area (USDA Forest Service 2010a, p. GL-1)

Activity Area - The smallest logical land area where the effect being analyzed or monitored is expected to occur. The area may vary in size depending on the effect being analyzed or monitored because some effects are quite localized and some occur across landscapes. *Activity areas* are to be specifically described when used in planning and project implementation documents.

Total Soil Resource Commitment – Effects are generally measured across an all-inclusive activity area, like a timber sale area, a prescribed burn area, or a grazing allotment, where effects to soil commitment could occur or are occurring. Effects include both proposed actions and existing uses for management actions including roads (classified and non-classified), dedicated trails, and landings. TSRC resulting from administrative sites, parking lots, ski areas, and mine excavations are evaluated as part of existing conditions to provide context of soil quality at larger scale (e.g., subwatershed). See the definition for total soil resource commitment for more information.

The *activity area* for estimating TSRC is the 19,327 acre project area, as activities that include roads, trails, and vegetation management are distributed across the larger area. This delineation is consistent with the Forest Plan guidance (USDA Forest Service 2010a, p. GL-1).

Becker Integrated Resource Project - Total Soil Resource Commitment (TSRC) Analysis

Project GIS data and field data from the Soil Health Assessment (SHA) protocols (Attachment E) were evaluated to identify areas of TSRC. The greatest areas of TSRC are associated with roads, which includes the total width of the road prism from the top of the cut slope to the bottom of the fill slope. Within the Becker Integrated Resource Project area there are about 200 miles of existing roads and 20 miles of non-motorized recreation trails. Included in the total road miles are 8.4 miles of Idaho State Highway 21 and 45 miles of known unauthorized routes on National Forest System (NFS) lands. There are about 3.6 acres of TSRC per mile of road on average, a number derived from the disturbed width attribute used in the BOISED Sediment Yield Prediction model (Reinig et al. 1991). Developed recreation trails are also considered TSRC and average 1.5 acres per mile of trail.

Other isolated locations having TSRC are scattered throughout the project area and approach 97 acres cumulatively. These numerous small sites primarily consist of past timber harvest landings, developed recreation sites, or dispersed recreation areas. The majority of the dispersed recreation areas occur in locations of log landings from prior timber harvest operations.

Existing Conditions

Existing TSRC for the Becker Integrated Resource Project area is estimated at 4.7 percent (Table 5). Travel routes (roads and trails) account for over 4 percent of the total TSRC. Localized disturbances from past and current livestock grazing, developed and dispersed recreation, off highway vehicle use, and personal fuelwood gathering account for the remaining 1 percent of TSRC.

Alternative A—Direct, Indirect, and Cumulative Effects

Alternative A would not be expected to change the current TSRC estimate of 4.7 percent for the activity area (Table 5). The current TSRC from existing roads, past harvest, campgrounds, trails, and dispersed recreation would persist over the short- and long-term.

Action Alternatives – Direct, Indirect, and Cumulative Effects

The action alternatives would increase total TSRC in the temporary and short-term timeframes to over 5 percent. A temporarily TSRC increase is expected from additional log landings and designated skid trails. Conversely, TSRC will decrease under all alternatives from road decommissioning and restoration of existing and proposed landings and primary skid trails (Design Features FH-6 and TH-5). Alternative E and Alternative F would realize greater decreases in road-related TSRC because they propose to decommission 2 and 1 additional miles of routes, respectively, over the other alternatives.

In the long-term, the cumulative TSRC would be less than 5 percent because of rehabilitation of log landings and primary skid trails and road decommissioning (Design Features FH-6 and TH-5). All action alternatives would decrease TSRC by about 1 percent when compared to Alternative A (No Action). (Table 5, Table 6, Table 7, Table 8, Table 9, and Table 10).

Table 5. Total Soil Resource Commitment - Alternative A

Total Soil Resource Commitment (TSRC) Calculations			Existing Conditions - Alternative A			
Roads	**Miles**		**Length** (feet)	**Disturbed Width** (feet)	**Square Feet**	**Acres**
NFS Roads (includes 8.4 mi SH21)	160.7		848,496	33	28,000,368	642.8
NFS Road - New Construction			0	33	0	0.0
NFS Road - Reconstruction/Relocation			0	33	0	0.0
NFS Roads Decommissioned			0	33	0	0.0
			0		0	0.0
Other Roads	**Miles**		**Length** (feet)	**Disturbed Width** (feet)	**Square Feet**	**Acres**
UA Roads	45.0		237,600	25	5,940,000	136.4
UA Roads Decommissioned			0	25	0	0.0
Temporary Road Construction			0	25	0	0.0
Trails	**Miles**		**Length** (feet)	**Disturbed Width** (feet)	**Square Feet**	**Acres**
NFS Motorized Trails	0.0		0	17	0	0.0
NFS Non-motorized Trails	19.5		102,960	9	926,640	21.3

Table C-1. Total Soil Resource Commitment (TSRC) - Existing Conditions and Alternative A

Feature	Acres	TSRC (values in percent, as a function of 19,327 acre analysis area)						
		Existing	Year 1	Year 2	Year 3	Year 4	Year 5	Cumulative
NFS Roads (includes 8.4 mi SH21)	642.8	3.33%	3.33%	3.33%	3.33%	3.33%	3.33%	3.33%
NFS Road - New Construction								
NFS Road - Reconstruction/Relocation								
NFS Roads Decommissioned								
UA Roads	136.4	0.71%	0.71%	0.71%	0.71%	0.71%	0.71%	0.71%
UA Roads Decommissioned								
Temporary Road Construction								
NFS Motorized Trails								
NFS Non-motorized Trails	21.3	0.11%	0.11%	0.11%	0.11%	0.11%	0.11%	0.11%
Recreation Disturbances (actual acres)	97.0	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%
Skid Trails (.5 mi/10 ac harvest)								
Landings (18 @ 0.5 acre)								
Livestock Disturbances (acres)	16.0	0.08%	0.08%	0.08%	0.08%	0.08%	0.08%	0.08%
Analysis Area	**19,327**	**4.7%**	**4.7%**	**4.7%**	**4.7%**	**4.7%**	**4.7%**	**4.7%**

Table 6. Total Soil Resource Commitment - Alternative B

Total Soil Resource Commitment (TSRC) Calculations			Alternative B			
Roads	**Miles**		**Length** (feet)	**Disturbed Width** (feet)	**Square Feet**	**Acres**
NFS Roads (includes 8.4 mi SH21)	136.5		720,720	33	23,783,760	546.0
NFS Road - New Construction	1.2		6,336	33	209,088	4.8
NFS Road - Reconstruction/Relocation	4.8		25,344	33	836,352	19.2
NFS Roads Decommissioned	-22.8		-120,384	33	-3,972,672	-91.2
			0		0	0.0
Other Roads	**Miles**		**Length** (feet)	**Disturbed Width** (feet)	**Square Feet**	**Acres**
UA Roads	28.7		151,536	25	3,788,400	87.0
UA Roads Decommissioned	-8.1		-42,768	25	-1,069,200	-24.5
Temporary Road Construction	3.2		16,896	25	422,400	9.7
Trails	**Miles**		**Length** (feet)	**Disturbed Width** (feet)	**Square Feet**	**Acres**
NFS Motorized Trails	4.2		22,176	17	376,992	8.7
NFS Non-motorized Trails	44.5		234,960	9	2,114,640	48.5

Table C-2. Total Soil Resource Commitment (TSRC) - Alternative B

Feature	Acres	TSRC (values in percent, as a function of 19,327 acre analysis area)						
		Existing	Year 1	Year 2	Year 3	Year 4	Year 5	Cumulative
NFS Roads (includes 8.4 mi SH21)	546.0	3.33%	2.83%	2.83%	2.83%	2.83%	2.83%	2.83%
NFS Road - New Construction	4.8		0.02%	0.02%	0.02%	0.02%	0.02%	0.02%
NFS Road - Reconstruction/Relocation	19.2		0.10%	0.10%	0.10%	0.10%	0.10%	0.10%
NFS Roads Decommissioned	-91.2		-0.47%	-0.47%	-0.47%	-0.47%	-0.47%	-0.47%
UA Roads	87.0	0.71%	0.45%	0.45%	0.45%	0.45%	0.45%	0.45%
UA Roads Decommissioned	-24.5		-0.13%	-0.13%	-0.13%	-0.13%	-0.13%	-0.13%
Temporary Road Construction	9.7		0.05%	0.05%	0.05%	0.05%	-0.05%	0.00%
NFS Motorized Trails	8.7		0.04%	0.04%	0.04%	0.04%	0.04%	0.04%
NFS Non-motorized Trails	48.5	0.11%	0.25%	0.25%	0.25%	0.25%	0.25%	0.25%
Recreation Disturbances (actual acres)	103.0	0.50%	0.53%	0.53%	0.53%	0.53%	0.53%	0.53%
Skid Trails (.5 mi/10 ac harvest)	237.0		1.23%	1.23%	1.23%	1.23%	0.92%	0.31%
Landings	67.0		0.35%	0.35%	0.35%	0.35%	-0.35%	0.00%
Livestock Disturbances (acres)	16.0	0.08%	0.08%	0.08%	0.08%	0.08%	0.08%	0.08%
Analysis Area	**19,327**	**4.7%**	**5.3%**	**5.3%**	**5.3%**	**5.3%**	**4.2%**	**4.0%**

Table 7. Total Soil Resource Commitment - Alternative C

Total Soil Resource Commitment (TSRC) Calculations **Alternative C**

Roads	**Miles**		**Length** (feet)	**Disturbed Width** (feet)	**Square Feet**	**Acres**
NFS Roads (includes 8.4 mi SH21)	136.5		720,720	33	23,783,760	546.0
NFS Road - New Construction	1.2		6,336	33	209,088	4.8
NFS Road - Reconstruction/Relocation	4.8		25,344	33	836,352	19.2
NFS Roads Decommissioned	-22.8		-120,384	33	-3,972,672	-91.2
			0		0	0.0

Other Roads	**Miles**		**Length** (feet)	**Disturbed Width** (feet)	**Square Feet**	**Acres**
UA Roads	28.7		151,536	25	3,788,400	87.0
UA Roads Decommissioned	-8.1		-42,768	25	-1,069,200	-24.5
Temporary Road Construction	3.2		16,896	25	422,400	9.7

Trails	**Miles**		**Length** (feet)	**Disturbed Width** (feet)	**Square Feet**	**Acres**
NFS Motorized Trails	4.0		21,120	17	359,040	8.2
NFS Non-motorized Trails	44.5		234,960	9	2,114,640	48.5

Table C-3. Total Soil Resource Commitment (TSRC) - Alternative C

Feature	**Acres**	**TSRC** (values in percent, as a function of 19,327 acre analysis area)						
		Existing	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Cumulative**
NFS Roads (includes 8.4 mi SH21)	546.0	3.33%	2.83%	2.83%	2.83%	2.83%	2.83%	2.83%
NFS Road - New Construction	4.8		0.02%	0.02%	0.02%	0.02%	0.02%	0.02%
NFS Road - Reconstruction/Relocation	19.2		0.10%	0.10%	0.10%	0.10%	0.10%	0.10%
NFS Roads Decommissioned	-91.2		-0.47%	-0.47%	-0.47%	-0.47%	-0.47%	-0.47%
UA Roads	87.0	0.71%	0.45%	0.45%	0.45%	0.45%	0.45%	0.45%
UA Roads Decommissioned	-24.5		-0.13%	-0.13%	-0.13%	-0.13%	-0.13%	-0.13%
Temporary Road Construction	9.7		0.05%	0.05%	0.05%	0.05%	-0.05%	0.00%
NFS Motorized Trails	8.2		0.04%	0.04%	0.04%	0.04%	0.04%	0.04%
NFS Non-motorized Trails	48.5	0.11%	0.25%	0.25%	0.25%	0.25%	0.25%	0.25%
Recreation Disturbances (actual acres)	103.0	0.50%	0.53%	0.53%	0.53%	0.53%	0.53%	0.53%
Skid Trails (.5 mi/10 ac harvest)	237.0		1.23%	1.23%	1.23%	1.23%	0.92%	0.31%
Landings (18 @ 0.5 acre)	68.0		0.35%	0.35%	0.35%	0.35%	-0.35%	0.00%
Livestock Disturbances (acres)	16.0	0.08%	0.08%	0.08%	0.08%	0.08%	0.08%	0.08%
Analysis Area	**19,327**	**4.7%**	**5.3%**	**5.3%**	**5.3%**	**5.3%**	**4.2%**	**4.0%**

Table 8. Total Soil Resource Commitment - Alternative D

Total Soil Resource Commitment (TSRC) Calculations			Alternative D			
Roads	**Miles**		**Length** (feet)	**Disturbed Width** (feet)	**Square Feet**	**Acres**
NFS Roads (includes 8.4 mi SH21)	136.5		720,720	33	23,783,760	546.0
NFS Road - New Construction	1.2		6,336	33	209,088	4.8
NFS Road - Reconstruction/Relocation	4.8		25,344	33	836,352	19.2
NFS Roads Decommissioned	-22.8		-120,384	33	-3,972,672	-91.2
			0		0	0.0
Other Roads	**Miles**		**Length** (feet)	**Disturbed Width** (feet)	**Square Feet**	**Acres**
UA Roads	28.7		151,536	25	3,788,400	87.0
UA Roads Decommissioned	-8.1		-42,768	25	-1,069,200	-24.5
Temporary Road Construction	3.2		16,896	25	422,400	9.7
Trails	**Miles**		**Length** (feet)	**Disturbed Width** (feet)	**Square Feet**	**Acres**
NFS Motorized Trails	4.0		21,120	17	359,040	8.2
NFS Non-motorized Trails	44.5		234,960	9	2,114,640	48.5

Table C-4. Total Soil Resource Commitment (TSRC) - Alternative D

Feature	Acres	TSRC (values in percent, as a function of 19,327 acre analysis area)						
		Existing	Year 1	Year 2	Year 3	Year 4	Year 5	Cumulative
NFS Roads (includes 8.4 mi SH21)	546.0	3.33%	2.83%	2.83%	2.83%	2.83%	2.83%	2.83%
NFS Road - New Construction	4.8		0.02%	0.02%	0.02%	0.02%	0.02%	0.02%
NFS Road - Reconstruction/Relocation	19.2		0.10%	0.10%	0.10%	0.10%	0.10%	0.10%
NFS Roads Decommissioned	-91.2		-0.47%	-0.47%	-0.47%	-0.47%	-0.47%	-0.47%
UA Roads	87.0	0.71%	0.45%	0.45%	0.45%	0.45%	0.45%	0.45%
UA Roads Decommissioned	-24.5		-0.13%	-0.13%	-0.13%	-0.13%	-0.13%	-0.13%
Temporary Road Construction	9.7		0.05%	0.05%	0.05%	0.05%	-0.05%	0.00%
NFS Motorized Trails	8.2		0.04%	0.04%	0.04%	0.04%	0.04%	0.04%
NFS Non-motorized Trails	48.5	0.11%	0.25%	0.25%	0.25%	0.25%	0.25%	0.25%
Recreation Disturbances (actual acres)	103.0	0.50%	0.53%	0.53%	0.53%	0.53%	0.53%	0.53%
Skid Trails (.5 mi/10 ac harvest)	251.0		1.30%	1.30%	1.30%	1.30%	0.97%	0.32%
Landings (18 @ 0.5 acre)	71.0		0.37%	0.37%	0.37%	0.37%	-0.37%	0.00%
Livestock Disturbances (acres)	16.0	0.08%	0.08%	0.08%	0.08%	0.08%	0.08%	0.08%
Analysis Area	**19,327**	**4.7%**	**5.4%**	**5.4%**	**5.4%**	**5.4%**	**4.3%**	**4.0%**

Table 9. Total Soil Resource Commitment - Alternative E

Total Soil Resource Commitment (TSRC) Calculations **Alternative E**

Roads	**Miles**		**Length** (feet)	**Disturbed Width** (feet)	**Square Feet**	**Acres**
NFS Roads (includes 8.4 mi SH21)	133.6		705,408	33	23,278,464	534.4
NFS Road - New Construction	1.2		6,336	33	209,088	4.8
NFS Road - Reconstruction/Relocation	4.8		25,344	33	836,352	19.2
NFS Roads Decommissioned	-24.8		-130,944	33	-4,321,152	-99.2
			0		0	0.0

Other Roads	**Miles**		**Length** (feet)	**Disturbed Width** (feet)	**Square Feet**	**Acres**
UA Roads	29.3		154,704	25	3,867,600	88.8
UA Roads Decommissioned	-8.1		-42,768	25	-1,069,200	-24.5
Temporary Road Construction	0.9		4,752	25	118,800	2.7

Trails	**Miles**		**Length** (feet)	**Disturbed Width** (feet)	**Square Feet**	**Acres**
NFS Motorized Trails	0.0		0	17	0	0.0
NFS Non-motorized Trails	47.4		250,272	9	2,252,448	51.7

Table C-5. Total Soil Resource Commitment (TSRC) - Alternative E

Feature	**Acres**	**TSRC** (values in percent, as a function of 19,327 acre analysis area)						
		Existing	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Cumulative**
NFS Roads (includes 8.4 mi SH21)	534.4	3.33%	2.77%	2.77%	2.77%	2.77%	2.77%	2.77%
NFS Road - New Construction	4.8		0.02%	0.02%	0.02%	0.02%	0.02%	0.02%
NFS Road - Reconstruction/Relocation	19.2		0.10%	0.10%	0.10%	0.10%	0.10%	0.10%
NFS Roads Decommissioned	-99.2		-0.51%	-0.51%	-0.51%	-0.51%	-0.51%	-0.51%
UA Roads	88.8	0.71%	0.46%	0.46%	0.46%	0.46%	0.46%	0.46%
UA Roads Decommissioned	-24.5		-0.13%	-0.13%	-0.13%	-0.13%	-0.13%	-0.13%
Temporary Road Construction	2.7		0.01%	0.01%	0.01%	0.01%	-0.01%	0.00%
NFS Motorized Trails	0.0		0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
NFS Non-motorized Trails	51.7	0.11%	0.27%	0.27%	0.27%	0.27%	0.27%	0.27%
Recreation Disturbances (actual acres)	100.0	0.50%	0.52%	0.52%	0.52%	0.52%	0.52%	0.52%
Skid Trails (.5 mi/10 ac harvest)	150.0		0.78%	0.78%	0.78%	0.78%	0.58%	0.19%
Landings (18 @ 0.5 acre)	54.0		0.28%	0.28%	0.28%	0.28%	-0.28%	0.00%
Livestock Disturbances (acres)	16.0	0.08%	0.08%	0.08%	0.08%	0.08%	0.08%	0.08%
Analysis Area	**19,327**	**4.7%**	**4.6%**	**4.6%**	**4.6%**	**4.6%**	**3.9%**	**3.8%**

Table 10. Total Soil Resource Commitment - Alternative F

Total Soil Resource Commitment (TSRC) Calculations			Alternative F			
Roads	**Miles**		**Length** (feet)	**Disturbed Width** (feet)	**Square Feet**	**Acres**
NFS Roads (includes 8.4 mi SH21)	133.6		705,408	33	23,278,464	534.4
NFS Road - New Construction	1.2		6,336	33	209,088	4.8
NFS Road - Reconstruction/Relocation	4.8		25,344	33	836,352	19.2
NFS Roads Decommissioned	-23.6		-124,608	33	-4,112,064	-94.4
			0		0	0.0
Other Roads	**Miles**		**Length** (feet)	**Disturbed Width** (feet)	**Square Feet**	**Acres**
UA Roads	28.9		152,592	25	3,814,800	87.6
UA Roads Decommissioned	-8.1		-42,768	25	-1,069,200	-24.5
Temporary Road Construction	3.0		15,840	25	396,000	9.1
Trails	**Miles**		**Length** (feet)	**Disturbed Width** (feet)	**Square Feet**	**Acres**
NFS Motorized Trails	2.9		15,312	17	260,304	6.0
NFS Non-motorized Trails	47.4		250,272	9	2,252,448	51.7

Table C-6. Total Soil Resource Commitment (TSRC) - Alternative F

Feature	Acres	TSRC (values in percent, as a function of 19,327 acre analysis area)						
		Existing	Year 1	Year 2	Year 3	Year 4	Year 5	Cumulative
NFS Roads (includes 8.4 mi SH21)	534.4	3.33%	2.77%	2.77%	2.77%	2.77%	2.77%	2.77%
NFS Road - New Construction	4.8		0.02%	0.02%	0.02%	0.02%	0.02%	0.02%
NFS Road - Reconstruction/Relocation	19.2		0.10%	0.10%	0.10%	0.10%	0.10%	0.10%
NFS Roads Decommissioned	-94.4		-0.49%	-0.49%	-0.49%	-0.49%	-0.49%	-0.49%
UA Roads	87.6	0.71%	0.45%	0.45%	0.45%	0.45%	0.45%	0.45%
UA Roads Decommissioned	-24.5		-0.13%	-0.13%	-0.13%	-0.13%	-0.13%	-0.13%
Temporary Road Construction	9.1		0.05%	0.05%	0.05%	0.05%	-0.05%	0.00%
NFS Motorized Trails	6.0		0.03%	0.03%	0.03%	0.03%	0.03%	0.03%
NFS Non-motorized Trails	51.7	0.11%	0.27%	0.27%	0.27%	0.27%	0.27%	0.27%
Recreation Disturbances (actual acres)	103.0	0.50%	0.53%	0.53%	0.53%	0.53%	0.53%	0.53%
Skid Trails (.5 mi/10 ac harvest)	209.0		1.08%	1.08%	1.08%	1.08%	0.81%	0.27%
Landings (18 @ 0.5 acre)	57.0		0.29%	0.29%	0.29%	0.29%	-0.29%	0.00%
Livestock Disturbances (acres)	16.0	0.08%	0.08%	0.08%	0.08%	0.08%	0.08%	0.08%
Analysis Area	**19,327**	**4.7%**	**5.1%**	**5.1%**	**5.1%**	**5.1%**	**4.1%**	**3.9%**

Appendix E:

Noxious Weed Control and Design Features

Becker Integrated Resource Project

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The purpose of implementing an Integrated Weed Management program is to best meet the Boise National Forest's (Forest's) responsibility for noxious weed control by using an array of effective tools while minimizing adverse effects to non-target resources and operating within the constraints of time, money, and human resources.

Options to be used for noxious weed control in the Becker Project area through Management Actions include the following:

- Biological Control Agents (biocontrol agents or bioagents)
- Mechanical Treatments (such as hand pulling, chopping, or cutting)
- Herbicides specifically formulated for forests, rangelands, and/or riparian areas

Biological Control Agents:

Biological control of weeds is the deliberate use of natural enemies to limit the distribution and abundance of a target weed. Classical biological control uses host-specific natural enemies from the target weed's native range. These natural enemies can kill or severely damage plants by consuming or injuring seeds, roots, foliage, or stems. Damage caused by natural enemies may limit the reproduction of the weed, diminish the weed's ability to compete with other plants, and facilitate secondary infection from pathogens.

Using biocontrol agents for weed control has a several advantages:

- Targets a specific weed
- Provides sustainable, long-term control
- Reduces labor costs associated with repeated mechanical or chemical treatments

Disadvantages of using biocontrol agents for weed control includes:

- Uncertainty about whether approved bioagents will be effective in controlling the target weed
- Risk of unintended, adverse impacts on native vegetation and other organisms
- Possible difficulty in adapting the bioagent to varying climatic conditions to ensure successful propagation
- Bioagents do not always work, and in most cases, does not eradicate the target weed

Currently, the Boise National Forest has effective bioagent populations established at various locations on the Idaho City and Mountain Home Ranger Districts for spotted knapweed, leafy spurge, and Dalmation and yellow toadflax. Table 1 includes the biocontrol agents and target weed species.

Table 1. Target species and biocontrol agent

Target Weed Species	Bio-Control Agent	Target
Spotted Knapweed	Urophora affinis (Seed gall fly) Agapeta zoegana (Root moth) Larimus minutus (Flower weevil) Cyphocleonus achates (Root boring weevil) Metzneria paucipunctella (Seedhead moth)	Seedhead Roots Flowers Roots Seedhead
Dalmation Toadflax	Mecinus janthiformis (Stem mining weevil)	Stem
Leafy Spurge	Aphthona nigriscutis (Leafy Spurge Flea Beetle) Apthona flava	Roots, flowers, and foliage

Rush Skeletonweed (RSW) was first documented in Idaho in 1960 and is currently the "heart" of the western US infestations. It has spread rapidly with no known native biocontrol agents to counter the infestations. Research is ongoing to isolate and test introduced biocontrol agents, and to date, four introduced bioagents have been tested and approved for release in the US to control RSW. These agents will be used on sites within the Clear Creek project area (Table 2).

Table 2. Approved bio-agent for RSW control

Bio-Agent Type	Scientific Name	U.S. Field Efficacy	Availability
Rust	*Puccinia chondrillina*	Moderate	Readily available
Mite	*Aceria chondrillae*	Moderate	Readily available
Fly	*Cystiphora schmidti*	Low on its own	Readily available
Moth	*Bradyrrhoa gilveolella*	Unknown	Being tested in Idaho along South Fork of Payette river sites

Distribution of all existing biocontrol agents established on the Forest will occur throughout the Becker Project area in an effort to provide long-term, cost-effective management of noxious weeds.

As part of an integrated approach to long-term noxious weed management options, and as more biocontrol agents become available in the United States and prove to be effective for control of these weeds and other weed species that establish in the Becker Project area, any of these biocontrol agents, as well as others, may be used if it is determined that they can withstand the climatic conditions, propagate, and provide a long-term solution for weed control.

Mechanical Treatments:

Mechanical treatments are methods that physically damage, destroy, or disrupt the growth and/or reproduction of noxious weeds. These treatments can consist of hand pulling, grubbing, digging, hoeing, tilling, cutting, mowing, burning, or mulching and may use tools such as a handsaw, shovel, rake, weed eater, axe, hoe, hand clippers, mower, or other motorized weeding equipment.

Most mechanical treatments should occur prior to seed production. If the weeds are in the flowing stage, it is best to cut off the seed heads and bag them for disposal before mechanically treating the remaining vegetative parts.

Mechanical treatments are typically used on a limited basis, primarily to control individual plants or very small, isolated infestations of weeds in sensitive areas such as riparian areas or near rare plant populations. Mechanical treatments are most effective in removing or preventing production of weed seeds. Larger infestations of weeds are very difficult to control with mechanical treatment and may require multiple treatment types.

Mechanical treatments may be used in small areas throughout the project area that are too sensitive for herbicide use or too harsh for bioagent establishment.

Hand pulling and grubbing of weeds is less effective on rhizomatous than non-rhizomatous weed species because of their well-developed root system and carbohydrate reserves. These treatments often leave root fragments in the ground. If sufficient root mass is removed, the

individual plant can be destroyed. However, some weed species such as leafy spurge respond to mechanical treatment by aggressively re-sprouting even if only small root fragments remain in the soil.

Cutting and mowing weeds can reduce reproduction in perennial species and weaken their competitive advantage by using up carbohydrates stored in the root systems. Mechanical treatments must be repeated several times a year for many years to eradicate weed species that are prolific seed producers and have built up a residual seed bank in the soil. To be most effective, mechanical treatment must occur before seed production occurs. Weeds that have already flowered must be removed from the treatment area and destroyed.

Burning is occasionally used as a tool to help herbicides treatment reach the ground and the roots more effectively. Burning is rarely used as a primary treatment practice. Herbicides may be used in combination or as a follow-up to mechanical treatments. It is anticipated that burning could occur at a frequency of 1 in every 5 years and will be less than 1 acre in size. Prescribed burning is not part of this proposed action and will be completed through separate actions.

Chemical Treatments:

Chemical treatments involve the application of herbicides (chemical compounds) at certain stages of plant growth to kill targeted weed species. Herbicides are used to treat unwanted vegetation, such as noxious weeds, because they are very effective and results occur within a short period of time.

As part of an Integrated Weed Management program within the Becker Project area to treat noxious weeds, herbicide use will take place prior to ground disturbing activities, and after, to prevent the spread of existing weed species and to ensure eradication of newly introduced noxious weed species. Herbicides, such as Tordon (picloram), have residual characteristics and decompose slowly over the course of 1 to 2 years, providing continuous noxious weed control until the residual is gone. Herbicides with residual characteristics are advantageous in upland areas where it is not feasible to return several times a year to re-apply herbicides. Such sites may include obliterated roadbeds with known noxious weed seed sources.

Currently, all herbicide use on the Boise National Forest is done by ground-based application. Backpack sprayers, compressed air hand sprayers, truck mounted and ATV/UTV mounted sprayers are used to spot spray individual weeds or small patches, while boom sprayers are used to broadcast-spray large or continuous area infestations.

Herbicides are made up of various substances which make them effective, safer to use, and easier to apply. The active ingredient (AI) in herbicides is the chemical that affects the target species. Other components of the herbicide, are inert (inactive) ingredients, and may include water or a petroleum solvent, wetting agents, spreaders, stickers, extenders, or diluents. The complete mixture is called the pesticide formulation. Some formulations are ready for use, while others may require further dilution with water, a petroleum solvent, or air before they are applied.

The herbicide list for the Boise National Forest is listed in Table 3.

Table 3. Boise National Forest herbicide list

Product Name	Active Ingredient (AI)	Approved for Aquatic or Non-Aquatic Application	Maximum Label Application Rate	Application Rates
Milestone, Milestone VM	Aminopyralid	Non-aquatic	Cannot exceed 7 fl oz/ac/yr; spot spray = 0.22 lb AE/ac or less (14 fl oz/ac/yr) but not more than 50% of an acre at that rate	0.08-0.18 lbs AI/ac or less
Weedestroy, UAP-Timberland Platoon	2,4-D amine	Both	3 lbs AE/ac/yr or less	2 lbs AE/ac or less
Telar XP	Chlorsulfuron	Non-aquatic	Do not apply more than 3 times/yr; do not apply more than 0.02 lbs AI/ac/yr	0.02 lbs AI/ac/yr or less
Tordon 22K, Outpost 22K	Picloram	Non-aquatic	1 lb AI/ac	1 lb AI/ac or less
Rometsol	Metsulfuron- methyl	Non-aquatic	Do not exceed 1 $^{2}/_{3}$ oz/ac/yr	1 oz AI/ac or less
2,4-D Amine 4 (Agri-Star)	2,4-D amine	Non-aquatic	3 lbs AE/ac/yr or less	Less than 2 lbs AE/ac/yr or less
Escort XP	Metsulfuron- methyl	Non-aquatic	$1^{2}/_{3}$ oz/ac/yr or less with no restrictions; at rates up to 3 $^{1}/_{3}$ oz/ac/yr delay grazing until 3 days after treatment	1 oz AI/ac or less
Aqua Neat	Glyphosate	Both	3.75 lbs AI/ac or less	2.7 lbs AI/ac or less
Weedar 64	2,4-D amine	Both	3 lbs AI/ac	.95 to 1.9 lbs AE/ac or less
Roundup	Glyphosate	Non-Aquatic	3.75 lbs AI/ac or less	1.5 lbs AI/ac or less; 1.5 qts/25 gal water/ac
Plateau	Imazapic	Non-Aquatic	0.75 lb AI/ac	0.16 lbs AI/ac or less
Transline	Clopyralid	Non-Aquatic	0.5 lbs AI/ac	.15 lbs AI/ac to 0.5 lbs AI/ac or less
2,4-D/Round-up mixture	2,4-D/Glyphosate	Non-Aquatic	3 lbs AI/ac (2,4-D); 3.75 lbs AI/ac (Glyphosate)	1.9 lbs AI/ac or less (2,4-D); 1.5 lbs AI/ac or less (Round-up)
Tordon 22K/2,4-D Amine mixture	Picloram/2,4-D amine	Non-Aquatic	1 lb AI/ac (picloram); 2.0 lbs AI/ac (2,4-D)	.5 lb AI/ac (Tordon 22K); 1 lb AI/ac (2,4-D)
Escort	Metsulfuron- methyl	Non-Aquatic	2 oz AI/ac	1 oz AI/ac or less
Telar	Chlorsulfuron	Non-Aquatic	1 oz AI/ac	1 oz AI/ac or less
Glypro	Glyphosate	Non-Aquatic	3.75 lbs AI/ac	1.35 lbs AI/ac
Redeem	Clopyralid/Triclopyr	Non-Aquatic	.375 lbs AI/ac (Clopyralid); 1.25 lbs AI/ac (Triclopyr)	.375 lbs AI/ac (Clopyralid); 1.125 lbs AI/ac (Triclopyr)
Tordon 22K/Banvel mixture	Picloram/Dicamba	Non-Aquatic	1 lb AI/ac; 2.0 lbs AI/ac (Dicamba)	.25 lbs AI/ac (Tordon 22K); 1 lb AI/ac (Banvel)
Banvel, Diablo, Rifle	Dicamba	Non-Aquatic	2.0 lbs AI/ac	1 lb AI/ac or less

Product Name	Active Ingredient (AI)	Approved for Aquatic or Non-Aquatic Application	Maximum Label Application Rate	Application Rates
Garlon 3A	Triclopyr	Non-Aquatic	2 lbs AI/ac of less	.02 lb AE/ac
Razor	Glyphosate	Non-Aquatic	3.75 lbs AI/ac	.5 to 3 lbs AI/ac or less
Veteran 720	2,4-D/Dicamba	Non-Aquatic	3.0 lbs AI/ac (2,4-D); 2.0 lbs AI/ac (Dicamba)	.47 to 1 lbs AI/ac or less
Weedmaster	2,4-D/Dicamba	Non-Aquatic	3.0 lbs AI/ac (2,4-D); 2.0 lbs AI/ac (Dicamba)	1.43 lbs AI/ac or less (2,4-D); 0.5 lbs AI/ac or less (Dicamba)
Roundup Original Max	Glyphosate	Non-Aquatic	3.75 lbs AI/ac	.67 to 1.34 lbs AI/ac
Formula 40	2,4-D	Non-Aquatic	3.0 lbs AI/ac	Less than 2 lbs AI/ac

*AI – Active Ingredient; AE – Acid Equivalent.

Types of Herbicides

2,4-D amine—The most commonly used and most widely studied herbicide in the U.S. (SERA 2001), 2,4-D is a member of the chlorinated phenoxy family and interferes with normal plant growth processes by stimulating nucleic acid and protein synthesis and affecting enzyme activity, respiration, and cell division. It is labeled for a wide range of uses and is an active ingredient in many products offered by several manufacturers for home use. Several common brand names containing 2,4-D formulations are, Weedar 64, HiDep, Formula 40, and Solution. 2,4-D acts as a growth-regulating hormone on broad leaf plants and is absorbed by leaves, stems, and roots and accumulates in a plant's growing tips.

Aminopyralid—Aminopyralid is a pyridine carboxylic acid herbicide used to control susceptible broadleaf weeds, including noxious and invasive weeds. Aminopyralid is systemic and is absorbed through the leaves and the roots where it is transported to other parts of the plant. Aminopyralid disrupts plant growth metabolic pathways, affecting the growth process of the plant. Aminopyralid provides systemic postemergence broad-spectrum control of a number of key noxious and invasive annual, biennial and perennial weed species, as well as agronomic broadleaf weeds. Aminopyralid can also provide residual weed control activity by controlling re-infestations and reducing the need for re-treatment depending on the rate applied and the target weeds. This product can be sprayed up to the edge of water and can also be used on "seasonally dry" wetland. Aminopyralid is the only active ingredient in the herbicide product Milestone (40.6%). According to the product label, Milestone also contains 59.4% inert ingredients (unspecified). Milestone is applied at a maximum of 7 fluid ounces per acre per year, which is equivalent to 0.22 pounds of the active ingredient aminopyralid per acre per year. Where used, the typical application rate of Milestone is equivalent to about 0.093 pounds of Aminopyralid per acre per year.

Chlorsulfuron—Chlorsulfuron is used to control many broadleaf weeds and some annual grass weeds. It is absorbed by the leaves and roots of the weed and prevents production of an essential amino acid, which inhibits cell division and plant growth. Treatment areas include non-crop sites such as roadsides, rights-of-way, and fence rows. A common formulation of this herbicide is the marketed product, Telar.

Clopyralid—A relatively new and very selective herbicide, clopyralid is a 3,6-dichloro-2-pyridinecarboxylic acid, commonly known as Transline, Stinger, or Reclaim. Transline contains clopyralid (40.9%) and inert ingredients (water, isopropyl alcohol, and a proprietary surfactant) (59.1%). Clopyralid is the active ingredient in Transline and one of two active ingredients (the other being 2,4-D) in Curtail. Clopyralid is absorbed by the leaves and roots of broadleaved plants and moves rapidly through plants, affecting plant cell respiration and growth.

Clopyralid is toxic to some members of only three plant families: the composites (Compositae), the legumes (Fabaceae), and the buckwheats (Polygonaceae). Clopyralid is very effective against knapweeds, hawkweeds, and Canada thistle at application rates of one-quarter to one-half pound per acre (U.S. Forest Service 2001d). Its selectivity makes it an attractive alternative herbicide on sites with non-target species that are sensitive to other herbicides. Clopyralid is more persistent than 2,4-D and dicamba, but less persistent than picloram. It is degraded almost entirely by microbes and is not susceptible to photo or chemical degradation (Tu et al. 2003).

Dicamba—Dicamba (2-methoxy-3,6-dichlorobenzoic acid) is a selective benzoic acid herbicide registered for the control of certain broadleaf weeds and woody plants before their emergence. It will kill broadleaf weeds before and after they sprout. Dicamba is rapidly taken up by the leaves and roots of plants and is readily translocated to other plant parts. Dicamba is absorbed by the leaves and translocated throughout the plant, where it exerts an auxin-like growth regulatory effect. Weed control is generally achieved in 5 to 7 days.

Glyphosate—Labeled for a wide variety of uses, including home use, glyphosate is marketed as Rodeo, Accord, Roundup, and numerous other brand names (Table 3). Glyphosate is a non-selective, broad-spectrum herbicide that is readily absorbed by leaves, translocated throughout the plant, and disrupts the photosynthetic process. This herbicide affects a wide variety of plants, including grasses and many broadleafs, and has the potential to eliminate desirable as well as undesirable vegetation. Some plant selectivity can be achieved by using a wick applicator to directly apply glyphosate to the target plant, thereby avoiding desirable vegetation. Rodeo is proposed as the main glyphosate compound for use on the Sawtooth NF, mainly for its low toxicity to aquatic systems. The Rodeo and Accord formulations of this herbicide (without the surfactant in Roundup) are labeled for aquatic use and are the formulations which will be used adjacent to water (SERA 2003).

Imazapic—Imazapic (trade name Plateau® and Cadre®) is a pyridine carboxylic acid herbicide intended for use in rangelands and forests. Imazapic is a selective herbicide for both the pre- and post-emergent control of some annual and perennial grasses and some broadleaf weeds. Imazapic will be used primarily for the direct control of annual grasses, leafy spurge, and Dalmatian and yellow toadflax. It could be used on other noxious weed species as well where either trials or research indicate it is effective. Imazapic kills plants by inhibiting the activity of the enzyme acetohydroxy acid synthase (AHAS or ALS).

Imazapic may be mixed with other herbicides such as triclopyr (Garlon®), glyphosate (RoundUp®), picloram (Tordon®), imazapyr (Arsenal®), or other products to provide total vegetation control. However, mixtures of imazapic with 2,4-D and other phenoxy-type herbicides provide less control of perennial grass weeds than imazapic alone. According to

the manufacturer, combining imazapic with other herbicides should not increase the toxicological risk over that of either herbicide when used alone.

Metsulfuron methyl—Metsulfuron methyl is methyl 2-[(4-methoxy-6-methyl-1,3,5-triazin-2-yl)-amino]carbonyl]-amino]-sulfonyl]benzoate and is commonly known as Escort. Escort contains metsulfuron methyl (60%) and inert ingredients (40%). Metsulfuron methyl is absorbed through the roots and foliage and moves rapidly through the plants. It inhibits cell division in the roots and shoots, which stops growth. This herbicide is used to control annual and perennial broadleaf weeds. Typical control areas include rights-of-way along roadsides and powerline corridors. The most commonly used formulation of this herbicide is the marketed product, Escort. Metsulfuron methyl can be mixed with other chemicals to provide more effective weed control.

Picloram—Picloram is 4-Amino-3,5,6-trichloro-2-pyridinecarboxylic acid, and is known as Access®, Grazon®, Pathway®, or Tordon®. This is a restricted use pesticide (for use only by certified applicators) labeled for non-cropland forestry, rangeland, rights-of-way, and roadside weed control. Picloram was placed in this category due to its mobility in water. It is the active ingredient in the marketed product Tordon. Tordon® K contains essentially 24.4% of picloram (potassium salt), and 75.6% inert ingredients, which include water and dispersing agents, including surfactants. Although picloram is most often applied in Forest Service programs as the sole herbicide, it is also applied in combination with 2,4–D and less commonly with other herbicides.

Picloram acts as a growth regulator and is used to control a variety of broadleaf weed species. It is absorbed through leaves and root uptake, is easily translocated through plants, and accumulates in new growth causing leaves to cup and curl. Picloram is generally applied at rates of one-quarter to one-half pound per acre for non-rhizomatous weeds.

Triclopyr—Triclopyr is sold under names such as Access, Crossbow, ET, Garlon, Grazon, PathFinder, Redeem, Rely, Remedy, and Turflon. However, the only herbicide analyzed in this assessment is Redeem. Triclopyr herbicides proposed for use contains triethylamine salt (TEA) found in Redeem. In comparison, the ester form of triclopyr, known as triclopyr BEE, is exponentially more toxic to fish when compared to TEA. The Sawtooth N.F. will not use the BEE form.

Triclopyr is a growth-regulating herbicide to control woody and broadleaf perennial weeds in non-cropland, forestland, range, permanent grass pasture, turf, and rights-of-way. Triclopyr mimics auxin, a natural plant hormone, causing an auxin overdose 1,000 times greater than natural levels. This interferes with hormonal balance and normal growth, eventually causing death of the plant. Triclopyr has a low toxicity to grasses, but can harm conifers in high doses.

Most triclopyr is sold as a triethylamine salt (abbreviated TEA) or butoxyethyl ester (abbreviated BEE) derivative of the parent chemical, triclopyr acid. Triclopyr TEA was registered with the Environmental Protection Agency (EPA) in 1979 and triclopyr BEE was registered with the EPA in 1980. Triclopyr BEE and triclopyr TEA rapidly degrade into the parent chemical, triclopyr acid, after application.

Combinations of herbicides may be the most appropriate treatment where several species of noxious weeds occur together, or where the herbicides affect weeds differently. For example, a mixture of picloram and 2,4-D, which are both broadleaf-selective herbicides, is used for many broadleaf weed species. 2,4-D generally has a shorter half-life compared to the more persistent picloram, and when used with picloram may provide more effective weed control than either chemical used alone. By itself, picloram is generally the most persistent of the herbicides described above. It therefore requires fewer repeat applications, is more effective against many weed species, and when applied according to label specifications is not likely to affect non-target plants. By comparison, glyphosate (via wick application only) or 2,4-D labeled for use near water might be the only or most appropriate chemicals allowed in the treatment of common tansy, which occurs largely in moist habitats or near water. In contrast, picloram may be used more often to treat yellow star-thistle, which occurs in dry sites. Chemical treatment also can be used in conjunction with, or preceding, non-chemical weed control treatments, depending on weed species composition, infestation level, and environmental setting.

Adjuvants: The inert ingredients added to an herbicide formulation or mixture to increase the effectiveness of the active ingredient or offset problems such as adverse water quality or wind, is called an **adjuvant**. Some common adjuvants are:

- **Wetting Agents**—allow powders to mix with water and adhere to plants.
- **Emulsifiers**—allow petroleum-based pesticides to mix with water.
- **Invert Emulsifiers**—allow water-based pesticides to mix with petroleum carriers.
- **Spreaders**—allow herbicides to form a uniform coating over the treated plant surface.
- **Stickers**—allow herbicides to stick to the plant surfaces.
- **Foaming Agents**—reduce herbicide drift.
- **Compatibility Agents**—allow herbicides to combine effectively.
- **Buffers**—allow pesticides of different acidity or alkalinity to mix.
- **Anti-foaming Agents**—reduce foaming of mixtures that require vigorous agitation.

Spray adjuvants used on the Boise National Forest are non-ionic surfactants, meaning they have no ionic charge and are hydrophilic (water-loving). Spray adjuvants are commonly used in a 1:800 ratio of adjuvant to water as a typical rate of application. They are generally biodegradable and are compatible with many fertilizer solutions. R11 is a spreading agent that lowers the surface tension on the droplet so it covers the target plant more efficiently. The additives used on the Boise National Forest are not hazardous or listed as Level 1 (Inert Ingredients of Toxicological Concern) or Level 2 (Potentially Toxic Inert Ingredients) compounds when used as intended and label directions are followed. Inert ingredient toxicity level ratings are different than herbicide toxicity level ratings.

The adjuvant (surfactants and dyes) list for the Boise National Forest is found in Table 4.

Table 4. Boise National Forest adjuvants

Surfactant or Dye Name	Rate
Activator 90 (Non-ionic)	1 lb/ac or less
Bullseye Spray Pattern Indicator (Dye)	NA
Cayuse	2.68 lbs AI/ac
HiLight (Dye)	NA
R-11 Spreader Activator	NA
Ad-Wet 90	1 lb/ac or less

Herbicides can be characterized by how they enter plants or move within plants, as well as how they are applied to plants and persist in the soil. The following are various characteristics of herbicides:

- **Foliar-Contact-Nonselective**: these herbicides are applied to weed foliage. They kill the foliage they come in contact with (*nonselective*), with little to no translocation to other parts of the plant (*contact*). These herbicides are effective on annual weed seedlings.
- **Foliar-Contact-Selective**: these herbicides are applied to weed foliage. They kill certain types of foliage they come in contact with by a contact-burning effect (*contact* and not translocated). These herbicides kill only certain types of weeds due to the various plant leaf surfaces and plant structures, thus some weeds are tolerant of this type of herbicide (*selective*). These herbicides are effective on weed seedlings.
- **Foliar-Systemic-Nonselective**: these herbicides are applied to weed foliage where they are absorbed and translocated throughout the plant (*systemic*), including the roots. These herbicides do not remain residual in soils. They are effective on perennial weeds. An example of such herbicide is Glyphosate.
- **Foliar-Systemic-Selective**: these herbicides are applied to weed foliage where they are absorbed and translocated throughout the plant (*systemic*), including the roots. These herbicides kill only certain types of weeds due to various plant leaf surfaces and plant structures, thus some grassy weeds are tolerant of this type of herbicide (*selective*). Grasses are not affected by these types of herbicides, which makes this one of the most widely used herbicide types. Examples of these herbicides include dicamba, triclopyr, and 2,4-D.
- **Soil-Short Residual-Nonselective**: this herbicide group is one of the smallest. Herbicides in this group are applied to the soil, have a residual activity of a few hours to less than 1 year, and are nonselective.
- **Soil-Short Residual-Selective**: these herbicides, often referred to as Preemergence herbicides, are applied to the soil because they are absorbed by weeds through their roots or shoots. This group of herbicides has a residual activity of less than 1 year.
- **Soil-Long Residual-Nonselective**: these herbicides are used to control all types of vegetation for a lengthy period of time.
- **Soil-Long Residual-Selective**: these herbicides have a low solubility in water, and if applied at lower rates, do not leach readily; thus, they are good for weed control in deep-rooted vegetation. They are often applied to the foliage, but may also be absorbed through the roots.

There are several factors that may affect the use and expected results of herbicide application in the environment. Some of the main factors include the following:

- **Soil Type**: soils with high organic matter content may adhere to the active ingredient in herbicides, limiting their effectiveness. Applicators may often need to increase application rates for the best control of weeds on sites with organic soils. Soils with larger particles, such as sandy soil, require lower application rates whereas soils with high clay content require higher rates for best coverage.
- **Plant Surface Moisture**: if vegetation is too dry, herbicides may not spread evenly over the vegetation and to the vegetative parts where absorption is needed to be effective. If vegetation is too moist on the vegetative parts where absorption is needed, the herbicide may not be absorbed at the level needed to be effective. Herbicides work best when the vegetative surfaces are of a moderate moisture level.
- **Rain**: depending on the type of herbicide used, a rain event following too soon after herbicide application may cause the herbicide to wash off prior to being absorbed. This may result in herbicides being leached into the soils and transported off site. However, there are certain types of herbicides, such as granular forms or soil application forms, which require rain to release them or wash them down to roots to be absorbed.
- **Air Temperature and Humidity**: if temperatures are too hot, herbicides may breakdown too quickly before they can be transported to the site of absorption or before they are in contact long enough to be effective. Low temperatures may slow physiological processes in the plant, thus affect herbicide effectiveness. Humidity affects how plants grow—high humidity often causes plants to grow rapidly and is an optimal time for herbicides to be effective.
- **Wind**: herbicides should never be applied when wind speeds exceed 10 mph because herbicides can drift to non-target species. Even if some of the herbicide makes contact with the target weed species, it may not be at a high enough concentration to be effective.

How Pesticides Breakdown in the Environment:

- **Photodegradation:** the breakdown of pesticides by exposure to sunlight.
- **Microbial degradation:** the process in which microorganisms in soil use pesticides as food.
- **Chemical reactions with soils**: soil pH levels, temperature and moisture influence the rate and type of chemical reactions and breakdown that occurs in the soils. The products of these reactions are usually nontoxic and do not create new pesticide compounds.

<u>Understanding Pesticide Toxicity:</u>

Toxicity is estimated by testing animals at different dosages of the active ingredient and each of its formulations.

Acute toxicity is based on a single dosage of the chemical by exposure to the skin, breathing the vapors, and ingestion. The harmful effects to the test specimen through exposure by these three methods is acute toxicity and is expressed as *lethal dose 50* (LD_{50}) and *lethal concentration 50* (LC_{50}). This is the amount of active ingredient in the tested pesticide required to kill 50% of the test specimens under laboratory testing conditions.

When comparing LD_{50} and LC_{50} values, the lower the value of a pesticide, the less it takes to kill 50% of the lab specimens tested—which means the greater the acute toxicity is for the pesticide.

Signal words are used to identify toxicity categories for acute toxicity effects. Table 5 contains a list of the signal words used and their relative reference.

Table 5. Toxicity Signal Words

Herbicide Toxicity Category	Signal Word	Toxicity	Oral LD50 (mg/kg)	Dermal LD50 (mg/kg)	Inhalation LC50 (mg/L)	Eye Irritation	Skin Irritation
I	Danger - Poison	Highly toxic	0-50	0-200	0-0.2	Corrosive; corneal opacity not reversible within 7 days	Corrosive
II	Warning	Moderately toxic	>50-500	>200-2,000	>0.2-2.0	Corneal opacity reversible within 7 days; irritation persisting for 7 days	Severe irritation at 72 hours
III	Caution	Slightly toxic	>500-5,000	>2,000-20,000	>2.0-20	No corneal opacity; irritation reversible within 7 days	Moderate irritation at 72 hours
IV	None	None	>5,000	>20,000	>20	No irritation	Mild or slight irritation at 72 hours

Chronic toxicity of a pesticide involves long-term exposure to the active ingredient. The harmful effects occurring from this exposure are *chronic effects*. The following is a list of suspected chronic effects from long-term exposure to certain pesticides:

- Teratogenesis—birth defects
- Fetotoxic effects—toxicity to a fetus
- Oncogenesis—production of tumors
- Noncancerous—benign tumors
- Cancerous/Carcinogenesis—malignant tumors
- Mutagenesis—genetic changes
- Hemotoxic effects—blood disorders
- Neurotoxic effects—nerve disorders

Table 6 is a toxicology profile for some of the most common herbicides used on the Boise National Forest.

Table 6. Common herbicide toxicology profile

Toxicology	Transline Clopyralid	Weedar 64 2,4-D	Roundup Glyphosate	Escort Metsulfuron Methyl	Tordon 22K Picloram	Plateau Imazapic	Banvel Dicamba
Rainbow Trout (96 hr LC50)(mg/L)	103	250	>1000	>150	5.5-19.3	>100	28
Daphnia (96 hr L C50)(mg/L)	232	184	930	>12.5 (48 hr)	68.3	>100	100
Bio-accumulates	No	Np	No	No	No	No	No
Persistence in soil	40 days (moderate)	10 days (low)	47 days (moderate)	30 days (1-4 wks)(low)	90 days (20-300)(mod-high)	7-150 days (low-high)	7-42 days (low-mod)
Mobile in soil	No	Yes, but degrades rapidly	No	No	Yes	No	Yes

Most pesticide accidents can be traced to applicator carelessness or misuse. There are four main routes of entry for a pesticide to enter the human body through 1) the skin (dermal), 2) the lungs (inhalation), 3) the mouth, and 4) the eyes. For these reasons, it is required to wear personal protective equipment while working with and around herbicides.

<u>Standard management practices for applying herbicides to avoid or minimize adverse effects:</u>

- Herbicides will not be applied if wind speed exceeds 8 mph or less, depending on the herbicide label.
- Herbicides will not be applied if weather reports indicate rainfall will occur within 3 hours after application.
- Herbicides with non-aquatic labels will be applied **outside** a 100-foot riparian buffer zone (from high-water mark), except in Resource Areas of Concern identified by the National Marine Fisheries Service (NMFS), where the riparian buffer zone is 300 feet (from high-water mark). Herbicides with aquatic labels are approved to be applied inside the buffer zones, as well as below the high-water mark. Applications below the high-water mark will be managed within direction established by the EPA in accordance with the NPDES Pesticide General Permits issued to the Boise National Forest.
- Riparian zones will be spot treated with backpack sprayers and hand sprayers, or wipers.
- Application rates will be the minimum necessary to control target species.
- Sensitive plant species sites will be identified prior to herbicide application, no herbicide will be applied directly to sensitive plant species, and a 100-foot buffer will be maintained around the sensitive plant species.
- No more than one application of picloram in a treatment area will occur per year.

- Herbicide mixing sites must be farther than 100 feet from surface water, and 300 feet from surface water in NMFS Resources Areas of Concern areas. Motorized equipment must be placed on a hard surface that will not allow mix to flow in the direction of water. Hand equipment must be placed on a double layer of 5 .ml plastic sheets large enough to contain any spills.
- Applicators mix only those quantities of herbicides that can be reasonably used in a day. Any unused herbicide is stored in an herbicide locker.
- All application equipment will be maintained and calibrated at the beginning of the season and checked often during herbicide application operations throughout the season. Maintenance and calibration records will be kept, as required by the Boise National Forest's NPDES Pesticide General Permit.
- All pesticide applicators will be required to wear personal protective equipment.
- Dyes will be added to herbicide mixes so treated areas can be easily identified.
- Materials Safety Data Sheets and product labels will be reviewed prior to applications at the beginning of the season.
- A pesticide spill kit will be available on site while handling, mixing, and applying herbicides.
- Any areas that cannot be treated with herbicide before application begins at the site will be identified, and all applicators will be made aware that the area needs to be avoided.
- All treatments will be included in a Pesticide Use Proposal (PUP) before herbicide application occurs for the year.
- Herbicide treatments will be coordinated with District employees who may be working in or around the area the same day.
- Cleaning of all chemical storage, mixing, and post-application equipment will be ensured and completed in such a manner as to prevent the potential contamination of any RCA, or perennial or intermittent waterway with non-aquatic labeled herbicides.
- The Boise National Forest Pesticide Discharge Management Plan (PDMP) will be readily available during all field applications.
- All pesticide applications will be in accordance with the Boise National Forest's Pesticide General Permits, IDG87A500 (for all areas outside NMFS Resources of Concern) and IDG87A596 (for all areas inside NMFS Resources of Concern).

Table 7 depicts the Aquatic Level of Concern Assessment for some of the common herbicides used on the Boise National Forest.

Table 7. Aquatic Level of Concern Assessment

Active Ingredient	Product Name	Typical Application Rate (lbs AI/ac)	Max Label Application Rate (lbs AI/ac)	EEC (ppm)	Toxicity 96-hour LC50 (mg/L)	Safety Factor 1/20 LC50 (mg/L)	Species Tested	Risk Quotient and Level of Concern
Clopyralid	Transline	.15 lbs AI/ac to 0.5 lbs AI/ac	0.5	0.184	103	5.2	Rainbow Trout	28 Low
2,4-D amine	Amine 4, Weedar 64	2 lbs AI/ac or less	3.0	1.103	250	12.5	Rainbow Trout	11 Low
Glyphosate	Roundup	1.5 lbs AI/ac or less	3.75	1.379	1000	50	Rainbow Trout	36 Low
Metsulfuron-methyl	Escort	1 oz AI/ac or less	2.0 oz	0.046	150	7.5	Rainbow Trout	163 Low
Picloram	Tordon 22K	1 lb AI/ac or less	1.0	0.368	19.3	0.965	Rainbow Trout	2 Moderate
Imazapic	Plateau	0.16 lbs AI/ac or less	0.75	0.276	100	5.0	Rainbow Trout	18 Low
Dicamba	Banvel	1 lb AI/ac or less	2.0	0.735	28	1.4	Rainbow Trout	1.9 Moderate

Herbicide Background—Laws and Requirements:

The herbicides that will be used in the Clear Creek Project area for noxious weed control are registered with the United States Environmental Protection Agency (EPA). Several federal agencies administer pesticide laws and require all pesticides to be registered before they can be sold or used in the United States.

Both the United States Congress and the Idaho Legislature have enacted legislation regulating the production, transportation, sale, use, and disposal of all pesticides. The most prominent pesticide law is the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), which is overseen by the EPA.

The Idaho Pesticide Act of 1976, as amended, is the major state regulatory law and is administered by the Idaho Department of Agriculture (ISDA). Rules and regulations relating to pesticide use and chemigation for Idaho originate from this act.

When an herbicide is registered by the EPA, it means the product has been tested by the manufacturer and all required criteria are met. The test data must show that the intended use(s) of the product will not create unreasonable risks.

In addition to the test data, the manufacturer must submit a label that includes special information on how to properly use the herbicide. Labels contain information on the proper administration of each herbicide including: ingredient list; chemical name; common name; type of herbicide; net contents; name and address of manufacturer; EPA registration number; precautionary statements; directions for use, storage, and disposal; mixing and application rates; approved uses and inherent risks of use; and limitations of remedies.

The EPA grants Section 3 registrations to herbicide products after all data and tests fully satisfy the requirements for federal registration, which could take anywhere from 3 to more than 7 years to complete.

All pesticides used on the Boise National Forest for vegetation management have been evaluated for risks to human health and the environment. These risk assessments are available for review from the Forest Health Protection Unit of USFS State and Private Forestry.

Pesticide application on the Boise National Forest is completed by employees who are certified pesticide applicators, or directly supervised in the field by a certified pesticide applicator. Certified pesticide applicators have completed training programs pertaining to the principles of proper handling and use of pesticides. In order to maintain a certification for pesticide application, applicators are required to complete continuing education programs (credits) throughout their careers.

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Appendix F:

Programmatic Culvert Replacement Biological Assessment and Biological Opinion Requirements

Becker Integrated Resource Project

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D. Construction Methods and Design Features

This section describes construction phases and design parameters generally necessary to complete projects in the activity categories and design features specific to typical construction activities and represent typical actions required for implementation of programmatic activities. These methods and measures are designed to minimize potential detrimental effects to listed fish species, critical habitat, and Essential Fish Habitat (EFH) and will be incorporated into project design and implementation by the PDT. All measures should be incorporated into design and implementation, unless there are alternatives for accomplishing the underlying objectives of the measure and alternatives are accepted by the PDT. Based on site-specific conditions and activity category, the phases, methods, and timing may vary to more effectively meet the goals of stream simulation. Variations in design features will involve the Level 1 Team and PDT input, to ensure that adverse effects to listed species, stream channels, and aquatic habitats are minimized.

Many streams have invasive aquatic species such as the New Zealand mudsnail and whirling disease. Many of these species are practically invisible to the naked eye and nearly impossible to detect if attached to heavy equipment. Projects in streams known or suspected to contain non-native, invasive, or competitive fish species (*e.g.*, brook trout) that would not facilitate expansion into occupied bull trout habitat, will require evaluation by the PDT during project planning.

Site Preparation

Site clearing, staging areas, access routes, and stockpile areas will be recommended by the PDT in order to minimize disturbance, reduce impacts to riparian vegetation, and minimizes the potential erosion into stream channels.

Riparian buffers will avoid the potential for delivery of sediment or contaminants to streams. Buffers of different widths may be recommended for different activities such as site preparation, equipment work areas, equipment staging areas, equipment fueling and maintenance areas, earthmoving, and stockpile areas, depending on the level of protection necessary. Site specificity and the level of protection necessary will be evaluated by the PDT, and will take into account, but may not be limited to the following; presence of listed species, flow regime, floodplain width, riparian characteristics, stream size, valley shape.

- Install sediment barriers (*e.g.* silt fences, weed free straw bales, sandbags, etc...) around disturbed areas (*e.g.* stockpile and staging areas) to minimize the potential for sediment delivery into stream channels and road ditches.
- Riparian buffers will be designated and flagged.
- Trees that are removed in order to facilitate structure placement, will be stockpiled for use in stream channel or floodplain rehabilitation or maintenance.
- A supply of surplus sediment barriers will be kept on hand, to respond to unanticipated events that have the potential to deliver sediment to stream channels.
- Boundaries of staging areas, stockpile areas, and other locations where impacts might be anticipated will be designated and flagged.

- Existing disturbed areas, such as road prisms, will be utilized whenever possible.
- Areas of minimally sufficient size would be cleared if staging or stockpile areas do not exist.

Fish Avoidance

A fisheries biologist will conduct, or direct, a survey of the project location during project planning and also prior to implementation, in order to determine if ESA-listed fish species inhabit the project area. The fisheries biologist or designee will also conduct clearing operations. Once evaluations and operations are completed, it is not necessary for a fisheries biologist to be on site during following activities, although it is encouraged. Passive movement of fish can usually be achieved by slow dewatering in steeper channels. Should active removal methods be warranted, such as electrofishing, netting or seining, depending on local site conditions, a fisheries biologist will clear the area, to the best of their abilities, before site is dewatered.

- All projects will be conducted during low flow conditions, to minimize effect to or delay movement of ESA-listed species.
- Should ESA-listed fish species be observed at the project location during planning, consider appropriate removal actions to clear the area.
- Conduct pre-work survey, within 1 week prior to project implementation. Should listed fish be observed at site, or 600 feet downstream, which would be affected by project actions, determine appropriate methods (passive or active) for removing fish.
- Should migrating or spawning listed fish, or redds of listed fish species be observed within the project area during implementation, or 600 feet downstream of the project area, consult the Level 1 team for an appropriate course of action or initiate emergency consultation.
- Handling of fish will be conducted by or under the direction of a fisheries biologist, using methods directed by the following; NMFS Guidelines for Electrofishing Waters Containing Salmonids Listed Under the Endangered Species Act (Appendix E), Idaho Department of Fish and Game Scientific Collection Permit (or Montana, Washington, or Nevada equivalent), or NMFS steelhead collection permits, if applicable.

Dewatering

In most cases, project design will call for dewatering which typically consists of a pipe or side-channel diversion to carry diverted streamflow from a diversion point around the project site to a location downstream of the project site and the diversion structure may act as a temporary barrier to fish passage. It may be necessary to have temporary equipment access through the riparian area to the site of the dewatering structure. If a lined channel, rather than a pipe or side-channel diversion is used for dewatering, excavation would be required from the diversion point, through the floodplain, and down to a re-entry point below the project site.

The dewatering structure is typically a temporary dam built just upstream of the project site with rock or sand bags filled with clean gravel, covered with plastic sheeting. A portable bladder dam or other diversion technologies constructed of non-erodible material may be used to contain stream flow; however, mining of stream or floodplain rock cannot be used for

diversion dam construction. In many cases, a pipe carries diverted streamflow from the diversion dam, around the project site, to a location immediately downstream of the construction zone. The length of the dewatered stream channel varies, depending on the width of the road prism at the crossing. Fish may be allowed to move downstream through the diversion, when it is determined that entrapment will not occur. The access to the stream edge and diversion construction may impact a narrow cross section of riparian area, removing vegetation and exposing bare soil to erosion

Within-channel rerouting may occur when the stream channel is wide enough to accommodate rerouting within the active channel, at low flows, and the diversion path, which may include a pipe or one side of the existing channel, is essentially non-erosive. This method is typically associated with the construction of open-bottomed arches and bridges. The length of stream reroute will vary, depending on the width of the road prism at the stream crossing.

- Project sites will be dewatered and completely bypassed prior to excavation.
- Dewatering will be accomplished slowly to capture and move stranded fish and other aquatic organisms to the extent possible.
- Pumps will have a fish screen installed, and operated and maintained in accordance with NMFS fish screen criteria (Appendix F)
- Diversion dams will not be constructed with material mined from the stream or floodplain.
- Prior to constructing a water diversion, a fisheries biologist will conduct or direct an inspection of the stream and identify the appropriate means necessary to minimize the potential for fish to enter a constructed diversion and associated dewatering conveyance.
- Flow diversion around project site will be constructed using non-erodible material, such as a pipe, plastic to line a channel, or revegetated abandoned stream channel of appropriate size to accommodate peak flows that may be expected during construction may be used (including storm events).
- If streamflow is rerouted to one side of the existing channel, diversion structures, such as sandbags, cofferdams, or portable bladders constructed of non-erodible materials will be used
- Outflow will be directed to an area that minimizes or prevents erosion.
- If diversion inlet is not screened, the diversion outlet will be placed in a location that facilitates safe reentry of fish into the stream channel.
- If appropriate, water from the dewatering activities may be pumped to a temporary storage/treatment site, or into upland areas, and allowed to filter through vegetation prior to water reentering the stream channel.
- If a diversion channels is excavated, material will be stored at designated stockpile areas, for use in rehabilitating the excavated channel.

Construction and Earthmoving Activities

Stream simulation objectives mimic natural stream processes at a culvert removal site or at a stream crossing within a culvert, open-bottom arch, ford, or under a bridge. Fish passage, sediment transport, and flood and debris conveyance, within the structure, will imitate the stream 18 conditions upstream and downstream of the crossing, as close to natural conditions as the structure type allows (i.e. stream simulation). Stream simulation requires a high level

of integration among specialists and requires input from the Project Design Team. Examples of stream simulation parameters are provided in the San Dimas Stream Simulation Design Training Manual (USDA FS 2004).

Machinery would typically operate from the road fill and only cross streams at dewatered areas, temporary bridges, or at designated temporary crossings. Earthmoving activities within the active stream channel would typically occur within a dewatered segment. In typical earthmoving activities associated with these actions, road fill is excavated around the crossing to just above the wetted perimeter in preparation for dewatering, although dewatering is sometimes conducted before excavation. Excavating equipment typically works from the road fill without disturbing water flow or side-casting material into stream channels. Implementation of the following measures will minimize effects to ESA listed fish species.

Additional sediment or erosion barriers may be recommended by the PDT once construction commences. These could include Sedimat, straw bale retentions, and off-channel sediment settling ponds. In-channel sediment abatement barriers will capture sediment that is liberated during re-watering of dewatered channels, barriers will be removed, and captured sediment will be disposed of so it is not reintroduced into stream channels. Such barriers will be maintained throughout the related construction and removed only when construction is complete and erosion control is assured.

Grade control treatment may be included in project design based on site limitations (i.e. channel slope or bed material type), material availability, economics, land use, design competence or familiarity, and/or regulatory restrictions. Treatment alternatives that control grade so that incision is prevented (Castro 2003) can include large roughness element grade controls, rock and log weir grade controls, constructed step-pool and cascade grade controls, and sizing the culvert to contain the floodplain.

Removal of culverts involves removal of road fill immediately associated with existing culverts and is completed entirely within the dewatered work area. Road fill would be removed and stored at a designated stockpile site or hauled to a permanent waste area. At this point, the culvert would be removed, and the remaining material would be excavated down to streambed elevations. Excavation widths would vary depending on whether the culvert would be removed or replaced with a bankfull culvert, open-bottom arch, bridge footings, or trail ford. Excavating equipment would typically work from the road fill and cross the stream within the dewatered area or at a designated stream crossing. Excess groundwater may be removed from the work area by pumping to a settling area before discharging back into any water body. Headwalls may be applied to the culvert, arch, and bridge construction phases, outside of bankfull widths. Riprap placement for structure protection, and where needed to achieve passage objectives and maintenance of channel features, would be approved by the PDT. Concrete may be poured to provide bedding for squashed culverts in some instances**.**

Construction methods for open bottom arches typically include excavation of footing locations for either poured-in-place or pre-cast footings. Placement of forms or pre-cast footings, followed by pouring and curing of concrete would generally occur next. After substrate is placed, the arch is assembled and attached to the concrete footings.

Bridge construction, depending on design, may include the following: placement of substrate material and fill-slope riprap, beam placement, grout seam, build deck, form curbs, place guardrails and approach rails, and paving.

The stream channel and road fill down to the construction elevation would be exposed to potential erosion. Small amounts of sediment may be discharged into the stream, resulting in increased turbidity. However, mitigation measures will be implemented to minimize sediment delivery to the maximum extent possible. The stream channel and road fill down to the channel bed or construction elevation will be exposed to potential erosion.

- All projects will be conducted during low flow conditions, which typically occur from late summer through fall, to minimize effect to or delay of movement for ESA-listed species
- All in-stream and channel rehabilitation activities will be completed within one work season
- Prior to construction activities any visible plants, mud and dirt will be removed by washing machinery and equipment, well away from project area and will be dried thoroughly after decontamination.
- Conduct excavation with minimal impact to the active stream channel.
- Excavated material will be stored in designated stockpile areas.
- Waste material will be staged in designated locations or end hauled to approved disposal site.
- Machinery will operate from the road fill and cross streams at dewatered areas, temporary bridges, or at designated temporary crossings.
- Machinery, equipment, and materials will be stored in the staging areas, when not in use.
- In the event of local precipitation events or high flows, all project operations will cease, except efforts to minimize storm damage or excessive erosion,
- Native materials (*e.g.* substrate, riparian vegetation, rock, woody debris) excavated on-site, will be conserved and stockpiled for later use in channel reconstruction, filling of culverts, or other site rehabilitation and will be kept separate from other stockpiled material which is not native to the site.
- Stream channel and floodplain will be reconstructed in a manner which matches channel dimension, pattern, and profile for the stream type above and below the crossing.
- Large wood and/or boulders may be placed in the reconstructed stream channel and floodplain where natural conditions possess these attributes.
- Structure width shall be greater than or equal to the bankfull channel width (NMFS 2008; Bates 2003).
- Structure will be designed to accommodate general bed shape, channel forms, and elevations.
- Design crossings to accommodate at least 100-year flows, facilitate sediment and debris movement, and other valley and floodplain processes

- Simulate bed material and structure, bankfull cross-section, and slope of the natural channel to provide diverse avenues for passage by aquatic organisms.
- Design velocity, roughness and slope for swimming abilities of appropriate species
- Provide for wildlife and other AOP as necessary, to provide for overall ecological connectivity
- Decommissioning of routes will remove the former roadway or trail (including any imported road base), re-establish natural topography and drainage to the extent possible, incorporate available organic material, and in general, apply methods that accelerate site restoration and discourage unauthorized use.
- Equipment and vehicles will have all plant parts, soil, and other materials that may carry noxious weed seeds removed prior to entry onto the project site
- Equipment will be inspected for other undesirable aquatic organisms (aka aquatic nuisance species)
- Erosion control materials will be certified weed free in order to prevent the spread of noxious weeds.

Culverts and Open Bottom Arches

- Culverts would then be embedded with appropriate substrate from offsite locations, or suitable material would be used from a project stockpile.
- Properly sized and sorted substrate would be placed and compacted in lifts inside the culvert to the designed height.
- Culverts will be embedded at 20% or more, so that the stream bed at the widest part of the culvert and deep enough to account for scour, grade adjustments, footings, and bed integrity.
- Culverts will be designed to sufficient length to avoid fill failures or chronic erosion from fill.
- Infill material will consist of suitable material from a project stockpile, or may be hauled from an offsite location, provided the material is of similar characteristics of project site.
- Properly sized substrate will be placed and compacted in thin lifts to the required height within the footings.
- Fill will be placed in thin lifts or layers around structures, when reconstructing the road prism.

Language from the Biological Opinion

2.8.3 Reasonable and Prudent Measures

The Service concludes that the following reasonable and prudent measures (RPM) are necessary and appropriate to minimize the take of bull trout caused by the proposed action.

1. Minimize incidental take and site disturbance by appropriate consideration of alternative project designs and implementation methods during the streamlining process.

2. Minimize incidental take that occurs as a result of programmatic project implementation.
3. Establish a monitoring program on each Forest or Bureau District to confirm that projects implemented under this Program are meeting objectives of the programmatic consultation and are also not exceeding the amount and/or extent of take from permitted activities.

2.8.4 Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the Act, the Forest Service and Bureau of Land Management must comply with the following terms and conditions, which implement the reasonable and prudent measures described above:

1. To implement RPM #1 the Forest Service, Bureau, and Corps shall ensure the Project Design Team (PDT) seeks input and agreement from Level 1 Teams during design process and during pre-project reviews. The PDT shall remain flexible in the design process in order to adapt to various and unique site conditions and ensure the likelihood that completed projects meet programmatic objectives.
2. To implement RPM #2 the Forest Service, Bureau, and Corps shall ensure the following.
    a. Implement the following best management practices in addition to implementing all programmatic activities consistent with the project design criteria, activity types, and mitigation measures presented in the proposed action.
        1. Determine, based on site characteristics, whether or not reducing stream flow in order to passively move fish out of the construction site prior to electroshocking would reduce the potential for take of bull trout associated with electroshocking. Prioritize this passive movement of fish as appropriate.
        2. Electroshocking (where utilized) will be conducted with a three pass method to ensure the greatest level of fish salvage unless previously approved by the appropriate Level 1 Team to perform more or fewer passes.
        3. Ensure that holding conditions for any transported fish provide the lowest level of stress to captured individuals by ensuring the availability of cold, well oxygenated water in holding vessels, minimizing holding time, and avoiding any predation in holding vessels. To avoid predation consider separate holding vessels for different age classes.
        4. While block nets are set, inspect them regularly for fish and remove any living to an area far enough away from the crossing to avoid additional impingement risk.

5. Stream dewatering is not expected to last more than two weeks. If site specific conditions require dewatering and diverting the stream channel for longer than two weeks, Level 1 Teams shall be consulted to determine if additional measures are necessary to ensure that project effects are within those described in this Opinion.
6. For projects in bull trout spawning and rearing habitat, if in-stream work is required, in-stream work shall be completed by August 15th and in-stream work may not commence in the spring until May 1, to avoid potential effects to spawning bull trout, eggs, alevins, and fry. If site specific information and rationale (attached to the pre-project checklist) shows that these time frames can be adjusted without additional harm to bull trout, the Level 1 Team has the discretion to do so. Rationale for work in spawning areas in the spring prior to May 1 should also include site specific survey data that indicates bull trout did not spawn there the previous year.

b. The guidelines found at http://swr.nmfs.noaa.gov/pdf/Treated%20Wood%20Guidelines-FINALClean_2010.pdf (NOAA 2010) shall be used for any installation of treated wood if copper or creosote-based treatments are used. For other treated wood products, adhere to guidelines and BMPs in "Preservative-Treated Wood and Alternative Products in the Forest Service" (USFS 2006) and the Western Wood Preservers Institute "Best Management Practices for the Use of Treated Wood in Aquatic Environments" (1996).

c. Survey all proposed ford sites prior to design and implementation to evaluate the stream for potential bull trout spawning habitat and to ensure project design does not promote spawning at or immediately downstream of the proposed ford site.

d. Provide Level 1 Teams with a written rationale statement (attached to pre-project checklist) supporting any determination that overall impacts to stream channels will be reduced at crossing sites proposed for conversion to a ford.

e. If a temporary crossing is needed, the PDT will ensure that the designated temporary crossing area minimizes effects to fish and critical habitat.

    1. Provide Level 1 Teams with a written rationale statement (attached to the pre-project checklist) as to why the temporary crossing is necessary and what steps are being taken to ensure effects are minimized.
    2. The area shall be cleared of fish prior to equipment crossing, and the block nets will removed immediately after equipment crosses.
    3. Minimize the frequency of crossings by equipment: Only allow equipment and vehicles to cross that are absolutely necessary.
    4. Width of temporary crossings will be approximately 14 feet wide, the average road width of Forest Service roads.

3. To implement RPM #3 the Forest Service, Bureau, and Corps shall ensure the following.
   a. All captured, handled and killed ESA-listed fish shall be identified, counted, and reported on the 'post-project checklist' (Appendix A).
   b. The Action Agencies will implement a suspended sediment/turbidity monitoring program. Under the monitoring plan a reasonable sample of projects implemented under this consultation will be assessed to assure that the incidental take associated with suspended sediment and exempted in this Opinion has not been exceeded. At a minimum, 25 percent of projects completed under this Program will have monitoring completed that assesses the duration and intensity of turbidity. Monitoring can be adjusted as needed, but should consider the following recommendations.
      1. Monitoring should occur above the site once for reference conditions before the project begins and prior to stream re-watering.
      2. Monitoring should occur below the construction site where the bypass or stream diversion enters the stream and 600 feet below the site. Alternative sites may be chosen if 600 feet is excessive for a particular site.
      3. Measurements shall be recorded at the following times: (a) Prior to re-watering the stream, and (b) every 30 minutes after re-watering for 4 hours or until turbidity decreases to background.

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Appendix G

Detailed Schematics of Proposed Trailhead Facilities

Becker Integrated Resource Project

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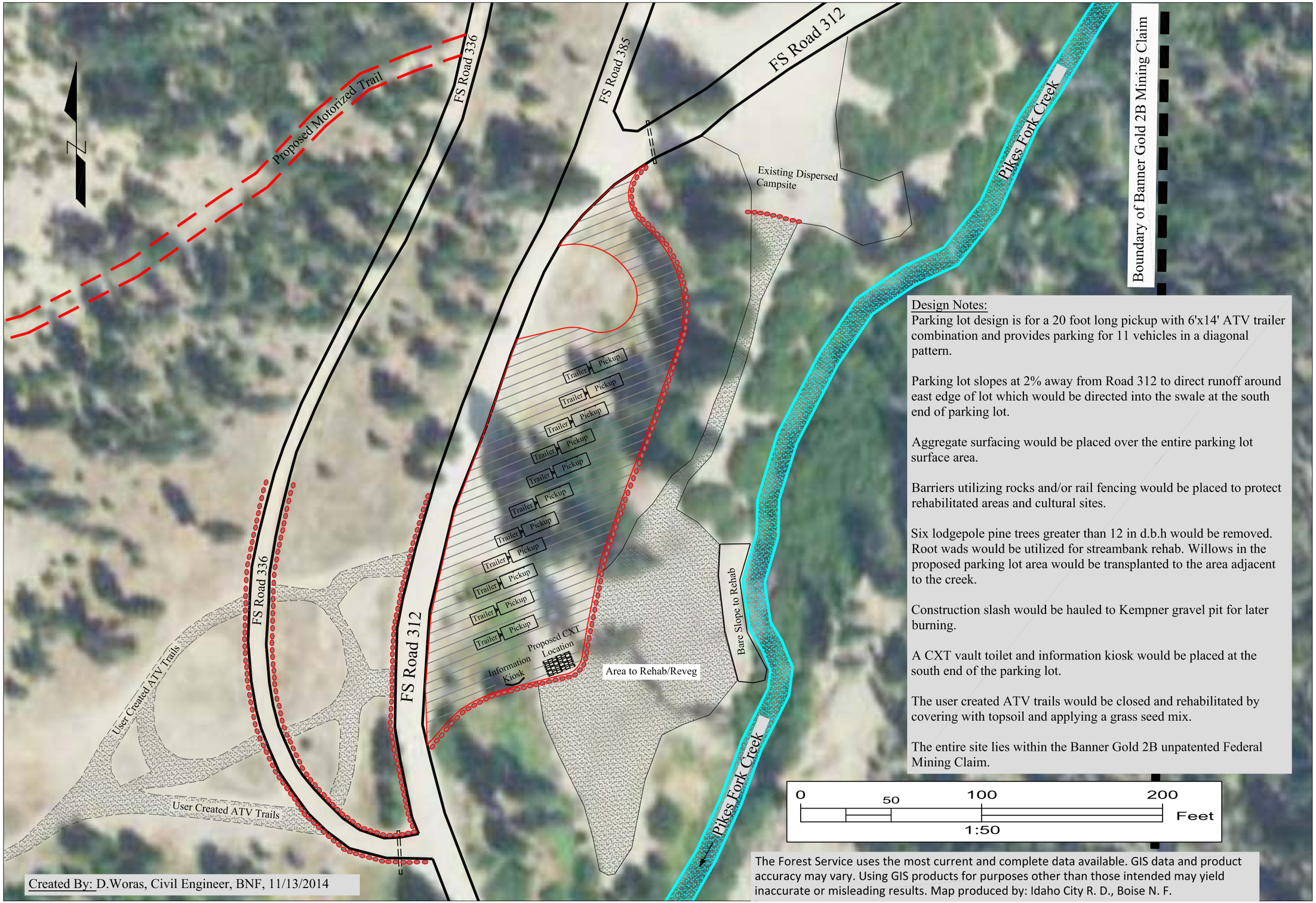


Design Notes:

Parking lot design is for a 20 foot long pickup with 6'x14' ATV trailer combination and provides parking for 11 vehicles in a diagonal pattern.

Parking lot slopes at 2% away from Road 312 to direct runoff around east edge of lot which would be directed into the swale at the south end of parking lot.

Aggregate surfacing would be placed over the entire parking lot surface area.

Barriers utilizing rocks and/or rail fencing would be placed to protect rehabilitated areas and cultural sites.

Six lodgepole pine trees greater than 12 in d.b.h would be removed. Root wads would be utilized for streambank rehab. Willows in the proposed parking lot area would be transplanted to the area adjacent to the creek.

Construction slash would be hauled to Kempner gravel pit for later burning.

A CXT vault toilet and information kiosk would be placed at the south end of the parking lot.

The user created ATV trails would be closed and rehabilitated by covering with topsoil and applying a grass seed mix.

The entire site lies within the Banner Gold 2B unpatented Federal Mining Claim.

Created By: D.Woras, Civil Engineer, BNF, 11/13/2014

The Forest Service uses the most current and complete data available. GIS data and product accuracy may vary. Using GIS products for purposes other than those intended may yield inaccurate or misleading results. Map produced by: Idaho City R. D., Boise N. F.

U. S. Department of Agriculture
FOREST SERVICE
Boise National Forest
Engineering
REGION 4

DESIGN BY: D.Woras
CHECK: B.Barry
DRAWING BY: D.Woras
CHECK: B.Barry
DRAWING NUMBER:

Plan View of Pikes Fork Proposed Motorized Trailhead

Becker Integrated Resource Project

SHEET

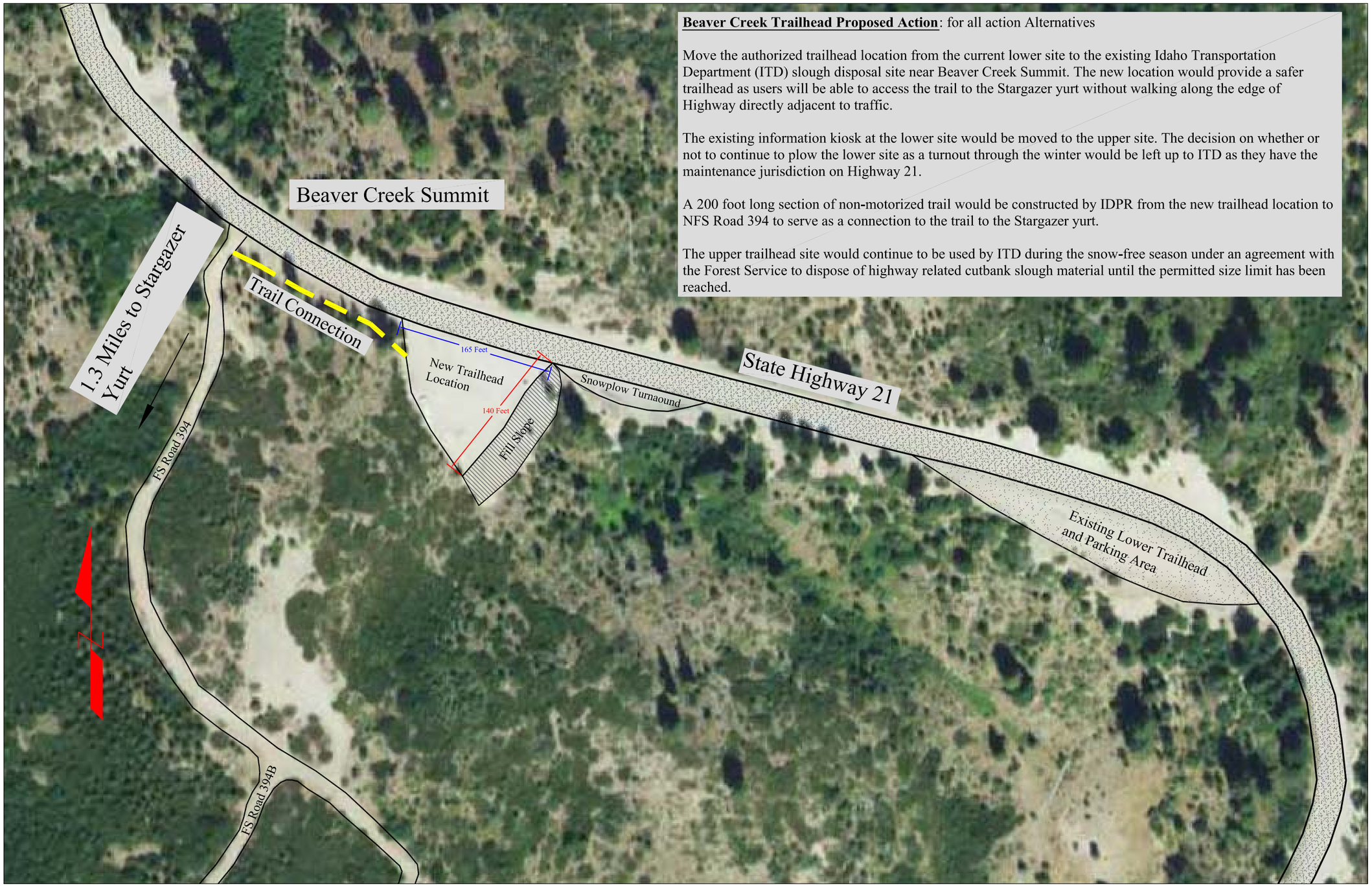
Beaver Creek Trailhead Proposed Action: for all action Alternatives

Move the authorized trailhead location from the current lower site to the existing Idaho Transportation Department (ITD) slough disposal site near Beaver Creek Summit. The new location would provide a safer trailhead as users will be able to access the trail to the Stargazer yurt without walking along the edge of Highway directly adjacent to traffic.

The existing information kiosk at the lower site would be moved to the upper site. The decision on whether or not to continue to plow the lower site as a turnout through the winter would be left up to ITD as they have the maintenance jurisdiction on Highway 21.

A 200 foot long section of non-motorized trail would be constructed by IDPR from the new trailhead location to NFS Road 394 to serve as a connection to the trail to the Stargazer yurt.

The upper trailhead site would continue to be used by ITD during the snow-free season under an agreement with the Forest Service to dispose of highway related cutbank slough material until the permitted size limit has been reached.



Created By: Dave Woras, Civil Engineer, BNF, 12/08/2014

0 50 100 200 Feet
1:100

The Forest Service uses the most current and complete data available. GIS data and product accuracy may vary. Using GIS products for purposes other than those intended may yield inaccurate or misleading results.
Map produced by: Idaho City R. D., Boise N. F.

U. S. Department of Agriculture
FOREST SERVICE
Boise National Forest
Engineering
REGION 4

DESIGN	BY:	D.Woras
	CHECK:	B.Barry
DRAWING	BY:	D.Woras
	CHECK:	B.Barry

DRAWING NUMBER:

Plan View of Beaver Creek Summit Proposed Trailhead Site

Becker Integrated Resource Project

SHEET

Appendix H:

Pikes Fork Trailhead Rehabilitation and Monitoring Plan

Becker Resource Integration Project

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The proposed new trailhead is adjacent to Pikes Fork (tributary to Crooked River) and is located in a previously disturbed site. Although Bull trout have not been detected (n-14) in Pikes Fork, this stream is US Fish and Wildlife Service (USFWS) designated critical bull trout habitat. Furthermore, the Bull Trout Recovery Plan identifies this creek as potential spawning and rearing habitat. The Becker Integrated Resource Project proposes to replace culverts that are currently barriers limiting access to spawning and rearing habitat. Restoring aquatic organism passage to reestablish bull trout populations is a priority objective for this creek.

Currently, riparian and instream conditions are degraded by dispersed uses, human foot traffic, and an unauthorized OHV ford which are eroding the streambanks and widening the stream at this location (Figure 1). Based on numerous field visits, the condition of this site is having localized and measurable/immeasurable negative effects on multiple Watershed Condition Indicators (WCI) (see sections 3.8 and 3.9 of the DEIS). This plan has been designed to rehabilitate current effects associated with the ongoing dispersed uses as well as mitigate potential effects expected from recreation uses under Alternatives B, C, D, and F. Implementing the restoration activities is expected to rapidly improve conditions in the temporary (0-3 years) and short-term (3-15 years) timeframes. Completion of the attached monitoring plan will validate if rehabilitation objectives and effects of the proposed trailhead are consistent with the analysis in this document over the long-term (>15 years) timeframe.

Rehabilitation objectives for riparian and stream conditions associated with the proposed Pikes Fork OHV Trailhead:

1. Streambank restoration along approximately 50 feet of Pikes Fork where streambanks are eroding and exposed soils are delivering sediment to the stream (Figure 2). This restoration will require reshaping the existing banks to reduce the bank angle and revegetation using willows, grasses, and sedges to increase bank cohesion.
2. Reshaping the trailhead parking area for appropriate drainage and blocking other access points to the stream with either barrier rock and/or riparian fencing throughout the site.

Before construction of the new trailhead can be implemented, rehabilitation of the previous disturbed site needs to be completed. Rehabilitation includes fencing along the Pikes Fork in the disturbed site and the new trailhead site, which should prevent human traffic and allow recovery of the streambank and streamside vegetation which are important to bull trout core habitat. Also, vegetation planting needs to occur in the disturbed site to expedite recovery of exposed soils near the streambank. In addition, the OHV crossing of Pikes Fork needs to be blocked to stop the negative effects of width/depth/max stream ratios associated with this crossing.

Figure 1. User-created ford across Pikes Fork Creek proposed to be blocked with fencing surrounding the riparian area.

Figure 2. Unstable stream bank proposed to be rehabilitated in conjunction with trail head construction

Monitoring Objectives:

The Forest will use the best management practices (BMP) monitoring evaluation for dispersed recreation uses (Rec B) from the National Core BMPs Program (USDA Forest Service 2012) to document site conditions for pre- and post-construction, as well as effectiveness of rehabilitation activities over time. These monitoring evaluations will be conducted every year for 3 years post-construction and then repeated once every 3 years. If monitoring results demonstrate degrading conditions over time, additional site management planning will be conducted to address impacts to aquatic/riparian resources.

The initial BMP monitoring evaluation conducted May 2015 is included in this appendix as Attachment A.

Pikes Fork Trailhead Monitoring Plan

Date: GPS Location:

Field Observer: Weather Conditions:

Distance from Trailhead to Pikes Fork:

Field Review Questions:

1. Specific to the trailhead facilities and implemented riparian and stream restoration activities, are there any unresolved maintenance needs to reduce impacts to water, aquatic, or riparian resources?
2. What is the condition of fencing along Pikes Fork?
3. Is there evidence of erosion or sedimentation along the Pikes Fork streambank?
4. In total, how many places do you observe erosion and sedimentation along the Pikes Fork streambank?
5. For all occurrences of erosion and sedimentation in Pikes Fork identified in question 4, what is the evidence? Select all that apply?
   a. Turbidity present
   b. Evidence of localized sediment deposition in the waterbody
   c. Changes to substrate composition
   d. Changes to waterbody geometry (width, depth, meander patterns, bank or bed slope, etc.)
   e. Streambank instability
   f. Streambank trampling or compaction
   g. Vegetation damage or bare ground
   h. Sheet erosion
   i. Rill erosion
   j. Gully erosion
   k. Slumping/slips
   l. Mass wasting
   m. Sediment plumes or accumulations
   n. Rutting
   o. Other
6. What are the sources (user-created trail, road or parking area, etc.)?
7. Are additional restoration activities needed to achieve riparian and instream rehabilitation objectives?

Attachment A:

Initial BMP Monitoring Evaluation

Becker Integrated Resource Project

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Best Management Practices Evaluation

Rec B. Dispersed Recreation Areas

(Reference BMPs Rec-1, Rec-3, and Rec-4)

DRAFT v2.1 January 2015

Header (2 pages)

1. Type of review being performed. Select one:

(Implementation) Effectiveness Both Implementation and Effectiveness

Follow-up Implementation Follow-up Effectiveness Follow-up Implementation and Effectiveness

2. If current review is for an initial evaluation of effectiveness only, what was the date of the implementation review for this site?

3. If current review is a follow-up evaluation, what was the date of the most recent evaluation?

4. Date of current field evaluation: 5/20/15

5. If this is a follow-up evaluation, describe all of the corrective actions that were applied to protect or improve water quality since the initial evaluation:

6. If this is a follow-up evaluation, describe all of the adaptive management actions that were applied to protect or improve water quality since the initial evaluation:

7. Reviewers and Titles: Brian Anderson - Hydrologist
Scott Brandt - Fish Biologist
Terry Hardy - Soil Scientist, Watershed Program Mgr.

8. Region number: 04

9a. Proclaimed Forest or Grassland number and name: Boise - 02

9b. Administrative Forest or Grassland number and name: Boise - 02

10. District number and name: Idaho City - D3

11a. Reason for monitoring. Select all that apply:

National BMP Targets Land Management Plan Monitoring (Project Review) Quality Assurance Other (specify):

11b. Was the project/site selected randomly from the pool developed using the National BMP Monitoring Program instructions that correspond to this form? Select one:

a. Yes
b. (No)

If No, describe the procedures used to select the project/site:

Selected because of ongoing planning efforts.

Best Management Practices Evaluation

11c. Will the project/site be evaluated using the procedures described in the National BMP Monitoring Program instructions that correspond to this form (e.g., evaluating the appropriate areas or transects, etc.)? Select one:

a. Yes
b. No

If No, describe the procedures that will be used to evaluate the project/site or how they will differ from the procedures in the instructions:

Site was evaluated based on observed impacts to document existing conditions and provide baseline information relative to proposed changes associated with planning efforts.

12. 6th level HUC number and name for the subwatershed this dispersed recreation area is in:

Pikes Fork 17050111 0503

13. Is any part of the dispersed recreation area that is being evaluated located within a municipal supply watershed?

Select one: Yes No

14a. Location.	14b. Location.	14c. Location.	15a. Location.	15b. Location.	15c. Location.
UTM Zone: 11 N UTM Datum: WGS 83	Easting: 614 22.8	Northing: 4870570	Latitude: 43.982258°	Longitude: -115.548084°	Lat/Long Datum:

16. Wet weather conditions during the field evaluation and the 24 hours before the evaluation. Select all that apply:

Rain Snow Snowpack on the ground Melting snow Hail/ sleet Freezing rain/ freezing fog Other (specify): Unknown

17. Name of area:

Pikes Fork

18. Dates this area is normally available for use (month to month):

May - November

19. Was this area used for a special event during the past 12 months?

Select one: Yes No

If Yes, give the name of event and dates of event:

20. What are the primary recreation uses at this area? Select all that apply:

Camping Swimming Picnicking Hunting Fishing Rock climbing Other (specify):

21. Are sanitation facilities available at this area?

Select one: Yes No

22. Approximate size of area (ac, ha, m^2 or ft^2; specify unit):

2 acres

23. Is any part of this area located within an AMZ? Select one: Yes No Waterbody has no designated AMZ

24. Distance from area to nearest waterbody (ft or m; specify unit):

0 ft, Pikes Fork Creek

25. Type of waterbody adjacent to the waterbody transect. Select all that apply:

Ephemeral stream Intermittent stream Perennial stream/river Pond Lake Wetland/ wet meadow Estuary Other (specify):

Best Management Practices Evaluation

Implementation (4 pages)

26. Are there any unresolved maintenance needs related to water, aquatic, or riparian resources that were identified for this dispersed recreation area prior to this evaluation? Select one:
    a. Yes
    b. No

    If Yes, what needs were unresolved?

    DRAINAGE, EXPANSION, ACCESS, STREAM BANK ENCROACHMENT OHV CROSSING CREEK, CHANNEL IS WIDENED / DEGRADED, FIREWOOD GATHERING

27. Does the operation and maintenance plan or other operation and maintenance guidance documents for this use area contain provisions for protecting water, aquatic, and riparian resources? Select one:
    a. Yes, the plan or other O&M guidance documents contain provisions for water/aquatic/ riparian protection (go to question 28)
    b. Plan or other O&M guidance documents exist for this area, but they do not contain provisions for water/aquatic/riparian protection (go to question 29)
    c. No operation and maintenance plan or other O&M guidance documents exist for this area (go to question 29)

28. Indicate if provisions to protect water, aquatic, and riparian resources in the list below that were included in the operation and maintenance plan or other O&M guidance documents were implemented fully during this operating season. Select one response in each line. If the provision exists in the operation and maintenance plan or other guidance documents and it was implemented fully, select "Yes". If the provision exists in the operation and maintenance plan or other guidance documents but it was not implemented fully, select "No". If the provision does not exist in the operation and maintenance plan or other guidance documents, or it is too early in the operating season to require implementation, select "Not applicable".

a.	Locations and spacings of cross drains on trails (e.g., waterbars)	Yes	No	Not applicable
b.	Cross drain techniques	Yes	No	Not applicable
c.	Trail grades	Yes	No	Not applicable
d.	Trail surfacing	Yes	No	Not applicable
e.	Trail locations	Yes	No	Not applicable
f.	Waterbody crossing techniques	Yes	No	Not applicable
g.	Mulching and/or seeding, or other soil cover techniques	Yes	No	Not applicable
h.	Locations and numbers of trash receptacles	Yes	No	Not applicable
i.	Trash receptacle maintenance	Yes	No	Not applicable
j.	Permanent sanitation facilities	Yes	No	Not applicable
k.	Temporary (portable) sanitation facilities	Yes	No	Not applicable
l.	Maintenance requirements for roads and access routes	Yes	No	Not applicable
m.	Maintenance requirements for parking areas	Yes	No	Not applicable
n.	Water supply/delivery system maintenance	Yes	No	Not applicable
o.	Invasive species control	Yes	No	Not applicable
p.	Other (specify): Not Applicable	Yes	No	Not applicable

For any provisions you answered "No", briefly explain how implementation is deficient:

29. Were inspections during this operating season performed at critical times for addressing water quality issues? Select one:
    a. Not applicable, no inspections were performed
    b. Yes
    c. No LOOKING AT DURING BEFORE PROJECT PLANNING

Best Management Practices Evaluation

30. If problems occurred during this operating season that affected or potentially may have affected water, aquatic, or riparian resources, were corrective actions taken to reduce or eliminate the problems? Select one:
    a. No problems occurred so no corrective actions were needed
    b. Corrective actions were needed but not taken
    c. Corrective actions were needed and implemented

31. Has the dispersed recreation area or portions of it been closed, or have restrictions been placed on use during the past 5 years to protect or restore water, aquatic, or riparian resources? Select one:
    a. Not applicable, no problems warranted closure or use restriction (go to question 33)
    b. Needed and closed or use restricted (go to question 32)
    c. Needed but not closed or use not restricted (go to question 33)

32. What length of time passed between when the problem was identified and the closure or use restriction was implemented? (days, weeks, months, or years; specify unit):

33. Were any treatments applied to this dispersed recreation area during the past 5 years to reduce negative impacts to water, aquatic, or riparian resources? Select one:
    a. Not applicable, no problems warranted application of treatments (go to question 35)
    b. Needed and applied (go to question 34)
    c. Needed but not applied (go to question 35)

    If applied, describe the treatments:

34. What length of time passed between when the problem was identified and the treatment was applied? (days, weeks, months, or years; specify unit): Not Applicable

35. Why was the area closed, use restricted, and/or treatments applied? Select all that apply:
    a. Not applicable, no closure, use restriction, or treatments applied during the past 5 years
    b. Trampled vegetation
    c. Soil compaction
    d. Sheet erosion
    e. Rill erosion
    f. Gully erosion
    g. Shoreline/bank erosion
    h. Road washout
    i. Washout in use area
    j. Water quality in waterbody
    k. Extreme precipitation/weather event
    l. Other (specify):

36. Were chemical or fuel spills or leaks, or dumping that occurred at this dispersed area during the past 5 years handled/treated according to the contingency and emergency response plan? Select one:
    a. Not applicable, the Forest or Grassland has no contingency and emergency response plan
    b. Not applicable, no spills, leaks, or dumping occurred during the last 5 years
    c. Yes, spills, leaks, or dumping were handled/treated according to the contingency and emergency response plan
    d. No, spills, leaks, or dumping were not handled/treated according to the contingency and emergency response plan

37. Are any corrective actions needed to improve implementation? Select one:
    a. Yes (go to question 38)
    b. No (go to question 39)

Best Management Practices Evaluation

38. Provide information about corrective actions needed to improve implementation, and reference the question number to which each correction applies.

- OHV CROSSING (FORD) NEEDS BLOCKED
- UNVEGETATIVE & UNSTABLIZED STREAMBANK NEEDS REPAIR
- EROSION CONTROL / REVEG. / RESTRICT ACCESS
- RECOMMEND FENCING AND SIGNING TO RESTRICT ACCESS
- PARKING AREA NEEDS MAINTENANCE (GRADING, SURFACING MATERIAL)

Best Management Practices Evaluation

39. Are any adaptive management actions needed to improve implementation? Select one:
    a. Yes (go to question 40)
    b. No (go to question 41 if effectiveness is to be evaluated at this time; otherwise go to General Comments)

40. Provide information about adaptive management actions needed to improve implementation, and reference the question number to which each action applies. Go to question 41 if effectiveness is to be evaluated at this time; otherwise go to General Comments after answering this question.

TAKE THE RECOMMENDATIONS FROM #38 AND IMPLEMENT, THEN MONITOR FOR A PERIOD OVER TIME.

Best Management Practices Evaluation

Effectiveness (5 pages)

41. Is there evidence of erosion or sedimentation along the waterbody transect from the use of this dispersed area? Select one; when multiple occurrences would yield different answers, select the most severe occurrence, with severity increasing from b to c.
    - a. No evidence of erosion or sedimentation (go to question 46)
    - b. Evidence of erosion or sedimentation, but not reaching the waterbody (go to question 43)
    - c. Evidence of sediment transport to or deposition in the waterbody, or evidence of changes to waterbody morphology (go to question 42)

42. How many total places do you observe erosion or sedimentation delivered to/present in the waterbody and changes to waterbody morphology? Select one:
    - a. 1 or 2
    - b. 3 or 4
    - c. 5 or more

43. For all of the occurrences of erosion and sedimentation in the area you identified in question 41, what is the evidence? Select all that apply:
    - a. Traceable evidence to the waterbody, but not currently visible in the waterbody
    - b. Turbidity present
    - c. Evidence of localized sediment deposition in the waterbody
    - d. Changes to substrate composition
    - e. Changes to waterbody geometry (e.g., width, depth, meander patterns, bank or bed slope, etc.)
    - f. Bank instability
    - g. Bank trampling or compaction
    - h. Vegetation damage or bare ground
    - i. Sheet erosion
    - j. Rill erosion
    - k. Gully erosion
    - l. Headcutting
    - m. Slumping/slips
    - n. Mass wasting
    - o. Sediment plumes or accumulations
    - p. Rutting
    - q. Water quality monitoring results ? BULP
    - r. Other (specify):

44. What are the sources? Select all that apply:
    - a. Dispersed camping area
    - b. Forest Service-created trail
    - c. User-created trail
    - d. Road or parking area
    - e. Other (specify): DISPERSED ACCESS TO STREAM (PUBLIC SWIMMING AREA)

45. What are the causes? Select all that apply:
    - a. Use is exceeding carrying capacity of the area
    - b. Inappropriate location of the use area
    - c. Inappropriate location of trails USER CREATED
    - d. Inappropriate trail design
    - e. Lack of trail maintenance
    - f. Insufficient number of trails to the waterbody
    - g. Too many trails to the waterbody
    - h. Watercraft use or wave action
    - i. Runoff from road or parking area
    - j. Other (specify):
    - k. Unknown

46. What evidence of trash or domestic animal or human sanitary waste exists along the waterbody transect? Select all that apply:
    - a. No evidence of trash or domestic animal or human sanitary waste (go to question 48)
    - b. Evidence of trash within the AMZ (go to question 47)
    - c. Evidence of trash in the waterbody (go to question 47)
    - d. Evidence of domestic animal or human sanitary waste/toilet paper within the AMZ (go to question 47)
    - e. Evidence of domestic animal or human sanitary waste/toilet paper in the waterbody (go to question 47)

Best Management Practices Evaluation

47. What are the causes? Select all that apply:
    a. Insufficient number of waste receptacles
    b. Waste receptacles not emptied frequently enough
    c. Use is exceeding carrying capacity of the area
    d. Insufficient number of toilet facilities
    e. Toilet facilities are not functioning properly
    f. Inconsiderate human actions
    g. Other (specify): NO SANITATION FACILITIES AVAILABLE

48. What is the total length of the waterbody transect? (ft or m; specify unit):

49. What percentage of the length of the waterbody transect has evidence of potential or current impacts to water quality? (percent):

    50 %

50. Is there evidence of erosion or sedimentation on or originating from the trails that connect the dispersed area to AMZs or waterbodies? Select one; when multiple occurrences would yield different answers, select the most severe occurrence, with severity increasing from c to e.
    a. Not applicable, no connecting trails (go to question 62)
    b. No evidence of erosion or sedimentation (go to question 56)
    c. Evidence of erosion or sedimentation outside an AMZ (go to question 52)
    d. Evidence of erosion or sedimentation within an AMZ, but not reaching a waterbody (go to question 52)
    e. Evidence of sediment transport to or deposition in a waterbody, or evidence of changes to waterbody morphology (go to question 51)

51. How many total places do you observe erosion or sedimentation delivered to/present in a waterbody and changes to waterbody morphology? Select one; after answering go to question 53:
    a. 1 or 2
    b. 3 or 4
    c. 5 or more

52. What is the shortest distance between the evidence and the waterbody? Select one:
    a. ≤10 feet
    b. >10 to 50 feet
    c. >50 to 100 feet
    d. >100 feet

53. For all of the occurrences of erosion and sedimentation observed within the area you identified in question 50, what is the evidence? Select all that apply:
    a. Traceable evidence to the waterbody, but not currently visible in the waterbody
    b. Turbidity present
    c. Evidence of localized sediment deposition in the waterbody
    d. Changes to substrate composition
    e. Changes to waterbody geometry (e.g., width, depth, meander patterns, bank or bed slope, etc.)
    f. Bank instability
    g. Bank trampling or compaction
    h. Vegetation damage or bare ground
    i. Sheet erosion
    j. Rill erosion
    k. Gully erosion
    l. Headcutting
    m. Slumping/slips
    n. Mass wasting
    o. Sediment plumes or accumulations
    p. Rutting
    q. Water quality monitoring results
    r. Other (specify):

54. What are the sources? Select all that apply:
    a. Dispersed camping area
    b. Forest Service-created trail
    c. User-created trail
    d. Road or parking area
    e. Other (specify):

Best Management Practices Evaluation

55. What are the causes? Select all that apply:
    a. Use is exceeding carrying capacity of the use area and/or trails
    b. Inappropriate location of trails
    c. Inappropriate trail design
    d. Lack of trail maintenance
    e. Insufficient number of trails to the waterbody
    f. Too many trails to the waterbody
    g. Other (specify):

56. What evidence of trash or domestic animal or human sanitary waste exists on or along the trails that connect the dispersed area to AMZs or waterbodies? Select all that apply:
    a. No evidence of trash or domestic animal or human sanitary waste (go to question 58)
    b. Evidence of trash outside an AMZ (go to question 57)
    c. Evidence of trash within an AMZ (go to question 57)
    d. Evidence of trash in a waterbody (go to question 57)
    e. Evidence of domestic animal or human sanitary waste/toilet paper outside an AMZ (go to question 57)
    f. Evidence of domestic animal or human sanitary waste/toilet paper within an AMZ (go to question 57)
    g. Evidence of domestic animal or human sanitary waste/toilet paper in a waterbody (go to question 57)

57. What are the causes? Select all that apply:
    a. Insufficient number of waste receptacles
    b. Waste receptacles not emptied frequently enough
    c. Use is exceeding carrying capacity of the area and/or trails
    d. Insufficient number of toilet facilities
    e. Toilet facilities are not functioning properly
    f. Inconsiderate human actions
    g. Other (specify):

58. How many trails were reviewed in this evaluation?

59. How many of the trails that were reviewed were user created?

60. What is the total length of trails evaluated? (ft or m; specify unit):

61. What is the total length of user-created trails evaluated? (ft or m; specify unit):

62. What evidence of chemical or fuel spills or leaks or associated waste containers exists at the area? Select all that apply:
    a. No evidence of chemical or fuel spills, leaks, or associated waste containers
    b. Evidence of chemical or fuel spills or leaks outside an AMZ
    c. Evidence of chemical or fuel spills or leaks within an AMZ
    d. Evidence of chemical or fuel spills or leaks in a waterbody
    e. Evidence of chemical or fuel waste containers outside an AMZ
    f. Evidence of chemical or fuel waste containers within an AMZ
    g. Evidence of chemical or fuel waste containers in a waterbody

63. Did any of the unresolved maintenance needs for this dispersed recreation area contribute to any observed problems? Select one:
    a. Not applicable, no unresolved maintenance needs existed for this area
    b. Yes
    c. No

64. If inspections were not conducted at critical times during this operating season, did the lack of administration contribute to observed problems? Select one:
    a. Not applicable, inspections were conducted at critical times
    b. Yes
    c. No

65. If the area was closed, use was restricted, and/or treatments were applied during the past 5 years to protect or restore water, aquatic, or riparian resources, were the desired results achieved? Select one:
    a. Not applicable; no area closures, use restrictions, and/or treatments applied during the past 5 years
    b. The desired result was fully achieved
    c. The desired result was partially achieved
    d. Essentially no improvement to the area was achieved
    e. Too soon to determine

66. Are any corrective actions needed to improve effectiveness? Select one:
    a. Yes (go to question 67)
    b. No (go to question 68)

Best Management Practices Evaluation

67. Provide information about corrective actions needed to improve effectiveness, and reference the question number to which each correction applies.

Best Management Practices Evaluation

68. Are any adaptive management actions needed to improve effectiveness? Select one:
    a. Yes (go to question 69)
    b. No (go to General Comments)

69. Provide information about adaptive management actions needed to improve effectiveness, and reference the question number to which each action applies. Go to General Comments after answering this question.

Best Management Practices Evaluation

General Comments

Appendix I:

Project-Specific Non-Significant Amendment and Corrections (i.e., Errata)

of

Boise National Forest

Land and Resource Management Plan

Becker Integrated Resource Project

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BACKGROUND INFORMATION

Proposed Amendments and Corrections

Amendments to Visual Quality standard 0763 in Management Area (MA) 07 of the Boise National Forest Land and Resource Management Plan (Forest Plan; USDA Forest Service 2010a) is proposed to both modify current requirements adjacent to Highway 21 and to add new visual quality requirements around the new motorized trail proposed to be designated in all action alternatives except Alternative E, around all non-motorized trails proposed to be authorized under all action alternatives, as well as from areas seen from the existing 5 yurts within or immediately adjacent to the project area.

Standards are binding limitations placed on management actions. Standards are typically action restrictions designed to prevent degradation of resource conditions, or exceeding a threshold of unacceptable effects, so that conditions can be maintained or restored over time. However, exceptions are made in some cases to allow temporary or short-term degrading effects in order to achieve long-term goals (e.g., SWRA Resources Standard #04). Standards must be within the authority and ability of the Forest Service to enforce. A project or action that varies from a relevant standard may not be authorized unless the Forest Plan is amended to modify, remove, or waive application of the standard.

Forest Service Visual Management System

The goal of landscape management on all NFS lands is to manage for the highest possible visual quality, commensurate with other appropriate public uses, costs, and benefits. Since the mid-1970s, the Forest Service has utilized the Visual Management System (VMS)[1] to measure the inherent scenic quality of any forest area and a measurement of the degree of alteration for use in inventory and management. Through the Forest Plan[2], the VMS continues to provide the Boise National Forest (Forest) with direction for management of the scenic environment.

Visual Quality Objectives and Distance Zones

Visual Quality Objectives (VQOs), as defined within the VMS, are measurable standards or objectives for the visual management of Forest lands. VQOs define how the landscape will be managed, the level of acceptable modification permitted in the area, and under what circumstances modification may be allowed. VQOs are defined as follows:

- Preservation—untouched environment, typically Wilderness
- Retention—not visually evident
- Partial Retention—visually subordinate
- Modification—visually dominant but harmonious
- Maximum Modification—dominant impact

[1] USDA Forest Service. 1974. National Forest Landscape Management. Vol. 2. The Visual Management System. Agricultural Handbook 462. Washington, DC: USDA Forest Service.
[2] USDA Forest Service. 2010. Boise National Forest Land and Resource Management Plan. Boise, ID: USDA Forest Service, Boise National Forest.

The project area includes all VQOs except **Preservation**. The Agricultural Handbook 462[1] provides the following definitions (for this proposal) for ***Retention, Partial Retention****, and* ***Modification*** VQOs[3][4]:

> *Retention: Results of management activities are not evident to the casual Forest visitor. The activity must be well integrated to blend nearly completely with the landscape or be screened. The vegetative clearings for ski runs and lifts…would not be visually evident to the casual Forest visitor. The clearings repeat form, line, and texture from the surrounding vegetative patterns to achieve the Retention quality objective.*
>
> *Partial Retention: Allows results of management activities to be visible, but not recognized as an unnatural occurrence and as a visual subordinate to the characteristic landscape. Activities may introduce form, line, color, or texture, which are found infrequently or not at all in the characteristic landscape, but they should remain subordinate to the visual strength of the characteristic landscape.*
>
> *Modification: Results of management activities may be seen and dominate the characteristic landscape, but they should repeat natural patterns of the surrounding area or character type so that they eventually appear as a natural occurrence. Activities which are predominantly introduction of facilities such as buildings, signs, roads, etc., should borrow naturally established form, line, color and texture so completely and at such a scale that its visual characteristics are compatible with the natural surroundings.*

In addition to proposed amendments to Visual Quality Standard 0763 discussed above, a correction will be completed to Forest Plan MA 07 to correct an error concerning Forest Plan objectives that were not included in this management area. As discussed below, this includes adding 5 new objectives in this management area and removing one objective from MA 08, which should have only been included in MA 07,

Objectives are concise time-specific statements of actions or results designed to help achieve goals. Objectives form the basis for project-level actions or proposals to help achieve Forest goals. Like goals, objectives are typically designed to maintain conditions if they are currently within their desired range, or restore conditions to their desired range if they are currently outside that range. The timeframe for accomplishing objectives, unless otherwise stated, is generally considered to be the planning period, or the next 10 to 15 years. More specific dates are not typically used because accomplishment can be delayed by funding, litigation, environmental changes, and other influences beyond the Forest's control.

[3] USDA Forest Service. 1974. National Forest Landscape Management. Vol. 2. The Visual Management System. Agricultural Handbook 462. Washington, DC: USDA Forest Service.
[4] USDA Forest Service. 2010. Boise National Forest Land and Resource Management Plan. Boise, ID: USDA Forest Service, Boise National Forest.

PROJECT SPECIFIC FOREST PLAN AMENDMENT AND CORRECTIONS

The following section first discloses the changes to existing Forest Plan management direction for visual quality management within MA 07. This is followed by the discussion concerning corrections to be made to MAs 07 and 08.

Mapped or adopted VQOs within the Project Area include **Retention**, **Partial Retention**, **Modification**, and **Maximum Modification**. The proposed VQO changes are project area-specific rather than wholly inclusive of the entire Forest segment of the Highway 21 scenic byway corridor. This narrowed focus is necessary because Forest-level VQO mapping can only occur at a broad scale (those that are currently mapped or adopted) and a more detailed project-level VQO analysis (or ground-truthing) occurs on a project-by-project basis. As noted in the VMS for the Forest, "The VQOs mapped in this inventory should never be regarded as infinitely complete, but rather as general guidance to be used and supplemented routinely. It is expected that during any project-level assessment, a perceptive observer will modify or refine the mapped inventory data to best reflect on-the-ground conditions."

The appropriate VQO for the foreground distance zone (defined as within 0.5 miles) of a primary travel route/scenic byway with an associated high level of adjacent recreational developments (including Project Area trailheads along State Highway 21, cabins, campgrounds, and yurts) is **Partial Retention** due to their relative/typical development levels compared to the natural characteristic landscape. These are further described above in Travel Routes and Use Areas.

Further recreational development was anticipated within and along this corridor in the 2010 Forest Plan:

Objective 0844*—Identify and evaluate opportunities along the Highway 21 corridor to improve recreation opportunities and experiences through additional parking, trails and trailhead facilities, and yurts, as well as improvements to existing recreation facilities.*

As described above, the existing and proposed level of development within this area, currently mapped as **Retention**, is completely compatible and consistent with the proposed **Partial Retention** VQO. Correcting these mapping errors through a VQO update will not affect how these sites are managed but will bring these sites into appropriate VQO compliance.

Per the Forest Plan as amended in 2010, all projects on the Forest shall be designed to meet the adopted VQOs as displayed on the Forest VQO map (USDA Forest Service 2010a). In conjunction with this analysis, the project IDT Landscape Architect analyzed existing developments within the Project Area and found several specific sites—Whoop-Um-Up, Banner Ridge, Lamar, and Gold Fork Trailheads; the Edna Creek and Whoop-Um-Up Campgrounds; the Whispering Pines, Stargazer, Banner, Elkhorn, Skyline, and Rocky Ridge Yurts; and the Beaver Creek Cabin—to be incompatible with the exiting inventoried VQO of ***Retention***, as defined below. The management and level of development of each of these sites are each fully conforming with a **Partial Retention** VQO.

Proposed Forest Plan Amendment #1

MA 7 VQO table (Table 1) associated with Forest Plan standard 0763 would be amended (bolded portion) to provide the following VQOs for the

- 23.3 miles of designated motorized trail for vehicle less than or equal to 50 inches width (all action alternatives, except Alternative E),
- 60.2 miles of authorized nonmotorized over-snow tail route miles (all action alternatives),
- 41.3 miles of authorized nonmotorized trails for non-snow period use**,** and
- Areas as viewed from the existing Whispering Pines, Stargazer, Skyline, Banner Ridge and Elkhorn yurts.

Black text is existing Forest Plan direction for recreation trails and roads within this Forest Plan management area, blue text is the proposed changes/additions for new motorized trails to be designated and existing non-motorized trails and yurt systems operated under a cost-share agreement with Idaho State Parks and Recreation (IDPR) to be authorized as an National Forest System (NFS) trail to allow for use of federal recreation dollars to support trail management per ongoing agreements with IDPR.

Table 1. Proposed Amendments to standard 0763 in the Forest Plan concern Visual Quality Objectives around visually sensitive areas. This table displays additions proposed and does not change the existing requirements in the Table displayed in Forest Plan Management Area 07

Standard	0763	Meet the visual quality objectives as represented on the Forest VQO Map, and where indicated in the table below as viewed from the following areas/corridors:

Sensitive Travel Route Or Use Area	Sensitivity Level	Visual Quality Objective								
		Fg			Mg			Bg		
		Variety Class			Variety Class			Variety Class		
			B	C	A	B	C	A	B	C
Forest Trails 051, 158, 197	1	R	R	PR	R	PR	PR	R	PR	M
Edna Creek, Black Rock Campgrounds	1	R	R	PR	R	PR	PR	R	PR	M
Forest Roads 312, 316, 327, 348, 384	2	PR	PR	M	PR	M	M	PR	M	MM
Forest Roads 315, 333, 351	2	M	M	M	M	M	M	M	M	MM
Forest Trails 048, 049, 166, 167, 168, 169	2	M	M	M	M	M	M	M	M	MM
Forest Trail 171	2	PR	PR	M	PR	M	M	PR	M	MM
Forest Trails, non-motorized summer: 700 - 730	2	PR	PR	M	PR	M	M	PR	M	MM
Forest Trails, non-motorized winter: 700-730	2	PR	PR	M	PR	M	M	PR	M	MM
Forest Trails, motorized summer:,731-769 [Not applicable to Alternative E]	2	M	M	M	M	M	M	M	M	MM
Yurts: Whispering Pine, Rocky Ridge, Stargazer, Skyline, Banner Ridge and Elkhorn	2	PR	PR	M	PR	M	M	PR	M	MM

Proposed Forest Plan Amendment #2

To further achieve Purpose #1 along Highway 21, MA 7 VQO retention requirements along Highway 21 identified in standard 0763 would be amended to allow for partial retention requirements for that section of the highway that fall between Banner Ridge south to Whoop-um Up trailhead. The retention requirement would continue to apply for all other sections along Highway 21 outside north and south of this segment of the highway in MA 7. Black text is existing, blue text is proposed change.

Standard	0763	Meet the visual quality objectives as represented on the Forest VQO Map, and where indicated in the table below as viewed from the following areas/corridors:

Sensitive Travel Route Or Use Area	Sensitivity Level	Visual Quality Objective								
		Fg			Mg			Bg		
		Variety Class			Variety Class			Variety Class		
		A	B	C	A	B	C	A	B	C
Highway 21, except as identified below from Banner Ridge South to Whoop-um Up Trailhead	1	R	R	PR	R	PR	PR	R	PR	M
Highway 21 from Banner Ridge South to Whoop-um Up Trailhead	1	PR	PR	PR	PR	PR	PR	PR	PR	M

Proposed Forest Plan Errata

The following management area objectives currently located in MA 8 should have also been included in MA 07, or in MA 07 only (see objective introduction below). Thus, the following updates to Forest Plan Management Area 7 direction would be completed as part of Alternative B.

MA 08, Recreation Objective 0844 should have been applied to both MA 7 and MA 8 based on the area/location description in the objective.

Objective	0770	Identify and evaluate opportunities along the Highway 21 corridor to improve recreation opportunities and experiences through additional parking, trails and trailhead facilities, and yurts, as well as improvements to existing recreation facilities.

MA 08, Recreation Objective 0841 should have been applied to both MA 7 and MA 8 based on the area/location description in the objective.

Objective	0771	Minimize conflicts between backcountry skiers and snowmobilers arising from increased winter recreation use in the upper Mores Creek/Pilot Peak area.

MA 08, Recreation Objective 0843 should have been applied to both MA 7 and MA8 based on the area/location description in the objective.

Objective	0772	Continue to coordinate with Counties (Boise/Elmore) and other groups related to grooming trails for over-snow activities to maintain these winter recreation opportunities.

MA 08, Recreation Objective 0845 should have been in MA 7 and not in MA8 based on the area/location description in the objective.

Objective	0773	Protect the groomed cross-country ski system from the Gold Fork parking lot to Beaver Creek Summit from damage by unauthorized snowmobile use.

MA 08, Recreation Objective 0850 should have been applied to both MA 7 and MA8 based on the area/location description in the objective.

Guideline	0774	Continue coordination with the State of Idaho on management of park-and-ski areas to maintain winter recreation opportunities.

POLICY AND ANALYSIS

As identified above, the corrections to objectives identified above was an error and thus is not being viewed as a Forest Plan amendment that needs to be considered in this policy and analysis section. Thus, the discussion below only pertains to the proposed amendments to VQOs along Highway 21 from Banner Ridge south to Whoop-um-Up trailhead.

Under the National Forest Management Act (NFMA, 16 USC 1604(f)(4)), forest plans may "be amended in any manner whatsoever after final adoption and after public notice, and, if such amendment would result in a significant change in such plan, be in accordance with subsections (e) and (f) of this section and public involvement comparable to that required by subsection (d) of this section."

As required in the 2012 National Forest Land Management Planning Rule implementing the NFMA:

- *"Projects and activities authorized after approval of a plan, plan amendment, or plan revision must be consistent with the plan as provided in paragraph (d) of this section" (36 CFR 219.15(b)).*
- *"When a proposed project or activity would not be consistent with the applicable plan components, the responsible official shall take one of the following steps, subject to valid existing rights:*

  (1) Modify the proposed project or activity to make it consistent with the applicable plan components;
  (2) Reject the proposal or terminate the project or activity;
  (3) Amend the plan so that the project or activity will be consistent with the plan as amended; or
  (4) Amend the plan contemporaneously with the approval of the project or activity so that the project or activity will be consistent with the plan as amended. This amendment may be limited to apply only to the project or activity." (36 CFR 219.15(c))

As identified above, the Forest Plan will be amended for that portion of Highway 21 that is located within project area only. For the portion of Highway 21 between Banner Ridge and Whoop-Um-Up trailhead, the change in VQOs under Standard 0763 will remain in effect from the remainder of the planning period; revision of the Forest Plan is anticipated to be initiated in 2018–2020.

As required at 36 CFR 219.16, public notification of this non-significant amendment was made consistent with the requirements at 36 CFR 218.

As allowed at 36 CFR 219.17(a)(3), the effective date of this project specific amendment will be on the date the project may be implemented in accordance with administrative review regulations at 36 CFR 218.

Finally, as allowed at 36 CFR 219.17(b)(2), *"…with respect to plans approved or revised under a prior planning regulation, including the transition provisions of the reinstated 2000 rule (36 CFR part 209, published at 36 CFR parts 200 to 209, revised as of July 1, 2010), plan amendments may be initiated under the provisions of the prior planning regulation for 3 years after May 9, 2012, and may be completed and approved under those provisions…"*

As allowed at 36 CFR 219.17(b)(2), because the Forest Plan amendment was initiated through scoping prior to May 2015, the amendment has been completed consistent with transition provisions of the reinstated 2000 rule. Thus, determination as to whether the amendment is significant or non-significant is based on Forest Service Handbook policy in place prior to 2000 (Forest Service Handbook 1909.12, Section 5.32, effective date 8/3/1992). This handbook lists four factors to be used when determining whether a proposed change to a forest plan is significant or non-significant: (a) timing; (b) location and size; (c) goals, objectives, and outputs, and; (d) management prescriptions.

Timing

The timing factor examines at what point over the course of the forest plan period that the plan is amended. Both the age of the underlying document and the duration of the amendment are relevant considerations. The handbook indicates that the later in the time period, the less significant the change is likely to be. The decision to revise the Forest Plan was issued in July 2003 and implementation began in September 2003.

The project-specific amendment will take effect in approximately 2016. The anticipated revision of the Forest Plan is expected to begin between 2018 and 2020. Thus, the amendment would be in effect 2-4 years before being reconsidered/validated under plan revision work.

Location and Size

The key to the location and size criteria is context or *"the relationship of the affected area to the overall planning area", "the smaller the area affected, the less likely the change is to be a significant change in the forest plan."*

This proposed non-significant Forest Plan amendment will include the following VQO changes:

- Retention to Partial Retention: 4,587 acres
- Maximum Modification to Modification: 805 acres
- Maximum Modification to Partial Retention: 321 acres

This proposed update constitutes approximately 0.11% of the entire acreage (171,400 acres) of MA 07 (the North Fork Boise River unit). Relative to the Forest as a whole, the change is substantially less.

Goals, Objectives, and Outputs

The goals, objectives, and outputs factor involves the determination of "*whether the change alters the long-term relationship between the level of goods and services in the overall planning area*" (Forest Service Handbook 1909.12, Section 5.32(c)). Application of this criterion requires an analysis of the overall Forest Plan and the various multiple-use resources, services and outputs that may be affected by the proposed amendment.

As described above, the existing mapped/adopted VQOs of ***Retention*** *and* ***Partial Retention*** along Highway 21 are incompatible with the existing recreational and road developments within the Project Area. Based on a review by the Project IDT, the proposed Forest Plan amendment to VQOs along Highway 21 from Banner Ridge to Whoopum Up Trailhead to reflect existing infrastructure is not anticipated to negatively impact the long-term management or development of these sites with respect to Forest Plan guidance in anyway.

Management Prescription

The management prescription factor involves the determination of (1), "whether the change in a management prescription is only for a specific situation or whether it would apply to the future decisions throughout the planning area" and (2), "whether or not the change alters the desired future condition of the land and resources or the anticipated goods and services to be produced" (Forest Service Handbook 1909.12, Section 5.32(d)).

The Becker Integrated Resource Project area falls within Management Prescription Category (MPC) 5.1[5]. The proposed Forest Plan amendment would not change this MPC, nor would it affect anticipated outputs from this MPC.

MPC 5.1 prescription applies to lands that are predominantly (>50%) forested. Emphasis is on restoring or maintaining vegetation within desired conditions in order to provide a diversity of habitats, reduce risk from disturbance events, and provide sustainable resources for human use. Commodity production is an outcome of restoring or maintaining the resilience/resistance of forested vegetation to disturbance events; achievement of timber growth and yield is not the primary purpose. The full range of treatment activities may be used. Restoration occurs through management activities and succession. Combinations of mechanical and fire treatments are used to restore forested areas while maintaining or improving resources such as soils, water quality, fish and wildlife habitat, and recreation settings. The risk of temporary and short-term degradation to the environment is minimized, but impacts may occur within acceptable limits (i.e., consistent with Forest Plan standards and guidelines) as resources are managed to achieve long-term goals and objectives.

As disclosed in the final environmental impact statement (FEIS) for the Becker Integrated Resource Project, the proposed amendments did not alter the ability of action alternative to accomplish Purposes #1 (Vegetation (FEIS, section 3.2), Fire and Fuels (FEIS, section 3.3) and Wildlife habitat (FEIS, section 3.5)) and #2 (Watershed Restoration (FEIS sections 3.8 thru 3.10)), consistent with the emphasis for MPC 5.1 prescriptions. The outcomes resulting from the amendments will continue to provide the visual quality important to supporting the recreation experience in this project area and along Highway 21 (FEIS, sections 3.7 and 3.15).

FINDING OF NON-SIGNIFICANCE

On the basis of the information and analysis contained in the FEIS, associated Biological Assessment, concurrence from the US Fish and Wildlife Service regarding the determination for listed species, associated planning record, and evaluation of the amendment under the four factors outlined above, the Responsible Official determined that adoption of the proposed plan amendment to standard 0763 for the remainder of this planning period, as well as inclusion of the corrections to objectives identified above, does not constitute a significant amendment of the Forest Plan as amended in 2010.

[5] MPC 5.1 includes the majority of active restoration areas that fall within the lands identified as suited timberlands on the Boise National Forest; MPC 5.1 encompasses about 904,000 total acres. The acres of MPC 5.1 within the project area represent about 1.7% of the total MPC 5.1 acres on the Forest.

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Appendix J:
Maps

Becker Integrated Resource Project

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List of Maps

Map 1: Transportation, Alternative A
Map 2: Transportation—MVUM, Alternative A
Map 3: Recreation—Summer, Alternative A
Map 4: Recreation—Winter, Alternative A
Map 5: Vegetation Treatment/Harvest System, Alternatives B and C
Map 6: Fuels, Alternatives B and C
Map 7: Transportation, Alternative B
Map 8: Transportation—MVUM, Alternative B
Map 9: Culverts—All Alternatives
Map 10: Recreation—Summer, Alternative B
Map 11: Recreation—Winter, Alternative B
Map 12: Transportation, Alternative C
Map 13: Transportation—MVUM, Alternative C
Map 14: Recreation—Summer, Alternative C
Map 15: Recreation—Winter, Alternative C
Map 16: Vegetation Treatment/Harvest System, Alternative D
Map 17: Fuels, Alternative D
Map 18: Transportation, Alternative D
Map 19: Transportation—MVUM, Alternative D
Map 20: Recreation—Summer, Alternative D
Map 21: Recreation—Winter, Alternative D
Map 22: Vegetation Treatment/Harvest System, Alternative E
Map 23: Fuels, Alternative E
Map 24: Transportation, Alternative E
Map 25: Transportation—MVUM, Alternative E
Map 26: Recreation—Summer, Alternative E
Map 27: Recreation—Winter, Alternative E
Map 28: Vegetation Treatment/Harvest System, Alternative F
Map 29: Fuels, Alternative F
Map 30: Transportation, Alternative F
Map 31: Transportation—MVUM, Alternative F
Map 32: Recreation—Summer, Alternative F
Map 33: Recreation—Winter, Alternative F

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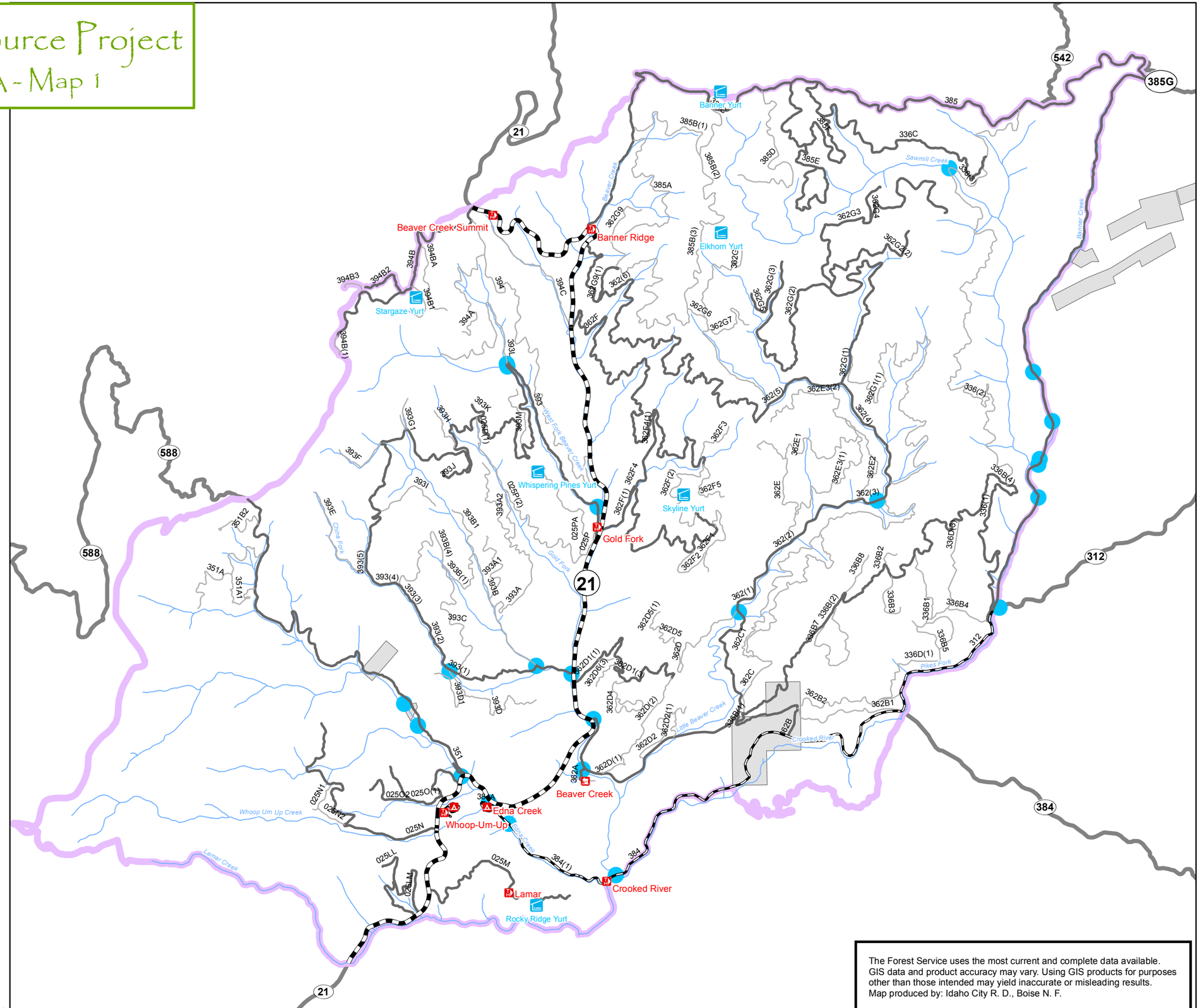
Becker Integrated Resource Project

Transportation - Alternative A - Map 1

Legend

- **Project Boundary**
- **Existing Roads - Alternative A**
- Operational Maintenance Level
  - 1 - BASIC CUSTODIAL CARE (CLOSED)
  - 2 - HIGH CLEARANCE VEHICLES
  - 3 - SUITABLE FOR PASSENGER CARS
  - 5 - HIGH DEGREE OF USER COMFORT
- **AOP Barrier Culverts**
- **Yurts**
- **Existing Beaver Creek Summit Trailhead**
- **Existing Recreation Sites**
  - Campground
  - Lookout/Cabin
  - Trailhead
- **Streams - Perennial**
- **Roads - Outside Project Area**
- **Private**



The Forest Service uses the most current and complete data available. GIS data and product accuracy may vary. Using GIS products for purposes other than those intended may yield inaccurate or misleading results.
Map produced by: Idaho City R. D., Boise N. F.

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FEIS

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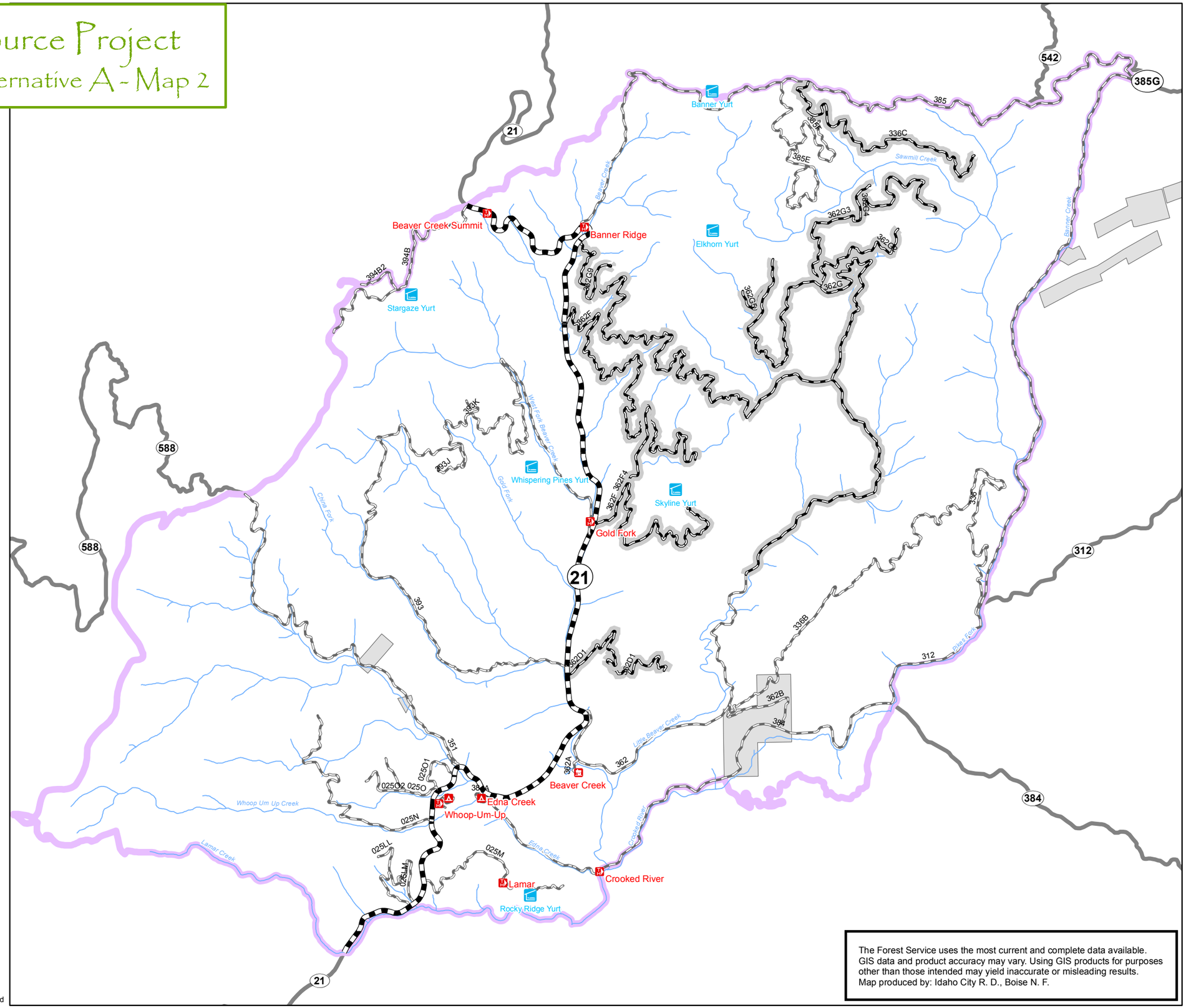
Becker Integrated Resource Project
Transportation - MVUM Alternative A - Map 2

Legend

- **Project Boundary**
- **Motor Vehicle Use Map - Current**
  - Roads Open to All Vehicles,
  - Roads Open to All Vehicles, Seasonal 06/16-09/14
  - Highway 21
  - **Yurts**
  - **Existing Beaver Creek Summit Trailhead**
- **Existing Recreation Sites**
  - Campground
  - Lookout/Cabin
  - Trailhead
  - **Streams - Perennial**
  - **Roads - Outside Project Area**
  - **Private**



The Forest Service uses the most current and complete data available. GIS data and product accuracy may vary. Using GIS products for purposes other than those intended may yield inaccurate or misleading results.
Map produced by: Idaho City R. D., Boise N. F.

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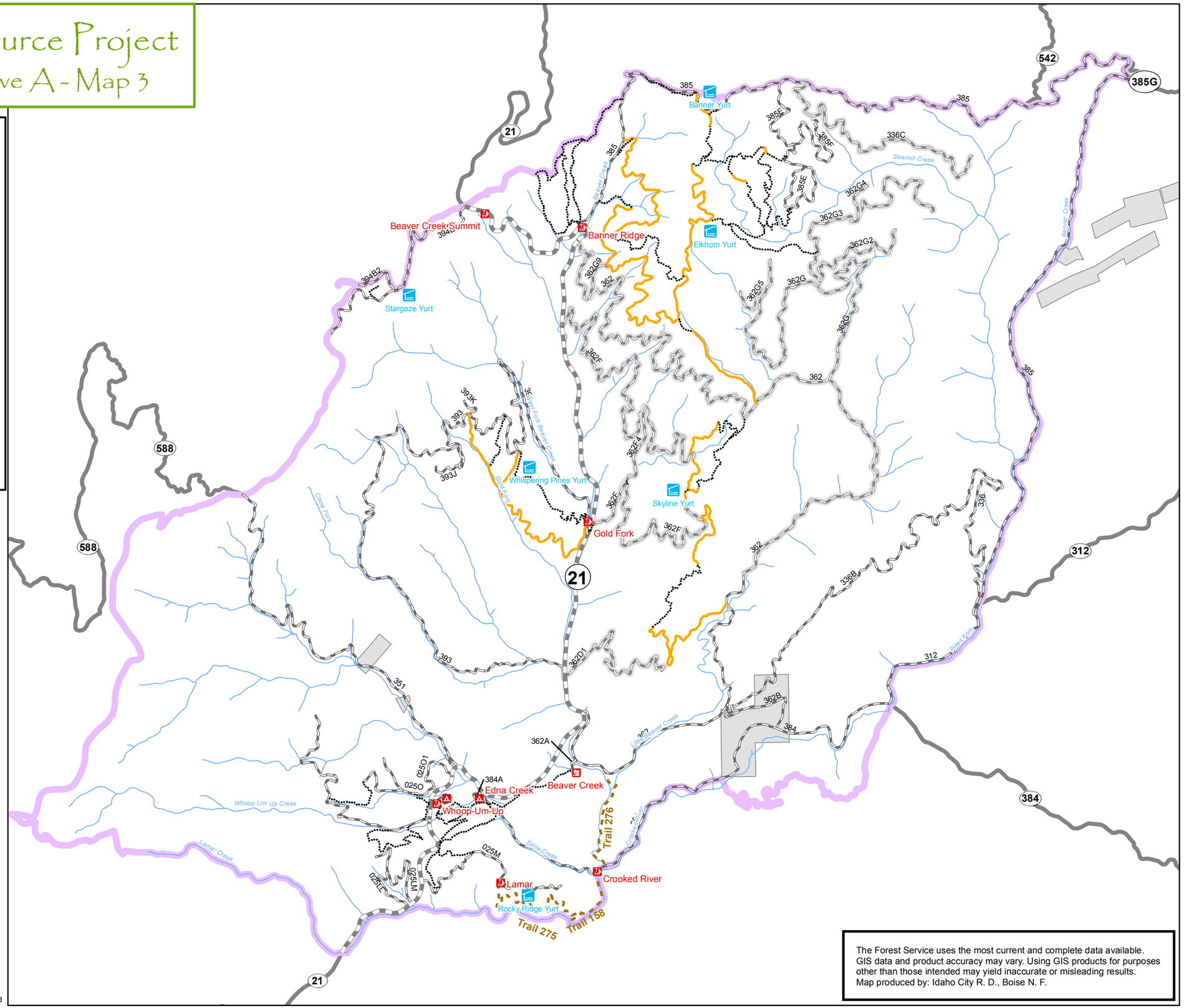
Becker Integrated Resource Project

Recreation - Summer Alternative A - Map 3

Legend

- **Project Boundary**
- **Authorization of Non-motorized**
  - Non-motorized Trail on Closed NFS Roads
  - Non-motorized Trail on unauthorized
- **Motor Vehicle Use Map - Current**
  - Roads Open to All Vehicles,
  - Roads Open to All Vehicles, Seasonal 06/16-
  - Highway 21
- **Yurts**
- **Existing Beaver Creek Summit**
- **Existing Recreation Sites**
  - Campground
  - Lookout/Cabin
  - Trailhead
- **Existing Non-motorized Trail**
- **Streams - Perennial**
- **Roads - Outside Project**
- **Private**



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Becker Integrated Resource Project

Recreation - Winter Alternative A - Map 4

Legend

Project Boundary

Winter Non-Motorized Trails Managed Under Agreement with IDPR

- Groomed
- Un-groomed

Travel Management - Winter

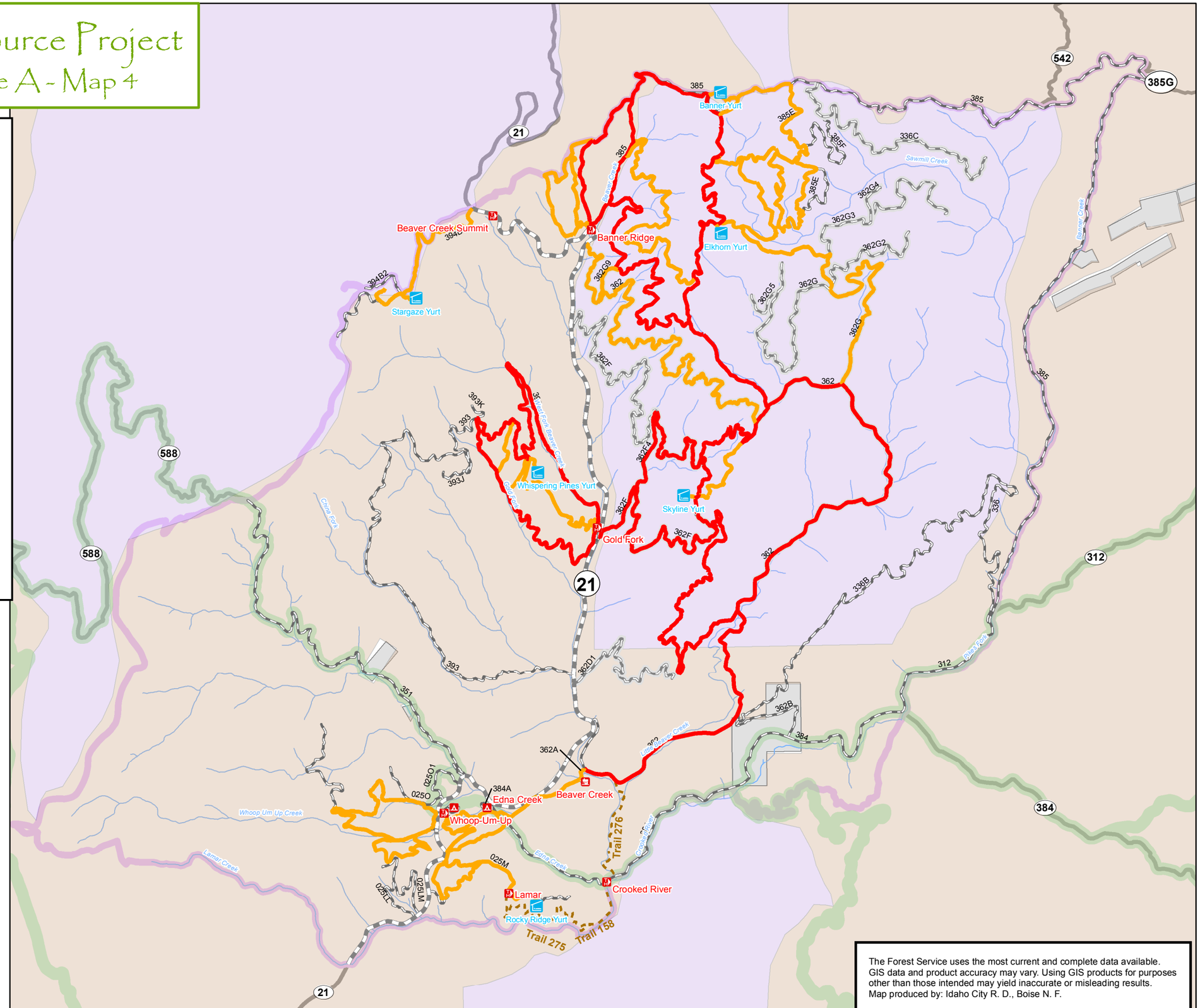
- Motorized
- Non-motorized
- **2013 Groomed Snowmobile Trail**

Motor Vehicle Use Map - Current

- Roads Open to All Vehicles,
- Roads Open to All Vehicles, Seasonal 06/16-09/14
- Highway 21
- **Yurts**
- **Existing Beaver Creek Summit Trailhead**

Existing Recreation Sites

- Campground
- Lookout/Cabin
- Trailhead
- **Existing Non-motorized Trail**
- **Streams - Perennial**
- **Roads - Outside Project Area**
- **Private**



The Forest Service uses the most current and complete data available. GIS data and product accuracy may vary. Using GIS products for purposes other than those intended may yield inaccurate or misleading results. Map produced by: Idaho City R. D., Boise N. F.

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Becker Integrated Resource Project

Vegetation Treatment/Harvest System - Alternatives B & C - Map 5

Legend

Project Boundary

Alternative B & C - Vegetation Treatments

- Thinning with No Product Removal
- Thinning (Optional Mastication) No Product Removal
- Thinning with Optional Miscellaneous Wood Product Removal
- Thinning with Product Removal
- Mixed Treatment with Product Removal

Alternative B & C - Harvest System

- Light Cable
- Tractor/Jammer
- Tractor

Landings - Alternatives B & C

- Tractor

Alternatives B & C - Road Construction Associated with Vegetation Treatment

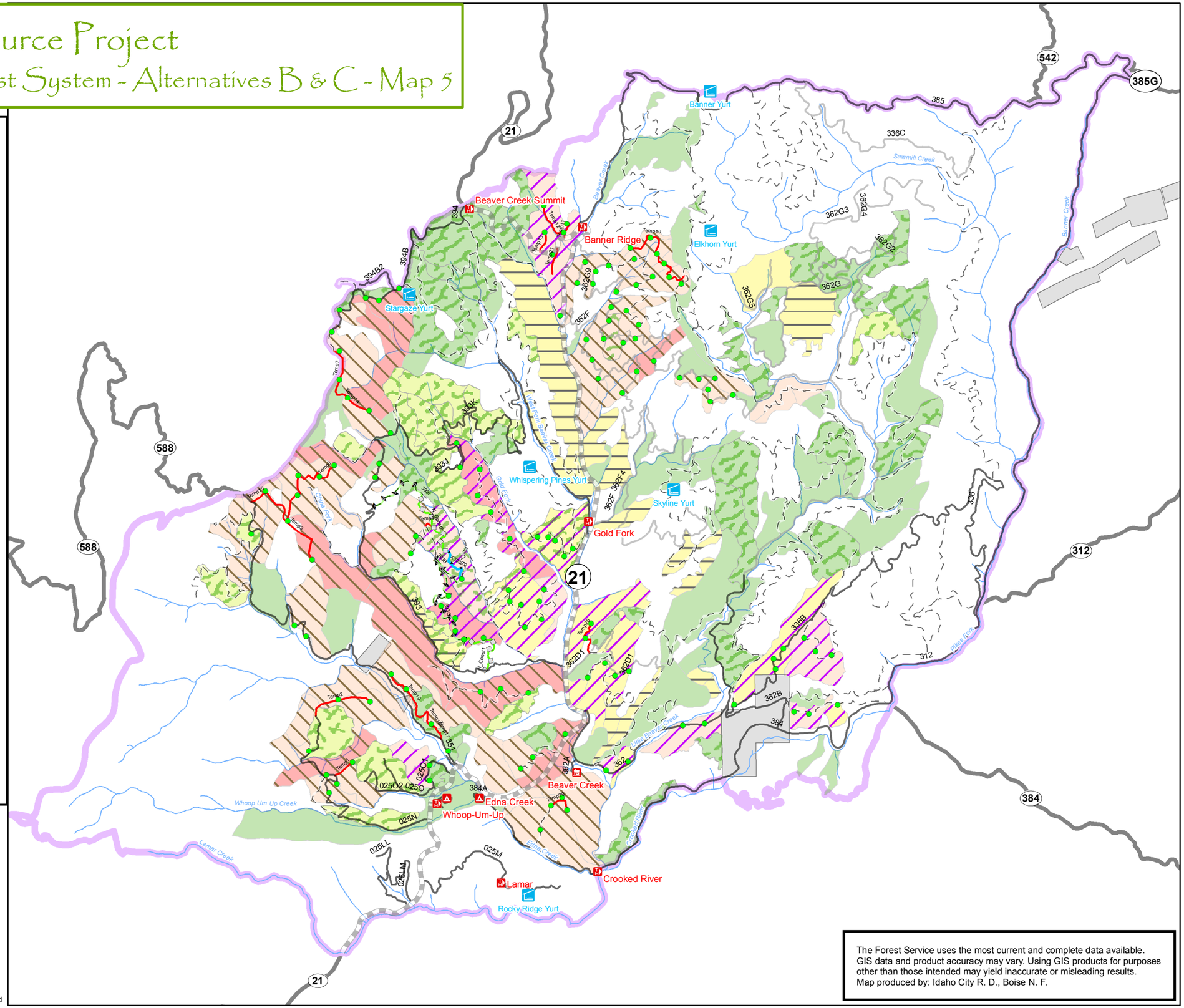
- Add to System (ML2)
- NFS Road 393 Realignment (ML2)
- Reconst_ML1 to 2
- Temporary Road Construction
- **Existing Plantations that will be Treated**

Road (.Existing)

- Highway 21
- Open NFS Roads
- NFS Roads Seasonally Closed to Public Motorized Use (Open 6/16 - 9/14)
- NFS Roads Closed to Motorized
- **Yurts**

Recreation Sites

- Campground
- Lookout/Cabin
- Trailhead
- **Streams - Perennial**
- **Roads - Outside Project Area**
- **Private**



N

0 0.25 0.5 1 1.5 2 Miles

FELS

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Becker Integrated Resource Project

Fuels - Alternatives B & C - Map 6

Legend

- **Project Boundary**
- **Natural Fuels - Direct Application of**
- **Natural Fuels - Indirect Application of**
- **Application of Broadcast Burn Treatment**

Alternative B & C - Activity

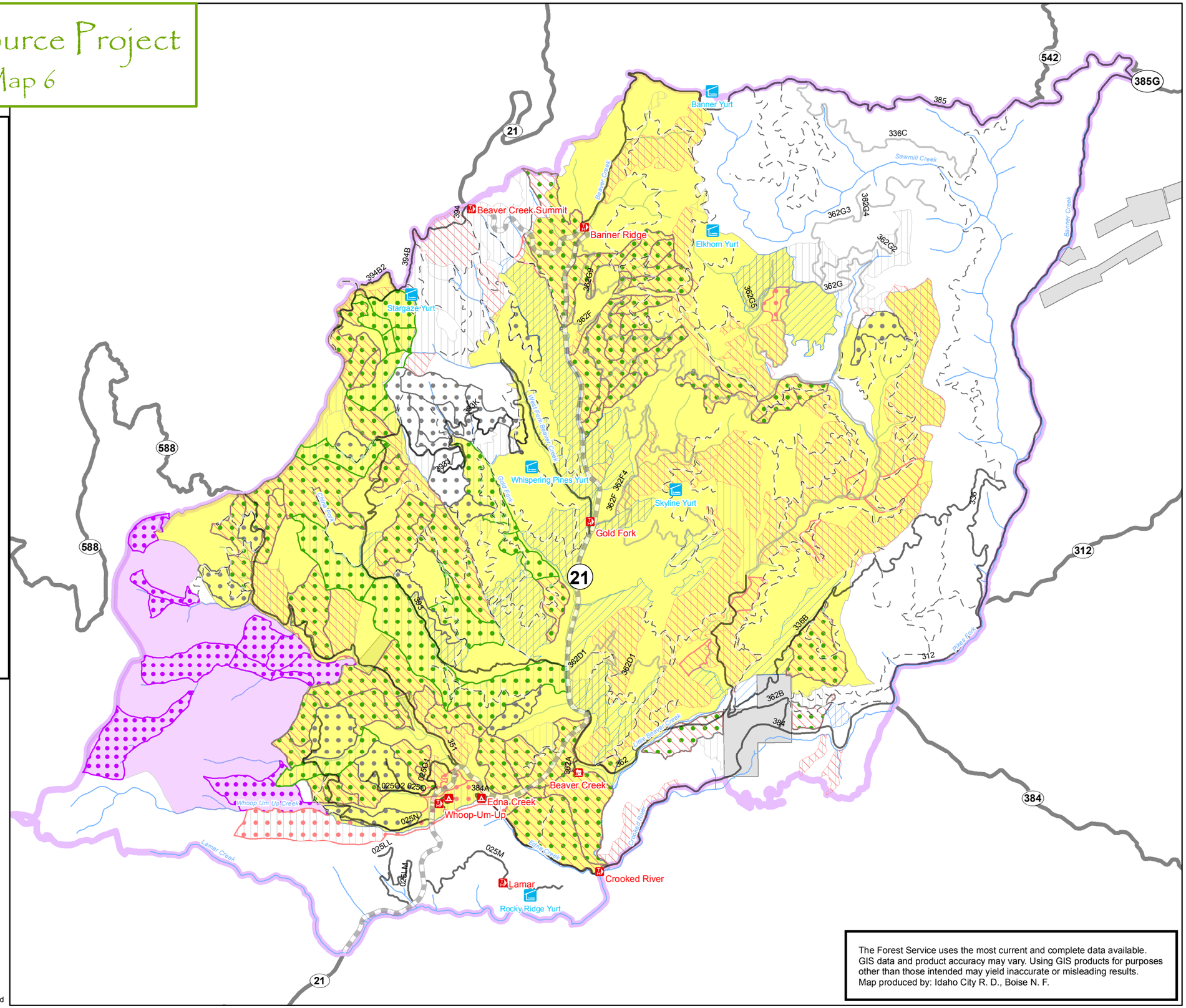
- Lop & scatter
- Handpile and Lop & scatter
- Handpile concentrations
- Handpile concentrations and Lop & scatter
- Chip or Lop & scatter
- Yard Handpile concentrations
- Yard Handpile concentrations and Lop & scatter
- Whole Tree Yard and Lop & scatter
- Whole Tree Yard and Handpile

Road (.Existing)

- Highway 21
- Open NFS Roads
- NFS Roads Seasonally Closed to Public Motorized Use (Open 6/16 - 9/14)
- NFS Roads Closed to Motorized
- **Yurts**

Recreation Sites

- Campground
- Lookout/Cabin
- Trailhead
- **Streams - Perennial**
- **Roads - Outside Project Area**
- **Private**



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Becker Integrated Resource Project

Transportation - Alternative B - Map 7

Legend

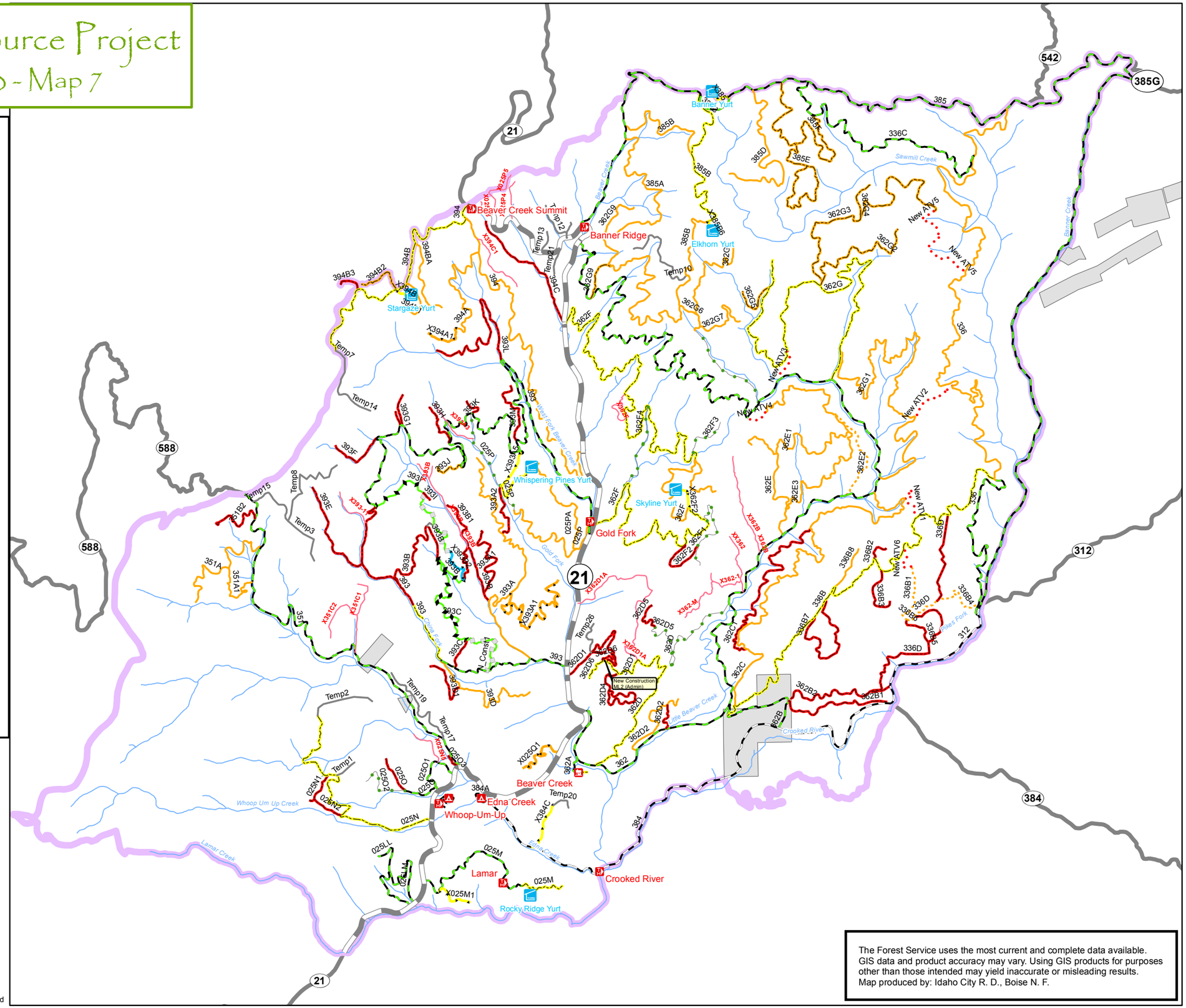
Project Boundary

Alternative B - Transportation Treatments

- Decommission
- Closed to All Motorized Access (ML2 to ML1)
- Closed to Public Motorized Access (ML2 Admin)
- Add to System - Closed to All Motorized Access (ML1)
- Add to System - (ML2)
- Add to System - Closed to Public Motorized Access (ML2 Admin)
- New Construction (ML2)
- New Construction - Closed to Public Motorized Access (ML2 Admin)
- Reconstruction (ML1 to ML2)
- Convert ML1 to Motorized Trail for Vehicles 50" or less
- Temporary Road Construction
- Motorized Trail Construction for Vehicles 50" or less; ATV_NewConstruction-Visible Prism
- Convert to Non-motorized Trail
- No Change - ML 1 - Closed to All Motorized
- No Change - ML 2 - High Clearance Vehicles
- No Change - ML 3 - Suitable for Passenger Cars
- Highway 21
- **Unauthorized Routes - Decommission**
- **Yurts**

Recreation Sites

- Campground
- Lookout/Cabin
- Trailhead
- **Streams - Perennial**
- **Roads - Outside Project Area**
- **Private**



N

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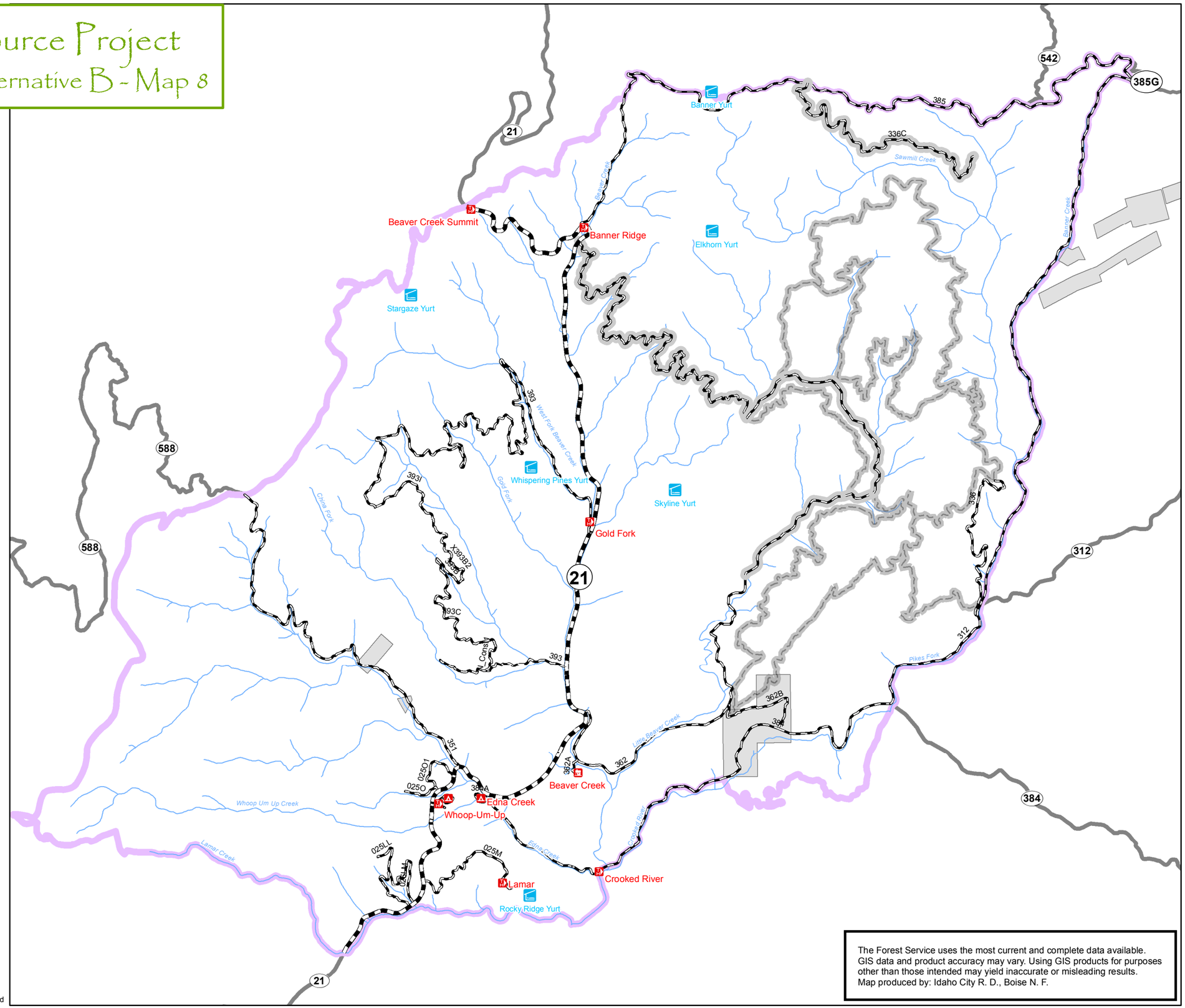
Becker Integrated Resource Project
Transportation - MVUM Alternative B - Map 8

Legend

- **Project Boundary**
- **Alternative B - Motorized Trail**
  - Trails Open to Vehicles 50" or Less in Width, Seasonal
- **Alternative B - MVUM**
  - Roads Open to All Vehicles, Yearlong
  - Roads Open to All Vehicles, Seasonal 06/16-09/14
  - Highway 21
  - **Yurts**
- **Recreation Sites**
  - Campground
  - Lookout/Cabin
  - Trailhead
  - **Streams - Perennial**
  - **Roads - Outside Project Area**
  - **Private**



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N

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Becker Integrated Resource Project

AOP Culverts - Alternative B, C, D, E & F - Map 9

Legend

- **Project Boundary**

AOP Barrier Culvert Treatments

- Priority Critical Bull Trout Culvert
- Culvert Treatment
- Culvert - Outlet Pool Modification
- **Bull Trout Critical Habitat Stream**

Bull Trout Patches

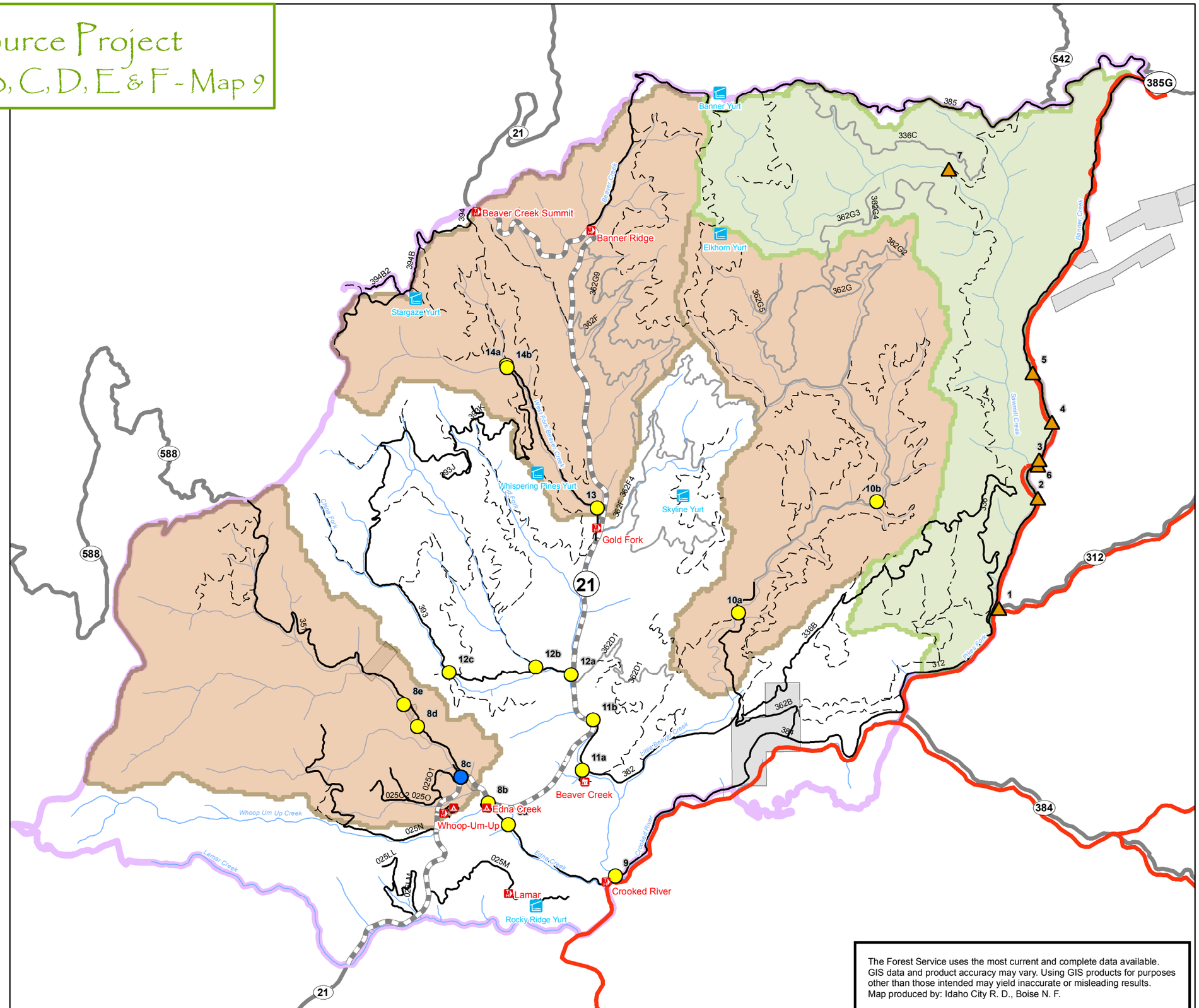
- 2 - Suitable but no spawning/early rearing
- 3 - Unsuitable Patch

Road (Existing)

- Highway 21
- Open NFS Roads
- NFS Roads Seasonally Closed to Public Motorized Use (Open 6/16 - 9/14)
- NFS Roads Closed to Motorized
- **Yurts**

Recreation Sites

- Campground
- Lookout/Cabin
- Trailhead
- **Streams - Perennial**
- **Roads - Outside Project**
- **Private**



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Becker Integrated Resource Project

Recreation - Summer Alternative B - Map 10

Legend

- **Project Boundary**
- **Motorized Trail Trailhead - Alt. B, C, D & F**

Authorization of Non-motorized Routes

- Non-motorized Trail on Closed NFS Roads — Label 999
- Non-motorized Trail on unauthorized route

Alternative B - Motorized Trail

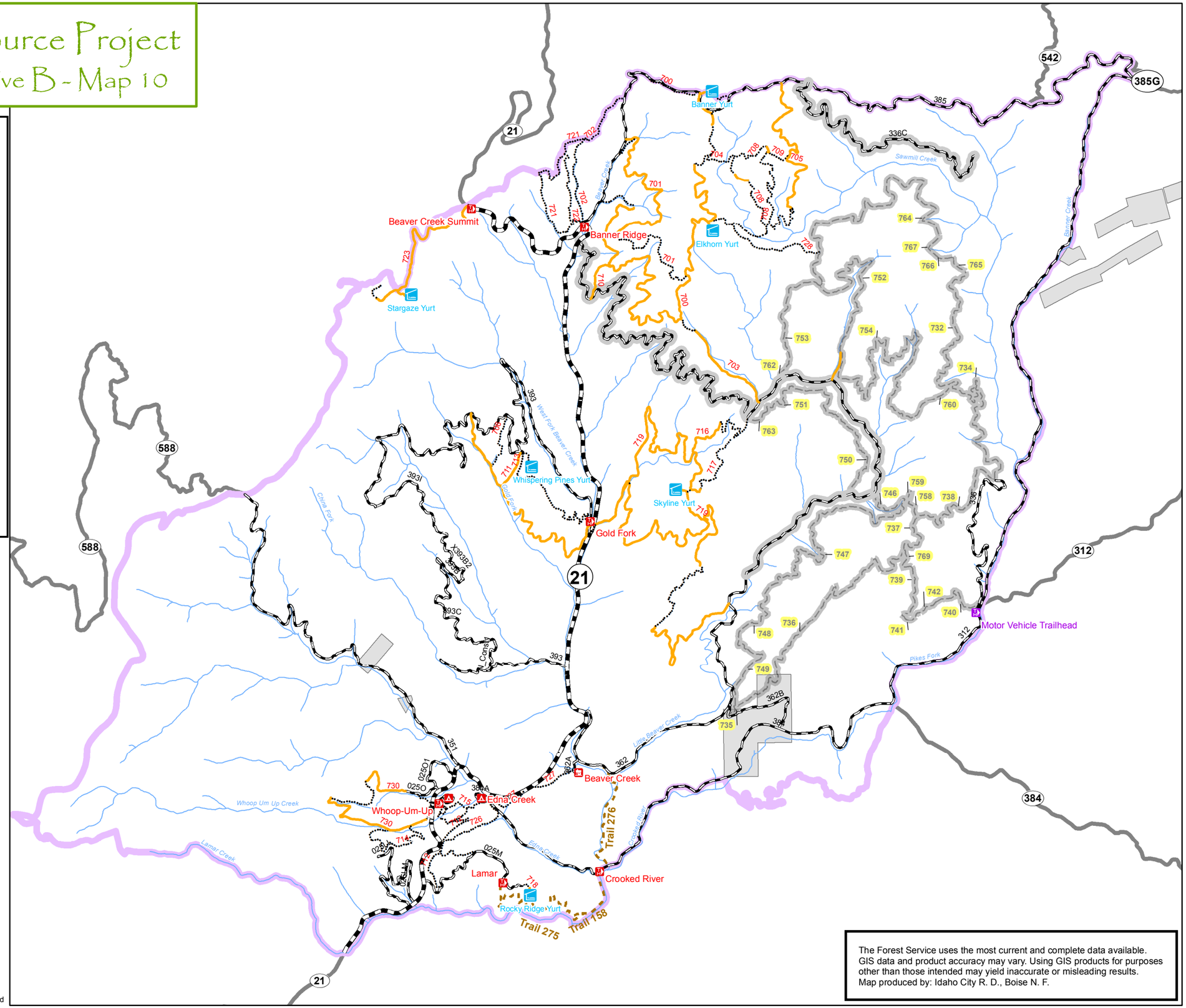
- Trails Open to Vehicles 50" or Less in Width, Seasonal — Label 999

Alternative B - MVUM

- Roads Open to All Vehicles, Yearlong
- Roads Open to All Vehicles, Seasonal 06/16-09/14
- Highway 21
- **Yurts**

Recreation Sites

- Campground
- Lookout/Cabin
- Trailhead
- **Existing Non-motorized Trail**
- **Streams - Perennial**
- **Roads - Outside Project**
- **Private**



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N

0 0.25 0.5 1 1.5 2 Miles

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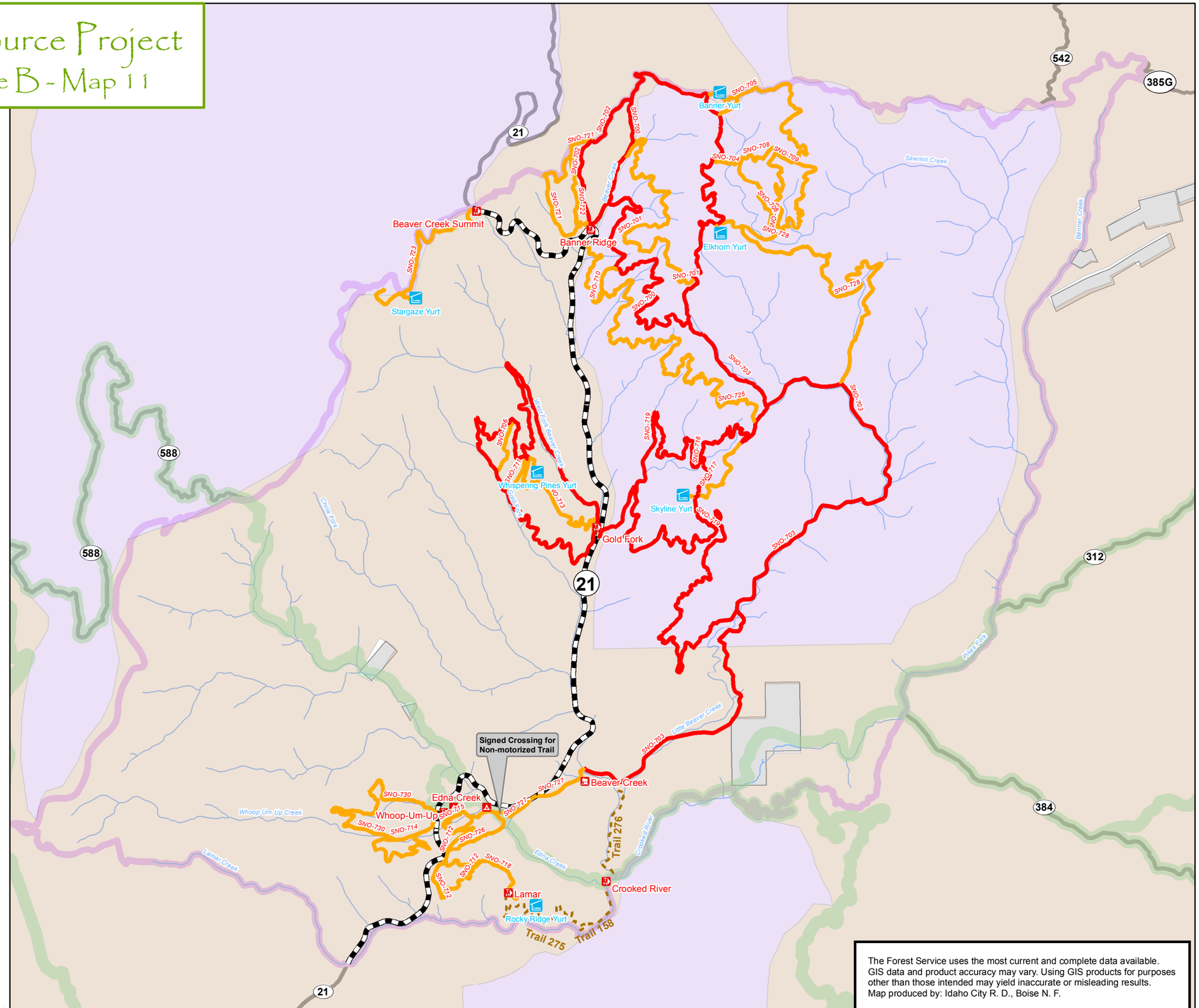
Becker Integrated Resource Project

Recreation - Winter Alternative B - Map 11

Legend

- **Project Boundary**
- **Winter Non-Motorized Trails**
  - Groomed
  - Un-groomed
- **Travel Management - Winter**
  - Motorized
  - Non-motorized
- **2013 Groomed Snowmobile Trail**
- **Highway 21**
- **Yurts**
- **Recreation Sites**
  - Campground
  - Lookout/Cabin
  - Trailhead
- **Existing Non-motorized Trail**
- **Streams - Perennial**
- **Roads - Outside Project Area**
- **Private**



N

0 0.25 0.5 1 1.5 2 Miles

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Becker Integrated Resource Project

Transportation - Alternative C - Map 12

Legend

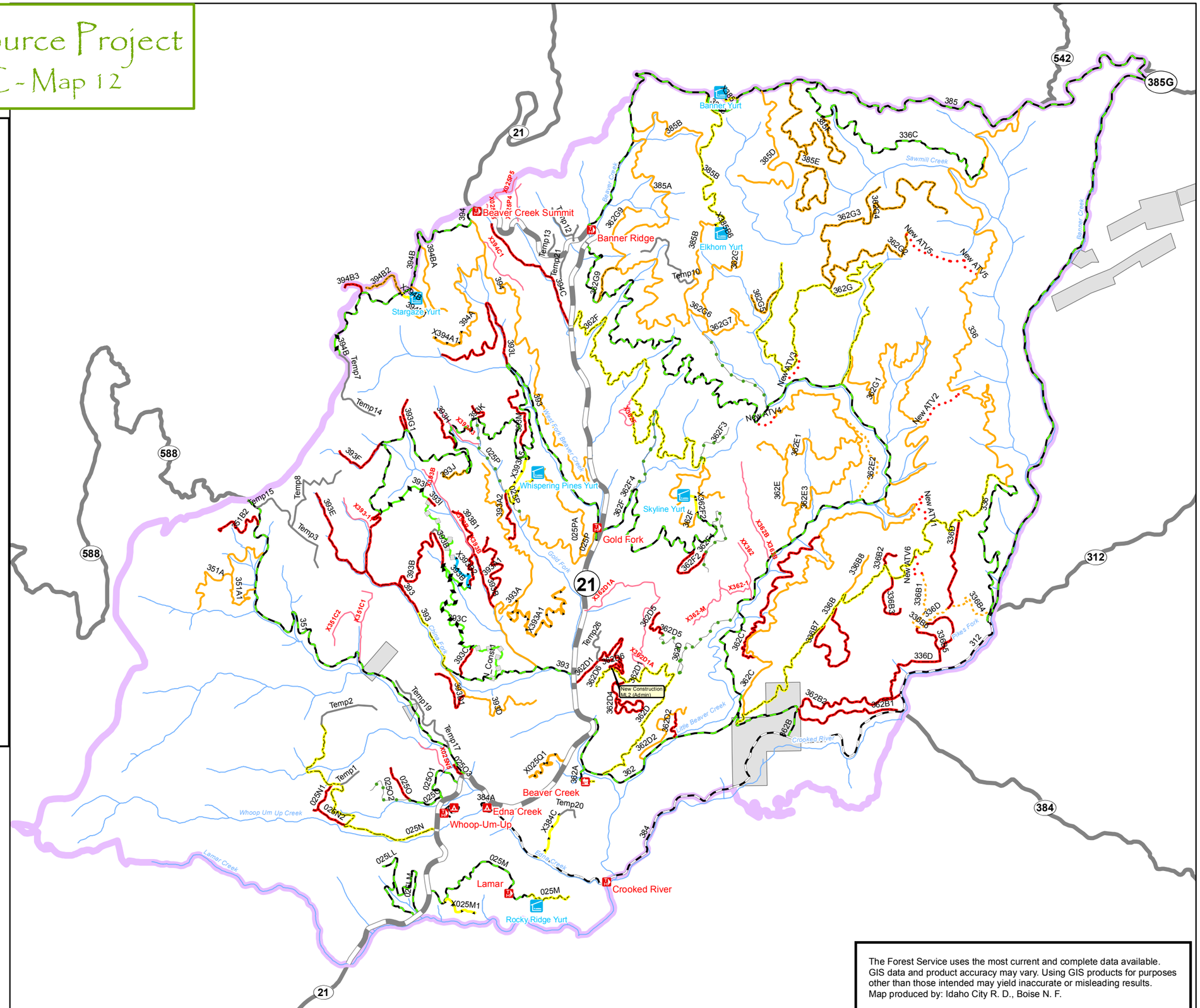
Project Boundary

Alternative C - Transportation Treatments

- Decommission
- Closed to All Motorized Access (ML2 to ML1)
- Closed to Public Motorized Access (ML2 Admin)
- Add to System - Closed to All Motorized Access (ML1)
- Add to System - (ML2)
- Add to System - Closed to Public Motorized Access (ML2 Admin)
- New Construction (ML2)
- New Construction - Closed to Public Motorized Access (ML2 Admin)
- Reconstruction (ML1 to ML2)
- Convert ML1 to Motorized Trail for Vehicles 50" or less
- Temporary Road Construction
- Motorized Trail Construction for Vehicles 50" or less; ATV_NewConstruction-Visible Prism
- Convert to Non-motorized Trail
- No Change - ML 1 - Closed to All Motorized
- No Change - ML 2 - High Clearance Vehicles
- No Change - ML 3 - Suitable for Passenger Cars
- Highway 21
- **Unauthorized Routes - Decommission**
- **Yurts**

Recreation Sites

- Campground
- Lookout/Cabin
- Trailhead
- **Streams - Perennial**
- **Roads - Outside Project Area**
- **Private**



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N

0 0.25 0.5 1 1.5 2 Miles

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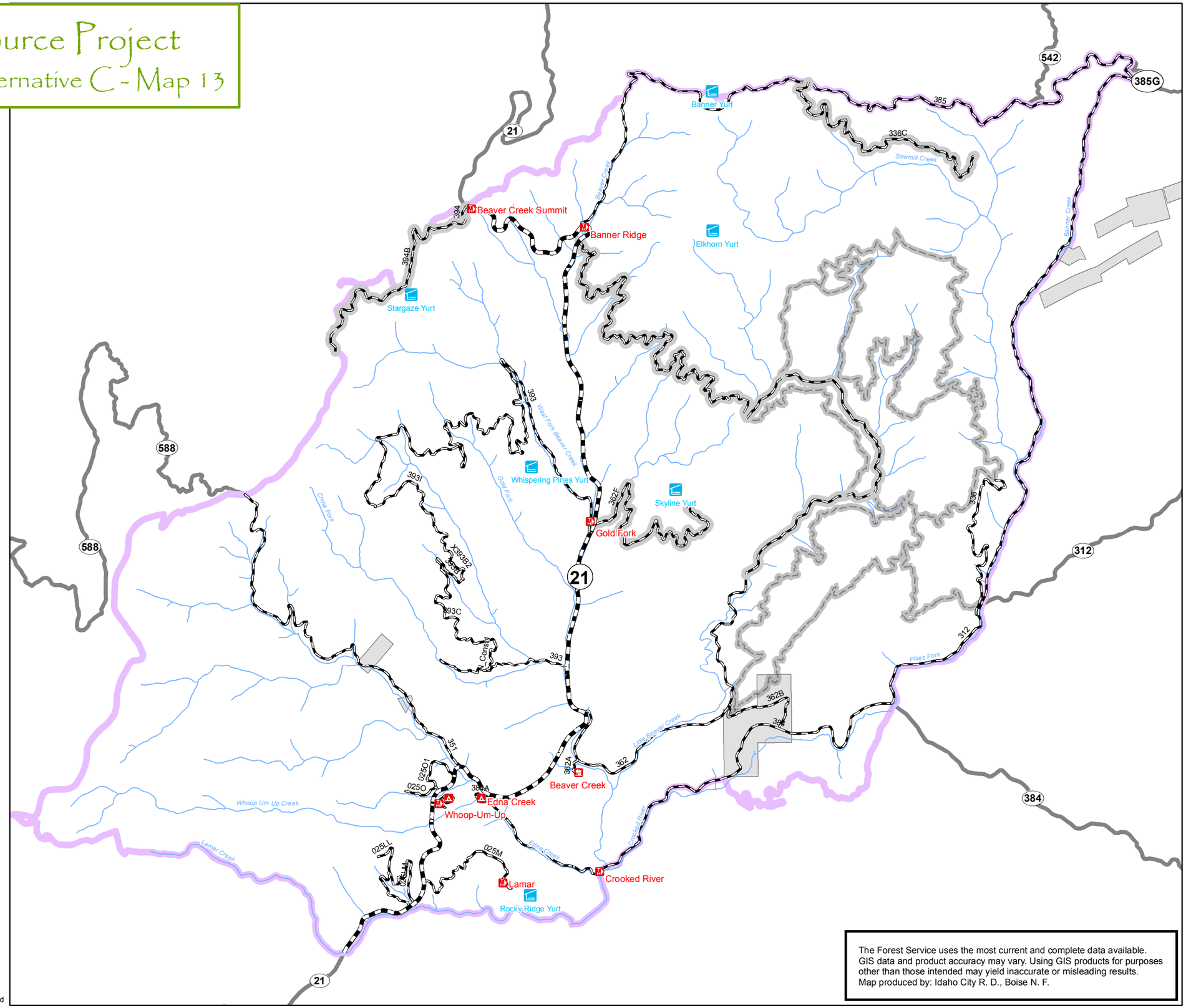
Becker Integrated Resource Project
Transportation - MVUM Alternative C - Map 13

Legend

- **Project Boundary**
- **Alternative C - Motorized Trail**
  - Trails Open to Vehicles 50" or Less in Width, Seasonal
- **Alternative C - MVUM**
  - Roads Open to All Vehicles, Yearlong
  - Roads Open to All Vehicles, Seasonal 06/16-09/14
  - Highway 21
  - **Yurts**
- **Recreation Sites**
  - Campground
  - Lookout/Cabin
  - Trailhead
  - **Streams - Perennial**
  - **Roads - Outside Project Area**
  - **Private**



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N

0 0.25 0.5 1 1.5 2 Miles

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Becker Integrated Resource Project

Recreation - Summer Alternative C - Map 14

Legend

- **Project Boundary**
- **Motorized Trail Trailhead - Alt. B, C, D & F**

Authorization of Non-motorized

- Non-motorized Trail on Closed NFS — Label 999
- Non-motorized Trail on unauthorized

Alternative C - Motorized Trail

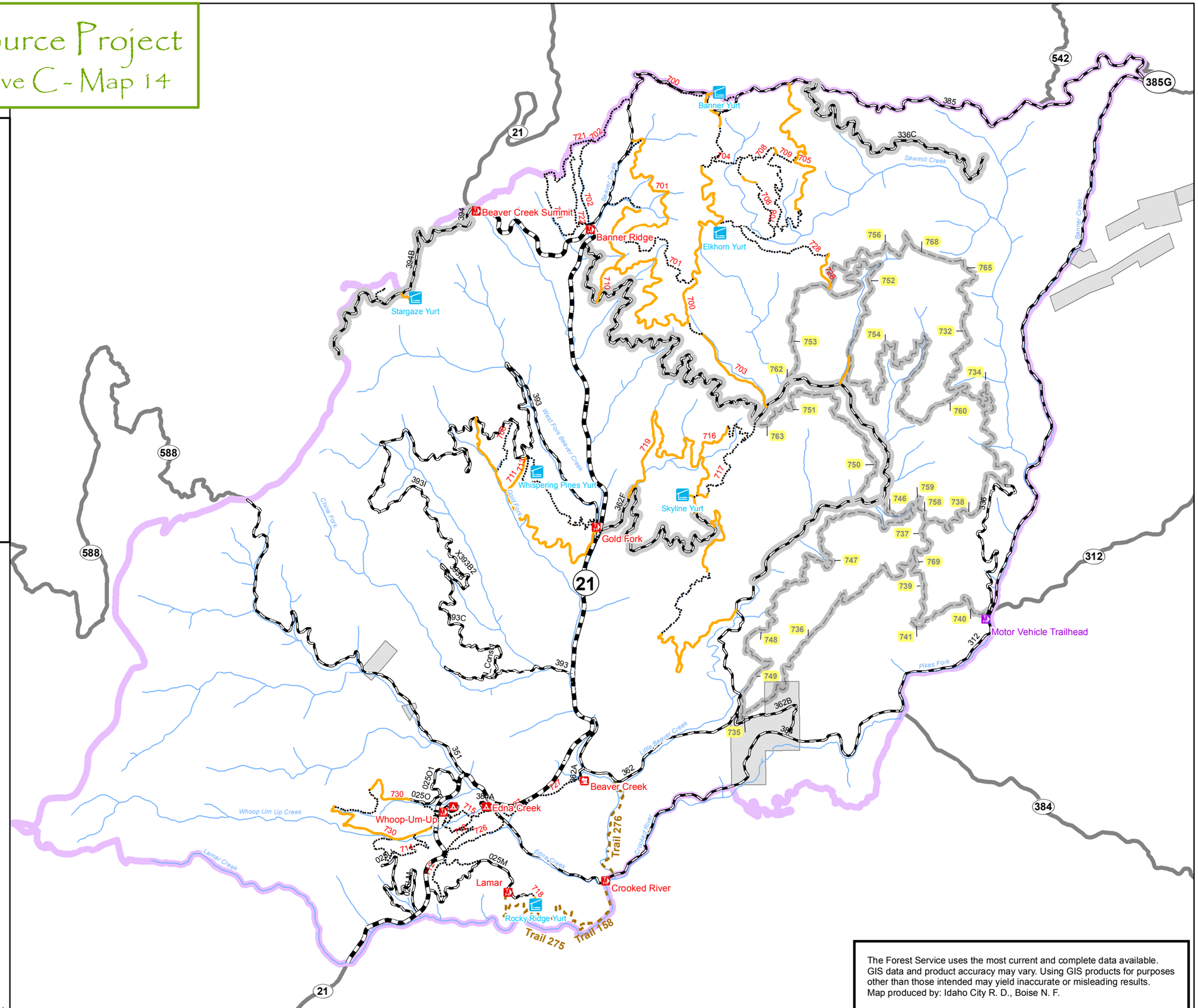
- Trails Open to Vehicles 50" or Less in Width, Seasonal — Label 999

Alternative C - MVUM

- Roads Open to All Vehicles, Yearlong
- Roads Open to All Vehicles, Seasonal 06/16-09/14
- Highway 21
- **Yurts**

Recreation Sites

- Campground
- Lookout/Cabin
- Trailhead
- **Existing Non-motorized Trail**
- **Streams - Perennial**
- **Roads - Outside Project**
- **Private**



N

0 0.25 0.5 1 1.5 2 Miles

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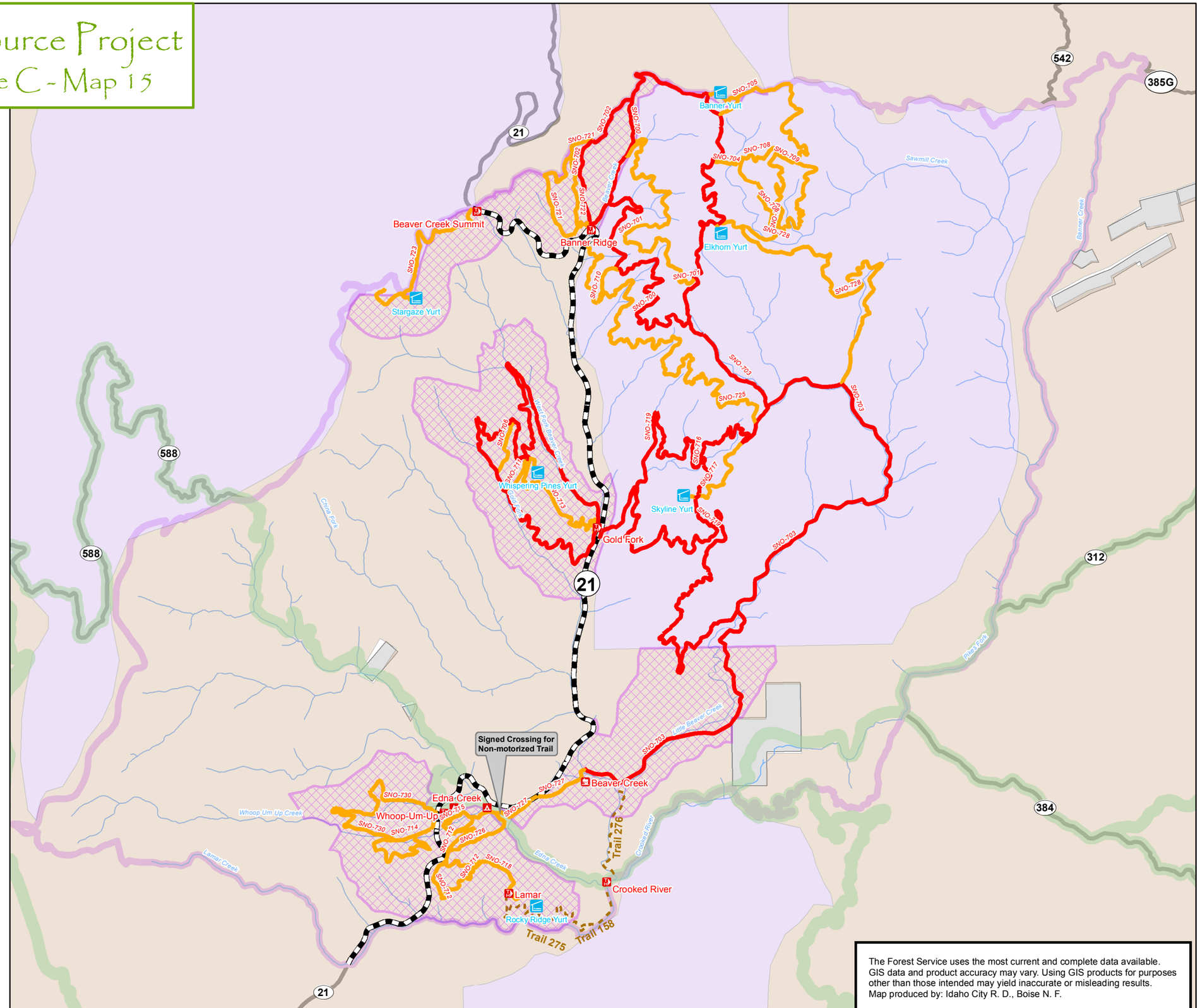
Becker Integrated Resource Project

Recreation - Winter Alternative C - Map 15

Legend

- **Project Boundary**
- **Winter Non-Motorized Trails**
  - Groomed
  - Un-groomed
  - **Motorized Winter Closure - Alt. C, E, F, Modified C**
- **Travel Management - Winter**
  - Motorized
  - Non-motorized
- **2013 Groomed Snowmobile Trail**
- **Highway 21**
- **Yurts**
- **Recreation Sites**
  - Campground
  - Lookout/Cabin
  - Trailhead
- **Existing Non-motorized Trail**
- **Streams - Perennial**
- **Roads - Outside Project Area**
- **Private**



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N

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Becker Integrated Resource Project

Vegetation Treatment/Harvest System - Alternative D - Map 16

Legend

Project Boundary

Alternatives Mod. C & D - Vegetation Treatments

- Thinning with No Product Removal
- Thinning (Optional Mastication) No Product Removal
- Thinning with Optional Miscellaneous Wood Product Removal
- Thinning with Product Removal
- Mixed Treatment with Product Removal

Alternatives Modified C & D - Harvest System

- Light Cable
- Tractor/Jammer
- Tractor

Landings - Alternatives Modified C & D

- Tractor

Alternatives Modified C & D - Road Construction Associated with Vegetation Treatment

- Add to System (ML2)
- NFS Road 393 Realignment (ML2)
- Reconst_ML1 to 2
- Temporary Road Construction

Existing Plantations that will be Treated

Road (.Existing)

- Highway 21
- Open NFS Roads
- NFS Roads Seasonally Closed to Public Motorized Use (Open 6/16 - 9/14)
- NFS Roads Closed to Motorized

Yurts

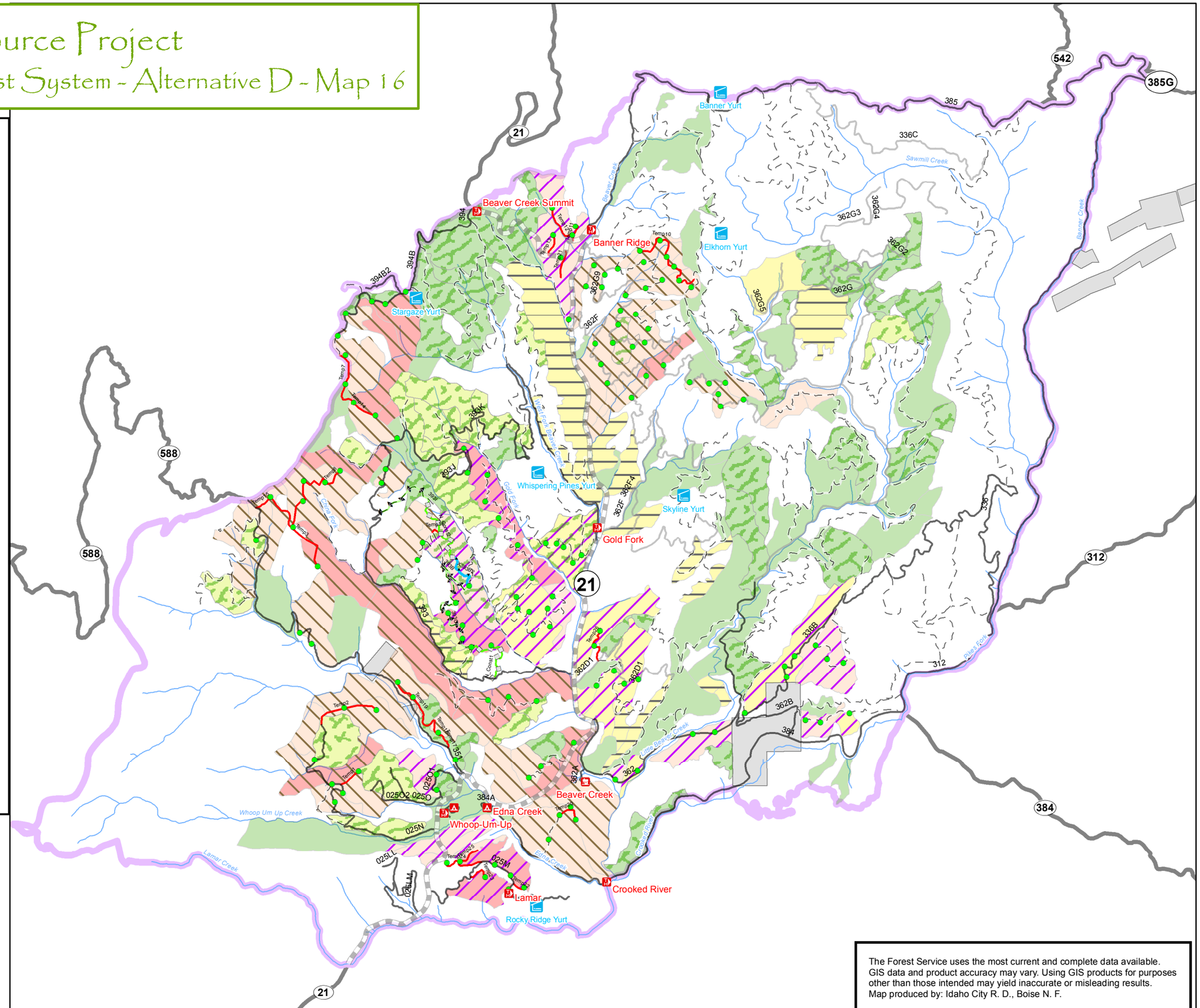
Recreation Sites

- Campground
- Lookout/Cabin
- Trailhead

Streams - Perennial

Roads - Outside Project Area

Private



N

0 0.25 0.5 1 1.5 2 Miles

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Becker Integrated Resource Project

Fuels - Alternative D - Map 17

Legend

- **Project Boundary**
- **Natural Fuels - Direct Application of**
- **Natural Fuels - Indirect Application of**
- **Application of Broadcast Burn Treatment**

Activity Fuels Treatments

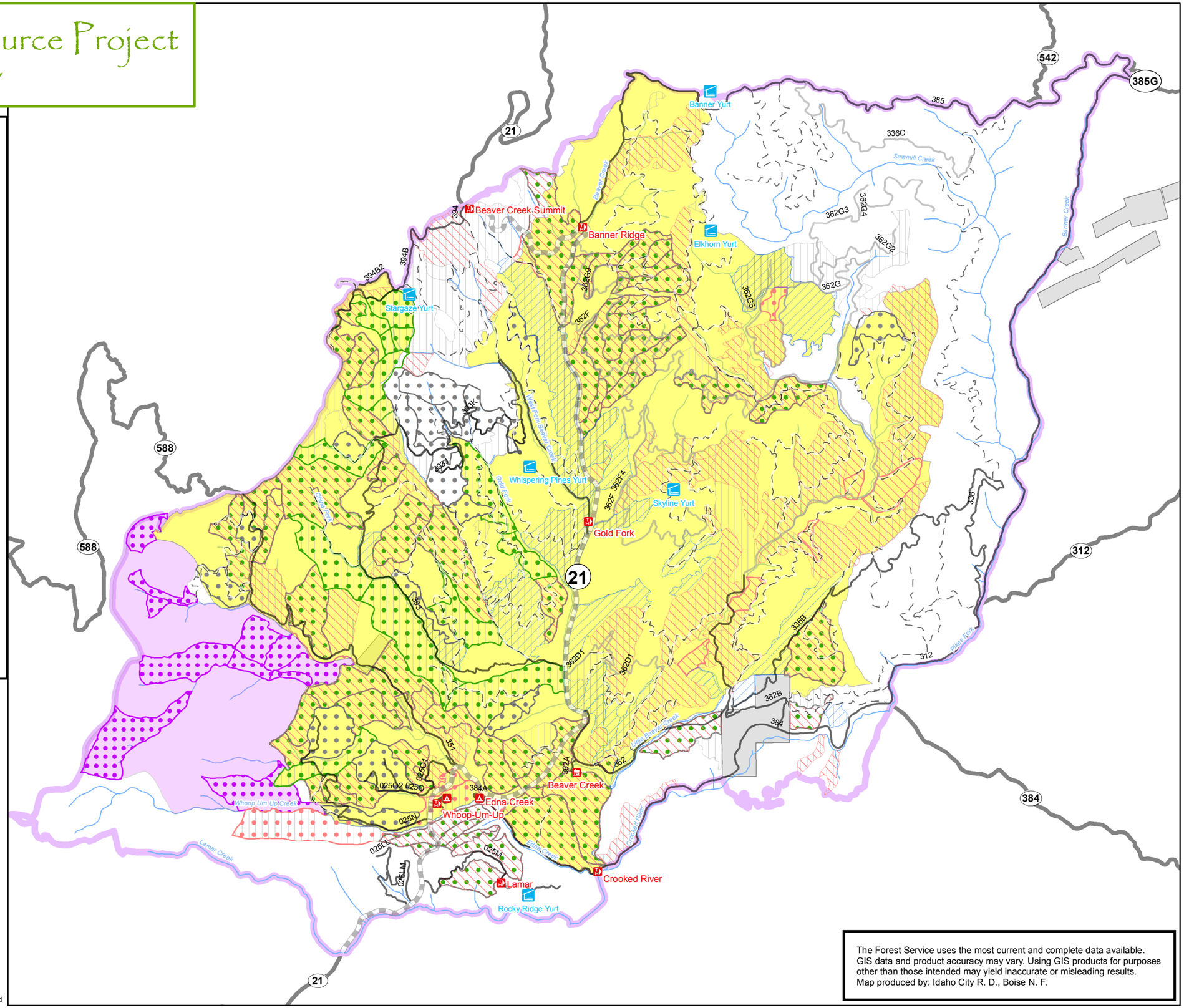
- Lop & scatter
- Handpile and Lop & scatter
- Handpile concentrations
- Handpile concentrations and Lop & scatter
- Chip or Lop & scatter
- Yard Handpile concentrations
- Yard Handpile concentrations and Lop & scatter
- Whole Tree Yard and Lop & scatter
- Whole Tree Yard and Handpile

Road (.Existing)

- Highway 21
- Open NFS Roads
- NFS Roads Seasonally Closed to Public Motorized Use (Open 6/16 - 9/14)
- NFS Roads Closed to Motorized
- **Yurts**

Recreation Sites

- Campground
- Lookout/Cabin
- Trailhead
- **Streams - Perennial**
- **Roads - Outside Project Area**
- **Private**



N

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Becker Integrated Resource Project

Transportation - Alternative D - Map 18

Legend

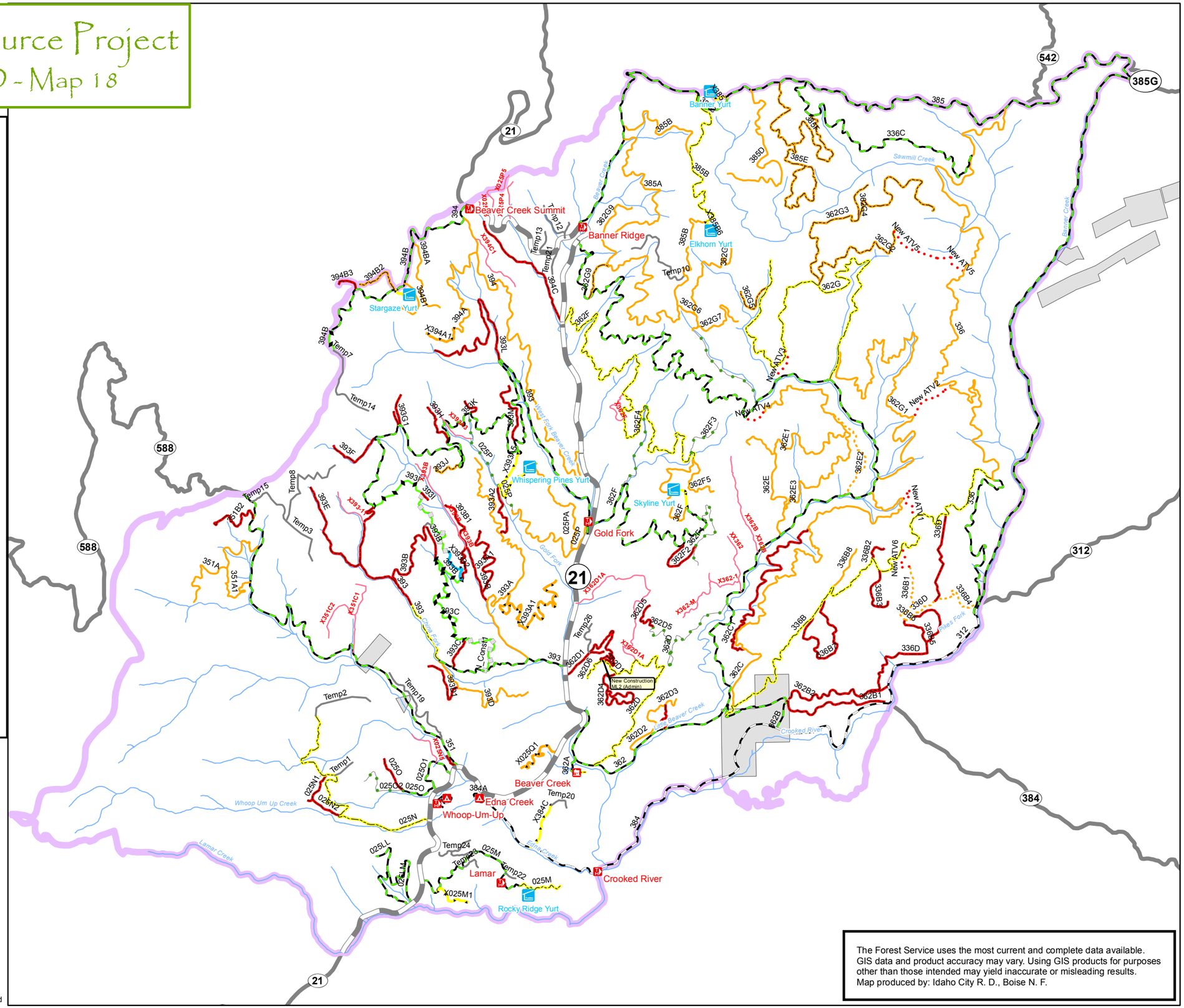
Project Boundary

Alternative D - Transportation Treatments

- Decommission
- Closed to All Motorized Access (ML2 to ML1)
- Closed to Public Motorized Access (ML2 Admin)
- Add to System - Closed to All Motorized Access (ML1)
- Add to System - (ML2)
- Add to System - Closed to Public Motorized Access (ML2 Admin)
- New Construction (ML2)
- New Construction - Closed to Public Motorized Access (ML2 Admin)
- Reconstruction (ML1 to ML2)
- Convert ML1 to Motorized Trail for Vehicles 60" or less
- Temporary Road Construction
- Motorized Trail Construction for Vehicles 60" or less; ATV_NewConstruction-Visible Prism
- Convert to Non-motorized Trail
- No Change - ML 1 - Closed to All Motorized
- No Change - ML 2 - High Clearance Vehicles
- No Change - ML 3 - Suitable for Passenger Cars
- Highway 21
- **Unauthorized Routes - Decommission**
- **Yurts**

Recreation Sites

- Campground
- Lookout/Cabin
- Trailhead
- **Streams - Perennial**
- **Roads - Outside Project Area**
- **Private**



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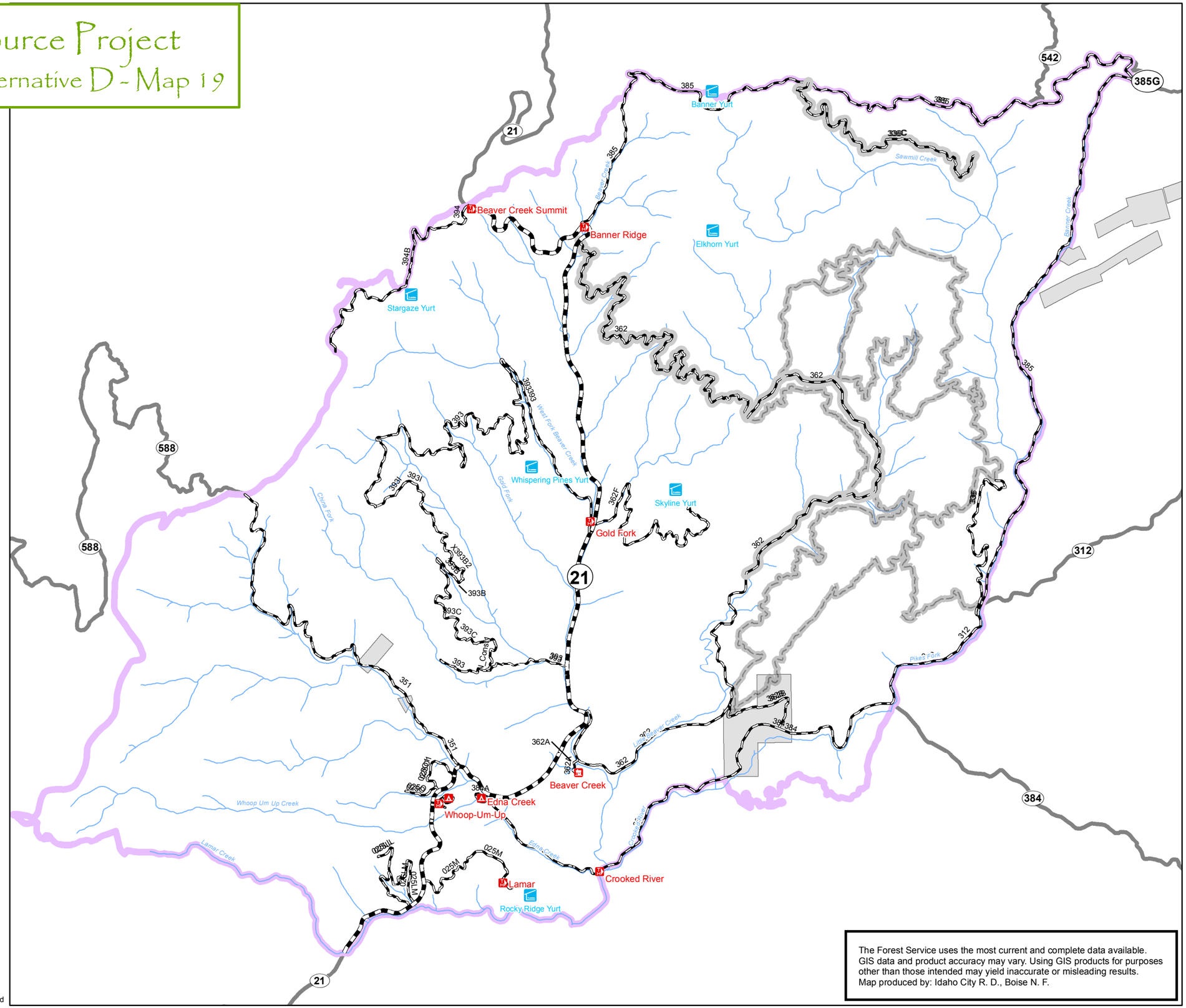
Becker Integrated Resource Project
Transportation - MVUM Alternative D - Map 19

Legend

- **Project Boundary**
- **Alternative D - Motorized Trail**
  - Trails Open to Veh. 60" or Less in Width, Seasonal
- **Alternative D - MVUM**
  - Roads Open to All Vehicles,
  - Roads Open to All Vehicles, Seasonal 06/16-09/14
  - Highway 21
  - **Yurts**
- **Recreation Sites**
  - Campground
  - Lookout/Cabin
  - Trailhead
  - **Streams - Perennial**
  - **Roads - Outside Project Area**
  - **Private**



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N

0 0.25 0.5 1 1.5 2 Miles

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Becker Integrated Resource Project

Recreation - Summer Alternative D - Map 20

Legend

- **Project Boundary**
- **Motorized Trail Trailhead - Alt. B, C, D & F**

Authorization of Non-motorized Routes

- Non-motorized Trail on Closed NFS Roads — Label 999
- Non-motorized Trail on unauthorized route

Alternative D - Designation of Motorized Trails

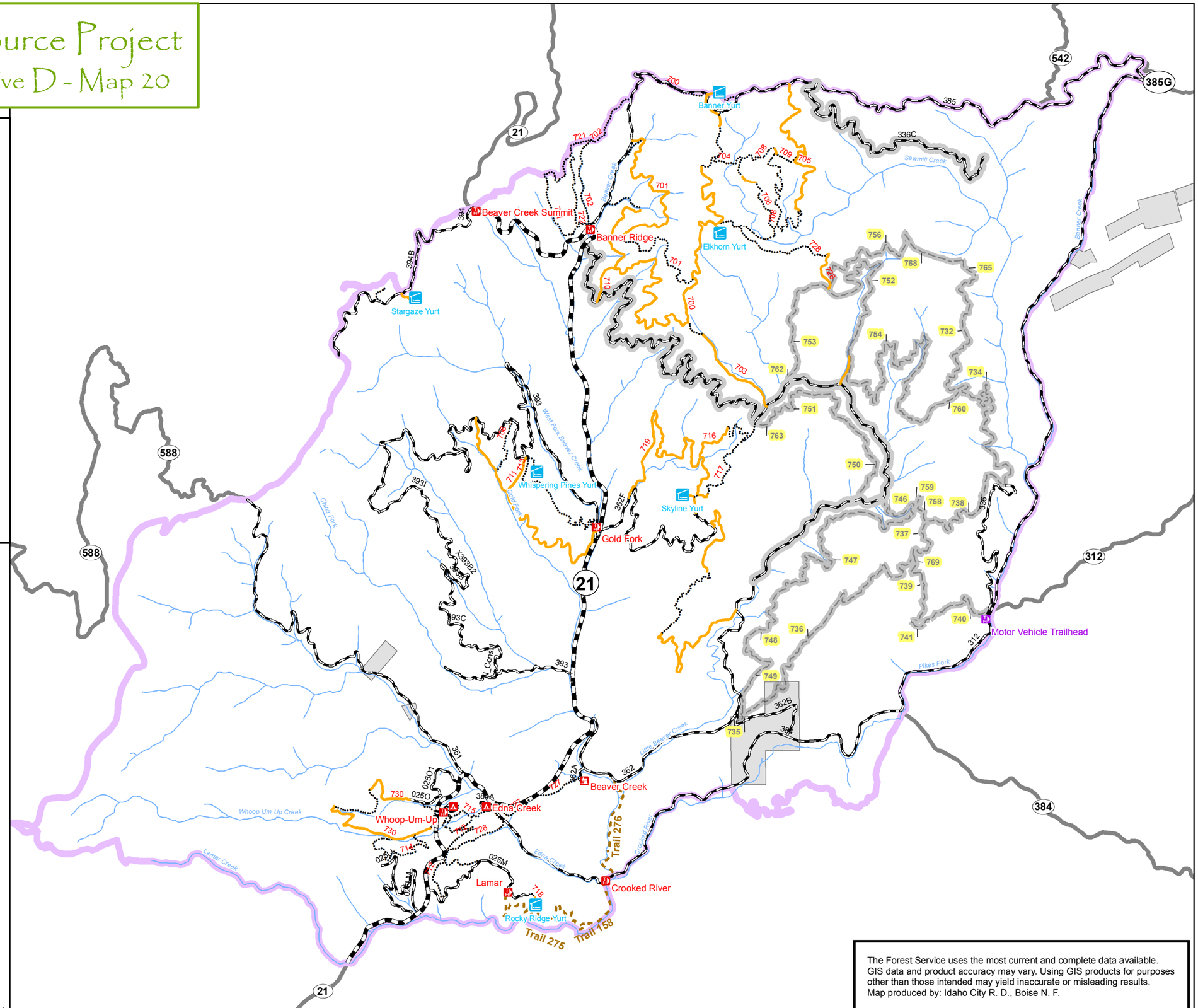
- Trails Open to Veh. 60" or Less in Width, Seasonal — Label 999

Alternative D - MVUM

- Roads Open to All Vehicles, Yearlong
- Roads Open to All Vehicles, Seasonal 06/16-09/14
- Highway 21
- **Yurts**

Recreation Sites

- Campground
- Lookout/Cabin
- Trailhead
- **Existing Non-motorized Trail**
- **Streams - Perennial**
- **Roads - Outside Project Area**
- **Private**



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0 0.25 0.5 1 1.5 2 Miles

FEIS

dbrown - 1/20/16

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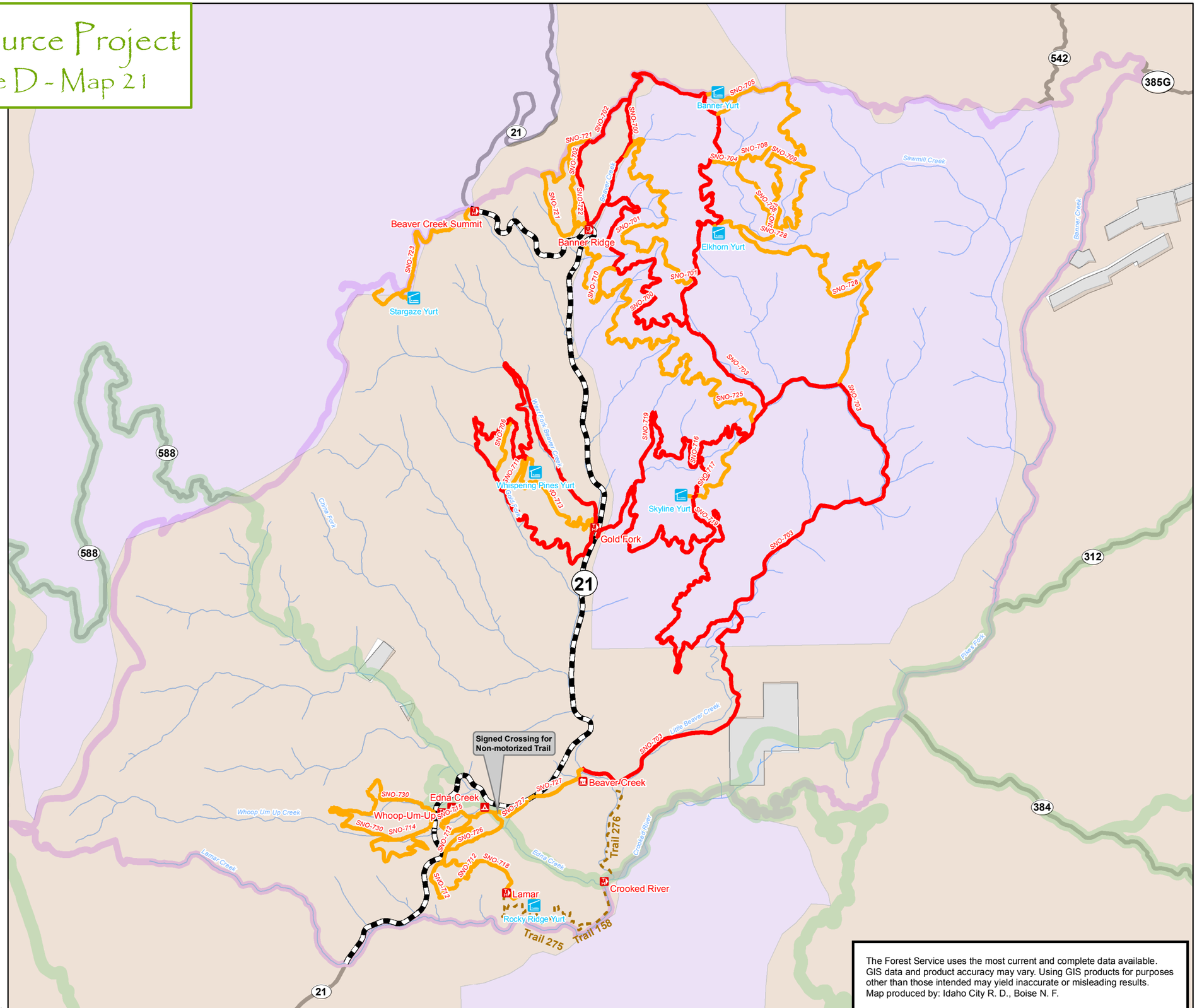
Becker Integrated Resource Project

Recreation - Winter Alternative D - Map 21

Legend

- **Project Boundary**
- **Winter Non-Motorized Trails**
  - Groomed
  - Un-groomed
- **Travel Management - Winter**
  - Motorized
  - Non-motorized
- **2013 Groomed Snowmobile Trail**
- **Highway 21**
- **Yurts**
- **Recreation Sites**
  - Campground
  - Lookout/Cabin
  - Trailhead
- **Existing Non-motorized Trail**
- **Streams - Perennial**
- **Roads - Outside Project**
- **Private**



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FELS

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Becker Integrated Resource Project

Vegetation Treatment/Harvest System - Alternative E - Map 22

Legend

Project Boundary

Alternative E - Vegetation Treatments

- Thinning with No Product Removal
- Thinning (Optional Mastication) No Product Removal
- Thinning with Optional Miscellaneous Wood Product Removal
- Thinning with Product Removal
- Mixed Treatment with Product Removal

Alternative E - Harvest System

- Helicopter
- Helicopter with Pre-Bunch
- Light Cable
- Tractor/Jammer
- Tractor

Landings - Alternatives E & F

- Helicopter
- Tractor
- Service

Alternative E - Road Construction Associated with Vegetation Treatment

- Add to System (ML2)
- NFS Road 393 Realignment (ML2)
- Reconst_ML1 to 2
- Temporary Road Construction

Existing Plantations that will be Treated

Road (.Existing)

- Highway 21
- Open NFS Roads
- NFS Roads Seasonally Closed to Public Motorized Use (Open 6/16 - 9/14)
- NFS Roads Closed to Motorized Access

Yurts

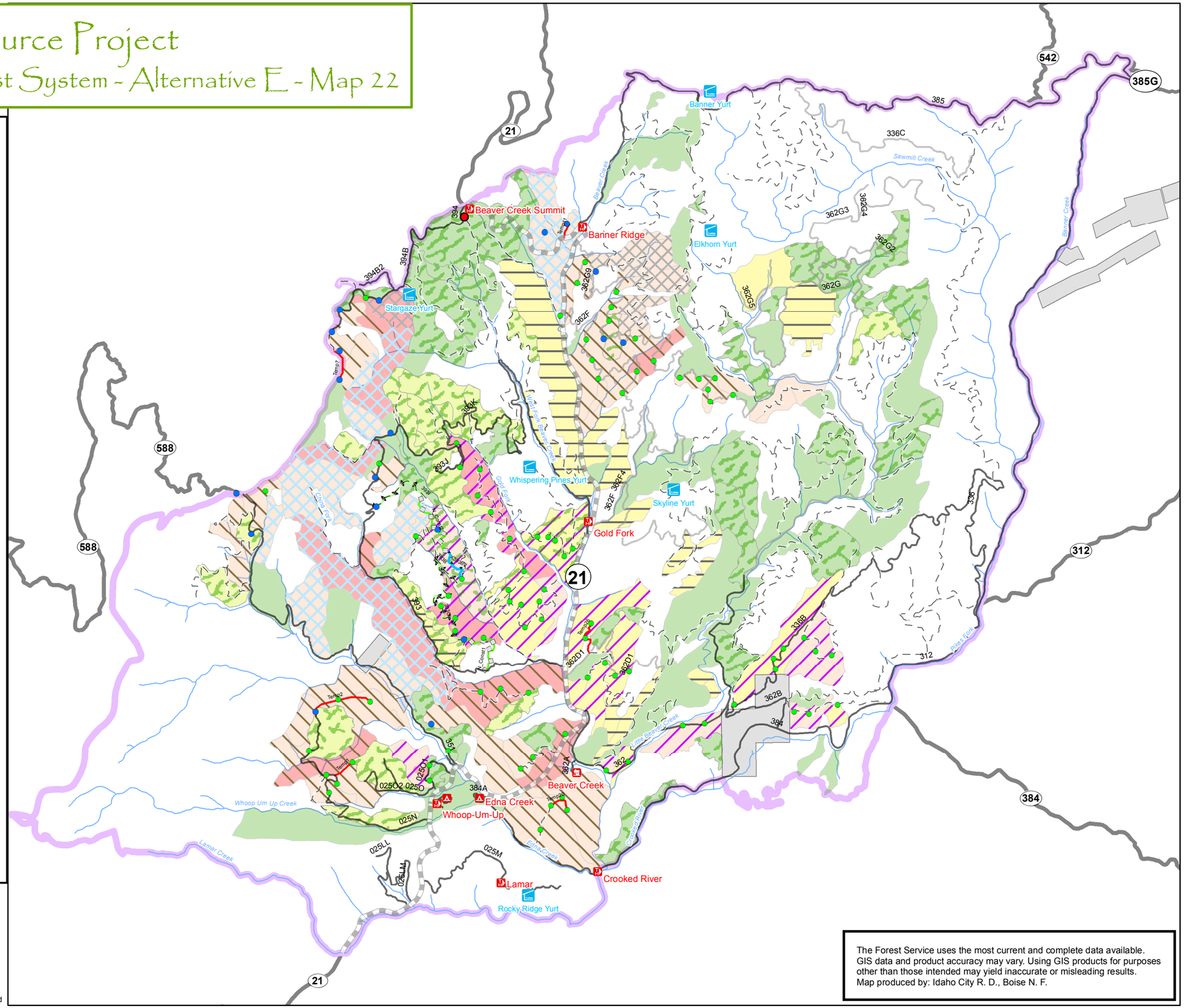
Recreation Sites

- Campground
- Lookout/Cabin
- Trailhead

Streams - Perennial

Roads - Outside Project Area

Private



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Becker Integrated Resource Project

Fuels - Alternative E - Map 23

Legend

- **Project Boundary**
- **Natural Fuels - Direct Application of**
- **Natural Fuels - Indirect Application of**
- **Application of Broadcast Burn Treatment**

Activity Fuels Treatments

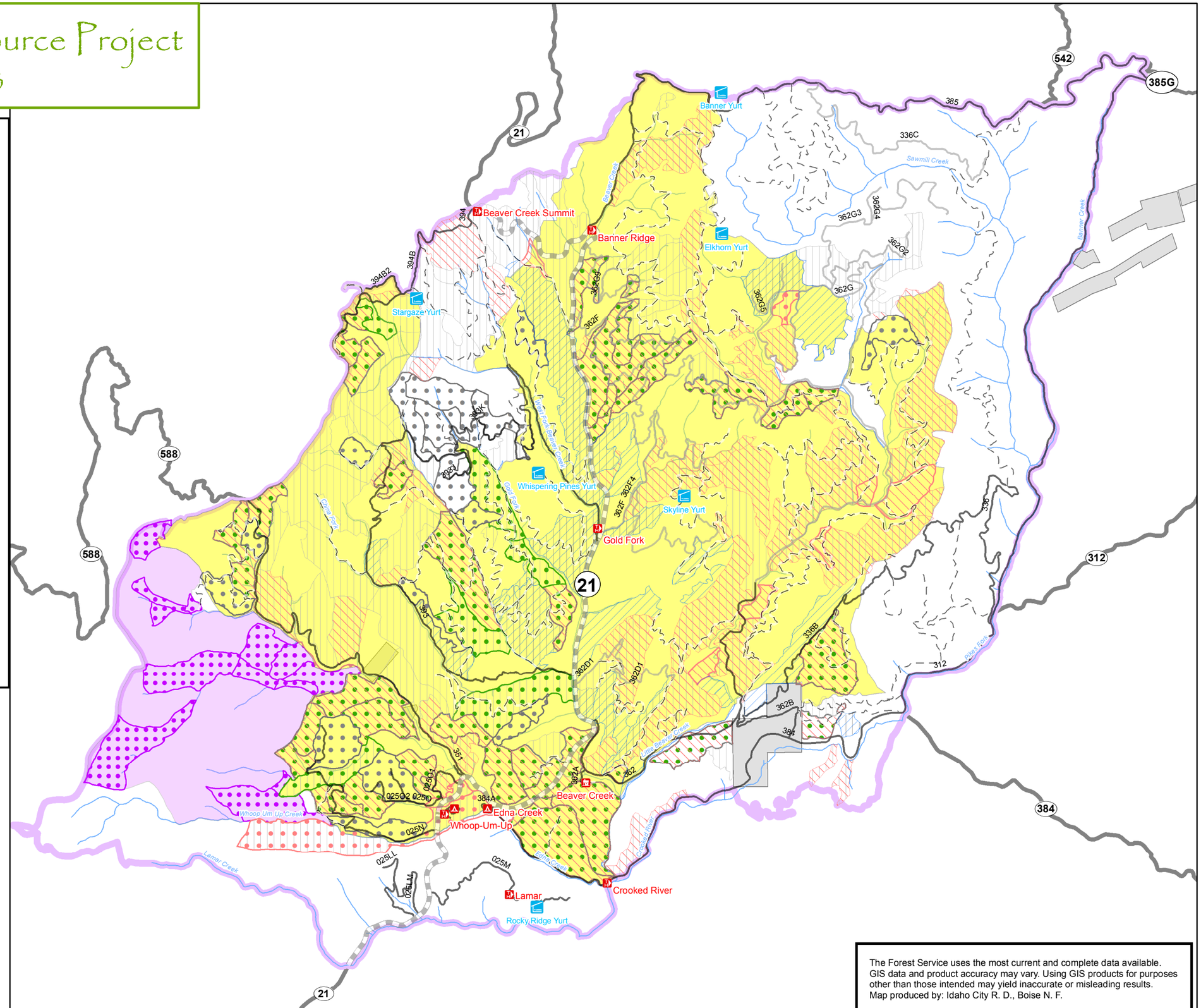
- Lop & scatter
- Handpile and Lop & scatter
- Handpile concentrations
- Handpile concentrations and Lop & scatter
- Chip or Lop & scatter
- Yard Handpile concentrations
- Yard Handpile concentrations and Lop & scatter
- Whole Tree Yard and Lop & scatter
- Whole Tree Yard and Handpile

Road (.Existing)

- Highway 21
- Open NFS Roads
- NFS Roads Seasonally Closed to Public Motorized Use (Open 6/16 - 9/14)
- NFS Roads Closed to Motorized
- **Yurts**

Recreation Sites

- Campground
- Lookout/Cabin
- Trailhead
- **Streams - Perennial**
- **Roads - Outside Project Area**
- **Private**



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Becker Integrated Resource Project

Transportation - Alternative E - Map 24

Legend

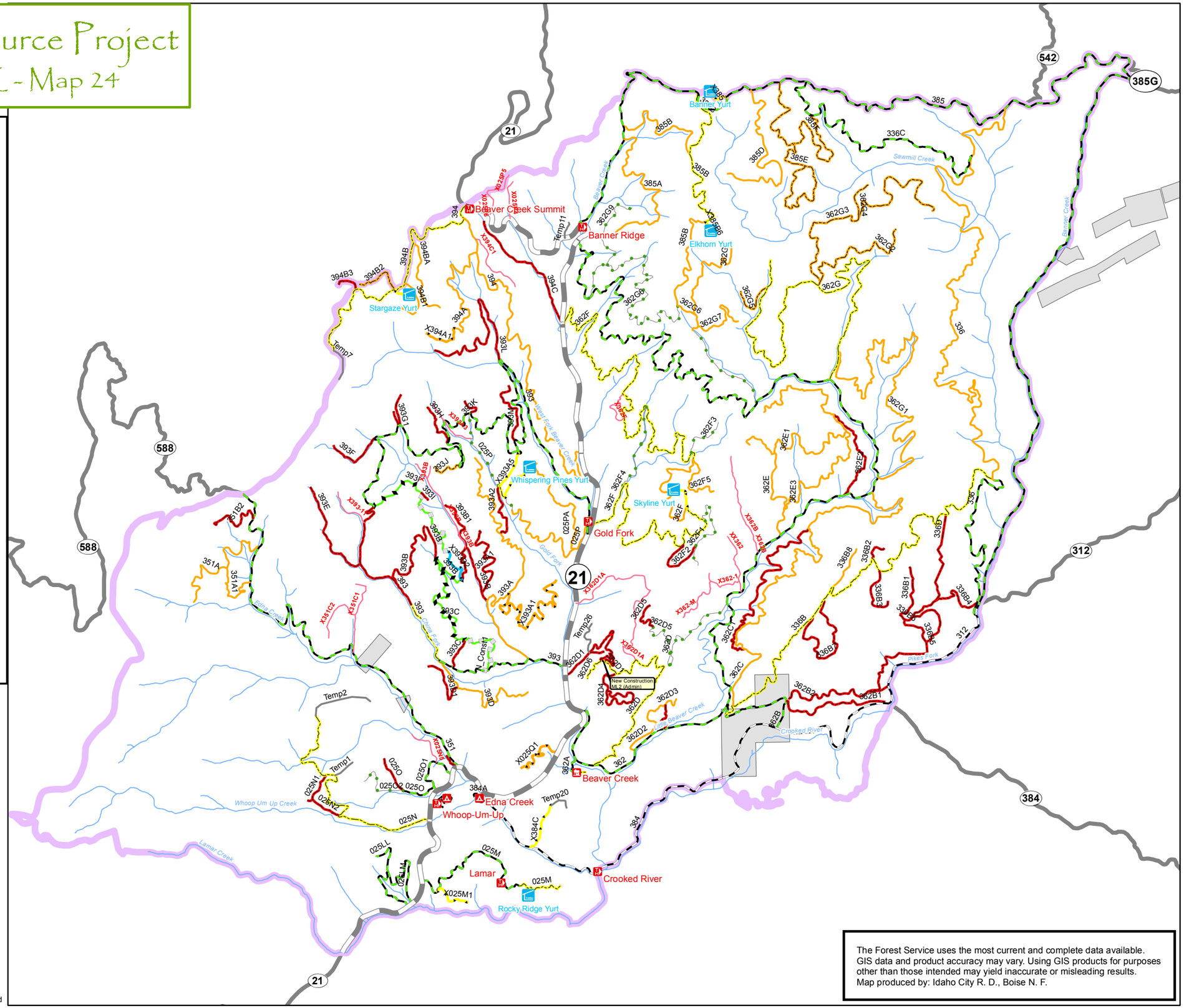
- **Project Boundary**

Alternative E - Transportation

- Decommission
- Closed to All Motorized Access (ML2 to ML1)
- Closed to Public Motorized Access (ML2 Admin)
- Add to System - Closed to All Motorized Access (ML1)
- Add to System - (ML2)
- Add to System - Closed to Public Motorized Access (ML2 Admin)
- New Construction (ML2)
- New Construction - Closed to Public Motorized Access (ML2 Admin)
- Reconstruction (ML1 to ML2)
- Temporary Road Construction
- Convert to Non-motorized Trail
- No Change - ML 1 - Closed to All Motorized
- No Change - ML 2 - High Clearance Vehicles
- No Change - ML 3 - Suitable for Passenger Cars
- Highway 21
- **Unauthorized Routes - Decommission**
- **Yurts**

Recreation Sites

- Campground
- Lookout/Cabin
- Trailhead
- **Streams - Perennial**
- **Roads - Outside Project**
- **Private**



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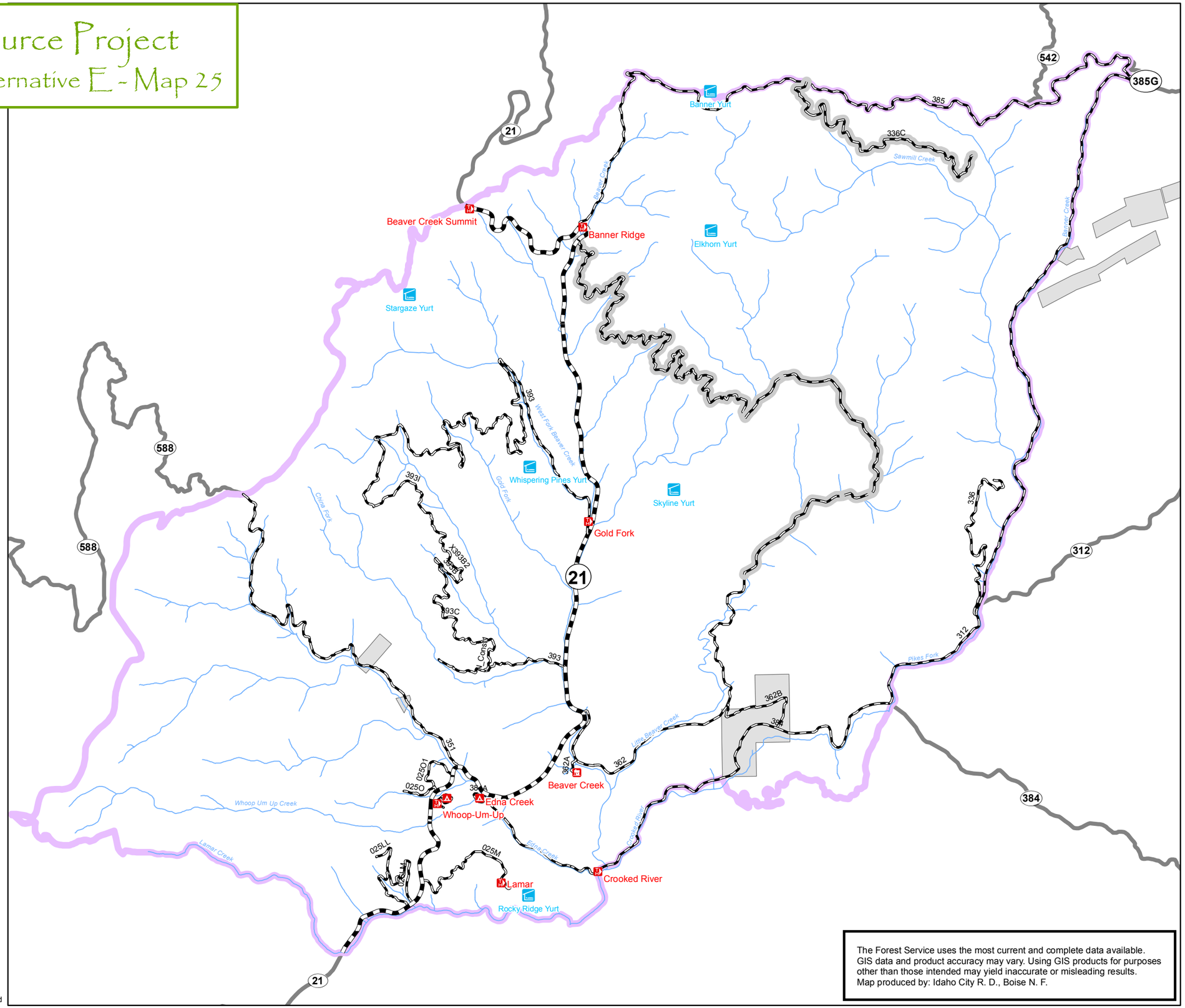
Becker Integrated Resource Project
Transportation - MVUM Alternative E - Map 25

Legend

- **Project Boundary**
- **Alternative E - MVUM**
  - Roads Open to All Vehicles,
  - Roads Open to All Vehicles, Seasonal 06/16-09/14
  - Highway 21
  - **Yurts**
- **Recreation Sites**
  - Campground
  - Lookout/Cabin
  - Trailhead
- **Streams - Perennial**
- **Roads - Outside Project Area**
- **Private**



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Becker Integrated Resource Project

Recreation - Summer Alternative E - Map 26

Legend

- **Project Boundary**

Authorization of Non-motorized Routes

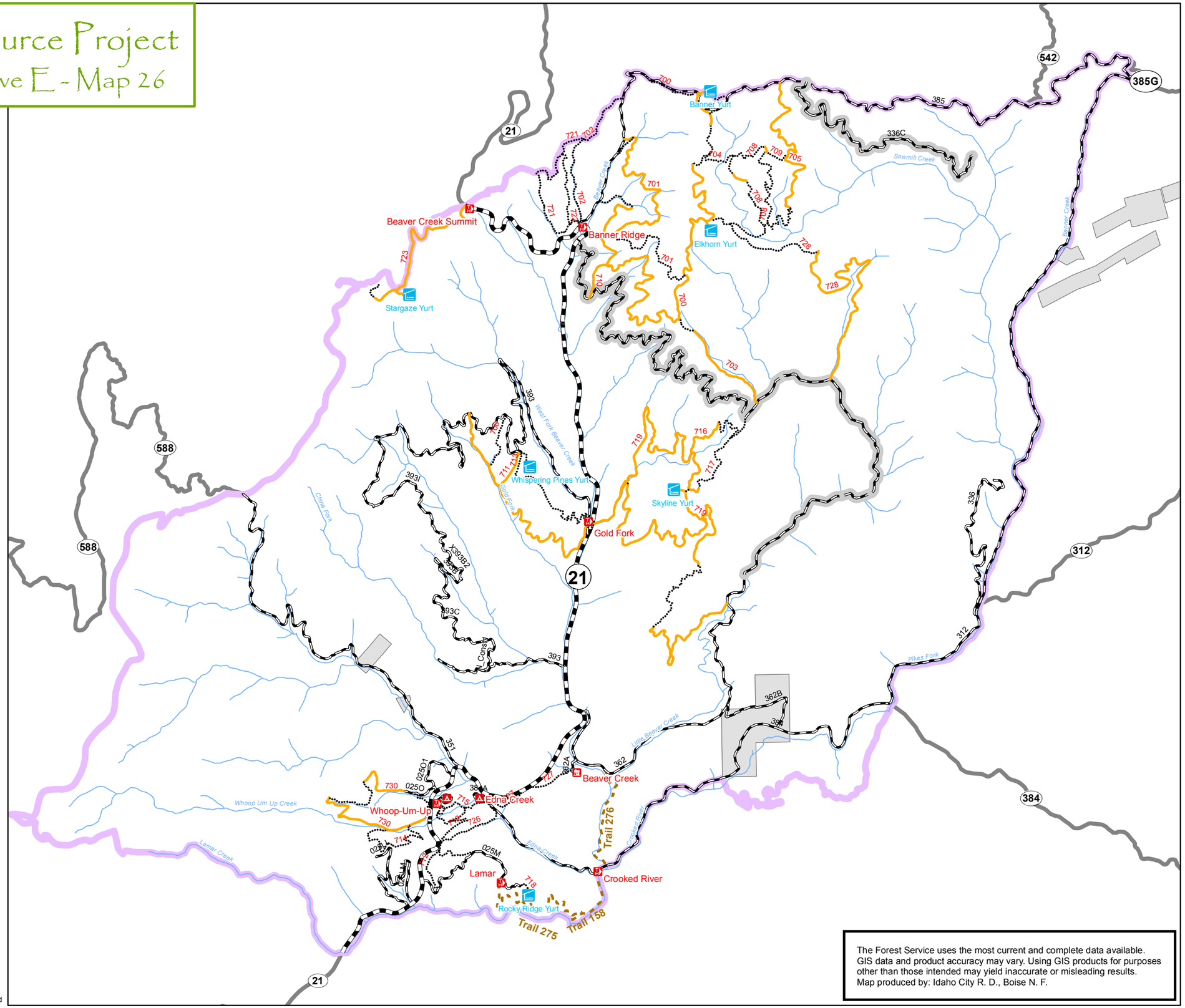
- Non-motorized Trail on Closed NFS Roads — Label 999
- Non-motorized Trail on unauthorized route

Alternative E - MVUM

- Roads Open to All Vehicles, Yearlong
- Roads Open to All Vehicles, Seasonal 06/16-09/14
- Highway 21
- **Yurts**

Recreation Sites

- Campground
- Lookout/Cabin
- Trailhead
- **Existing Non-motorized Trail**
- **Streams - Perennial**
- **Roads - Outside Project Area**
- **Private**



N

0 0.25 0.5 1 1.5 2 Miles

FELS

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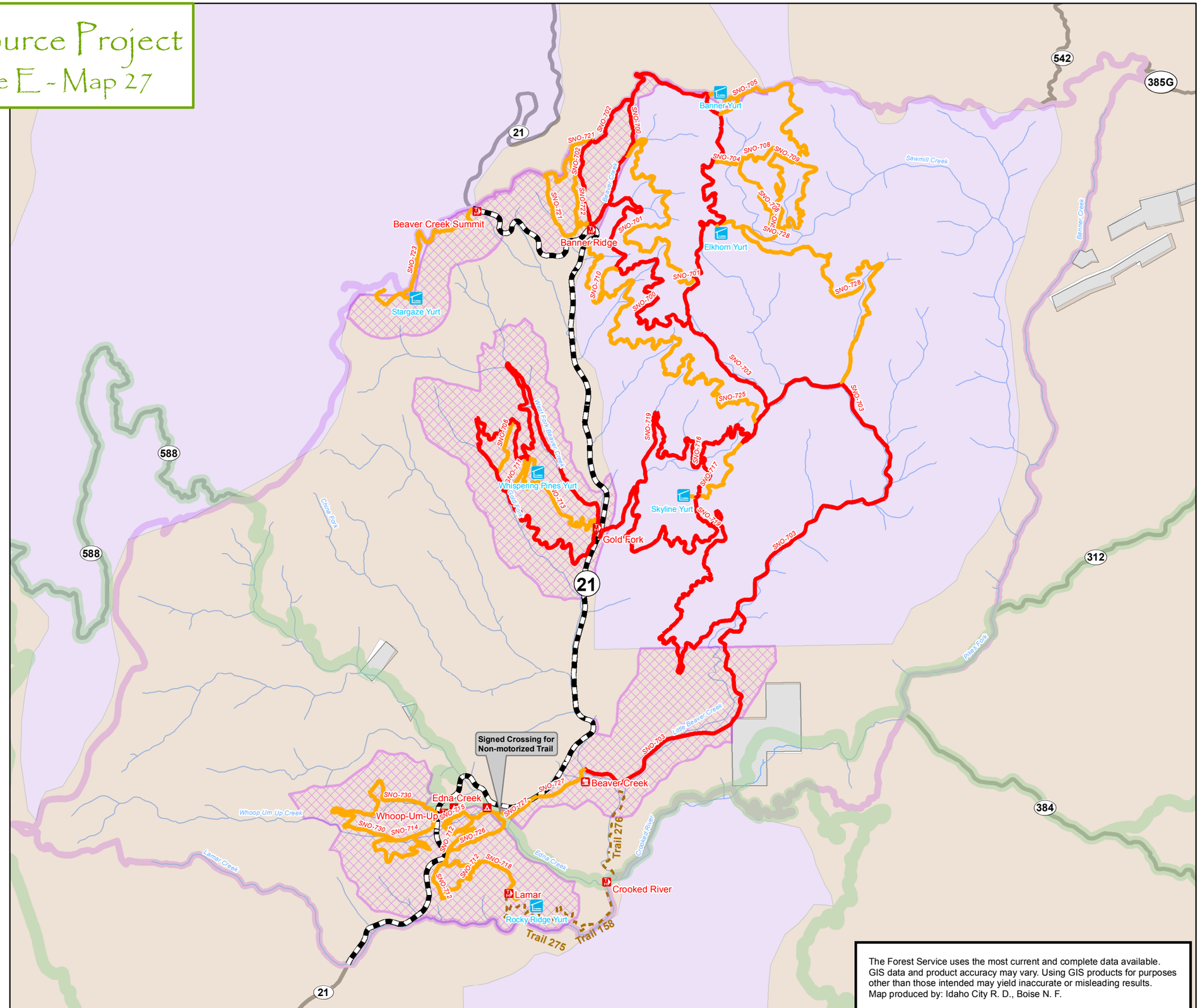
Becker Integrated Resource Project

Recreation - Winter Alternative E - Map 27

Legend

- **Project Boundary**
- **Winter Non-Motorized Trails**
  - Groomed
  - Un-groomed
  - **Motorized Winter Closure - Alt. C, E, F, Modified C**
- **Travel Management - Winter**
  - Motorized
  - Non-motorized
- **2013 Groomed Snowmobile Trail**
- **Highway 21**
- **Yurts**
- **Recreation Sites**
  - Campground
  - Lookout/Cabin
  - Trailhead
- **Existing Non-motorized Trail**
- **Streams - Perennial**
- **Roads - Outside Project Area**
- **Private**



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N

0 0.25 0.5 1 1.5 2 Miles

FELS

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Becker Integrated Resource Project

Vegetation Treatment/Harvest System - Alternative F - Map 28

Legend

Project Boundary

Alternative F - Vegetation Treatments

- Thinning with No Product Removal
- Thinning (Optional Mastication) No Product Removal
- Thinning with Optional Miscellaneous Wood Product Removal
- Thinning with Product Removal
- Mixed Treatment with Product Removal

Alternative F - Harvest System

- Helicopter
- Light Cable
- Tractor/Jammer
- Tractor

Landings - Alternatives E & F

- Helicopter
- Tractor
- Service

Alternative F - Road Construction Associated with Vegetation Treatment

- Add to System (ML2)
- NFS Road 393 Realignment (ML2)
- Reconst_ML1 to 2
- Temporary Road Construction

Existing Plantations that will be Treated

Road (.Existing)

- Highway 21
- Open NFS Roads
- NFS Roads Seasonally Closed to Public Motorized Use (Open 6/16 - 9/14)
- NFS Roads Closed to Motorized

Yurts

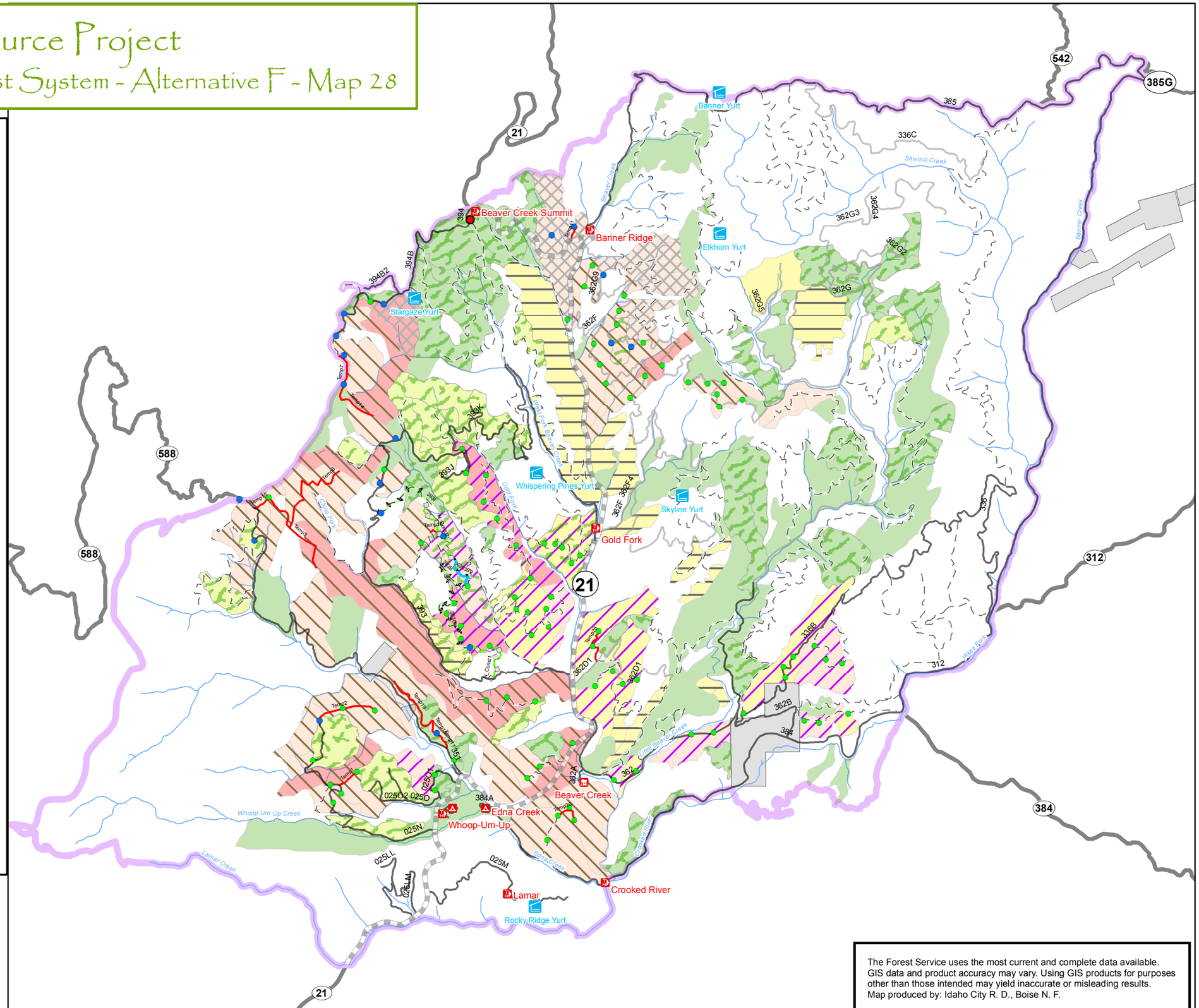
Recreation Sites

- Campground
- Lookout/Cabin
- Trailhead

Streams - Perennial

Roads - Outside Project Area

Private



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N

0 0.25 0.5 1 1.5 2 Miles

FEIS

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Becker Integrated Resource Project

Fuels - Alternative F - Map 29

Legend

- **Project Boundary**
- **Natural Fuels - Direct Application of**
- **Natural Fuels - Indirect Application of**
- **Application of Broadcast Burn Treatment**

Activity Fuels Treatments

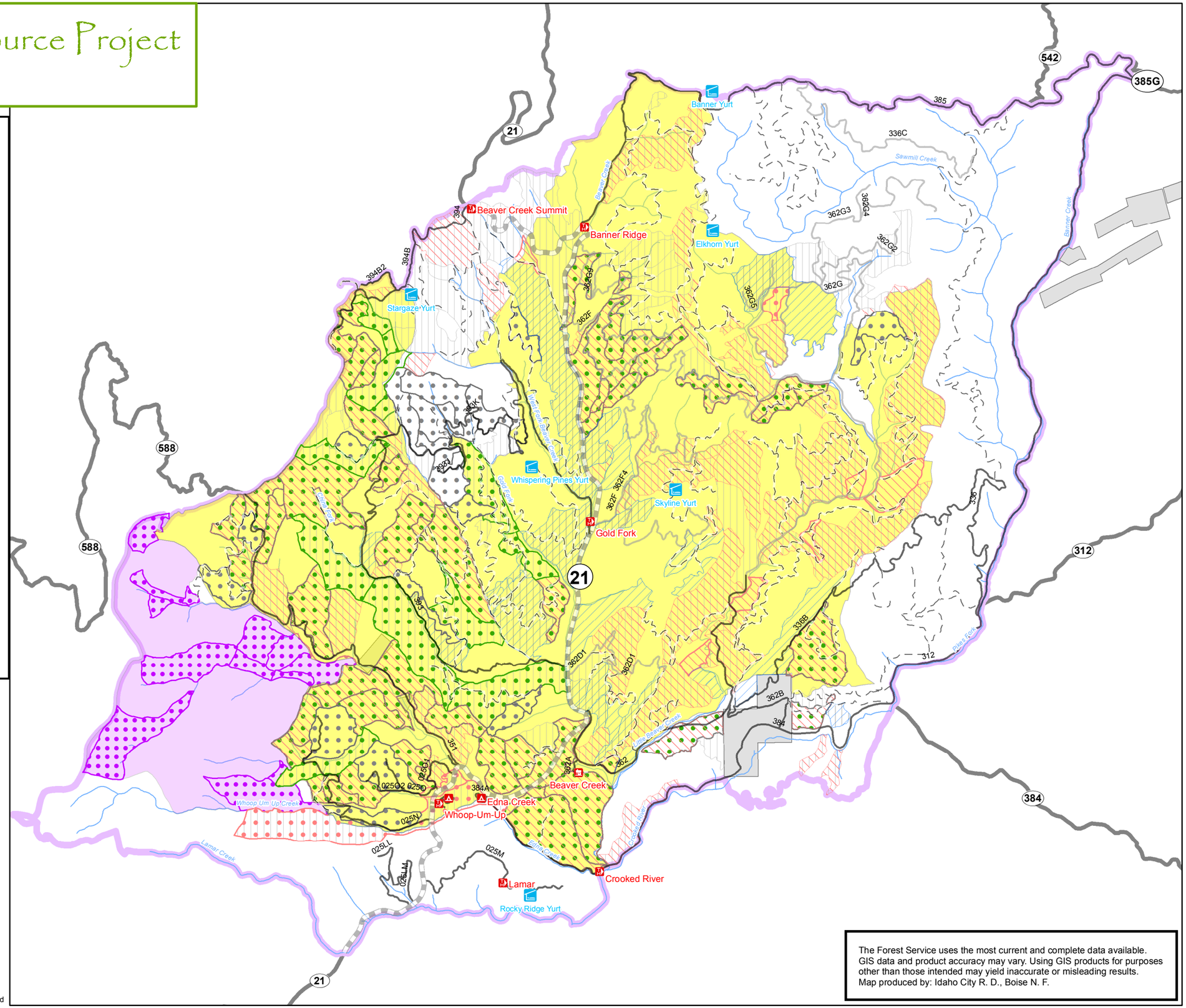
- Lop & scatter
- Handpile and Lop & scatter
- Handpile concentrations
- Handpile concentrations and Lop & scatter
- Chip or Lop & scatter
- Yard Handpile concentrations
- Yard Handpile concentrations and Lop & scatter
- Whole Tree Yard and Lop & scatter
- Whole Tree Yard and Handpile

Road (.Existing)

- Highway 21
- Open NFS Roads
- NFS Roads Seasonally Closed to Public Motorized Use (Open 6/16 - 9/14)
- NFS Roads Closed to Motorized
- **Yurts**

Recreation Sites

- Campground
- Lookout/Cabin
- Trailhead
- **Streams - Perennial**
- **Roads - Outside Project Area**
- **Private**



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Map produced by: Idaho City R. D., Boise N. F.

N

0 0.25 0.5 1 1.5 2 Miles

FEIS

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Becker Integrated Resource Project

Transportation - Alternative F - Map 30

Legend

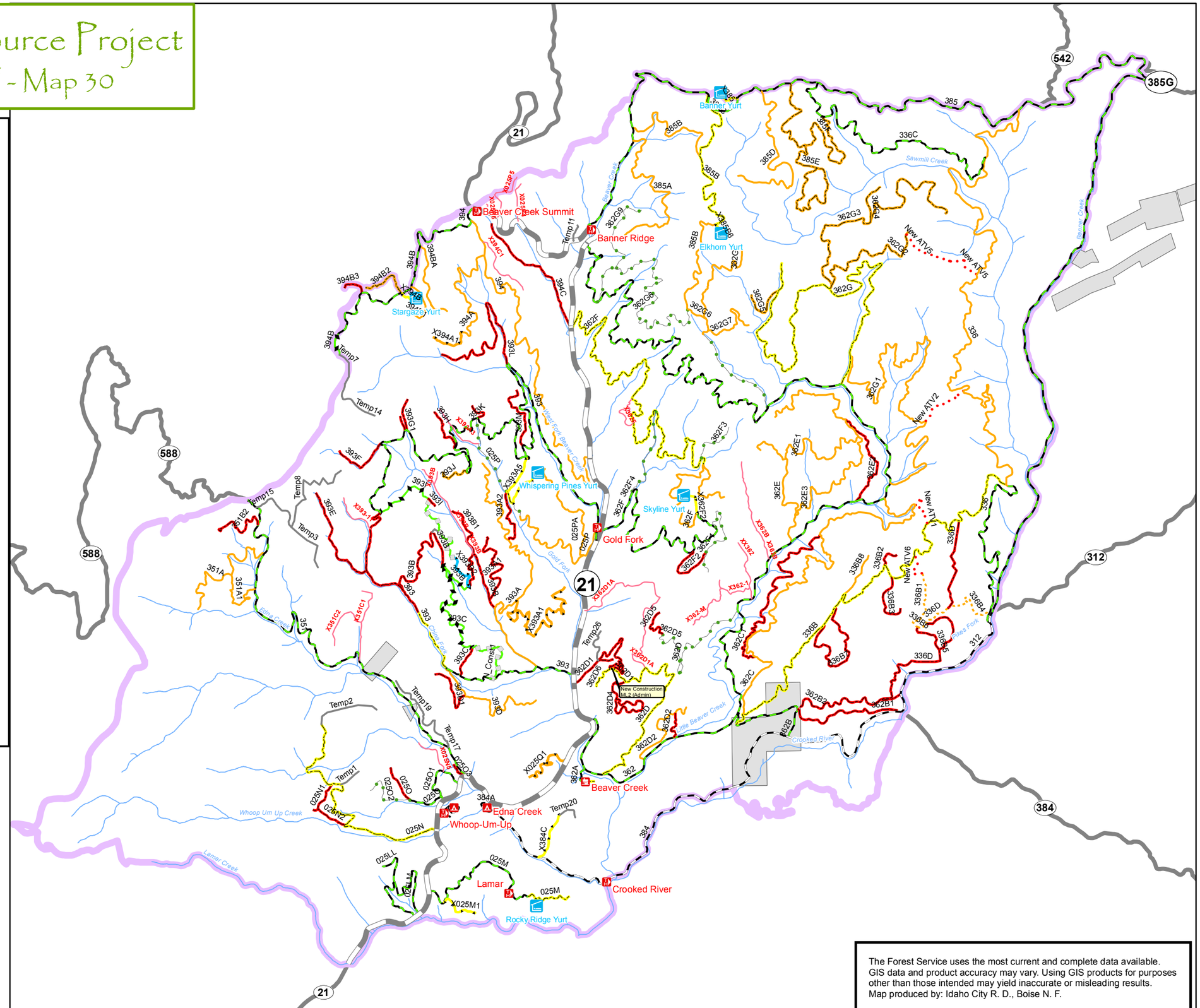
Project Boundary

Alternative F - Transportation Treatments

- Decommission
- Closed to All Motorized Access (ML2 to ML1)
- Closed to Public Motorized Access (ML2 Admin)
- Add to System - Closed to All Motorized Access (ML1)
- Add to System - (ML2)
- Add to System - Closed to Public Motorized Access (ML2 Admin)
- New Construction (ML2)
- New Construction - Closed to Public Motorized Access (ML2 Admin)
- Reconstruction (ML1 to ML2)
- Convert ML1 to Motorized Trail for Vehicles 60" or less
- Temporary Road Construction
- Motorized Trail Construction for Vehicles 60" or less; ATV_NewConstruction-Visible Prism
- Convert to Non-motorized Trail
- No Change - ML 1 - Closed to All Motorized
- No Change - ML 2 - High Clearance Vehicles
- No Change - ML 3 - Suitable for Passenger Cars
- Highway 21
- **Unauthorized Routes - Decommission**
- **Yurts**

Recreation Sites

- Campground
- Lookout/Cabin
- Trailhead
- **Streams - Perennial**
- **Roads - Outside Project Area**
- **Private**



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N

0 0.25 0.5 1 1.5 2 Miles

FEIS

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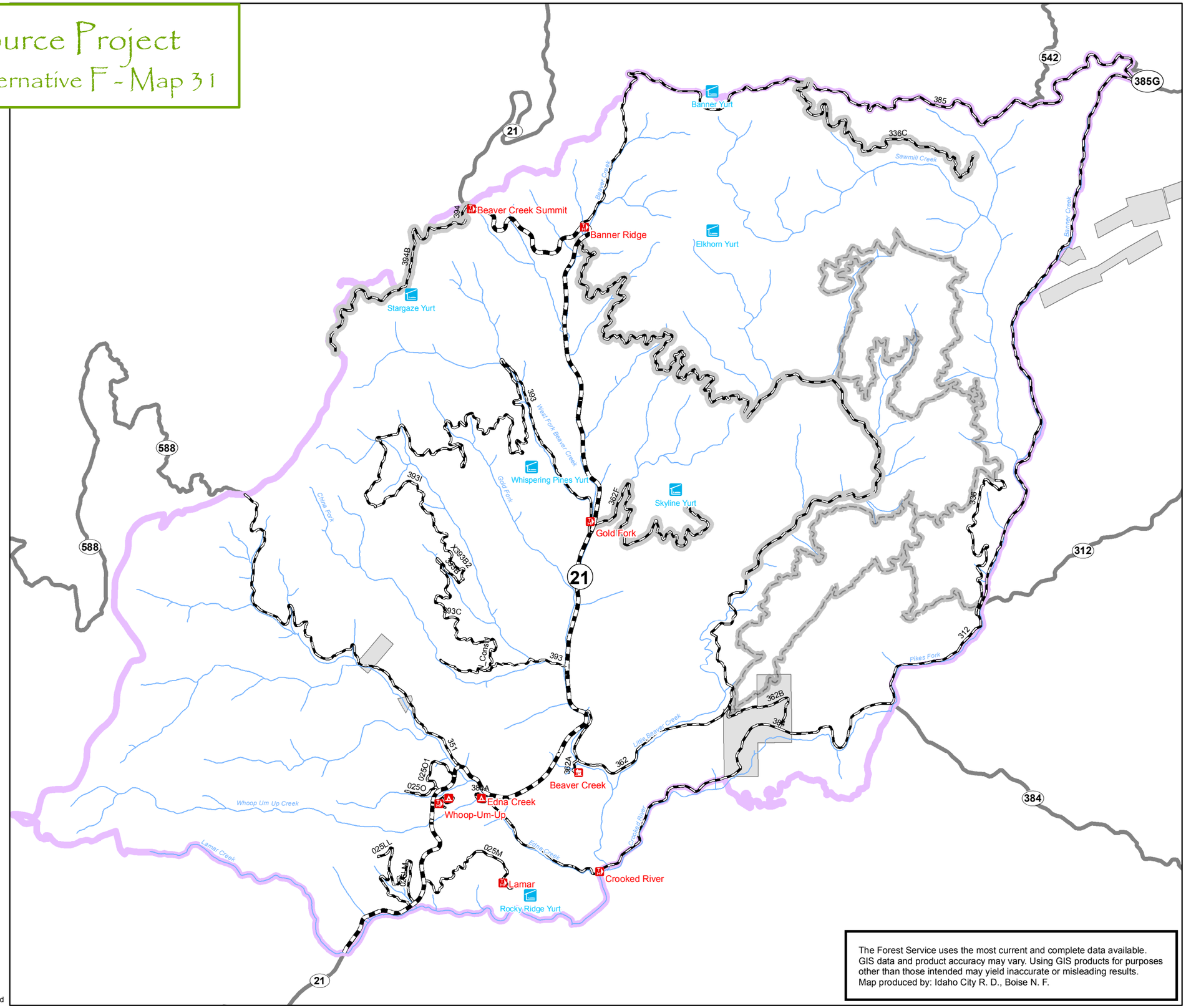
Becker Integrated Resource Project

Transportation - MVUM Alternative F - Map 31

Legend

- **Project Boundary**
- **Alternative F - Motorized Trail**
  - Trails Open to Vehicles 60" or Less in Width, Seasonal
- **Alternative F - MVUM**
  - Roads Open to All Vehicles,
  - Roads Open to All Vehicles, Seasonal 06/16-09/14
  - Highway 21
  - **Yurts**
- **Recreation Sites**
  - Campground
  - Lookout/Cabin
  - Trailhead
  - **Streams - Perennial**
  - **Roads - Outside Project**
  - **Private**



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N

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FEIS

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Becker Integrated Resource Project

Recreation - Summer Alternative F - Map 32

Legend

- **Project Boundary**
- **Motorized Trail Trailhead - Alt. B, C, D & F**

Authorization of Non-motorized Routes

- Non-motorized Trail on Closed NFS Roads — Label 999
- Non-motorized Trail on unauthorized route

Alternative F - Motorized Trail

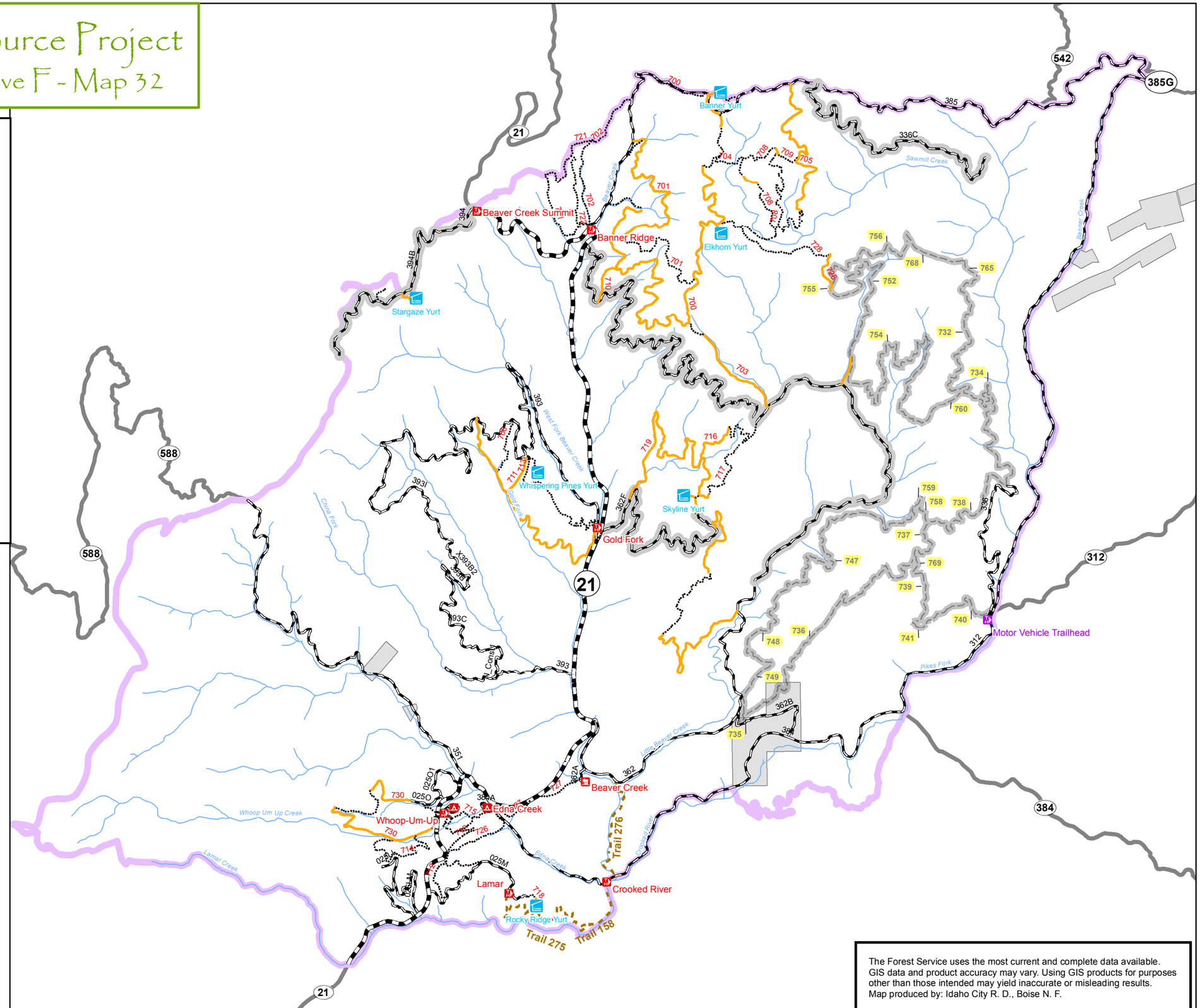
- Trails Open to Vehicles 60" or Less in Width, Seasonal — Label 999

Alternative F - MVUM

- Roads Open to All Vehicles,
- Roads Open to All Vehicles, Seasonal 06/16-09/14
- Highway 21
- **Yurts**

Recreation Sites

- Campground
- Lookout/Cabin
- Trailhead
- **Existing Non-motorized Trail**
- **Streams - Perennial**
- **Roads - Outside Project Area**
- **Private**



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Map produced by: Idaho City R. D., Boise N. F.

N

0 0.25 0.5 1 1.5 2 Miles

FEIS

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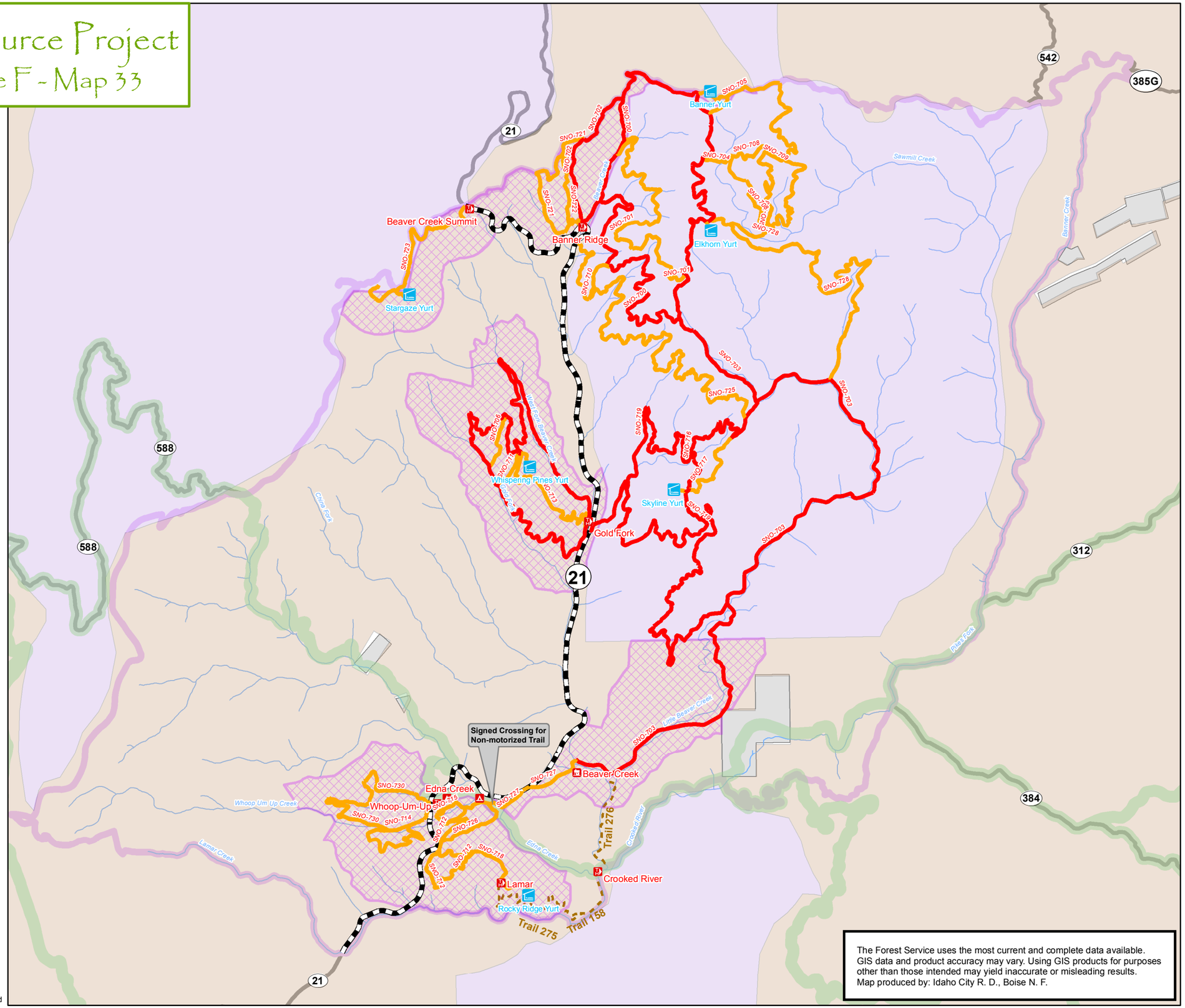
Becker Integrated Resource Project

Recreation - Winter Alternative F - Map 33

Legend

- **Project Boundary**
- **Winter Non-Motorized Trails**
  - Groomed
  - Un-groomed
  - **Motorized Winter Closure - Alt. C, E, F, Modified C**
- **Travel Management - Winter**
  - Motorized
  - Non-motorized
- **2013 Groomed Snowmobile Trail**
- **Highway 21**
- **Yurts**
- **Recreation Sites**
  - Campground
  - Lookout/Cabin
  - Trailhead
- **Existing Non-motorized Trail**
- **Streams - Perennial**
- **Roads - Outside Project Area**
- **Private**



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Appendix K
Response to Comments
Becker Integrated Resource Project

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Table 1 – Boise County Commissioners Comment Letter

Comment Number	Comment Letter	Response Code[1]	Forest Service Response
BC-1	BOISE COUNTY BOARD OF COUNTY COMMISSONERS P. 0. Box 1300 Idaho City, Idaho 83631 (208) 392-4431 FAX (208) 392-4473 October 6th , 2015 Becker Integrated Resource Project USDA Forest Service Brant Petersen 3833 Highway 21 Idaho City, ID 83631 Re: Becker Integrated Resource Project The Boise County Board of Commissioners supports the proposed environmental impact statement which analyzes the proposed vegetation and watershed restoration, recreation improvement and enhancement, and local economic support activities, in the Becker Integrated Resource Project area, within the Idaho City Ranger District of the Boise National Forest.	D	Thank you for your review of the Becker Integrated Resource Project.
BC-2	We understand that the purpose of this environmental impact statement is vital. The Boise County Board of Commissioners supports this project and we would like to see it move forward.	D	The Forest Service acknowledges the Boise County Commissioners support for this project.

Comment Number	Comment Letter	Response Code[1]	Forest Service Response
	If you have any questions, please contact the Board of Boise County Commissioners at 392-4431. Sincerely, Board of County Commissioners Alan D. Ward Chairman Roger B. Jackson Commissioner Laura L. Baker Commissioner	A	Thank you for your comments.

[1] Response Codes
A. Comment is beyond the scope of the project or not relevant to the action proposed (e.g., identified cause-effect relationship would not result should the proposal be implemented)?
B. Comment will be addressed and resolved though application of the Forest Plan standards and guidelines or best management practices?
C. Comment will be addressed and resolved through implementation of project specific mitigation measures to the Proposed Action?
D. Comment will be addressed during processes or analyses routinely conducted by the ID Team?
E. Comment is a point of unresolved conflict with the Proposed Action and will be considered in alternative development.
F. Comment includes a request for an alternative.

Table 2 – Thomas Foote Comments (tax.advocacy@ymail.com)

Comment Number	Comment Letter	Response Code	Forest Service Response
TF-1	The preferred alternative for the Becker project is likely to have a serious, adverse effect on the yurt system operated by Idaho Parks and Recreation. Restricting vehicle access by requiring users to park at the paved roads will make it difficult, if not impossible for some users to utilize this wonderful resource because they will not be physically able to get themselves and their belongings to the facilities. These yurts represent a wonderful experience for these people who would not otherwise be able to enjoy the more remote experience in Idaho's forest.	D	Thank you for your comments. The preferred alternative, Alternative C, maintains the existing seasonal closure of NFS Road 362F to the Skyline Yurt and proposes a new seasonal closure on NFS Road 394B to the Stargazer Yurt. The seasonal closure period would be from 9/15 to 6/15, annually (DEIS Section 2.4.3). Much of this closure period is during the winter season when the roads cannot be accessed by motorized wheeled vehicles due to snow. Therefore, motorized wheeled vehicle access on these roads would only be closed during the shoulder seasons of spring and fall. Summer time motorized access would be allowed on NFS Roads 362F and 394B. The Forest Service completed a travel analysis process (TAP) and travel analysis report (TAR) for the Becker Integrated Resource project to inform the Proposed Action for travel management activities (USDA Forest Service 2014). The TAR is available in the Project Record. The TAP/TAR is available in the project record. The TAR recommended that the following for NFS Road 362F and 394B. • NFS Road 362F: No change from current management to facilitate management related activities associated with silvicultural and fuels treatments, wildfire suppression, and recreation access (USDA Forest Service 2014, p. 22). Current management of NFS Road 362F open for public use with a seasonal closure from 9/15-6/15, annually (DEIS, Map 2).

Comment Number	Comment Letter	Response Code	Forest Service Response
			• NFS Road 394B: Change from Maintenance Level 2 (Open for public use) to ML2 (Administrative Use only) in order to minimize deleterious effects on snags and downed logs, calving and fawning habitat, and big game security (USDA Forest Service 2014, p. 22). Current management of this road is open for public use (DEIS, Map 1). Effects analyses, including recreation (Section 3.7) and engineering/transportation (Section 3.6), are summarized in Chapter 3 of the DEIS. Complete technical reports are available in the project record. Additional discussion will be included in the Recreation section of the FEIS and supporting technical report to clarify the existing condition and impacts to recreation users resulting from the road proposals.

Comment Number	Comment Letter	Response Code	Forest Service Response
TF-2	This could also lead to a significant reduction in use of the yurt system and the consequent loss of revenue could lead to failure of the system. This would be a tragic result for a program that has been a significant success in expanding the use of Idaho's forest resources by a broader range of individuals.	D	DEIS, Section 3.16 (Socioeconomics) summarizes the effects of the alternative to economics including IDPR Yurt revenue. The Socioeconomics Technical Report is available in the Project Record. The analysis for Alternative C indicates that changing NFS road 394B accessing the Stargaze Yurt to seasonally closed may reduce nightly rental income by $65 to $75 per night during the closure period (DEIS Section 3.16.3). The seasonal closure period would be from 9/15 to 6/15, annually. Much of this closure period is during the winter season when the roads cannot be accessed by motorized wheeled vehicles due to snow. Therefore, motorized wheeled vehicle access on these roads would only be closed during the shoulder seasons of spring and fall. Summer motorized vehicle access would be allowed. Occupancy data provided to the Forest Service by IDPR indicates that the occupancy rates during each season have been highly variable since 2009. Please refer to DEIS, Table 3-152 for IDPR occupancy data from 2009-2013. IDPR's comment on the DEIS indicates that the Skyline Yurt has fewer stays than the Stargaze Yurt. Our reservation records show that the Stargaze Yurt has occupancy rates ranging from 65.22% in the spring to 70.45% in the fall. The Skyline Yurt has lower occupancy rates from 34.78% in the spring to 26.67% in the fall. IDPR also states in their comments on the DEIS; that the seasonal restriction on road accessing Stargaze Yurt would result in a 19 day reduction in occupancy and equate to a $959.31 revenue loss. The complete IDPR comment letter is available in the Project Record.

Comment Number	Comment Letter	Response Code	Forest Service Response
TF-3	If the preferred alternative is ultimately selected, I would strongly suggest that some form of grandfathering be put into place to allow vehicle access into these yurts during the spring, summer and fall seasons. Thank you for the opportunity to comment.	F	Thank you for your comment. An alternative that includes motorized access in the spring, fall, and summer to the Stargaze and Skyline yurts, Alternative D, was included in the alternative analyzed in detail and presented in the DEIS disclosures (DEIS Section 2.4.4).

Table 3 – Paul Dawson Comments. (pdawson@boisestate.edu)

Comment Number	Comment Letter	Response Code	Forest Service Response
PD-1	I use the Idaho City yurts and trail system in both the winter for skiing and the summer for biking. I hope there are no restrictions placed on the use of these facilities and activities. I recommend that USFS Road 394B to The Stargaze yurt and USFS road 362F to the Skyline do not have seasonal closures placed on them. The yurt and trail system is a tremendous resource for the residents of Boise and SW Idaho.	D	Thank you for your comments. Please see Forest Service responses to comments TF-1 and TF-3.

Table 4 – Pam McKnight Comments. (boiseartist@gmail.com)

Comment Number	Comment Letter	Response Code	Forest Service Response
PM-1	I would like to recommend that USFS Road 394B to The Stargaze yurt and USFS road 362F to the Skyline yurt do not have seasonal closures placed on them. This would curtail access to the yurts for all but the most robust. Having to carry gallons of water etc. up a steep incline would surly cause a decrease in the number of users and possible closures of this wonderful asset.	D	Thank you for your comments. Please see Forest Service responses to comments TF-1 and TF-3.

Table 5 – David Henry Comments. David Henry, 1407 S. Oriole Way, Boise, ID 83709, email: iruh60ti@yahoo.com

Comment Number	Comment Letter	Response Code	Forest Service Response
DH-1	I believe the plan has various flaw and the most important one is limiting access to the Stargazer and Skyline yurts during certain seasons. By doing this you limit access to those who cannot move under their own power including small children, elderly, handicapped, and to me the most important is disabled veterans.	D	Thank you for your comments. Please see Forest Service responses to comments TF-1 and TF-3.
DH-2	It also appears to me that the useable miles of trails to motorized vehicles is getting slashed dramatically. I am a big proponent of ORV usage and snow machine access. I pay the privilege to ride in Idaho and this is one of my favorite areas.	D	The Becker Integrated Resource Project area does not currently have any designated motorized trails for summer season use (DEIS, Table 3-118). All of the action alternatives, with the exception of Alternative E, propose a new designated motorized trail system in the project area (DEIS, section 2.4, DEIS Table 3-118).

Table 6 – Owen Jones comments. Owen Jones 9139 W. Covey Hill Ct., Boise, ID 83709, email: fearless@catpeople.com

Comment Number	Comment Letter	Response Code	Forest Service Response
OJ-1	The Idaho City Yurt System is an important recreational research for the State of Idaho. If access to these yurts us restricted during the summer months, income will be drastically reduced and the entire Yurt system could be in jeopardy.	D,F	Thank you for your comments. Please see Forest Service responses to comments TF-1 and TF-2.
	I recommend that USFS Road 394B to The Stargaze yurt and USFS road 362F to the Skyline do not have seasonal closures placed on them. Please help protect access to these critical recreational resources for Idaho.	D,F	Please see Forest Service response to commentTF-3.

Table 7 – Peter Lichtenstein comment. Peter Lichtenstein, 2078 E. Feldspar Ct., Boise, ID 83712, email: plichten2@gmail.com

Comment Number	Comment Letter	Response Code	Forest Service Response
PL-1	I am a long time user of the Idaho City Yurt and Trail System. In the summer and fall I often drive my vehicle to the yurts with my family. I believe I will be negatively affected by the Becker Integrated Resource Project and would like to see the roads remain open for vehicle use. Thank you. Peter M. Lichtenstein	D,F	Thank you for your comments. Please see Forest Service responses to comments TF-1 and TF-3.

Table 8 – Dan Morrow Comment letter. Dan Morrow 3066 S Crabapple Ln, Boise, ID (drmorrow@cableone.net)

Comment Number	Comment Letter	Response Code	Forest Service Response
DM-1	Hello, Thank you very much for giving us the opportunity to comment on this project. I appreciate all the work that has gone into the project and the plans for improving the health of the area. The plan does an exceptional job of defining the primary contributors to the degradation of the area and the types of restoration actions that can improve the forest's health. I would like to request a modification of Alternative C. I see great value in continuing to allow private vehicle access to yurts in the spring/summer/fall season. Specifically, I'm requesting the roads to the Stargaze and Skyline yurts (USFS Road 394B and 362F respectively) be kept open for public access. Access to these yurts for people who could not otherwise get food and water to them ensures non-backpackers with continued access to some very special resources. I say that as an avid backpacker. Ensuring the yurts can generate revenue all year long helping to keep them viable is of benefit to everyone. Best regards, Dan Morrow	D,F	Thank you for reviewing the Becker Integrated Resource Project DEIS. . Please see Forest Service responses to comments TF-1 and TF-3.

Table 9 – Carol Peterson Comment Letter. Carol Peterson, 6881 N. Tree Haven Way, Meridian, ID 83646 (carolleepeterson@yahoo.com)

Comment Number	Comment Letter	Response Code	Forest Service Response
CP-1	I recommend that USFS Road 394B to The Stargaze yurt and USFS road 362F to the Skyline do not have seasonal closures placed on them. It is important to keep the yurts accessible to users that are not in good a physical condition as the backpacker type. The roads give the elderly, disabled, and small children a reasonably short hike to these two yurts. Users would also have to carry about five gallons of water up to the yurt for drinking and dish washing climbing 600 to 800 feet in elevation. If spring/summer/fall vehicle access is denied, use will decline and income will decrease which could lead to unsustainable yurt and trail system.	D,F	Thank you for your comments. . Please see Forest Service responses to comments TF-1, TF-2 and TF-3.

Table 10 – Mark Schneider Comment Letter. Mark Schneider, 700 Ofarrell St., Boise ID 83702. (schneidermarka@hotmail.com)

Comment Number	Comment Letter	Response Code	Forest Service Response
MS-1	The parks and rec service out of boise does a lot for the national forest. I do not support any plan that restricts motorized access the the idaho city area yurt program as well as the winter grooming operations for cross country skiing	D	Thank you for your comments. . Please see Forest Service responses to comments TF-1 and TF-3.

Table 11 – Teri Stiburek Comment Letter. Teri Stiburek, 6579 S. Covewood Way, Boise, ID 83709 (tbtakara@yahoo.com)

Comment Number	Comment Letter	Response Code	Forest Service Response
TS-1	Please do not put seasonal closures on USFS Road 394B to The Stargaze yurt and USFS road 362F to the Skyline yurt. If you close the roads in the summer, I'm sure you would destroy the entire Idaho City yurt system. Who is going to hike in all the water they'd need? No one. How many volunteers who help maintain the yurts are going to hike in all the cleaning supplies, chain saws, clean laundry? A very few. What about the elderly, kids, people with health issues? They wouldn't go. Plus, all the city people who think a mile is a long distance wouldn't go either. So, there you will have taken away the income to pay for the yurts and the maintenance of said yurts. A lot of time and money has been put into the yurt and trail system. Let's not destroy it. It's a benefit to those who live close by. Don't close the roads. Thank you!	D,F	Thank you for your comments. . Please see Forest Service responses to comments TF-1, TF-2, and TF-3.

Table 12 – James Wolf Comment Letter. James Wolf, 825 Warm Springs Ave., Boise, ID 83712 (jawolf05@msn.com)

Comment Number	Comment Letter	Response Code	Forest Service Response
JW-01	Gentlemen 1) I encourage you to maintain warm-weather road access on USFS Road 394B to the Stargaze yurt and on USFS road 362F to the Skyline yurt. Without road access, yurt usage will be unavailable to citizens who are very young, old, or otherwise physically unfit -- probably the majority of users. Patrons will be unable or unwilling to hike uphill, carrying water, for several miles. Loss of patronage would be the death-knell of the yurt program.	D,F	Thank you for your comments. . Please see Forest Service responses to comments TF-1, TF-2, and TF-3.

Comment Number	Comment Letter	Response Code	Forest Service Response
JW-02	2) An unintended consequence of USFS road closure would be increased parking along Hwy 21. It is already a narrow, winding highway on which cars and bicycles are jammed together. Roadside parking makes a bad situation worse. Please keep the side roads open AND provide off-road parking for forest patrons.	D	Parking for recreation users is currently provided at the four Park and Ski trailheads (Whoop-um-up, Gold Fork, Banner Ridge, and Beaver Creek Summit) along Highway 21. Gold Fork trailhead would still provide parking for those wishing to access the Skyline Yurt during the seasonal closure period (9/15-6/15). The Beaver Creek trailhead would still provide parking for those wishing to access the Stargaze Yurt during the closure period (9/15-6/15). A State of Idaho Park and Ski permit is required to park at these trailheads from November 15th through April 30th. Additional discussion will be included in the Recreation section of the FEIS and supporting technical report to clarify the existing condition and impacts to recreation users resulting from the road proposals.

Table 13 – Stephen Hill Comment Letter, 1809 N. 16th St., Boise, ID 83702 (stephenhill8@msn.com)

Comment Number	Comment Letter	Response Code	Forest Service Response
SH-1	I would want to see spring, summer and fall vehicle access continue to the Idaho City area yurts. Having to haul in a large amount of water up significant elevation gain would definitely put these outdoor resources out of reach for any use for our family. Our young son wouldn't be able to haul in gear or water up such a distance, and even the hike itself is borderline for his hiking range. I believe closing the road access would have visitor use and consequent income plummet.	D,F	Thank you for your comments. . Please see Forest Service responses to comments TF-1, TF-2, and TF-3.

Table 14 – Michael Lanza Comment Letter. Michael Lanza, 921W. Resseguie St., Boise, ID 83702 (michaelalanza79@gmail.com)

Comment Number	Comment Letter	Response Code	Forest Service Response
JL-1	I am writing to oppose your preferred alternative for the Becker Integrated Resource Project DEIS because of the negative impacts it would have for my family and the many people who make use of the Idaho City yurt system operated by the Idaho Department of Parks & Recreation. The yurt system and trails there are popular year-round with Idahoans because of their unique recreational opportunities to cross-country ski, hike, and mountain bike in the national forest. If the USFS selects preferred Alternative C, yurt visitors in spring, summer, and fall will have to park along Highway 21 and hike uphill 2.5 miles to the Skyline yurt or 1.5 miles to the Stargaze yurt. At present users can drive a full-size vehicle within a couple hundred yards of the yurt in the summer, which gives older people and young families a reasonably short hike to these two yurts. Yurt users would also have to carry about five gallons of water up 600 to 800 feet in elevation to the yurt for drinking and dishwashing, which could make the trip prohibitively difficult for these groups.	D	Thank you for your comments. . Please see Forest Service responses to comments TF-1, and TF-3.
JL-2	I am concerned that if spring/summer/fall vehicle access is denied, use will decline and income from the yurts will decrease, which could lead to an unsustainable yurt and trail system. My family has enjoyed the Idaho City area yurts for many years and we do not want to see this excellent system compromised.	D,F	Please see Forest Service response to comment TF-2.
JL-3	Please change your plan so that USFS Road 394B to The Stargaze yurt and USFS road 362F to the Skyline do not have seasonal closures placed on them. Thank you.	D,F	Please See Forest Service response to comment TF-3

Table 15 – Mary Cecilia Smith Comment Letter. Mary Cecilia Smith, 5028 Lakes Edge Place, Boise, ID 83714 (mccrickie@yahoo.com)

Comment Number	Comment Letter	Response Code	Forest Service Response
MCS-1	Please keep the SUMMER roads open to both the Stargaze and Skyline Yurts. Doing so will allow ease of access for the disabled, the elderly, and all those who are incapable of either backpacking or carrying five gallons of water for 1.5 to 2.5 miles. Thank you.	D,F	Thank you for your comments. . Please see Forest Service responses to comments TF-1 and TF-3.

Table 16 – Scott Arnold Comment Letter. Scott Arnold, 10713 N. Sagecrest Pl., Boise, ID 83714 (scottkparnold@yahoo.com)

Comment Number	Comment Letter	Response Code	Forest Service Response
SA-1	Please do not pursue Plan C which would close road access to impacted Idaho City yurts. Access to these yurts is possible for elderly and disabled Americans thanks to spring through fall road access. I am fit now and can manage with supplies the 800 ft. approach to Stargazer yurt, but I look forward to enjoying these yurts well into my later years thanks to seasonal road access. These yurts need not be just for the young and able bodied when existing roads are available. Thank you.	D	Thank you for your comments. . Please see Forest Service responses to comments TF-1 and TF-3.

Table 17 – Jean Kuty Comment Letter

Comment Number	Comment Letter	Response Code	Forest Service Response
JK-1	I recommend that USFS Road 394B to The Stargaze yurt and USFS road 362F to the Skyline do not have seasonal closures placed on them. It is important for our community to be able to access this important and viable recreation opportunity that we have. It is especially important for small children, elderly and anyone who is not physically able to walk the distance from the highway to be able to access the yurts by being able to drive closer to them during the spring, summer and fall. Also, the amount of water that needs to be hauled in during these seasons puts a burden on anyone using the yurts, even those in great physical shape. Please do not limit access to these yurts!	D,F	Thank you for your comments. . Please see Forest Service responses to comments TF-1 and TF-3.

Table 18 – Daniel Broockman Comment Letter

Comment Number	Comment Letter	Response Code	Forest Service Response
DB-1	Hello, I am writing to express my objection to the plan by the USFS to place a seasonal closure on USFS Road 394B to the Stargaze yurt and USFS road 362F to the Skyline yurt. These yurts provide a great deal of enjoyment to myself and many others that I know. There are a wide variety of folks who I enjoy introducing to Idaho winter wildlands via the yurts, many of whom are not experienced outdoors people in good shape. Seasonal closure of these roads threatens the ability of all these individuals to experience the outdoors and the beauty of Idaho. Thank you. Sincerely, Dan Broockmann	D	Thank you for your comments. . Please see Forest Service responses to comments TF-1 and TF-3.

Table 19 – Ramesh Chamala Comment Letter

Comment Number	Comment Letter	Response Code	Forest Service Response
RC-1	Alternative c is a bad idea as it impacts the use of yurts especially elderly and small children. If you folks select Alternative C, in the spring/summer/fall yurt users will have to park along Highway 21 just like they do in the winter and hike uphill 2.5 miles to the Skyline yurt or 1.5 miles to the Stargaze yurt. At present yurt users can drive a full size vehicle within a couple hundred yards of the yurt in the summer which allows the elderly and small children a reasonably short hike to these two yurts. Users would also have to carry about five gallons of water up to the yurt for drinking and dish washing climbing 600 to 800 feet in elevation. If spring/summer/fall vehicle access is denied, use will decline and income will decrease which could lead to unsustainable yurt and trail system. I am making these comments to protect the yurts by recommending that USFS Road 394B to The Stargaze yurt and USFS road 362F to the Skyline do not have seasonal closures placed on them. We hope USFS understands that it is important to keep the yurts accessible to users that are not in good a physical condition as the backpacker type.	D,F	Thank you for your comments. . Please see Forest Service responses to comments TF-1, TF-2, and TF-3.

Table 20 – Therese Gerald Comment Letter

Comment Number	Comment Letter	Response Code	Forest Service Response
TG-1	To Whom It May Concern: My family my friends and I are avid yurt enthusiasts and enjoy using the Idaho Parks & Recreation yurts in the area impacted by the Becker Integrated Resources Project. If the USFS selects their preferred alternative which is Alternative C, in the spring/summer/fall yurt users will have to park along Highway 21 just like they do in the winter and hike uphill 2.5 miles to the Skyline yurt or 1.5 miles to the Stargaze yurt. At present users can drive a full size vehicle within a couple hundred yards of the yurt in the summer which allows the elderly and small children a reasonably short hike to these two yurts. Users would also have to carry about five gallons of water up to the yurt for drinking and dishwashing climbing 600 to 800 feet in elevation. As a physical therapist, a yurt enthusiast and a concerned citizen, I feel it is important to keep the yurts accessible to users who may not be able to otherwise experience an overnight in the backcountry. I recommend that USFS Road 394B to The Stargaze yurt and USFS road 362F to the Skyline do not have seasonal closures placed on them.	D,F	Thank you for your comments. . Please see Forest Service responses to comments TF-1 and TF-3.

Table 21 – Jennifer Quick Comment Letter

Comment Number	Comment Letter	Response Code	Forest Service Response
JQ-1	To whom it may concern: I have utilized two Idaho City Yurts (Rocky Ridge and Stargazer) for family gatherings. I recently provided volunteer labor on Whispering Pines Yurt. My son's boy scout troop has worked on Rocky Ridge Yurt. It would be a disservice to lessen access to Stargazer and Skyline yurts during the summer months for those not capable of the hike; including young children and elderly. Also, It is difficult enough to haul water the short distance. Thank you for your kind attention to this matter. Regards, Jen Quick	D	Thank you for your comments. . Please see Forest Service responses to comments TF-1 and TF-3.

Table 22 – Allan Crockett Comment Letter

Comment Number	Comment Letter	Response Code	Forest Service Response
AC-1	The FS preferred alternative will close numerous miles of roads including short segments of road leading to two ID Parks and Recreation yurts, namely Skyline and Stargaze yurts. These yurts are used year round so closure of the roads leading to them, 2.5 miles to the Skyline yurt and 1.5 miles to the Stargaze yurt, will require users to carry their gear and water that distance. Such short distances are not a problem to backpackers but many current users are not so energetic but still like to get outside and enjoy spending time in a yurt. I expect that the distance to the yurts will result in less usage by the public and result in less income for IDPR to maintain them and the trail system. As a frequent volunteer for IDPR, I recommend leaving the roads to these 2 yurts open.	D,F	Thank you for your comments. . Please see Forest Service responses to comments TF-1 and TF-3.

Table 23 – Barbara McClain Comment Letter

Comment Number	Comment Letter	Response Code	Forest Service Response
BM-1	I ask that USFS Road 394B to The Stargaze yurt and USFS road 362F to the Skyline do not have seasonal closures placed on them. It is an important to keep the yurts accessible to users that are not in good a physical condition as the backpacker type.	D,F	Thank you for your comments. . Please see Forest Service responses to comments TF-1 and TF-3.

Table 24 – Howard Miller Comment Letter

Comment Number	Comment Letter	Response Code	Forest Service Response
HM-1	I am writing to express my concerns that closure of roads accessing the yurts in the summer months will negatively impact the Idaho City Yurt system. The way we access the yurts in the summer with bicycles, coolers, and water requires parking as close as possible. closing the roads to these yurts will result in very little summer use and possible closure of the yurt system.	D	Thank you for your comments. . Please see Forest Service responses to comments TF-1 and TF-3.

Table 25 – Bruce Murphy Comment Letter

Comment Number	Comment Letter	Response Code	Forest Service Response
BMurphy-1	I disagree with restricting vehicle access to Idaho City yurts in summer / fall, re: Becker DEIS letter. This is our forest, as US citizens and tax payers, to use. Restricting our access feels more like a control issue, as opposed to a forest management issue. I personally would never drive my vehicle up those roads, I would walk in, but others can't, and this restricts their use of these assets. This access route has been there for a long time, leave it alone!!!	D	Thank you for your comments. . Please see Forest Service responses to comments TF-1 and TF-3.

Table 26 – Mishel VandenBusch Comment Letter

Comment Number	Comment Letter	Response Code	Forest Service Response
MV-1	Please DO change your plan so that USFS Road 394B to The Stargaze yurt and USFS road 362F to the Skyline do not have seasonal closures placed on them.	D,F	Thank you for your comments. . Please see Forest Service responses to comments TF-1 and TF-3.

Table 27 – Daniel Appel Comment Letter

Comment Number	Comment Letter	Response Code	Forest Service Response
DAppel-1	I would heartily recommend that USFS Road 394B to The Stargaze yurt and USFS road 362F to the Skyline do not have seasonal closures placed on them.	D,F	Thank you for your comments. . Please see Forest Service responses to comments TF-1 and TF-3.

Table 28 – Sandy Caveney Comment Letter

Comment Number	Comment Letter	Response Code	Forest Service Response
SCaveney-1	Year round access to the Skyline and Stargazer yurts is important for users of the National Forest! These yurts provide outdoor recreation opportunities to those who may otherwise not be able to experience camping in a yurt and experiencing the natural world. Year round use of the yurts is important to the success of the yurt program. Have you considered the financial impact to the State Park yurt program as part of your analysis? What will be the impact on use? Sustainability of the yurt program? The yurt program is such an important and well-known partnership between the state and federal systems. Closing the roads to these two yurts harms not only that relationship, but also the users that enjoy the experience they provide. Please choose an alternative that allows year round access to the Stargazer and Skyline yurts. Thank you. Sandy Caveney	D,F	Thank you for your comments. . Please see Forest Service responses to comments TF-1, TF-2, and TF-3.

Table 29 – Ariela Gruszka Comment Letter

Comment Number	Comment Letter	Response Code	Forest Service Response
AGruszka-1	Please do not close the following roads so we can easily access the yurts: USFS Road 394B to The Stargaze yurt and USFS road 362F to the Skyline. We ask you not to go ahead with your plan to have seasonal closures placed on them. If these roads get seasonal closures, there are lots of people (elderly and/or kids that don't hike long distances, or anyone that for any reason can not hike all the way to the yurts from the parking lot) that won't be able to enjoy this wonderful yurt system we have. Thank you.	D,F	Thank you for your comments. . Please see Forest Service responses to comments TF-1 and TF-3.

Table 30 – Andrew Traub Comment Letter

Comment Number	Comment Letter	Response Code	Forest Service Response
ATraub-1	I feel it is critically important to have USFS Road 394B to The Stargaze yurt and USFS road 362F to the Skyline yurt open during the summer months to allow access for yurt users who are carrying gear and water in order to use the backcountry yurts. Not all uses are physically able to transport heavy items, or even themselves, long distances in order to enjoy the benefits of staying in an Idaho backcountry yurt.	D,F	Thank you for your comments. . Please see Forest Service responses to comments TF-1 and TF-3.

Table 31 – Shallece Jacobs Comment Letter

Comment Number	Comment Letter	Response Code	Forest Service Response
SJacobs-1	I am recommending that USFS Road 394B to The Stargaze yurt and USFS road 362F to the Skyline do not have seasonal closures placed on them. My reasoning is my family and I LOVE to use these yurts YEAR ROUND. A family with young children it would not be possible to utilize these yurts if we were recquired to walk 2.5 miles or more to get to them. The outdoors is a huge part of our lives and I feel the outdoors is an incredible life skill for children. The love for nature and its surroundings is not teachable in a classroom setting. Children need opportunities to get outside and MOVE! Closing the roads to these yurts would put an end to these amazing yurts we have available to us and would forever change our family trips we enjoy so much!	D,F	Thank you for your comments. . Please see Forest Service responses to comments TF-1 and TF-3.

Table 32 – Madonna Lengerich Comment Letter

Comment Number	Comment Letter	Response Code	Forest Service Response
MLengerich-1	I would like to recommend that USFS Road 394B to the Stargaze yurt and USFS road 362F to the Skyline NOT have seasonal closures placed on them. It is an important to keep the yurts accessible to users that are not in good physical condition, too young or disabled. Using these roads for access when the roads are driveable allows these people to enjoy the recreational qualities of the Boise National Forest. At present users can drive a full size vehicle within a couple hundred yards of the yurt in the spring/summer/fall which allows the elderly and small children a reasonably short hike to these two yurts. Users would also have to carry about five gallons of water up to the yurt for drinking and dishwashing, hiking uphill 2.5 miles to the Skyline yurt or 1.5 miles to the Stargaze yurt plus climbing 600 to 800 feet in elevation. The critical consequence of closing these roads means an increased possibility of a huge decline in yurt income, leading to yurt system closures and a marked decrease in tourist traffic through Idaho City. Without ALL abilities and ALL ages of people having access ALL year to these yurts, the economic impact to the Idaho City merchants and the IDPR yurt maintenance budget would be significant. The Boise National Forest would not be offering recreational opportunities to ALL as it is mandated.	D,F	Thank you for your comments. . Please see Forest Service responses to comments TF-1, TF-2, and TF-3.

Table 33 –Tracy Behrens Comment Letter

Comment Number	Comment Letter	Response Code	Forest Service Response
TBehrens-1	I applaud the Boise Forest's efforts to improve the overall health of the forest in the Becker Project area by thinning dense tree stands and closing some of the many miles of roads through out the project area. However, I would prefer that USFS Road 394B to the Stargaze yurt and USFS Road 362F to the Skyline yurt do not have seasonal closures placed on them. Both of these yurts receive heavy summer use that generates income for Idaho Parks & Recreation to maintain the structures and the associated biking & hiking trails. Limiting assess to these yurts would increase the distance users would have to carry water and other supplies needed for an overnight stay at the yurts. This increased burden would reduce the opportunity for families with small children, and elderly or limited-mobility citizens to use these yurts, potentially decreasing overall use of the yurts. It is important that all interested parties be provided with the best possible assess to the yurts, and that IDPR be able to maintain a constant income stream from the yurts. Please reconsider the seasonal closure of the above referenced roads. Thank you for the opportunity to comment on the Becker Project.	D,F	Thank you for your comments. . Please see Forest Service responses to comments TF-1, TF-2, and TF-3.

Table 34 – Jackie Roeder Comment Letter

Comment Number	Comment Letter	Response Code	Forest Service Response
JRoeder-1	Please do not place seasonal closures on USFS Road 394B to the Stargaze yurt and USFS road 362F to the Skyline Yurt. These yurts are used during all different seasons by many different people. Road closures will limit the accessibility to these yurts for the elderly and children due to the long hike in. There is significant elevation and also would require hauling in water for drinking and washing dishes, which is heavy. I have hiked in to the Skyline Yurt during the winter and with gear, food and water, it is not an easy feat. Closing these roads will decrease usage thus decreasing income. Thank you.	D,F	Thank you for your comments. . Please see Forest Service responses to comments TF-1, TF-2, and TF-3.

Table 35 – Kenneth Pedersen Comment Letter

Comment Number	Comment Letter	Response Code	Forest Service Response
LPedersen-1	Please don't disturb or disadvantage the Idaho City yurt program. Our family has rented the yurts often, and we really enjoy and appreciate the opportunity for the Idaho backcountry experience. For us, continued reasonable access especially to the Skyline Yurt is important. We understand the need to study and protect the wilderness and the wildlife, but we think this can be done without interfering with access to the yurts. The traffic load according to our experience is very light and the people load is not great either. Furthermore, we think that every person who has a chance to have a yurt experience is likely to be more attentive and more receptive to the conservation goals of the Forest Service, and willing to participate again in the Idaho Parks and Rec Idaho City Yurt Program. My wife and I are in our 60's, and making the access to any of the yurts longer or more rugged than it currently is, would be a big problem for us, severely limiting or eliminating our ability to use the yurts. While very young, healthy people would still be able to use the yurts in any season, older people, ill people, and physically-disadvantaged people would be left out of this wonderful experience.	D,F	Thank you for your comments. . Please see Forest Service responses to comments TF-1, and TF-3.

Table 36 – Boise Weekly Article by Jessica Murri with Comments from Leo Hennessy (IDPR)

Comment Number	Comment Letter	Response Code	Forest Service Response
BW-1	Boise Weekly 11/4/2015 Hutting It in Idaho's Backcountry Yurts provide a chance to experience wilderness – in comfort By Jessica Murri When the 280,642-acre Beaver Creek Fire swept through the mountains surrounding Sun Valley in August 2013, the Sun Valley Trekking Coyote Yurt site fell victim to the flames. Two yurts, a deck and a sauna were transformed into a pile of ash overlooking the spectacular Boulder, Smoky and Pioneer mountains. Only the stovepipe remained. With help from the community, Francie St. Onge and her husband rebuilt the yurts, making them better than ever. "They're our showcase yurts now," St. Onge said. "They are fresh and gorgeous." The new site now boasts a 20-foot and a 16-foot yurt, a new deck, hammock, barbecue, fire pit, a couple of outhouses and another sauna. Yurts are gaining popularity across the state as a way to enjoy Idaho's vast wilderness in comfort. While some are barely a step up from tents and peppered throughout state parks, others can only be accessed by snowmobile. Sun Valley Trekking offers six yurt sites: one nestled in the Pioneer Mountains, three in the Smoky Mountains just north of Ketchum and two overlooking Redfish Lake. The yurts sleep 15-20 people, and they're stocked with beds, kitchen equipment, saunas and hot tubs. Guests only need to bring sleeping bags, food and ski equipment.	A	This comment is the part of the Boise Weekly article that describes Yurt experiences in Idaho. No Forest Service response is required.

Comment Number	Comment Letter	Response Code	Forest Service Response
	Four of the yurts sit on mountain summits and take most of the day to get to, either on backcountry skis or snowshoes. The elevation makes for stellar backcountry skiing and powder turns, though skiers are required to have avalanche training to navigate the area. Sun Valley Trekking also has two easily accessible yurts, only a mile-and-a-half on snowshoes or cross-country skis, as well as the Boulder Dinner Tour. A guide meets guests at a trailhead 15 miles north of Ketchum around 4 p.m. and leads them on an hour-long cross-country ski jaunt to the Boulder Yurt at the base of Butterfly Mountain. After taking in the orange-red alpenglow, a fully catered dinner awaits. "The yurt is warm and the fire is burning, the appetizers are ready," St. Onge said. "The caterer has made a beautiful dinner, then you ski back to your car under the stars." Overnight yurt rentals begin at $175 and more information can be found at svtrek.com. For those not as excited about taking a long trek to reach the Mongolian-style domed shelters, Payette Powder Guides will deliver guests 100 yards from the front door via snowmobiles or snowcats. Their two yurts are perched at 7,000 feet on Lick Creek Summit, between McCall and the South Fork of the Salmon River. "It's more of a river-trip style," Payette Powder Guides owner Marty Rood said. "You spend all your time and energy skiing the backcountry instead of using it all up just to get there." Rood offers guided, fully catered multi-day backcountry trips starting at $675 per person. People with avalanche training can rent the yurt alone at a cost of $400 for eight people per weekend night, plus an additional $100 per person for transportation. More information can be found at payettepowderguides.com.		

Comment Number	Comment Letter	Response Code	Forest Service Response
	Idaho Parks and Recreation manages a variety of yurts throughout the state and charges a lot less for them. Overnight rentals range from $65 to $115 and the yurts sleep six. "The really popular ones are in the backcountry outside of Idaho City," said Leo Hennessy, trail coordinator for Idaho Parks and Recreation. "They are packed almost 95 percent of the time in the winter. In the summer, we're getting close to 60 percent." There are six yurts located around Idaho City, which range from a 1.4-mile ski-in to 3 miles. They are stocked with a propane stove—although guests need to bring their own propane—solar lights and padded bunks as well as a pit toilet, fire ring and picnic table. The Idaho City yurts are placed within easy reach of a variety of snowy activities, such as backcountry and telemark skiing, snowshoeing, Nordic skiing and skate skiing, though the paths are only groomed once a week. For more information, or to make reservations, go to parksandrecreation.idaho.gov/activities/yurts.		

BW-2	A possible U.S. Forest Service project may threaten access to two of the yurts in the summertime, however. The Becker Integrated Resource Project aims to create elk security, improve water quality and vegetation, and carry out several prescribed burns and logging. The project would close two roads to the Stargaze and Skyline yurts, making the trip to the yurts 2 miles longer. Hennessy said that would make it harder for families with children or grandparents to access the yurts. Users would even have to pack in their own dishwater. "Backpackers can do it, but not everyone else," he said. "We're asking the Forest Service to keep the access open. We rely on that income to hire staff and groom the trails." Public comment for the proposed project ends on Sunday, Nov. 8.	D	The preferred alternative, Alternative C, maintains the existing seasonal closure of NFS Road 362F to the Skyline Yurt and proposes a new seasonal closure on NFS Road 394B to the Stargazer Yurt. The seasonal closure period would be from 9/15 to 6/15, annually (DEIS Section 2.4.3). Much of this closure period is during the winter season when the roads cannot be accessed by motorized wheeled vehicles due to snow. Therefore, motorized wheeled vehicle access on these roads would only be closed during the shoulder seasons of spring and fall. Summer time motorized access would be allowed on NFS Roads 362F and 394B. A Notice of Availability (NOA) for the DEIS was published in the *Federal Register* on September 25, 2015 (Project Record). The publication date of the NOA in the *Federal Register* is the exclusive means for calculating the 45-day comment period for the DEIS. The Forest Service accepted comments on this project from 9/25/2015 to 11/9/2015 based on the publication date of the NOA in the Federal Register. The DEIS is available by request to the Boise National Forest and is available on the project web site at http://www.fs.usda.gov/project/?project=18922.

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BW-3	Other yurts managed by the state are located in Winchester, Harriman and Castle Rocks state parks, as well as along Lake Cascade. Those yurts are much simpler, or "basically a tent," as Hennessy put it. "Check out the guest journals in each yurt," Hennessy added. "People write about life-changing experiences. People love them and they take care of them."	A	Please refer to Forest Service Response to BW-1.

Table 37 – AFRC (Irene Jerome) Comments

Comment Number	Comment Letter	Response Code	Forest Service Response
AFRC-1	AMERICAN FOREST RESOURCE COUNCIL November 8, 2015 Boise National Forest Cecilia Seesholtz, Forest Supervisor Att: Melissa Yenko 1249 South Vinnell Way, Suite Boise, ID 83709 VIA EMAIL: comments-intermtn-boise-idaho-city@fs.fed.us Re: Becker Integrated Resource Project –DEIS Comment Dear Supervisor Seesholtz, Thank you for the opportunity to comment on the Becker Integrated Resource Project (Becker) Draft Environmental Impact Statement (DEIS) on the Idaho City Ranger District. These comments are on behalf of the members of the American Forest Resource Council (AFRC). AFRC represents nearly 60 forest product businesses and forest landowners in five states. Our mission is to create a favorable operating environment for the forest products industry, ensure a reliable timber supply from public and private lands, and to promote sustainable management of forests by improving federal laws, regulations, policies and decisions that determine or influence the management of all lands.	A	Thank you for reviewing the Becker Integrated Resource Project DEIS. This comment describes the mission of the American Forest Resource Council and no response is required.

Comment Number	Comment Letter	Response Code	Forest Service Response
AFRC-2	AFRC strongly supports active forest management that maintains and enhances our national forests, maximizes those resources for as many stakeholders as possible, provides jobs and revenues to local counties and provides badly needed raw materials to forest industry.	A	The Forest Service acknowledges your support for active forest management.

AFRC-3	A few comments: 1. Since the Idaho City Ranger District employees were kind enough to take AFRC members on two field trips to the Becker project area I am well aware that a significant portion of the land area is in younger ages classes and not yet suitable for producing commercial sawlog material. However, has the area been thoroughly analyzed to maximize both acres treated and commercial sawlog volume for removal? Becker is a marginal project at best when it comes to the economic returns. Given the significant opportunities, and subsequent associated costs, for improving various recreation activities it is critical to maximize the returns. It is also critical to maximize the returns in order to perform timber stand improvements over as much of the project area as possible.	D	The initial Becker project area was thoroughly analyzed over a period of several years by various Idaho City District specialists including Fuels, Timber and Silviculture. The project area was expanded in 2014 to include Pike's Fork to the east and Lamar Creek to the south. At that time, the South Zone Silviculturist and acting Timber Management Assistant conducted a field reconnaissance and data review of the additional areas. Much of the Pike's Fork watershed contains 30 to 40 year-old plantations. The accessible stands in this watershed were found to have low potential for commercial harvest due to low volume per acre and the need for extensive road reconstruction and maintenance to facilitate treatment. The north end of Pike's Fork was burned in the Sawmill Fire in 1989 and contains numerous 20 to 25 year-old plantations. In the Lamar Creek area the Timber and Silviculture specialists identified 183 acres of commercial harvest potential which were added to Alternative D. The area North of Highway 21 between Lamar and Edna creeks was found to have limited access and low commercial volume. Information on the process that was followed to identify additional treatment areas is available in the Forested Vegetation technical report in the project record. Field notes and photos from vegetation field reconnaissance will be included in the project record. The proposed treatments and prescriptions were established to meet the purposes of the vegetation treatments, specifically Purpose 1, while complying with Forest Plan Standards and Guidelines. Please refer to DEIS Section 1.4.1 and Section 2.4. The Becker Integrated Resource Project Forest Plan Consistency Table is available in the Project Record. A Stewardship proposal will be completed that could allow the Forest Service to supplement timber stand improvement projects within the project area. Refer to DEIS Table 3-165 for financial assessment for all alternatives.

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AFRC-4	2. AFRC does NOT support any form of diameter limits across the landscape. This model has been a disaster in Region 6 and once diameter limits are established it is virtually impossible to change the paradigm. Further, the Clear Creek Project on the Boise National Forest had diameter limits and that project has been a non-starter from beginning to date.	C,D	The Forest Service acknowledges your comment. Please refer to response to comment BCLW-4. DEIS Table 2-6 summarizes the diameter cut limits by vegetation treatment, location and tree species for Alternatives B, C, D, and F needed to meet restoration objectives. In the FEIS the diameter cut limits discussion will be clarified to outline the purpose of diameter limits: 1) diameter limits were set for the purpose of modeling effects of treatments; 2) designed to achieve silvicultural restoration objectives; 3) diameter limits represent a combination of design features and silvicultural prescriptions; and 4) that some diameter limits may be implemented without exception, e.g. RCA diameter limits, and others may be modified during implementation if the silviculturist, in coordination with other resource specialists, determines that actual stand conditions vary form modeled stand data and the diameter limits are not necessary to meet restoration objectives. Alternative E was designed with the 18’ diameter limits. Effects of the proposed treatments to forested vegetation are summarized in section 3.2 of the DEIS.

AFRC-5	3. Have opportunities for maximizing sawlog volume for removal while meeting objectives for the project been identified? This can be achieved through utilizing different silvicultural techniques such as creating openings for wildlife and thinning from both above and below. This opportunity is described on page 1 of the Becker DEIS Summary: **Purpose 1**: Contribute to the restoration of low- to mid-elevation forests in the project area; forests that fall within the non-lethal and mixed1 fire regime. • Modifying forest densities, tree size classes, and species composition and breaking-up the horizontal and vertical wildland fuel continuity will reduce the risk of uncharacteristic stand-replacement wildfire and improve forest resiliency. • Shifting conditions toward those more representative of the desired condition for the fire regimes in the project area will benefit wildlife habitat restoration, as well as provide greater assurance that forested overstory cover in this landscape, which attracts recreational users to the area, is sustained over time.		Proposed treatments and silvicultural prescriptions (Section 3.2.5.1) were developed to meet Purpose 1 (DEIS Section 1.4.1) in both the nonlethal and mixed1 fire regimes while complying with all Forest Plan standards and guidelines, and project design features. The Becker Integrated Resource Project Forest Plan Consistency Table is available in the Project Record. The proposed treatments include thinning with product removal, mixed treatment with product removal, thinning with optional product removal and thinning with no product removal. Mixed treatment is a commercial thinning with creation of openings up to 5 acres in size (DEIS Section 2.4.2). Within the nonlethal fire regime, the primary need to reduce risk of uncharacteristic (e.g. lethal) fire behavior is to promote large, early seral species (ponderosa pine) while reducing ladder fuels and late seral, shade tolerant species such as subalpine fir and Douglas-fir. Within the mixed1 fire regime, treatments are designed to promote early seral species (Douglas-fir or ponderosa pine) and reduce the amount of dwarf mistletoe in Douglas-fir and reduce the risk of bark beetle outbreaks (primarily Douglas-fir beetle and mountain pine beetle). This may result in the removal of larger, moderate to severe dwarf mistletoe infected Douglas-fir trees. Thinning with product removal allows for a wide range of treatments including thinning from below or thinning from above as appropriate for the particular patch as long as it achieves the desired condition and complies with all applicable design features. For example, within the nonlethal fire regime (PVGs 1 and 2) there may be cases where larger Douglas-fir trees are removed to promote smaller ponderosa pine or aspen trees. The prescriptions allow for the creation of openings (canopy gaps) up to 2.0

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			acres in proposed for thinning with product removal (mostly in the nonlethal fire regime) and up to 5.0 acres in stands proposed for mixed treatment (mostly in the mixed1 fire regime). Please see Vegetation Technical Report, Section 1.10.3.1.

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AFRC-6	4. AFRC supports work in RCAs and strongly encourages that activity. A field trip in 2012 to the Trinity Fire area provided numerous examples of the devastation that wildfire can inflict on riparian areas that are overgrown with vegetation. Miles and miles of pristine bull trout habitat were destroyed during the Trinity fire. Consider the following excerpt from the Moist Mixed Conifer Synthesis (PNW-GTR-897) under Aquatic Habitats on page 87: "From the literature, two concepts emerge as foundational for managing linked terrestrial and aquatic ecosystems: (a) watersheds and their aquatic habitats and species are dynamic and adapted to insect, disease, weather, and wildfire disturbances, and (b) the climate will continue to have a profound influence on terrestrial and aquatic ecosystems, disturbance processes, and their interactions (Bisson et al. 2003; Luce et al. 2013, 2014; Tague and Grant 2009)."	D	The Forest Service acknowledges your comment. The proposed treatments include vegetation treatments with RCAs as long as the treatments promote RCA process and function. The proposed treatments in RCAs include thinning with product removal, thinning with no product removal, mixed treatment with product removal and thinning with optional product removal. The Purpose and Need section of the DEIS (Section 1.4) describes the need for treatments as "most vegetation, including vegetation within the RCAs, is upland vegetation with only narrow communities of riparian (moisture-influenced) vegetation adjacent to stream channels. Desired vegetative conditions for the upland communities within RCAs are similar to the desired conditions outside of the RCAs. However, within RCAs how vegetative components function to provide aquatic habitat features (e.g., stream shade, and large coarse woody debris) is a major consideration while how vegetation functions to provide terrestrial habitat features is a major consideration upslope and outside of the RCA." The rational for treatments in RCAs is described under item #6 and #12 as "Restoration actions within RCAs are needed to develop structure and function that facilitate terrestrial and riparian/aquatic processes and to establish conditions that have a gradual, diverse transition zone with greater integrity and resiliency when subjected to physical events and natural disturbance processes." Literature cited will be reviewed, updates to effects disclosure added where applicable and the reports/documents will be added to the Project Record.

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AFRC-7	Disturbances play a vital role in structuring aquatic ecosystems. Wildfires \influence hydrological and physical processes, such as surface erosion, sedimentation, solar radiation, wood recruitment, and nutrient exchange in streams (Benda et al. 2003, Luce et al. 2009, Miller et al. 2003, Wondzell and King 2003)."	D	See response to AFRC-6 Literature cited will be reviewed; updates to effects disclosure added where applicable and the reports/documents will be added to the Project Record.
AFRC-8	In the analysis of effects it is be critical that a clear and concise analysis is provided outlining "why" it is necessary to work in some portions of RCAs to meet the purpose and need of the project as opposed to other riparian habitats where the needs are not compelling.		See response to AFRC-6
AFRC-9	5. Page 44 of the DEIS summary displays a table comparing how well each of the alternatives meets Purpose 3. Is it possible to modify the transportation system to maximize the recreation experiences (for example Alternative F shows 9.3 miles) and still support all the vegetation treatments described in Alternative D?	D	The road segments proposed for conversion to trail are segments that otherwise would be decommissioned based on the Becker TAP as identifying these road segments as "Likely Not Needed for Future Use", including vegetation management. The TAP process considered both Values and Risks associated with the road locations, including access for vegetation restoration, fuels management, and fire protection activities. The conversion to trail for these segments would provide an enhanced opportunity for motorized recreational uses. The Travel Analysis Process Report (TAR) is available in the Project Record.
AFRC-10	7. Has the forest considered analyzing forest log landings for dispersed recreation sites after the logging is complete? These can work very well since they are relatively level and have some sort of access.	C, D	The Forest acknowledges the use of existing forest landings may be used as dispersed recreation sites. Under all of the action alternatives, the landings used to facilitate vegetation management activities would be decommissioned following implementation. Please see descriptions of the alternatives analyzed in detail in DEIS Section 2.4.

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AFRC-11	The extensive use of tables to compare the alternatives under the various criteria is VERY much appreciated. It is helpful in coming to some grasp of the project without having to plow through the extensive narrative that is always associated with the environmental analysis associated with these projects, especially one with as many alternatives as Becker has. As a suggestion, a few maps in the summary indicating where the major roads, land ownerships, and recreation sites were located would have been helpful as well	D	Thank you for your comments. Maps are located in Appendix J of the DEIS. The DEIS will be edited in preparation of the FEIS and FEIS summary. Opportunities to add maps to the FEIS summary will be considered.
AFRC-12	Forest industry is anxiously awaiting the Becker project and I look forward to the Record of Decision. Thanks for the opportunity to comment on the Becker DEIS. Sincerely, Irene K. Jerome AFRC Representative, Eastern Oregon/Southwest Idaho		Thank you for your comments.

Table 38 – Department of Interior, Office of Environmental Policy and Compliance (Allison O'Brien) Comment Letter

Comment Number	Comment Letter	Response Code	Forest Service Response
DOI-1	United States Department of the Interior OFFICE OF THE SECRETARY Office of Environmental Policy and Compliance 620 SW Main Street, Suite 201 Portland, Oregon 97205-3026 Boise National Forest Attention: Melissa Yenko 1249 South Vinnell Way, Suite 200 Boise, ID 83709 Dear Ms. Yenko: The Department of the Interior has reviewed the Draft Environmental Impact Statement for the U.S. Forest Service's Becker Integrated Resource Project at Boise National Forest, Idaho. The Department has no comments on the document at this time. We appreciate the opportunity to comment. Sincerely, Allison O'Brien Regional Environmental Officer	D	Thank you for reviewing the Becker Integrated Resource Project DEIS.

Table 39 – U.S. EPA, Region 10 (Christine B. Littleton) Comment Letter

Comment Number	Comment Letter	Response Code	Forest Service Response
EPA-1	UNITED STATES ENVIRONMENTAL PROTECTION AGENCY REGION 10 1200 Sixth Avenue, Suite 900 Seattle, WA 98101-3140 November 9, 2015 Cecilia R. Seesholtz Forest Supervisor Boise National Forest 1249 South Vinnell Way, Suite 200 Boise, Idaho 83 709 Dear Ms. Seesholtz: In accordance with our responsibilities under Section 309 of the Clean Air Act, the National Environmental Policy Act and the Council on Environmental Quality regulations for implementing NEPA, the U.S. Environmental Protection Agency has reviewed the Draft Environmental Impact Statement for the proposed Becker Integrated Resource Project located on the Idaho City Ranger District of the Boise National Forest in Boise County, Idaho. (EPA Region 10 Project Number: 14-0029-AFS)	A	Thank you for your review of the Becker Integrated Resource Project DEIS.

Comment Number	Comment Letter	Response Code	Forest Service Response
EPA-2	The 19,327 acre Becker project lies within the Middle Crooked River and Pikes Fork subwatersheds. The DEIS analyzes the No Action Alternative and Action Alternatives B, C, D, and E. We support the overall Purpose and Need, which includes four elements: • contribute to the restoration of low-to-mid elevation forests; • improve watershed conditions by reducing motorized route related impacts to water resources, fish, soil and habitat; • improve the quality and diversity of recreational opportunities; and • provide enhanced recreational opportunities, by utilizing wood products from the suited timber base, and by implementing forest restoration activities.	A	This comment is an accurate summary of the project purposes and the alternatives analyzed in detail. This comment does not require a Forest Service Response.
EPA-3	The DEIS identifies Alternative B as the USFS Proposed Action and selects Alternative C as the Agency's Preferred Alternative. The distinction between these alternatives is related to different proposed management for recreational transportation. Under Alternative C, a motorized transportation route to the Stargazer and Skyline yurts would be open seasonally compared to year-round closure under Alternative B. Also under Alternative C, fewer roads would be converted to Maintenance Level 2 "administrative use only," and winter motorized restrictions on an additional 3,039 acres (currently 7,491 acres) would be included. Both of the alternatives would decommission 22.8 miles of road and propose similar vegetation treatments. Other action alternatives consist of additional vegetation treatments (Alt D), no designated motorized trails (Alt E), and additional recreation opportunities (Alt F).	A	This comment accurately identifies Alternative B as the Proposed Action and Alternative C as the Preferred Alternative in the DEIS (Section 2.6)

EPA-4	We are pleased that all of the action alternatives include Riparian Conservation Area buffers, which are dependent on stream type and stand siting within or outside of a plantation. The no-cut zone buffer for perennial streams inside and outside of plantations are 35 feet and 50 feet respectively and 15 feet for intermittent streams in either location. Both the Middle Crooked River and Pikes Fork subwatersheds are designated as either functioning at risk, or functioning at unacceptable risk based on the indicators defined in the DEIS. We strongly support riparian conservation measures and watershed improvement activities in the project area, particularly given the current declining conditions/ecological functions. We acknowledge that while there are no designated Clean Water Act §303(d) listed streams, monitoring has indicated that streams in the project area have elevated temperature, sediment, and in some cases nutrient loading. Elevated metals have also been observed in Pikes Fork from the Banner Mine adit.	C, D	Table 2-2, 2-3, and 2-5 as well as Figure 2-1 display the activity limitation distances from streams associated with vegetation treatments. Outside plantations, the no-cut zone is 0-50 feet from the channel. Within plantations, the no cut zone for non-commercial thinning is 0-1 shade tree height. In the DEIS, the no cut buffer zone inside of plantations was listed as 35 feet which was based on the average tree height as modeled vegetation data. In the FEIS, the no cut buffer has been updated to be 50 feet on all perennial streams. The within plantation RCA no-treatment buffer for non-commercial thinning was modified from "one shade tree height (modeled as an average of 35 feet, but intended to be determined on a stand by stand basis), to a 50 foot no-treatment buffer. This change was made to provide additional assurance that non-commercial thinning activities would not reduce stream shade and provide consistency with the no-treatment buffer outside plantations (also a 50 foot no-treatment buffer) which is expected to simplify implementation. The FEIS will be updated to reflect this change. Table 3.126 includes a list of current functionality ratings for Watershed Condition Indicators (WCIs) within the hydrology and fisheries analysis areas. Functionality ratings for WCIs analyzed include functioning at unacceptable risk, functioning at risk, and functioning appropriately. Effects to the WCIs and their future trend (for the no action as well as the action alternatives) are displayed in Table 3-127. Various monitoring data (described in section 3.9.1.2) have been used to build the baseline characterization of WCIs. Functionality ratings for those WCIs are based on results from monitoring data versus the desired conditions described in the Forest Plan Appendix B (USDA Forest Service 2010a). The functioning at risk rating for the Chemical Contaminants/Nutrients WCI is

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			due to observed heavy metals and adit discharge at the Banner Mine site, which is within the Pikes Fork subwatershed. There are no known sources of nutrient loading within either subwatershed.
EPA-5	We believe that the proposed activities would address important, underlying environmental functions by moving vegetation toward a desired range of age classes, size classes, species distributions, habitat complexity and landscape pattern. We support the inclusion of road decommissioning (22.8 miles) and culvert replacement (23) to address water quality and fish passage needs.	A	Thank you for your comment. Activities identified have been designed to accomplish aspects of the Purpose and Need for this project that have been summarized.

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EPA-6	However, we have concerns regarding potential increases to surface water temperature that would result from vegetation treatments within RCAs and with the lack of a monitoring plan for the project area. We also have questions regarding validation of sediment delivery from roads and whether or not opportunities exist for additional watershed improvements.	D	Section 3.9.3.1 of the DEIS discusses potential effects to stream temperatures and stream shade from vegetation thinning activities within RCAs. The analysis concludes that these activities would result in an immeasurable negative effect to the stream temperature WCI in the temporary and short-term timeframe with an immeasurable improvement in the long-term. The DEIS includes monitoring elements in section 2.4.8 for Pikes Fork Trailhead, Invasive Species, Rare Plants, and Terrestrial Wildlife. Additional monitoring to address the effects of non-commercial thinning on streams within the Becker Project area will be discussed with the Responsible Official and, as directed, will be incorporated into the FEIS. Section 1.1.1.1 of the DEIS (error in section numbering, should refer to Hydrology Section 3.9) discusses the potential for sediment delivery from roads and includes annual estimates of sediment volumes delivered to streams based on road location and road characteristics by alternative. Opportunities for watershed improvements related to roads were addressed. Proposed changes in the transportation system were developed during the travel analysis process (TAP). A travel analysis report (TAR) was completed for the Becker Integrated Resource Project Area to inform the proposed changes in the management of road and trail system. Travel analysis addresses the current Forest transportation system, and it identifies issues and assesses benefits, problems, and risks in order to inform decisions related to identifying the minimum road system and designating roads, trails, and areas for motor vehicle use.

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EPA-7	Based on our review we are rating the DEIS EC-2 (Environmental Concerns- Insufficient Information). Our attached comments focus on these areas of concern. We recommend that they be addressed in the final EIS.	D	Environmental Concerns and factors pertaining to insufficient information identified below will be reviewed with the Interdisciplinary Team members and recommendations for updates to the EIS discussed with the Responsible Official. Based on the decisions made by the Responsible Official, updates will be made to the EIS and supporting record documents. The Responsible Official will summarize how items identified below were addressed in the EIS and/or project record documentation in the Record of Decision.
EPA-8	Thank you for the opportunity to review the DEIS. If you need more information or would like to discuss these comments, please contact me at 206-553-1601 or by email at littleton.christine@epa.gov, or Lynne Hood of my staff at (208) 378-5757 or via email at hood.lynne@cpa.gov Sincerely, Allison B. Littleton, Manager Environmental Review and Sediment Management Unit	D	A meeting with representatives from EPA has been scheduled to discuss the environmental concerns and factors pertaining to insufficient information to be sure the Agency has a clear understanding, as well as to identified potential opportunities to resolve. Notes from this meeting will be available in the project record.
EPA-9	**GENERAL COMMENTS** We found the review of this document to be challenging. The Becker Project is unique in that it includes numerous activities with multiple project purposes over a large project area. Given the complexity, we understand the challenges in developing a document that presents the components clearly, describes multiple interconnected activities' effects and benefits on natural resources, and incorporates sufficient detail to support conclusions concisely. We appreciate the Forest Service staff's time in talking with us about the project and assistance with locating information. We note that as written, the rationale behind project components is unclear.	D	Updates to the Chapter 2 are being developed to help clarify activities by alternative and to provide more concise displays of the differences between alternatives. The rationale for the selected alternative will be clarified in the Record of Decision with specific references back to supporting evidence in the EIS effects disclosures, as well as project record.
EPA-10	An example is the discussion on "strata' - a categorization defined by fire regime and potential vegetation group (PVG) that form the basis of proposed treatments. It was difficult to understand the factors in relationship to overarching goals of the project. Supporting information was not easy to locate in the document. It would be helpful to provide a clear visual illustrating the treatments across the landscape.	D	A description of how the strata were defined is in Section 3.2.3.2. The strata were used as a way of grouping similar PVGs within fire regimes for the purposes of FVS modelling and analysis of effects on vegetation.

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EPA-11	Also, it would be useful to include a summary of the goals/objectives per strata. Below are suggestions for improvement: • The strata are explained in Table 3-2 (Page 144); however, the PVGs (factor of strata) for the site are not immediately explained; rather, they are included in Table 3-124 (Page 525). Please provide a description of the PVGs in the same section describing each strata.	D	Purpose 1 discusses the need for treatments in the nonlethal and mixed1 fire regimes. This relates to the fin Table 3-2. PVGs are defined and described in DEIS Section 3.2.3.1 and in Table 3-1 (immediately prior to the discussion of strata in Section 3.2.3.2). Table 3-124 lists the Site Potential Tree Height distances by PVG used to delineate RCAs. Site Potential Tree Height distances have no relationship to the development of strata.
EPA-12	• The current conditions are listed in a table, whereas the proposed activities are illustrated in a chart making it difficult to compare percent change (intensity of treatments needed per stand). We suggest comparing the information similarly.	D	Current conditions are displayed in charts in the silvicultural prescriptions section (DEIS Section 3.2.5.7). Current conditions are also displayed in each table in the environmental effects on vegetation (DEIS Section 3.2.6) along with the post-treatment, short term and long term conditions for each indicator. Additional clarification will be added in the silvicultural prescription section in the FEIS.
EPA-13	• On the map illustrating the distribution of strata across the landscape, differences are indiscernible given the gray scale with six various shades of black and white with some very closely resembling others. Please provide a map that more clearly displays the strata.	D	Figure 3-2 a map showing distribution of strata in the project area, was intended to be printed in color. This will be corrected in the FEIS.

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EPA-14	• All of the alternatives include the same treatments per strata except Alternative D. However, the rationale for only modifying Alternative D is unclear. Also, it is not obvious if other treatments were or could be considered in the alternatives. Please clarify the rationale behind limiting variations in treatment to one alternative.	D	The vegetation treatments in Alternative D were developed in response to a comment received during scoping requesting an alternative that maximizes the economic benefit for local communities (DEIS Section 1.11.2). Alternative D includes additional treatment acres for removal of wood products (Thinning and Mixed Treatment with Product Removal). The treatments in the proposed action (Alternative B) were developed as the best way to achieve Purpose 1 yet there is sufficient flexibility in the proposed treatments to allow for changing market conditions for wood products and costs of noncommercial treatments. Alternatives C, D, E and F were developed in response to issues raised and comments during scoping. Additionally, there were no comments or requests during scoping to consider alternative types of treatments to meet the purpose.
EPA-15	We also believe it would be helpful to expand the table of contents. The section pertaining to wildlife, Section 3.5, lists two subsections- Wildlife Habitat 3.5.1 and Source Habitat Families 3.5.2. However, this section is over 200 pages in length (264-469) with multiple subsections. Therefore, it is difficult to easily navigate to sections on specific species, Threatened and Endangered Species, special status species, and current conditions/effects analysis.	D	Updates to the table of contents in the FEIS will be made to assist in navigating between the multiple sections of Wildlife disclosures. Other resource sections will also be reviewed to determine if a similar adjustment would improve the navigability of the FEIS for readers.
EPA-15	Overall, the document would benefit from including summaries and identifying the rationale or themes among the alternatives. We recommend considering opportunities to clarify; information, link concepts more closely and organize information to be more traceable. Specific examples include: • Provide a description upfront about the strata classification, fire regimes, and potential vegetation group. • Include an expanded table of contents.	D	Where the Responsible Official believes it would add value to include clarifications of these descriptions within the body of the FEIS, either footnotes or expanded summaries will be included in Chapter 3 Introduction and/or Resource sections. As discussed in EPA-15, the Table of Contents is being reviewed and will be expanded to improve navigability.

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EPA-16	**Comparison of Alternatives** We spent a significant portion of our review obtaining clarifying information regarding the rationale behind, and the differences among alternatives. To assist readers in understanding the context, the document could include a short section summarizing the underlying objective of each alternative. Also, providing a simple table comparing the general benefits among alternatives (recreation, commercial harvest, watershed improvements, RCA), would more clearly highlight the different effects and benefits.	D	Section 2.4 in the DEIS identifies the issues that drove development of Alternatives C, D, E, and F. Where the Responsible Official believes it would add value the alternative discussion in Chapter 2 will be updated to clarify and summarize what issues/comments each alternative was developed to address. The alternative comparison tables in Chapter 2.5 will also be updated to more clearly highlight the differences in effects and benefits between alternatives.
EPA-17	For example, Alternative E includes the theme "emphasis on resource benefits/watershed improvements while providing for social and economic benefits." However, it is unclear how these objectives would be accomplished when compared to the other alternatives. The main difference appears to be that no motorized trails would be designated under Alternative E; however, Alternative D includes this same feature. We suggest highlighting the context of each alternative. One option would be to characterize alternatives with a theme (e.g., similar to Alternative E) and include a table comparing the benefits either by rank or another simplified format. This would provide the reviewer with an overall perspective of action alternatives, while referring to alternatives/resource sections for the specific detailed analyses.	D	Please see response to EPA-16. A point of clarification, as disclosed in the DEIS, Alternative E is the <u>only</u> alternative that does not include the addition of the motorized trail and supporting trailhead.

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EPA-18	It would also be helpful to more clearly compare transportation options among alternatives. There are multiple transportation-related tables in the DEIS and numerous maps (Appendix J), which aim to provide specific information on the options. However, the document does not include a concise summary or a discussion of the 'big picture' to understand how components satisfy the overarching goals. The maps include dozens of routes with an extensive legend. Therefore, it was difficult to compare and contrast differences listed in the tables with respect to their location on the landscape. It would be helpful to display the information on a map such that major differences are highlighted to facilitate a more appreciable comparison of the alternatives.	D	The transportation options include fourteen (14) different treatments grouped into six categories. This is a complex set of interacting treatments which vary from Alternative to Alternative. DEIS Table 2-10 displays these treatments/categories by Alternative in total miles treated, mileage and inside and outside of RCAs. Additionally, Appendix A of the DEIS includes a description of existing road conditions by segment and detailed description of road activities by road segment for each action alternative. Section 3.6 of the DEIS explains the relative changes between Alternative A and the various Alternatives analyzed. Tables are included along with text to highlight the differences between the existing condition and action alternatives. A spatial display of this data, segment by segment changes between alternatives, would be very complex to show in map form due to the number of treatments and to display maps comparing each of the alternatives to the others would require an additional nineteen maps. The full use of the tables in DEIS Sections 2.4 and 3.6, as well as DEIS Appendix A, gives an accurate picture of the transportation treatments proposed in each of the alternatives. Updates to FEIS tables and Appendix A will be completed, if updates are warranted. The comparison of alternatives in Section 2.5 will be reviewed and updated as needed to provide additional clarification in the comparison between alternatives.

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EPA-19	We recommend that the final EIS: • Include the rationale for designing alternatives and a simplified comparison providing a broader perspective of effects and benefits. • Provide a map that clearly illustrates the differences in transportation options among alternatives.	D	Please see response to EPA-16. Options to improve clarity of maps will be considered, however as discussed in the response to EPA-18, there is always a balance to be struck in the amount of information to display on a single map to ensure its readability/usability.
EPA-20	Characterization of Riparian Conservation Areas and Stream Temperature Our major concerns regarding the proposed vegetation treatments are potential adverse effects on water quality and potential impacts on riparian areas that support critical ecological processes. The DEIS does not clearly describe current conditions in RCAs, identify treatments in riparian corridors with respect to watershed improvement goals, nor discuss how the proposed buffers would provide adequate shade necessary to support cold water habitat.	D	The DEIS includes an effects analysis of proposed vegetation management activities to water quality indicators including stream temperatures and shade as well as other WCIs. Section 3.9.3.1 of the DEIS includes: a description of the current functionality of watershed condition indicator (WCIs) including the riparian conservation areas WCI, a description of RCA buffer widths and 8 inch diameter limit for thinning within the 1st Site Potential Tree Height (SPTH), and rationale for the determination of effects in temporary, short, and long-term timeframes.

EPA-21	The DEIS describes RCA composition and treatments in general terms; more specificity is needed. In the DEIS, RCA composition is described as generally upland vegetation with narrow communities of riparian (moisture-influenced) vegetation channels. The document states that restoration actions within RCAs are needed to develop structure and function that facilitate terrestrial and riparian/aquatic processes, and to establish conditions that have greater integrity and resiliency. The document does not clearly describe the condition of particular stands in RC As, the type of treatment proposed for a stand, nor how that treatment would move the site towards desired conditions. The project area is almost 20,000 acres and it is unclear where targeted riparian treatments would be warranted. The final EIS should include more site specific information and more clearly describe riparian conditions. For your reference we offer the following examples with details that assist in more clearly understanding riparian conditions and functions: • Ogden Landscape Vegetation Management Project Final EIS. 2012. Deschutes National Forest Service http://data.ecosystem-management.org/nepaweb/nepa project exp.php?project=31006 • Wolf Fuels Vegetation and Fuels Management Final EIS. 2014. Ochoco National Forest .http://data.ecosystem-management.org/nepaweb/nepa project exp.php?project=4 l 946	D	Section 3.2.3.1 describes stand exam data used to characterize the existing vegetation conditions throughout the project area. Site specific vegetation data for RCAs was not collected because vegetation treatments are intended to treat upland vegetation throughout the project area including areas of upland vegetation that extend into the RCA. No riparian vegetation treatments are proposed to occur as a part of this project. Section 3.2.5 describes treatments proposed within the various strata throughout the project area. The following additional information will be inserted in the Forested Vegetation Section in the EIS. With the exception of the immediate area adjacent to the riparian area, vegetation conditions within RCAs are similar to outside of the RCA. Vegetation conditions from 0 to 15 up to 50 feet of the riparian area tend to be higher density with a higher proportion of species that thrive in wetter and cooler conditions (e.g. subalpine fir and aspen). Engelmann spruce occurs rarely outside of the riparian area. Riparian understory species also are present in the RCAs within 15 to 30 feet of the riparian areas. This would include species such as redtwig dogwood, Sitka alder and various species of willow. These riparian species are protected within the 15- to 50-foot no treatment buffers in the RCAs. Vegetation treatments in the RCA will promote riparian process and function by promoting the growth and development of large size tree species that are resilient to disturbance and appropriate for the PVG. Within PVG 1 and PVG 2 the preferred species is ponderosa pine, in PVG 3 the preferred species are ponderosa pine and Douglas-fir while in PVG 4 and PVG 7 the preferred species is Douglas-fir. Ponderosa pine and Douglas-fir grow larger, live longer and provide suitable snag habitat for snag dependent species better than other

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			species in the project area. Furthermore, these species have fuller and wider crowns and grow taller and thus would provide more shade and large woody debris. Additionally, Engelmann spruce, which also provides habitat, shade and large woody debris, will be protected wherever it occurs. If the preferred species are not present, alternative species will be retained to provide shade and structure. Alternative species include Douglas-fir or lodgepole pine in place of ponderosa pine and lodgepole pine or subalpine fir in place of Douglas-fir. The objectives of the mechanical treatments in RCAs are to promote the desired species, reduce density to promote faster growth and development of large size trees, reduce dwarf mistletoe infection and reduce fuels and the risk of stand replacement fire. Upland vegetation treatments that may affect watershed condition indicators (i.e. sediment and stream temperature conditions) were analyzed and included in sections 3.8 and 3.9 (Fisheries/Hydrology Resources).

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EPA-22	The Preferred Alternative outlines vegetation prescriptions that would occur depending on location (inside or outside plantations), potential vegetation group, and fire regime. The DEIS includes a description of current forest density/basal area and proposed reduction based on this categorization. The proposal includes 2,327 acres of vegetation treatments within the RCA. However, the document does not specifically discuss current basal area, desired conditions, or change in basal area in RCAs. Therefore, it is unclear what degree of harvest would occur in these areas. It would be useful to provide a clear description of RCA conditions as explained above, along with specific treatments and how the proposal contributes to meeting desired future conditions for riparian habitat.	D	Table 3-7 summarizes the total acres to be treated in RCAs taking into account specific treatments in RCA buffer shown in Figure 2-1 and described near the end of Section 2.4.2.1 Purpose and Need in the DEIS. As described in Section 3.2.3.1 in the DEIS, site-specific data for RCAs was not collected in the stand exam data (collected from 1992 to 2006). However, the silviculturist and hydrologist have confirmed with field reconnaissance that, with the exception of the area immediately adjacent to the stream, vegetation conditions (species composition, size and density) are not noticeably different within RCAs versus outside of RCAs. Therefore, stand averages for current stand conditions and post-treatment conditions as shown in Section 3.2.6.1 Environmental Effects apply to the RCAs. Specifically, all treatments that involve commercial product removal (Thinning with Product Removal, Mixed Treatment with Product Removal and Thinning with Optional Miscellaneous Product Removal) would apply to the 2nd site potential tree height RCA buffer. The only vegetation treatment that would occur within the 1st site potential tree height RCA buffer are non-commercial thinning with an 8” diameter limit, piling and burning of slash and understory (backing) fire. To improve clarity of disclosures in Chapter 3 concerning this factor, effects of treatments identified above on vegetation within the 1st site potential buffer not discussed in the DEIS, will be added in the FEIS.

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EPA-23	The Middle Crooked River and Pikes Fork subwatersheds are functioning at risk based on the temperature water quality indicator. Thinning and prescribed fire are allowed within the RCA. The RCA buffers include one site potential tree height (SPTH) for perennial streams to supply shade and benefit water quality. Within plantations, the non-commercial thinning buffer adjacent to streams is 35 feet, whereas outside plantations, the non-commercial thinning buffer is 50 feet. Literature and past studies have shown that reducing canopy cover within one SPTH can reduce stream shade and result in increased stream temperature. We are concerned about the potential adverse effects of proposed thinning within one SPTH on stream shade, particularly the buffer associated with plantations. The DEIS does not include a shade analysis (recommended during scoping) and therefore, the rationale behind the proposed treatment and desired upward trend towards "functioning acceptably" is unknown. We are concerned that without a thorough analysis, the proposed thinning within one SPTH may not be protective.	D	Effects to stream temperatures as well as stream shade associated with proposed vegetation treatments are discussed in section 3.9.3.1 of the DEIS. The analysis concludes that the functionality rating for the stream temperature WCI (which is directly linked to stream shade for vegetation treatments) will be maintained in under all timeframes. As a result of the project, stream shade is expected to immeasurably decrease in the temporary and short-term timeframes associated with non-commercial vegetation treatments. The effect was determined to be immeasurable because RCA buffer widths would limit non-commercial thinning to outside 50 feet in non-plantations and 35 feet within plantations. Additionally, no trees greater than 8 inches diameter breast height would be cut within the first SPTH. Both the no-cut buffer and diameter limit design criteria are expected to result in minimal alteration of canopy cover adjacent to perennial streams. Understory thinning as described in the proposed action is expected to result in reduced competition between individual trees and grow larger trees in the long-term. Larger tree canopies are expected to provide increased shade and an immeasurable benefit to the stream temperature WCI in the long-term. See section 3.9.3.1, Action Alternatives, Vegetation Thinning for a detailed discussion.

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EPA-24	We understand the need for, and value of management within RCAs in some situations. Given the very sensitive nature of RCAs, the final EIS should better describe the rationale for the proposed thinning in these areas, including short and long-term impacts on shade. The EIS should demonstrate how the project will meet the targets in the Idaho Forest Practices Act Streamside Shade Rule (IDAPA 20.02.01). We are available to discuss technical approaches that we have used for similar shade analyses on other Idaho settings.	D	See response to comment EPA-23 for information about short and long-term impacts on shade. An analysis of how the proposed action is in compliance with the Idaho Forest Practices Act Streamside Shade Rule (IDAPA 20.02.01) was completed during this analysis and is included in the Hydrology Resources Technical Report. This information was not carried forward into the DEIS. For the FEIS section 1.8.4 will be updated to reflect the analysis completed to show compliance with this law. No treatment buffers for vegetation management activities in the RCA, will be updated in the FEIS to be 15 feet for intermittent streams and 50 feet for perennial streams. The within plantation RCA no-treatment buffer for non-commercial thinning was modified from "one shade tree height (modeled as an average of 35 feet, but intended to be determined on a stand by stand basis), to a 50 foot no-treatment buffer. This change was made to provide additional assurance that non-commercial thinning activities would not reduce stream shade and provide consistency with the no-treatment buffer outside plantations (also a 50 foot no-treatment buffer) which is expected to simplify implementation.

EPA-25	We recommend that the final EIS include: • Specific characterization of riparian areas and associated treatments. • Demonstrate how proposed treatments would improve watershed conditions. • Include a shade analysis of current conditions and potential effects.	D	A characterization of the current conditions of WCIs, including those that are associated with riparian areas throughout the project area are included in sections 3.8 and 3.9 (Fisheries and Hydrology Resources) of the DEIS. A more detailed characterization of the physiographic setting is included in the Hydrology Resources Technical Report (project record). Vegetation treatments are not intended to treat riparian vegetation, but rather to treat upland vegetation as described in Purpose 1 of the DEIS. Sections 3.8 and 3.9 (Fisheries and Hydrology Resources) discusses project effects on a suite of WCIs. Tables 3-126 and 3-127 provide a summary of effects for all WCIs in the temporary, short, and long-term timeframes. All action alternatives either maintain or improve the functionality of WCIs in the project area (e.g Physical barriers WCI is improved from FUR to FR). Many of the WCIs experience beneficial effects as a result of project activities but maintain their current functionality status. For example, the road density WCI is improved as a result of reductions in road density, but the functionality is maintained because the improvement is not enough to change functionality ratings as defined in the Forest Plan Appendix B. Vegetation treatments that occur within RCAs primarily benefit the disturbance history/disturbance regime WCIs. Vegetation treatments in upland vegetation that fall within the RCA are also expected to provide a benefit to the disturbance history/disturbance regime WCIs by providing greater integrity and resiliency to the RCA when subjected to physical events and natural disturbance processes. Other treatments in RCAs are also designed to improve watershed conditions. These treatments include: AOP culvert replacements/modifications, road

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			decommissioning, road realignment, road closure, and trail head area rehabilitation. Each of these activities is analyzed in section 3.8 and 3.9 of the DEIS and the analysis serves as the rationale for effects determinations described in Tables 3-126 and 3-127. While estimates of current stream shade have not been collected within the project area, a baseline characterization of stream temperature based on monitoring data is included in section 3.9 (Hydrology Resources) of the DEIS. Potential effects to the stream temperature WCI are analyzed in in section 3.9.3.1 which describes the effects of project activities on stream shade.

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EPA-26	**Transportation** High road density is a major factor contributing to poor watershed conditions. The desired condition for road density on the Forest is 0.7 mi/mi2 (Page 466). According to the DEIS, the current density is 4.0 mi/mi2. A 0.1 to 0.2 mi/mi2 reduction would be anticipated under Alternative C. The analysis includes results from the "Geomorphic Road Analysis and Inventory Package-lite" sediment delivery assessment across the two subwaterseheds. The document notes that stream conditions would improve somewhat over the long-term; however, based on the GRAIP-lite assessment, stream conditions are expected to continue to be 'functioning at unacceptable risk' due to the number of roads located within RCAs. This raises a couple of questions related to this assessment.	D	Road density was analyzed in section 3.9.4.2 of the Hydrology Resources section. Current road densities are 4.57 and 6.70 mi/mi^2 in the Middle Crooked and Pikes Fork subwatersheds respectively (Table 3-134). Anticipated reductions in road density are between 0.08 and 0.8 depending on alternative and subwatershed. Additionally, road density in RCAs would be further reduced (reductions from 1.89 to 0.3 depending on subwatershed and alternative) due to targeted road decommissioning in RCAs. The analysis of road density concludes that the functionality of the road density indicator would be maintained in all timeframes with a measurable improvement in the short and long-term. A travel analysis process (TAP) and travel analysis report (TAR) was completed for the Becker Project Area to inform the proposed changes in the management of road and trail system. Travel analysis addresses the current Forest transportation system, and it identifies issues and assesses benefits, problems, and risks in order to inform decisions related to identifying the minimum road system and designating roads, trails, and areas for motor vehicle use. The GRAIP-Lite assessment was used to inform the sediment/turbidity (bull trout and other fishes) WCI in Section 1.1.1.1 (note this reference is an error in the DEIS section numbering and will be updated to refer to Hydrology Section 3.9). Estimates of current and future road related sediment are presented in Figures 3-105 and 3-106 and Tables 3-131 and 3-132.

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EPA-27	It is our understanding that GRAIP-lite is intended to provide an initial understanding of problematic roads and sediment yield. The document should discuss the potential for conducting an on-the-ground GRAIP analysis on areas where sediment production is highest. This could assist in targeting roads for decommissioning/realignment and promoting improved watershed conditions.	D	A travel analysis process (TAP) and travel analysis report (TAR) was completed for the Becker Project Area to inform the proposed changes in the management of road and trail system. Travel analysis addresses the current Forest transportation system, and it identifies issues and assesses benefits, problems, and risks in order to inform decisions related to identifying the minimum road system and designating roads, trails, and areas for motor vehicle use. As a result of the analysis included in the TAP, several areas of high sediment delivery and concern for watershed conditions are proposed for decommissioning and realignment. These changes in the transportation system are discussed in section 1.4.2 under Purpose 2 of the project and effects to the sediment/turbidity WCI in section 1.1.1.1 (note this reference is an error in the DEIS section numbering and will be updated to refer to Hydrology Section 3.9). While the analysis conducted in support of the DEIS did not utilize a full GRAIP inventory, but rather a GRAIP-lite GIS analysis to estimate sediment yield, risks and benefits related to determining the minimum road system and roads targeted for decommissioning and realignment were addressed during the TAP. A full GRAIP inventory would provide a greater level of detail regarding exact locations of existing sediment delivery but would not be expected to lead to a change in roads identified for decommissioning or realignment due to the integrated nature of transportation planning.

EPA-28	Alternative C includes road decommissioning, closures to motorized use, new road construction, and conversion of roads to trail. The proposed transportation is not clearly linked to Purpose #2 "Improve watershed conditions by reducing motorized route related impacts to water resources, fish, soil and habitat." It is difficult to understand and compare proposed, specific route changes among alternatives (e.g., Alt B proposes 9.0 closures in RCA versus 7.9 closures with Alt C). The location and rationale of proposed road closings and those remaining in RCAs are unclear.	D	The transportation system management actions included in Alternative C are described in section 2.4.3 and summarized in Table 2-10, 2-11, 2-12, and 2-13 of the DEIS. Appendix J includes transportation system maps for each alternative that depict road decommissioning, road closures, new construction, conversion to trail, and other changes to the transportation system. The rationale for such changes are included in the TAP. Travel analysis addresses the current Forest transportation system, and it identifies issues and assesses benefits, problems, and risks in order to inform decisions related to identifying the minimum road system and designating roads, trails, and areas for motor vehicle use. For all action alternatives, the proposed changes to the transportation system include road closures, realignment, and decommissioning that results in reduced sediment delivery and reductions in road density and RCA road density (section 3.9 Hydrology Resources). Additionally, all action alternatives include treatments to treat or modify 23 documented aquatic organism passage barriers that result in a measurable improvement in the physical barriers WCI changing it from functioning at unacceptable risk to functioning at risk. These beneficial effects to the sediment/turbidity WCI, the road density WCI, and the physical barriers WCI result in reduced motorized route related impacts to water resources, fish, soil, and habitat and address the various needs under purpose 2 of the project. Also, Section 3.5.2, Source Habitat Families and Associated Wildlife Species, and Sections 3.4.2.1 (Low Elevation Old Forest [White-headed woodpecker]),

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			3.5.2.2 (Broad Elevation Old Forest [Flammulated owl, northern goshawk, black-backed woodpecker, and pileated woodpecker]), and 3.5.2.4 (Forest and Range Mosaic [Rocky Mountain elk, gray wolf]) provide specific analyses on the effects of the transportation components on each of the species identified above. With each, the assessment of effects are a function of the indicators and measures assigned to the transportation components of the Alternatives considered in detail, and may not specifically address the alternatives route by route. This is in part a function of the rationale provided in the Wildlife Technical Report, Appendix B1 and B2 provides the description of the indicators and measures used in this analysis as it relates to the focal species assessed (described above) and the Conservation Principles identified in Appendix E of the Forest Plan, as amended in 2010, form the basis for the wildlife analysis. The re-route of the 393 road is addressed specifically in several species and identify changes in vulnerability to loss of snags and down logs, or changes in habitat disturbance patterns (re: flammulated owl; Rocky Mountain elk). In general, the changes to the full sized motor vehicle transportation system (re: roads) result in a reduction in impact to source habitat features (snags, down logs) for Family 1 species and reduced risk of disturbance and vulnerability to hunting mortality for Family 5 species (Rocky Mountain elk).

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EPA-29	We also encourage the Forest Service to consider additional opportunities to address sediment loadings from roads either by incorporating such information into alternatives or describe any upcoming plans as future foreseeable actions.	C,D	The travel analysis process (TAP) and travel analysis report completed for this project identified the minimum transportation system needed to meet long-term management needs in the project area (USDA Forest Service 2014). Travel analysis addresses the current Forest transportation system, and it identifies issues and assesses benefits, problems, and risks in order to inform decisions related to identifying the minimum road system and designating roads, trails, and areas for motor vehicle use. Roads identified as not needed for long-term management, including those identified as impacting watershed conditions, have been identified for decommissioning and/or realignment in section 2.4 of the DEIS. An analysis of watershed condition indicators in sections 3.8 and 3.9 (Fisheries and Hydrology Resources), concludes that road related impacts on watershed conditions (i.e. sediment and temperature WCIs) would be measurably improved as a result of implementing the action alternatives.
EPA-30	We recommend consideration of incorporating fall GRAIP analysis on high risk roads.	C, D	While the analysis conducted in support of the DEIS did not utilize a full GRAIP inventory, but rather a GRAIP-lite GIS analysis to estimate sediment yield, risks and benefits related to determining the minimum road system and roads targeted for decommissioning and realignment were addressed during the TAP. A full GRAIP inventory would provide a greater level of detail regarding exact locations of existing sediment delivery but was not anticipated to lead to a change in roads identified as in need of decommissioning or realignment due to integrated nature of transportation system planning.

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EPA-31	We recommend that the final EIS include clarifying information regarding proposed roads, particularly related to RCAs.	D	Table 2-7 includes the number of miles of temporary road proposed to be constructed in RCAs by alternative. Design feature TS-7 requires all temporary roads to be recontoured at the end of project activities. Table 2-10 includes the number of miles of proposed new road construction and/or road realignment to be constructed in RCAs by alternative. Appendix J includes transportation system maps for each alternative that temporary road construction, road realignment and other changes to the transportation system.
EPA-32	We recommend that the final EIS include a discussion of additional opportunities to improve watershed conditions and to specifically address problematic roads.	D	Section 1.3 of the DEIS discusses how activities proposed under the action alternatives were developed to address goals, objectives, and priorities in the Forest Plan management area direction including the Aquatic Conservation Strategy, and Watershed and Aquatic Restoration Strategy. The travel analysis process (TAP) and travel analysis report completed for this project identified the minimum transportation system needed to meet long-term management needs in the project area (USDA Forest Service 2014). Roads identified as not needed for long-term management, including those identified as impacting watershed conditions, have been identified for decommissioning and/or realignment in section 2.4 of the DEIS. An analysis of watershed condition indicators in sections 3.8 and 3.9 (Fisheries and Hydrology Resources), concludes that road related impacts on watershed conditions (i.e. sediment and temperature WCIs) would be measurably improved as a result of implementing the action alternatives.

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EPA-33	**Monitoring** During scoping we recommended that the project include a monitoring program designed to assess impacts from the project, as well as track the implementation and effectiveness of measures taken to mitigate impacts. The DEIS includes monitoring information for specific sites, but not for the entire project area. For example, in Appendix H, the DEIS refers to the Pikes Fork Trailhead Rehabilitation and Monitoring Plan. It is unclear if this plan is currently in effect for the disturbed user-created ford or if it is proposed for a new trail that would be constructed.	C, D	The DEIS includes monitoring elements in section 2.4.8 for Pikes Fork Trailhead, Invasive Species, Rare Plants, and Terrestrial Wildlife.
EPA-34	A monitoring plan should be developed for the entire project that specifies monitoring goals/objectives, monitoring frequency, triggers/thresholds and associated action if thresholds are reached, and roles and responsibilities. The monitoring program should also describe how it would be used for present and future resources management, and whether there is likely to be support to fully implement the program (e.g., allocated funding).	C, D	If the Responsible official determines that a more specific monitoring plan is warranted it will be included in the FEIS.
EPA-35	We recommend that a robust, complete monitoring plan be included in the final EIS.	C, D	The monitoring plan included in the DEIS will be reviewed with the Responsible Official (RO) and per the RO's direction, updated accordingly in the FEIS.

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EPA-36	**Additional Water Quality Opportunities** The DEIS mentions that elevated levels of metals (arsenic, cadmium, chromium, lead, mercury, and silver) that exceed state groundwater and drinking water standards have been documented at the Banner Mine in the Pikes Fork subwatershed. We encourage the USFS to include this issue in the cumulative effects analysis and disclose opportunities and actions that can be implemented to clean up contaminated mine sites.	D	Section 3.8.3.2 of the DEIS describes the current condition for the chemical contaminants/nutrients WCI including a description of the elevated heavy metals found in the area associated with the Banner Mine. These conditions are documented in a Preliminary Assessment Report from Idaho Department of Environmental Quality (cited as IDEQ 2008). The baseline functionality rating of this WCI in the Pikes Fork subwatershed is characterized as "functioning at risk." This baseline characterization serves to incorporate past/ongoing activities that are relevant to cumulative effects within the analysis area. While the Banner Mine is within the analysis area for the hydrology/fisheries analysis (HUC6 subwatershed), it is outside the Becker project area. There are currently no documented plans for cleanup actions at the site. See IDEQ 2008 Preliminary Assessment Report for more information. Clean up and treatment of the elevated metals associated with the Banner mine site are outside the scope of this project. At this time, there are no present/ongoing or reasonably foreseeable projects/activities identified at the Banner Mine site in Appendix B (Cumulative Effects Activities) of the DEIS and therefore clean-up activities at this site will not be included in the cumulative effects analysis.

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EPA-37	**SPECIFIC COMMENTS** Alternative B and C. The DEIS identifies Alternative B as the Proposed Action throughout the document. It was not immediately clear in the review of the document that Alternative C was the Preferred Alternative. The agency's Preferred Alternative is identified later in the document (on page 135 at the end of Chapter 2). It is helpful to have clarity on alternatives at the beginning and throughout the document with a clearly identified Preferred Alternative and Proposed Action for comparison (summary, tables, etc.).	D	Alternative C was identified as the preferred alternative in the cover letter accompanying the release of the DEIS, in the DEIS summary and in Chapter 2 of the DEIS. Continued reference to Alternative C as the preferred alternative throughout resource disclosures in Chapter 3 was not done. The value of referencing Alternative C as the preferred alternative in additional locations in the EIS will be discussed with the Responsible Official and updates made where directed. As discussed earlier, the Chapter 2 alternative comparison section will be updated to clarify differences between alternatives, including Alternative B (Proposed Action) and Alternative C (Preferred Alternative).

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EPA-38	**Water Quality Standards** Please include a table with applicable water quality standards in the discussion on temperature, sediment, etc. on Page 464. Also, please include the information on Page 464 in the Water Quality Section of the document.	D	State of Idaho water quality standards are standards adopted by the state to protect public health and welfare, enhance the quality of water, and meet requirements of the Clean Water Act. The standards include antidegradation policy, beneficial uses, and criteria (numeric and narrative). While beneficial uses may vary from assessment unit to assessment unit, numeric and narrative criteria as well as anti-degradation policy should be consistent throughout the state. The hydrology resources technical report includes a table with designated beneficial uses and support status for the assessment units found within the project area. This table was not carried forward into the water quality pathways analysis in section 3.9.3. The discussion in section 3.9.3 does include a discussion indicating that no 303(d) listed streams or TMDLs are present within the analysis area. This would indicate that these assessment units are supporting designated beneficial uses. The FEIS will be updated to include the table showing designated beneficial uses and support status for the assessment units found within the project area. The discussion on page 464 is a brief summary of the water quality analysis as it relates to wildlife for Family 13 wildlife species and should not be interpreted as the primary analysis of water quality for the project.
EPA-39	**List of Acronyms.** Include "FA- Functioning Appropriately'' in the list of acronyms.	D	"FA-Functioning Appropriately" will be added.
EPA-40	**Table 2-25, Page 133.** The figures for Alternative A list zero under authorized roads. It would be helpful to include the existing system (USFS and Idaho Parks and Recreation) for comparison.	D	Options to more clearly display the existing condition will be considered and updates made accordingly for the FEIS.
EPA-41	**Page 95, Purpose 3**. This section is the description of Alternative F; however, the text describes Alternative C. It is unclear if only the label is misprinted or if the description for Alternative F is missing. Please correct or clarify.	D	References between Alternative F and C will be clarified in the Alternative F discussion in Chapter 2.

Comment Number	Comment Letter	Response Code	Forest Service Response
EPA-42	**Page 418**. The statement, "As noted, in total route density, Alternatives 8, C, D, and F would result in negative trend, wild Alternative E would result in ... " wild should be changed to while.	D	“Wild” will be changed to “while.”
EPA-43	Page 509 and 527 and others in the DEIS. The reference in the last paragraph reads (Error! Reference source not found). This also occurs in a number of other sections in the document. Please include the appropriate reference.	D	The corrections are being made.

EPA-44	**U.S. Environmental Protection Agency Rating System for Draft Environmental Impact Statements Definitions and Follow-Up Action* Environmental Impact of the Action** LO - Lack of Objections The U.S. Environmental Protection Agency Rating System for Draft Environmental Impact Statements Definitions and Follow-Up Action Environmental Impact of the Action The U.S. Environmental Protection Agency (EPA) review has not identified any potential environmental impacts requiring substantive changes to the proposal. The review may have disclosed opportunities for application of mitigation measures that could be accomplished with no more than minor changes to the proposal. EC - Environmental Concerns EPA review has identified environmental impacts that should be avoided in order to fully protect the environment. Corrective measures may require changes to the preferred alternative or application of mitigation measures that can reduce these impacts. EO - Environmental Objections EPA review bas identified significant environmental impacts that should be avoided in order to provide adequate protection for the environment. Corrective measures may require substantial changes to the preferred alternative or consideration of some other project alternative (including the no-action alternative or a new alternative). EPA intends to work with the lead agency to reduce these impacts. EU - Environmentally Unsatisfactory EPA review bas identified adverse environmental impacts that are of sufficient magnitude that they are unsatisfactory from the standpoint of public health or welfare or environmental quality. EPA intends to work with the lead agency to reduce these impacts. If the potential unsatisfactory impacts are not corrected at the final EIS stage, this proposal will be recommended for referral to the Council on Environmental Quality (CEQ).	D	We will review the definitions of the rating provided, EC/Category 2, and address factors identified in the definitions below.

Comment Number	Comment Letter	Response Code	Forest Service Response
	Adequacy of the Impact Statement Category 1 - Adequate EPA believes the draft EIS adequately sets forth the environmental impact(s) of the preferred alternative and those of the alternatives reasonably available to the project or action. No further analysis of data collection is necessary, but the reviewer may suggest the addition of clarifying language or information. Category 2 - Insufficient Information The draft EIS does not contain sufficient information for EPA to fully assess environmental impacts that should be avoided in order to fully protect the environment, or the EPA reviewer has identified new reasonably available alternatives that are within the spectrum of alternatives analyzed in the draft EIS, which could reduce the environmental impacts of the action. The identified additional information, data, analyses or discussion should be included in the final EIS. Category 3 - Inadequate EPA does not believe that the draft EIS adequately assesses potentially significant environmental impacts of the action, or the EPA reviewer has identified new, reasonably available alternatives that are outside of the spectrum of alternatives analyzed in the draft EIS, which should be analyzed in order to reduce the potentially significant environmental impacts. EPA believes that the identified additional information, data, analyses, or discussions are of such a magnitude that they should have full public review at a draft stage. EPA does not believe that the draft EIS is adequate for the purposes of the National Environmental Policy Act and or Section 309 review, and thus should.be formally revised and made available for public comment in a supplemental or revised draft EIS. On the basis of the potential significant impacts involved, this proposal could be a candidate for referral to the CEQ. •From EPA Manual 1640 Policy and Procedures for the Review of Federal Actions Impacting the Environment. February, 1987.		

Table 40 – Idaho Conservation League (Jonathan Oppenheimer) Comments

Comment Number	Comment Letter	Response Code	Forest Service Response
ICL -1	www.idahoconservation.org Idaho Conservation League PO Box 844, Boise, ID 83701 208.345.6933 Boise National Forest Forest Supervisor Cecelia Seesholtz and Brant Peterson, District Ranger Attention: Melissa Yenko 1249 South Vinnell Way, Suite 200 Boise, ID 83709 November 9, 2015 **Re: Idaho Conservation League comments on the Becker Integrated Resource Project Draft Environmental Impact Statement** Dear Cecelia and Brant: Thank you for the opportunity to provide comments on the Becker Integrated Resource Project DEIS. As Idaho's leading voice for conservation solutions, we represent over 25,000 supporters from across the state who have a deep interest in the health and management of our forests. The Idaho Conservation League works to protect the air you breathe, the water you drink and the land you love. To learn more about the Idaho Conservation League, log onto: www.idahoconservation.org.	A	Thank you for reviewing the Becker Integrated Resource Project DEIS. This comment describes the mission of the Idaho Conservation League and does not require a response.

Comment Number	Comment Letter	Response Code	Forest Service Response
ICL-2	The Becker Integrated Project proposes to carry out fuels reduction, timber harvest, prescribed fire, road/access management, watershed restoration and associated activities across the project area, located approximately 18 miles NE of Idaho City in Boise County. The project proposes upwards of 8,000 acres of thinning and logging, 13,000 acres of prescribed fire, 28 miles of road closure, 31 miles of road decommissioning and 23 culvert replacements. Timber outputs are estimated at approximately 8.4 mmbf.	D	This comment summarizes a portion of the actions proposed under the Proposed Action, Alternative B (DEIS Section 2.4.2). Alternative C has been identified as the Preferred Alternative in the DEIS, please refer to DEIS section 2.4.3 for a complete description.
ICL-3	The Idaho Conservation League appreciates the integrated nature of the project, seeking to address multiple issues with a single project. We also thank you for incorporating watershed restoration needs as one of the drivers for the project. We also agree that addressing fire and fuels related needs in the project is appropriate given the Wildland Urban Interface (WUI) concerns, and the fact that much of the surrounding landscape (and much of the Boise NF) has been impacted by fire in the recent past. Finally, we appreciate that the effects of the project were analyzed and disclosed in an Environmental Impact Statement.	D	Thank you for reviewing the Becker Integrated Resource Project DEIS. The project area does not contain Wildland Urban Interface. Please refer to the description of the project area in the DEIS Section 1.2. The fire history in the project area is described in Section 3.3.2.2 of the DEIS.

ICL-4	**Issues** We note that several of the issues identified in our scoping comments were incorporated into alternative development. Several remaining issues deserve additional scrutiny as you work towards a Final EIS and Record of Decision. Notably, the Forest should address wildlife vulnerability associated with the project. While we recognize that many of the road closures are intended to mitigate against the potential negative effects associated with decreased cover and habitat security, we remain concerned that the conversion to motorized trails would actually increase vulnerability and risk of disturbance. The DEIS recognizes this as a significant concern and we urge you to revisit this element of the proposal.	D	Thank you for your comment. Section 3.5.2.4 of the DEIS addresses the direct and indirect effects of the actions for each Alternative considered in detail, including, among other things, disturbance and vulnerability related effects to Rocky Mountain elk. Table 3-80 specifically summarizes and compares alternatives as it relates to changes in vulnerability, road and motorized route densities, and risk to disturbance associated with those routes, as well as non-motorized routes associated with the IDPR-managed (and to-be-authorized) non-motorized trails. Alternatives B, C (Preferred Alternative), D, and F would result in a declining trend in the condition of security cover, as a result of proposed vegetation and natural fuels treatments. At the same time, these alternatives would also result in declining trends in motorized and total route densities and risk of disturbance from motorized and non-motorized routes which in part, address the Nutritional Condition, Calving Success, and Vulnerability to Hunting Mortality. This would increase the overall vulnerability risk to hunter mortality and would increase the risk of disturbance during critical time periods, including calving and neonatal development (DEIS Section 3.5.2.4). Conversely, Alternative E would result in improving trends in motorized and total route densities and risk of disturbance from motorized and non-motorized routes, which in part, address the Nutritional Condition, Calving Success, and Vulnerability to Hunting Mortality. Again, Table 3-80 summarizes this comparison in trend for the Indicators and Measures referenced (DEIS Section 3.5.2.4).

Comment Number	Comment Letter	Response Code	Forest Service Response
			The primary factor differentiating Alternatives B, C, D, and F and Alternative E and the magnitude and trend of effect is the designation, or not, of the motorized trail routes and the effects associated with motorized and non-motorized recreation and administrative use of those routes. This contrast is particularly relevant to the area analyzed for the effects to Calving Success in both the magnitude of effects and the consequences to populations of elk using the Project Area (DEIS Section 3.5.2.4). Alternative E was developed to clearly display the effects and trade-offs the motorized trail and watershed, fisheries, and wildlife resources. Alternative E does not include the motorized trail designation and associated infrastructure and decommissions more road miles than the other action alternatives (DEIS Section 2.4.5). The ROD will identify the Responsible Official's selected Alternative with rationale as to why that alternative will maintain or contribute to restoration of ecological conditions within the Becker Project Area while providing for a broad spectrum of multiple uses.

Comment Number	Comment Letter	Response Code	Forest Service Response
ICL-5	The Forest should also consider additional options with regards to access to the Skyline and Stargazer Yurts, operated by the Idaho Department of Parks and Recreation. While there may be appropriate options for hike-in yurt access, we feel that it is important to maintain reasonable full-size vehicle access to these yurts. Further, we feel that it is appropriate to implement motorized closures around these yurts, especially because the thinning and vegetation management proposals have the potential to influence the accessibility of these areas to motorized winter and summer travel.	C,D	The preferred alternative, Alternative C, maintains the existing seasonal closure of NFS Road 362F to the Skyline Yurt and proposes a new seasonal closure on NFS Road 394B to the Stargazer Yurt. The seasonal closure period would be from 9/15 to 6/15, annually (DEIS Section 2.4.3). Much of this closure period is during the winter season when the roads cannot be accessed by motorized wheeled vehicles due to snow. Therefore, motorized wheeled vehicle access on these roads would only be closed during the shoulder seasons of spring and fall. Summer time motorized access would be allowed on NFS Roads 362F and 394B. FEIS will be updated to clarify the effects to yurt access. Project design features have been incorporated into all action alternatives for public safety at or near recreation sites during project implementation including RE-2, RE-5, RE-6, RE-7, RE-8, and RE-10. Many of these Design Features would result in temporary closures at or near recreation sites during project implementation (DEIS Section 2.4.7.9).

Comment Number	Comment Letter	Response Code	Forest Service Response
ICL-6	**RCA Treatment** The DEIS is unclear when it comes to commercial treatment within Riparian Conservation Areas (RCAs). While we recognize that fuel loading within RCAs can be a concern, especially in dry site forests, the FEIS should provide additional rationale for why product removal is required to meet the purpose and need.	D	DEIS Section 1.4.1 described the vegetation restoration Purpose and Needs in the Non-lethal and Mixed1 fire regimes. The objective of these treatments (commercial and non-commercial vegetation management) is to reduce stand densities, promote individual tree growth and development of large size class trees, promote desired species composition, reduce dwarf-mistletoe-infected trees, and begin to develop the desired stand structure in terms of age/size class distribution and horizontal aggregation (DEIS Section 3.2.5.2 and 3.2.5.5) . Additionally, the actions proposed to meet Purpose 1 are intended to modify forest densities, tree size classes, and species composition and breaking-up the horizontal and vertical wildland fuel continuity to reduce the risk of uncharacteristic stand-replacement wildfire and improve forest resiliency. Upland vegetation located within the second site potential height area of the RCAs is assumed to be similar to the upland vegetation located outside the RCA and differs from the riparian vegetation near stream channel zone(DEIS Section3.2, 3.8, and 3.9). Therefore, the need for treatment vegetation within the second site potential tree height area of the RCA is similar to the need for upland vegetation restoration outlined in Section 1.4.1 in order to meet Purpose 1. Additional discussion will be added to the FEIS to clarify the rationale for RCA vegetation treatments (DEIS Section 1.4.1). The effects disclosed in Watershed and Fisheries Sections (DEIS Section 3.8 and 3.9) will be updated to clarify effects of proposed vegetation treatments in the RCA.

Comment Number	Comment Letter	Response Code	Forest Service Response
ICL-7	It is unclear how the determination was made the lack of any commercial logging within one site potential tree height "should be ample enough to buffer bull trout and their habitats…" and that because 434 acres of commercial treatment in Edna Creek "would occur within the second site potential tree height…" that "effects to bull trout should also be negligible" (DEIS, page 535-536). These findings appear to be unsupported by the DEIS.	D	Please see response to ICL-7. The FEIS will include a new table in Section 2.4 that will clarify the acres to be treated with in the RCA. Project Design Features FH-30 (DEIS Section 2.4.7.4) would require that trees felled within the RCA be felled away from or parallel to the stream channel. The purpose of FH-30 is to mitigate direct effects to bull trout habitat that could result from harvested trees falling directly into the stream. The effects to bull trout habitat were analyzed through multiple WCI analysis. Stream shade from adjacent vegetation comes primary from riparian plant communities directly adjacent to the stream and from tress directly adjacent to the stream along the streambank. In fact, eighty percent of effective shade comes from approximately ½ site potential tree height distance from the channel (FEMAT, 1993). Harvested commercial trees will be winched out of the RCA, reducing heavy equipment within the RCA. Sediment delivery to streams is not expected to occur from these activities due to the incorporation of buffer distances from streams (Section 1.1.1.1; note this is an error in section numbering, should refer to Hydrology Section 3.9)). Further, Table 3-133 displays sediment travel distances which show the height of one site potential tree height will be adequate to protect streams. Other WCI analysis is located in DEIS sections 3.8.3.4, 3.8.3.8, 3.8.3.13, and 3.8.3.14.

Comment Number	Comment Letter	Response Code	Forest Service Response
ICL-8	The only apparent rationale provided to log within RCAs was a reference to an internal, non-peer reviewed, Forest Service "white paper" that recommends, among other things: • Going slow at first – focusing thinning on [Riparian Habitat Conservation Areas] RHCAs in the dry upland forests, and potentially in low fire-return interval mixed severity regimes or moist forest plantations where restoration is appropriate (due to historic clearcutting, etc.) • Recognizing scientific realities – where some level of treatment is supported for dry site treatments may be appropriate,	D	Powell 2014 is a white paper written by a Region 6 Forest Silviculturist, to provide thoughts and considerations relating to active management of certain portions of riparian habitat conservation areas (RHCAs). This paper includes multiple references to published/peer reviewed and unpublished science papers on this subject. DEIS Section 2.3.2 describes an alternative considered but eliminated from detailed study that would eliminate RCA vegetative and fuels treatments. Additional discussion will be added to this section of the FEIS to describe the ecological context of the area(s) in the RCA where vegetation management is being proposed and provide additional rationale for dismissing this alternative.

Comment Number	Comment Letter	Response Code	Forest Service Response
ICL-9	While we recognize the desire to reduce fuels, especially in dry site, frequent fire-return interval forests, the rationale for both commercial and non-commercial removal within the more moist vegetation types is not sufficiently supported in the DEIS. As a result, we recommend that you consider the following: drop commercial treatments in RCAs, drop RCA treatments within mixed severity fire regimes forests and/or provide further rationale for RCA treatments within mixed severity fire regime forests.	D,F	Please see response to ICL-6. RCA treatments (commercial and non-commercial) were not analyzed based on vegetation types. However, the objective of these treatment is not just fuels reduction; but also to reduce stand densities, promote individual tree growth and development of large size class trees, promote desired species composition, reduce dwarf-mistletoe-infected trees, and begin to develop the desired stand structure in terms of age/size class distribution and horizontal aggregation (see DEIS 3.2.5.2 and 3.2.5.5) design to promote RCA function and process (DEIS 3.8 and 3.9). No removal of vegetation will be removed in RCA areas proposed for non-commercial thinning. Please refer to DEIS Section 2.4.2.1, DEIS Figure 2-1 and DEIS Appendix C). DEIS Section 2.3.2 describes an alternative considered but eliminated from detailed study that would eliminate RCA vegetative and fuels treatments. Additional discussion will be added to this section of the FEIS to describe the ecological context of the area(s) in the RCA where vegetation management is being proposed and provide additional rationale for dismissing this alternative.
ICL-10	**Travel Management** We do appreciate that each of the alternatives closes and/or decommissions roads. We also appreciate that a Travel Analysis Process (TAP) identified a minimum network of roads to meet the long-term management needs of the project area. As a result, limited and declining road maintenance funds can be directed towards those roads where long-term access is needed.	D	Thank you for your comment. We acknowledge your support of the proposed road closure and decommissioning activities within the project area. The travel analysis process (TAP) and travel analysis report (TAR) completed for this project identified the minimum transportation system needed to meet long-term management needs in the project area (USDA Forest Service 2014). The TAP/TAR are available in the Project Record.

Comment Number	Comment Letter	Response Code	Forest Service Response
ICL-11	**Wildlife Habitat Security** While we appreciate consideration for reduction of the road system, we are concerned that the project converts many of these same roads to motorized trails, effectively nullifying the benefits associated with elk and wildlife habitat security. As the DEIS points out, "with the designation of motorized trail routes, only a slight decrease in motorized access would occur under Alternatives B, C, D, and F (Table 3-80). The net reduction in route density would only be 0.1 to 0.2 mi/mi.2 (Table 3-80)." (DEIS, p. 414). The DEIS goes on to state, "The last route, and of greatest concern, is located east of the NFS Road 362, east of Little Beaver Creek, in the NE 1/3 of the project area. It is here where the motorized trails would be designated, and would result in a substantial increase in the area in High Risk of Disturbance. East of State Highway 21, this redistribution of disturbance risk would result in a substantial increase in intensity of disturbance effects. This would be the result of a combination of a functional increase in motorized access and associated disturbance effects, particularly in an area that currently has little motorized access, and the overall net increase in route density in that portion of the project area." (DEIS, p. 414).	D	Thank you for your comment. Your comment accurately summarizes the analysis of Alternatives B, C, D, and F, as described in Section 3.5.2.4 of the DEIS as it pertains to motorized route densities. In the same Section, Alternative E, analyzed in detail, addresses in part the expressed concern regarding the designation of motorized trails in Alternatives B, C, D, and F. Alternative E would not designate motorized trail routes for any vehicle class, and would result in a greater level of reduction in road and all route densities in the Project Area (DEIS Table 3-80). This would result in a 1.0 to 1.2 mi/mi^2 density reduction when compared to the existing condition. The ROD will identify the Responsible Official's selected Alternative with rationale as to why that alternative will maintain or contribute to restoration of ecological conditions within the Becker Project Area while providing for a broad spectrum of multiple uses.

ICL-12	We also encourage the Forest to clearly explain how the project would meet the project's identified need and Forest Plan objective to "decommission authorized roads and unauthorized routes within the project area to reduce sediment to streams, improve wildlife habitat, and decrease noxious weed spread, thereby improving watershed, aquatic, and terrestrial resource conditions. The 2010 Forest Plan states that the transportation system should be managed to reduce degrading effects to resources and help achieve other resource objectives (FROB04; USDA Forest Service 2010a, p. III-60)." (DEIS, p. 14) (emphasis added).		Sediment loading associated with roads is analyzed in the DEIS in Section 3.9 (Hydrology Resources). This analysis concludes that a measureable improvement in the sediment/turbidity WCI and a reduction in annual road related sediment is expected in the long-term for all action alternatives. Please refer to DEIS Figures3-105 and 106. This conclusion is based on an analysis of the amount and location of road closures, decommissioning, and realignment proposed for all action alternatives. The Hydrologic Resource Technical Report is available in the Project Record. DEIS Section 3.5.2, Source Habitat Families and Associated Wildlife Species, and DEIS Section~~s~~ 3.4.2.1 (Low Elevation Old Forest [White-headed woodpecker]), DEIS Section 3.5.2.2 (Broad Elevation Old Forest [Flammulated owl, northern goshawk, black-backed woodpecker, and pileated woodpecker]), and DEIS Section 3.5.2.4 (Forest and Range Mosaic [Rocky Mountain elk, gray wolf]) provide specific analyses on the effects of the transportation components on each of the species identified above. With each, the assessment of effects are a function of the indicators and measures assigned to the transportation components of the Alternatives considered in detail, and may not specifically address the alternatives route by route. This is in part a function of the rationale provided in the Wildlife Technical Report (Project Record), Appendix B1 and B2 provides the description of the indicators and measures used in this analysis as it relates to the focal species assessed (described above) and the Conservation Principles that form the basis for the wildlife analysis and established in the Revised Forest Plan (USDA Forest Service 2010a). The re-route of NFS Road ~~-~~393 road is addressed specifically in several species and identify changes in vulnerability to loss of snags and down logs, or

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			changes in habitat disturbance patterns (re: flammulated owl; Rocky Mountain elk). In general, the changers to the full sized motor vehicle transportation system (re: roads) result in a reduction in impact to source habitat features (snags, down logs) for Family 1, 2 and Family 5 species and reduced risk of disturbance and vulnerability to hunting mortality (Rocky Mountain elk). The Forest Plan Consistency Table completed for this project is available in the Project Record. Additional discussion will be added to the FEIS to clarify how this project meets Purpose and Need 2 and Forest Plan Objective FROB04. The FEIS will disclose the resource effect trade-offs between resources in order to inform the Record of Decision (ROD). The ROD will identify the Responsible Official's selected Alternative with rationale as to why that alternative will maintain or contribute to restoration of ecological conditions within the Becker Project Area while providing for a broad spectrum of multiple uses.

ICL-13	The project area may be historically departed from natural regimes, as a result of intensive management, high road densities and fire suppression, however the areas of relative habitat security that remain become all the more important given that reality. As a result of these concerns, we urge the Forest to reconsider the proposal to designate motorized trails in a manner that outweighs the benefits associated with road closure/decommissioning.	D,F	Section 3.5.2.4 of the DEIS addresses the direct and indirect effects of the actions for each Alternative considered in detail, including, among other things, disturbance and vulnerability related effects to Rocky Mountain elk. Table 3-80 specifically summarizes and compares alternatives as it relates to changes in vulnerability, road and motorized route densities, and risk to disturbance associated with those routes, as well as non-motorized routes associated with the IDPR-managed (and to-be-authorized) non-motorized trails. Alternatives B, C (Identified Preferred Alternative), D, and F would result in a declining trend in the condition of security cover, as a result of proposed vegetation and natural fuels treatments. At the same time, these alternatives would also result in declining trends in motorized and total route densities and risk of disturbance from motorized and non-motorized routes which in part, address the Nutritional Condition, Calving Success, and Vulnerability to Hunting Mortality. This would increase the overall vulnerability risk to hunter mortality and would increase the risk of disturbance during critical time periods, including calving and neonatal development. Conversely, Alternative E would result in improving trends in motorized and total route densities and risk of disturbance from motorized and non-motorized routes, which in part, address the Nutritional Condition, Calving Success, and Vulnerability to Hunting Mortality. DEIS Table 3-80 summarizes this comparison in trend for the Indicators and Measures referenced. The primary factor differentiating Alternatives B, C, D, and F and Alternative E and the magnitude and trend of effect is the designation, or not, of the

Comment Number	Comment Letter	Response Code	Forest Service Response
			motorized trail routes and the effects associated with motorized and non-motorized recreation and administrative use of those routes. This contrast is particularly relevant to the area analyzed for the effects to Calving Success in both the magnitude of effects and the consequences to populations of elk using the Project Area. DEIS Section 3.5 includes a summary of the Wildlife Resources analysis completed for this project. The Wildlife Technical Report is available in the Project Record. Alternative E, which does not include designation of the motorized trails, was included in the alternative analyzed in detail and presented in the DEIS disclosures (DEIS Section 2.4.5). The FEIS will disclose the resource effect trade-offs between resources in order to inform the Record of Decision (ROD). The ROD will identify the Responsible Official's selected Alternative with rationale as to why that alternative will maintain or contribute to restoration of ecological conditions within the Becker Project Area while providing for a broad spectrum of multiple uses.
ICL-14	Please feel free to contact me if you have any questions about these comments and keep us on the mailing list for all future NEPA documents associated with this proposal. Sincerely, Jonathan Oppenheimer Senior Conservation Associate		Thank you for your comments. We will contact you if we have any questions regarding your comments. ICL will remain on our mailing lists for this project.

Table 41 – Idaho Department of Fish and Game (Scott Reinecker)

Comment Number	Comment Letter	Response Code	Forest Service Response
IDFG -1	Idaho Department of Fish and Game Southwest Region 3101 South Powerline Road Nampa, ID 83686 November 9, 2015 Boise National Forest Idaho City Ranger District ATTN: District Ranger Brant Peterson P.O. Box 129 Idaho City, ID 83631 comments-intermtn-boise-idaho-city@fs.fed.us RE: Becker Integrated Resource Project Dear Mr. Peterson, The Idaho Department of Fish and Game (Department) has reviewed the Becker Integrated Resource Project (project) Draft Environmental Impact Statement (DEIS). The purpose of this project is to address resource management issues identified by the Forest Service in relation to the 2010 Boise National Forest Plan. These include restoration and maintenance of priority forested wildlife habitats, restoration to improve watershed and aquatic conditions, enhancement of recreational opportunities, and commercial removal of wood products. The project area is approximately 19,300 acres and located on the Idaho City Ranger District of the Boise National Forest. Highway 21 bisects the project area. Proposed actions include vegetation management, culvert treatments, and motorized and non-motorized road and trail management.	A	Thank you for the comment and summary. Your statement provides an accurate description of the Project and Project Area.

Comment Number	Comment Letter	Response Code	Forest Service Response
IDFG -2	The purpose of these comments is to assist the decision-making authority by providing technical information addressing potential effects to fish, wildlife, and habitats and how any adverse effects might be mitigated. It is not the purpose of the Department to support or oppose this proposal. Resident species of fish and wildlife are property of all Idaho citizens and therefore a public trust resource. The Department and the Idaho Fish and Game Commission are expressly charged with statutory responsibility to preserve, protect, perpetuate and manage all fish and wildlife in Idaho (Idaho Code36- 103(a)). In fulfillment of our statutory charge and direction as provided by the Idaho Legislature, we offer the following comments.	A	Thank you for your comment and clarification of your role in this analysis and review of the DEIS.

Comment Number	Comment Letter	Response Code	Forest Service Response
IDFG -3	**General Comments** The DEIS identified four purposes of the project, including forest restoration, watershed improvement, recreational enhancements, and economic support for local communities. The Department understands that some existing recreation amenities in the project area were not formally reviewed through the National Environmental Policy Act (NEPA) process in the past. The Department also understands the Becker Project, as described to Department staff prior to Scoping, was originally intended to address forest health issues and fuels reduction. It is unclear to us why the two seemingly disparate issues of recreation and vegetation management are being analyzed together under one NEPA process. The Final EIS should further explain the development of the project purposes and how it is that recreation came to be a primary purpose for the project.	D	Recreation is not the primary purpose of the Becker Integrated Resource project, it is one of four integrated project purposes. Rationale for including the Recreation trail proposals with the Veg and Aquatic Restoration components was due to the following: • Non-motorized trail infrastructure associated with the Park and Ski trail infrastructure would be impacted by vegetation and fuels treatments and the values associated with and described in the Forest Plan, including Scenic Values, etc. The Responsible Official determined that addressing those impacts in an integrated fashion was important to informing/weighing subsequent decisions on how to balance benefits and impacts to one resource against another; • The non-motorized trail and Yurt infrastructure has been managed with IDPR in this area for over a decade. Currently IDPR manages this program under an agreement between the Forest Service and IDPR, and IDPR has identified the recreational value of this program as very high and one of the few of its kind in Idaho. • The need for additional motorized trails was identified during project development to meet overall recreation demands in and surrounding the project area as identified by motorized recreationist and local County commissioners. 1.

IDFG -4	The Becker Project DEIS has done a thorough job of assessing potential tradeoffs between recreation and natural resources, specifically motorized access and quality elk habitat. However, it is unclear to the Department how the Boise National Forest intends to apply the information in decision making. The DEIS states the Forest Service is responsible to meet transportation and recreation needs while minimizing impacts to other resources (pg. 37), but falls short of defining the threshold at which point adverse effects to resources becomes unacceptable. The Department asks that the FEIS clarify (and quantify where possible) transportation and recreation needs and how those are weighed against effects to public trust resources.	D	In determining whether beneficial or adverse impacts would likely result from implementation of an alternative, including those associated with transportation and recreation needs and those pertaining to quality and quantity of elk habitat, the Responsible Official considered several factors. As recognized by the responder, several factors pertaining to these topics were assessed in the EIS, both qualitatively and quantitatively, to help provide context concerning balancing effects on one resource against those of another. The purpose of the EIS effects disclosures, including consideration of public, state and local government, tribal and other Federal agency reviews, is to provide the Responsible Official with the necessary information to inform what effects would be “acceptable” to one resource when weighed against those of another. Clear thresholds are those that would result in violations of law, statute or regulation which the alternative selected cannot typically result in. Where alternatives being considered are clearly consistent with law, statute and regulations, the Responsible Official must then consider multiple factors when weighing effects between resources in the decision-making process. The following have been and will continue to be considered and documented in the Responsible Official’s decision rationale as to why an alternative selected for implementation was chosen over another: • Public opinion; • Reviews by other local, state, tribal government and other federal agencies; • Direct and Indirect impacts; • Cumulative Impacts;

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			• Relevant Legal Requirements in local; state and federal statutes and regulations • Scientific concerns, i.e. scientific controversy concerning any aspect of a proposed action; • Irreversible and Irretrievable Commitments of Resources. Rarely can beneficial effects be realized by all social, economic and natural resource interests in every location. Thus, where trade-offs must be made between resources in order to meet the Agency's multiple use mandates, the decision document provides the rationale (based on the factors above) for why the Responsible Official believes the level of effect on one resource was "acceptable" in order to meet the needs of other social, economic and natural resource needs.

IDFG -5	The Department suggests public surveys be used to inform the decision-making process for recreation related and access-related management actions on public lands, particularly where recreation and natural resources have the potential for conflict. We understand the population of the Treasure Valley has increased markedly over the last 25 years, as has registration numbers for OHV's (and UTV's specifically), but we suggest survey data be used to determine if that equates with an overall public desire to provide additional trails and routes on public lands, such as UTV-specific recreation trails, as proposed under Alternatives D and F.	A	The NEPA process for this project has provided opportunities for consideration of, among other things, recreation related and access-related needs and desires of the Project Area and road and recreational infrastructure within. Those opportunities include the following: At public meetings and through comments received in response to scoping of the Proposed Action, comments were received expressing desires for motorized recreational opportunities on roads and designated motorized trails, including alternatives considering vehicles greater than 50" wide (*Scoping comments*). While not a designed public survey effort to assess over desires of levels and types of motorized access, nor compare or contrast potential conflicts with other resource values (non-motorized recreation, wildlife population and habitat quality, etc.), these comment opportunities provide an indication of a desire for motorized recreation in the Project Area. Scoping comments received and Forest Service Responses are available in the Project Record. While not specifically addressing the Project Area, comments analyzed and considered in the Travel Management Rule (36 CFR Parts 212, 251, 261, and 295 Travel Management; Federal Register Vol. 70, No. 216 68264-68291) provide insight as to the general perspective of the public as it pertains motorized access and potential conflicts between multiple resource values and concerns. Review of these comments indicate a strong desire for finding balance between motorized and non-motorized interests for multiple reasons. DEIS Section 1.4.3.1, Purpose 3, Need 5 identifies a need to provide motorized trail

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			opportunities to, in part, address mixed use concerns of full sized and OHV vehicles on full sized motor vehicle while addressing and protecting other resource values and concerns.
IDFG -6	Similarly, we suggest user survey data be used to inform decision-making regarding different forms of recreation, such as motorized and non-motorized routes and trails. For example, the Department has commissioned various hunter surveys and has found that, in general, elk hunters supported restricting the use of OHV's to increase the quality and size of elk and improve elk hunting opportunities (Sanyal et al. 2012). Similarly, mule deer hunters were somewhat likely to enjoy hunting more if restrictions on ATV use were applied to more units (IDFG 2008).	A	Public involvement throughout the NEPA process has provided opportunities for interested parties to comment on the project and associated activities proposed. Please refer to Scoping comments received and Forest Service Responses (Project Record), The literature identified will be considered and the FEIS disclosures updated, as appropriate. See IDFG-5

IDFG -7	**Specific Comments** The elk vulnerability analysis highlights the difficulty in balancing forest restoration, transportation, recreation, and wildlife habitat in the same place at the same time. This is particularly true for low-mid elevation forests that are proposed for treatments resulting in more open stand conditions. Furthermore, as mentioned in the DEIS, the proposed Becker Project Area is one of the few remaining large blocks of the Idaho City Ranger District that has not been affected by stand-replacing wildfire in the last few decades. The Department has frequently emphasized to the Forest Service that functional habitat for several species of wildlife cannot be maintained when forest stand densities are reduced through vegetation management and road and trail densities remain unchanged. For instance, elk calving, hiding and escape cover is a function of predation and disturbance. Calving, hiding and escape cover will decrease under all action alternatives and the potential for disturbance through recreation will likely increase under all action alternatives except Alternative E. If route densities are not addressed along with habitat restoration, elk exposure to disturbance will increase (as analyzed in the DEIS), potentially resulting in displacement of elk from otherwise suitable habitat. This is a particular concern of the Department in the Beaver Creek area, identified by the Department and analyzed in the DEIS, as an elk calving area.	D	Your comment summarizes discussions documented in Section 3.5.2.4 (Family 5 – Forest and Range Mosaic) and the specific discussion for Rocky Mountain elk and Direct and Indirect Effects of actions proposed in the different Alternatives. Table 3-80 specifically summarizes and compares alternatives as it relates to changes in vulnerability, road and motorized route densities, and risk to disturbance associated with those routes, as well as non-motorized routes associated with the IDPR-managed (and to-be-authorized) non-motorized trails. As you noted, Alternatives B, C (Identified Preferred Alternative), D, and F would result in a negative trend in the condition of security cover, as a result of proposed vegetation and natural fuels treatments (Table 3-80). At the same time, these alternatives would also result in negative trends in motorized and total route densities and risk of disturbance from motorized and non-motorized routes which in part, address the Nutritional Condition, Calving Success, and Vulnerability to Hunting Mortality (Table 3-80). As noted in the analysis you summarized, this would increase the overall vulnerability risk to hunter mortality and would increase the risk of disturbance during critical time periods, including calving and neonatal development. Also in the analysis describing the affected environment and environmental consequences, and affirmed in your comment designated IDFG-8, those effects could have consequences on populations in the Sawtooth Zone, which seasonally occupy the Project Area, which are currently below IDFG population objectives.

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			Conversely, Alternative E, as you noted in your summary of Section 3.5.2.4 of the DEIS, specifically Rocky Mountain elk, would result in improving trends in motorized and total route densities and risk of disturbance from motorized and non-motorized routes, which in part, address the Nutritional Condition, Calving Success, and Vulnerability to Hunting Mortality. Again, Table 3-80 summarizes this comparison in trend for the Indicators and Measures referenced. The primary factor differentiating Alternatives B, C, D, and F and Alternative E and the magnitude and trend of effect is the designation, or not, of the motorized trail routes and the effects associated with motorized and non-motorized recreation and administrative use of those routes. As you noted, this contrast is particularly relevant to the area analyzed for the effects to Calving Success in both the magnitude of effects and the consequences to populations of elk using the Project Area.

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IDFG -8	The Rocky Mountain Elk Section of the DEIS discusses the Department's elk population objectives relative to animals using the project area, noting that elk objectives for the Boise River Zone are at or above objective while elk objectives for the Sawtooth Zone are below objective. We note that Department population management objectives are based on wintering animals and animal counts are conducted approximately every three-five years on winter range. The Becker Project is within the Boise River Zone, but does not support wintering elk, instead providing spring, summer, and fall habitats. Beginning in 2008, a sample of elk wintering in the South Fork Payette River area (Sawtooth Zone) was outfitted with GPS collars. The Department provided the Idaho City Ranger District with data and analysis in early 2015 demonstrating: 1) The Becker Project area is used seasonally by elk wintering in the Sawtooth Zone and, therefore, effects to elk resulting from the Becker Project are applied to Sawtooth Zone as well as the Boise Zone elk herds, and; 2) The upper Beaver Creek area receives disproportionately high use by adult female elk in late spring and early summer, signifying the use of the area for elk calving and rearing. Management actions in the Becker Project area affecting the capacity of the habitat to support elk could have repercussions for Department elk management objectives in the Sawtooth Zone, which has been persistently below management objectives for several years.	D	Your comment summarizes discussions documented in Section 3.5.2.4 (Family 5 – Forest and Range Mosaic) and the specific discussion of affected environment as it relates to the Sawtooth and Boise River elk management zones. Specifically, the contribution of the Project Area to both elk management zones and the assessment of elk use during calving and early neonatal development (rearing) in the Project Area. As noted in the comment and data assessed in the DEIS (Section 3.5.2.4), the Sawtooth zone is currently below population objectives. The referenced section also considered and is consistent with the assertion that actions proposed could have adverse consequences to the Sawtooth zone populations and the ability of the Department to meet management objectives for that zone. Responses to comment IDFG-7 addresses specific components of the project as it relates to this comment.

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IDFG -9	We are confident the Becker Project area supports seasonal use by Boise River Zone elk as well. Elk wintering in the Boise River Zone are found primarily south of the project area, along the Boise Front and east to the Bennet Mountain area. As stated in the DEIS, wintering elk numbers in the Boise River Zone have been on a steady increase over the last several years and are now at or above Department population management objectives. Recent radio telemetry data suggests much of that population growth has come from changes in elk wintering habits rather than an overall increase in the number of year-round elk in the zone. Elk herds that previously wintered in the South Fork Boise River area above Anderson Ranch Reservoir (in the Smoky Mountains Zone) are now wintering east of Highway 20 in the Boise River Zone.	D	Your comment summarizes discussions documented in Section 3.5.2.4 (Family 5 – Forest and Range Mosaic) and the specific discussion of affected environment as it relates to the Boise River elk management zone. Thank you for the additional information regarding the Department's interpretation of changes and trend in elk populations for the management unit; disclosures in the FEIS will be updated as applicable. The effects of the alternatives considered as discussed and summarized in Section 3.5.2.4 would be applicable to elk, regardless of wintering migration patterns.

IDFG -10	The DEIS makes note of a portion of the Department's management strategy identified in the Idaho Elk Management Plan 2014 – 2024 (IDFG 2014); "Encourage federal land management agencies to maintain overall motorized route densities that are within the 0.7 – 1.7 mi/mi2 "moderate" range." However, the complete strategy includes the additional objective of maintaining "…large areas that are within the "low range (<0.7 mi/mi2)." We recommend the area identified in the DEIS as the elk calving focus area maintain elk security by designating a year-round motorized road and trail density at or below 0.7 miles per square mile for the following reasons: • The Becker Project area represents one of the few remaining large blocks of the Idaho City Ranger District not affected by stand-replacing wildfire in the last few decades and, is therefore, intact mature habitat (as analyzed in the DEIS). • Proposed changes in vegetation will decrease elk cover, potentially affecting elk use of otherwise suitable habitats and increasing elk vulnerability to hunter harvest (as analyzed in the DEIS). • Potential changes in travel management would introduce increased disturbance to portions of the project area identified by the Department and DEIS as important for wildlife. • Department population objectives for Sawtooth Zone elk is below objective. • Department surveys of big game hunters indicate a majority of respondents were accepting of some restrictions to motorized access if those restrictions resulted in larger animals, improved hunting opportunities, or an improved hunting experience.	D/F	Sections 3.6.3.1 and 3.6.3.2 in the DEIS address the affected environment and the environmental consequences of the existing and proposed transportation system supporting full sized and recreational motorized vehicles. The assessment of the Affected Environment addresses the existing conditions and the recommendations that came from the Travel Analysis Process (TAP), which informed the Proposed Action; specifically the full sized motor vehicle transportation system. The TAP, in Sections 4, 5 and 6 provides an assessment of benefits, problems, and risks of the existing transportation system and opportunities for changes to the existing transportation system and recommendations for specific changes. This assessment considered a variety of resource values and concerns as it relates to the recommendations (Sections 4.2 and 5.2). The recommendations for changes to the full-sized motor vehicle transportation system responded to the assessments in Section 4.2 and 5.2. That recommendation is reflective of the transportation system components of Alternative E. The remaining Action Alternatives respond to the TAP recommendations with a similar proposal for full sized motor vehicles, with highlighted differences associated with the recommended motorized trails and seasonal closure alternatives on two segments (Roads 394B and 362F). These Alternatives are displayed and described in Section 2.5. An open road density of 1.6 mi/mi^2 (Sept 15 – June 15) and 1.9 mi/mi^2 would be achieved with Alternative E, with the remaining alternatives having slightly higher densities during those same time frames. Analysis in the TAP indicates additional reduction in route densities for full-sized motor vehicles would impact values

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			associated with administrative access/vegetation management and recreational access to the Project Area.
IDFG -11	Regardless of the decision made, the Department recommends the Idaho City Ranger District develop a robust monitoring and enforcement plan for motorized travel. The Department and the Forest Service have entered into an MOU (2004, R4 # 04-MU-11046000 - 059) whereby Department enforcement staff are authorized to enforce Forest Service motor vehicle restrictions that have a wildlife or wildlife habitat protection context. Any undesignated route pioneering in important wildlife habitat represents an additional enforcement concern for the Department and we suggest dedicated staff and/or funding be provided to address travel management rules and regulations specific to the Becker Project.	C,D	The purpose of this NEPA decision is to identify the necessary travel management restrictions needed to meet management objectives of the Alternative selected for implementation in the Becker Integrated Resource Project Area. Enforcement of the requirements resulting from this decision are expected and become part of the day to day efforts of law enforcement personnel to address. Should enforcement issues be identified by law enforcement personnel, they will be discussed with the appropriate Line Officer responsible for that management unit and corrective actions implemented, as appropriate.
IDFG -12	Thank you for the opportunity to comment. Please contact Rick Ward in the Southwest Region office at (208)475-2763 or rick.ward@idfg.idaho.gov if you have any questions. Sincerely, Scott Reinecker Southwest Regional Supervisor SR/rw ecc: Cook/IDPR Kiefer/ HQ R3 staff cc: Gold file		Thank you for your comments. We will contact Rick Ward with any questions we have regarding IDFG's comments.

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IDFG -13	Literature Cited Idaho Department of Fish and Game (IDFG). 2008. Idaho Mule Deer Management Plan 2008-2017. Idaho Department of Fish and Game, Boise, USA. Idaho Department of Fish and Game (IDFG). 2014. Idaho Elk Management Plan 2014-2024. Idaho Department of Fish and Game, Boise, USA. Sanyal, N., E. Krumpe, and A. Middleton. 2012. Elk hunting in Idaho: understanding the needs and experiences of hunters. Prepared for the Idaho Department of Fish and Game. Department of Conservation Social Sciences, University of Idaho, Moscow, USA.		Thank you for the literature citations that address your comments. Literature cited will be reviewed and included in the Project Record.

Table 42 – Idaho Department of Parks and Recreation (Jeff Cook)

Comment Number	Comment Letter	Response Code	Forest Service Response
IDPR-1	Idaho Department of Parks and Recreation November 16, 2015 Melissa Yenko Boise National Forest 1249 South Vinnell Way Boise, ID 83709 RE: Becker Integrated Resource Project DEIS Dear Melissa, The Idaho Department of Parks and Recreation (IDPR) staff reviewed the Becker Integrated Resource Project Draft Environmental Impact Statement (DEIS). The Becker Project proposes a variety of management activities including vegetation treatment, road decommissioning, and road designation in the Becker Project Area, between Idaho City and Lowman.	A	Thank you for reviewing the Becker Integrated Resource Project. This comment accurately summarizes the types of activities proposed by the Becker Project. This comment does not require a response.
IDPR-2	This area is extremely important to IDPR because the project area contains the Idaho City Backcountry Yurts. These yurts provide income to the Idaho City Park n' Ski Program which grooms the 28 mile Nordic system in the winter. In the spring, summer, and fall, the Nordic system is used by a variety of non-motorized uses and yurt visitors.	A	This comment summarizes the importance of this area to IDPR and the types of uses IDPR provides under agreement with the Forest Service in this area. This comment does not require a response.

IDPR-3	The DEIS identifies Alternative C as the preferred alternative. This alternative would change access to the Stargaze Yurt on the 394B road from open yearlong to seasonal (open from 06/16-09/14). This access change eliminates traditional access to the yurt and results in fewer stays as the yurt during the spring and fall. We do not support this recreational "taking".	D	The preferred alternative, Alternative C, maintains the existing seasonal closure of NFS Road 362F to the Skyline Yurt and proposes a new seasonal closure on NFS Road 394B to the StargazeYurt. The seasonal closure period would be from 9/15 to 6/15, annually (DEIS Section 2.4.3). Much of this closure period is during the winter season when the roads cannot be accessed by motorized wheeled vehicles due to snow. Therefore, motorized wheeled vehicle access on these roads would only be closed during the shoulder seasons of spring and fall. Summer time motorized access would be allowed on NFS Roads 362F and 394B. The Forest Service completed a travel analysis process (TAP) and travel analysis report (TAR) for the Becker Integrated Resource project to inform the Proposed Action for travel management activities (USDA Forest Service 2014). The TAP/TAR is available in the project record. -The TAR recommended that the following for NFS Road 362F and 394B. • NFS Road 362F: No change from current management to facilitate management related activities associated with silvicultural and fuels treatments, wildfire suppression, and recreation access (USDA Forest Service 2014, p. 22). Current management of NFS Road 362F open for public use with a seasonal closure from 9/15-6/15, annually (DEIS, Map 2). • NFS Road 394B: Change from Maintenance Level 2 (Open for public use) to ML2 (Administrative Use only) in order to minimize deleterious effects on snags and downed logs, calving and fawning habitat, and big game security (USDA Forest Service 2014, p. 22). Current management of this road is open for public use (DEIS, Map 1).

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			Effects analyses, including recreation and engineering/transportation, are summarized in Chapter 3 of the DEIS. Complete technical reports are available in the project record. Additional discussion will be included in the Recreation section of the FEIS and supporting technical report to clarify the existing condition and impacts to recreation users resulting from the road proposals. Additional discussion will be included in the Recreation section of the FEIS and supporting technical report to clarify the existing condition and impacts to recreation users resulting from the road proposals.

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IDPR-4	Alternative C doesn't change the access to the Skyline Yurt on Road 362 F from seasonal to yearlong. The Skyline Yurt has fewer stays than the Stargaze Yurt. Our reservation records show that the Stargaze Yurt has occupancy rates ranging from 65.22% in the spring to 70.45% in the fall. The Skyline Yurt has lower occupancy rates from 34.78% in the spring to 26.67% in the fall. The seasonal restriction on Road 362 F is effecting on occupancy rates at the Skyline Yurt.	D	Alternative C maintains the existing seasonal closure from 9/15 to 6/15, annually, on NFS Road 362F (DEIS Section 2.4.3). The existing closure is in place to protect big game calving and fawning habitat and big game security in the spring and fall. The Forest Service completed a travel analysis process (TAP) and travel analysis report (TAR) for the Becker Integrated Resource project to inform the Proposed Action for travel management activities (USDA Forest Service 2014). The TAR recommended that the following for NFS Road 362F. • NFS Road 362F: No change from current management to facilitate management related activities associated with silvicultural and fuels treatments, wildfire suppression, and recreation access (USDA Forest Service 2014, p. 22). Current management of NFS Road 362F open for public use with a seasonal closure from 9/15-6/15, annually (DEIS, Map 2). The Forest Service analyzed in detail Alternatives with a variety of access including non-motorized access, motorized access, motorized access with seasonal closure (9-15 to 6/15), and non-motorized access with mechanized closure (5/1 to 6/15), to the IDPR Yurts when compared to the No Action Alternative (DEIS Section 2.4), Table 2-25 summarizes the Alternatives by Yurt Access.

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IDPR-5	If Road 394B is seasonally restricted, we would expect yurt occupancy to fall. In 2014, the Skyline Yurt had 19 more days of occupancy in the fall than Skyline did. A seasonal restriction on the Stargaze Yurt would reduce our income by $959.31 per year. This is only a partial estimate because we don't know how the project activities will impact the yurt visitation to all the yurts. We expect that revenue could drop some due to project activities because people don't what to stay when project activities are going on.	C,D	See IDPR-3 Project design features have been incorporated into all action alternatives for public safety at or near recreation sites during project implementation including RE-2, RE-5, RE-6, RE-7, RE-8, and RE-10. Many of these Design Features would result in temporary closures at or near recreation sites during project implementation (DEIS Section 2.4.7.9). Design Features FF-2 (DEIS Section 2.4.7.2) and RE-10 were applied to all action alternatives to provide a mechanism for public notifications of project activities and closures that may impact the availability of recreation opportunities in the area.
IDPR-6	The reason that seasonal occupancy rates in the spring and fall are so low at Skyline Yurt is that people are unwilling to walk and haul water for a total of 2.5 miles and 600 feet in elevation. Our staff has found that any time that a yurt is moved more than a mile and half away from an open system road, summer yurt visitation drops.	D	Please see response to IDPR-3
IDPR-7	The Record of Decision needs to remove the proposed seasonal restriction on Road 394B and remove the existing seasonal restriction on Road 362F as identified in Alternative D. This alternative provides the best yurt access within the range of action alternatives.	D	The Record of Decision (ROD) will identify the Responsible Official's selected Alternative with rationale as to why that alternative will maintain or contribute to restoration of ecological conditions within the Becker Project Area while providing for a broad spectrum of multiple uses.

Comment Number	Comment Letter	Response Code	Forest Service Response
IDPR-8	Alternative C would designate the new OHV Trail System for vehicles 50 inches and under while Alternative D would designate these trails for vehicles 60 inches and under. The change from 50 inches to 60 inches would to accommodate more UTV vehicles.	D	Alternatives B and C propose a motorized trail system for motor vehicles 50 inches and less (DEIS Sections 2.4.2 and 2.4.3). Alternatives D and F propose a motorized trail system for vehicles 60 inches and less (DEIS Sections 2.4.4 and 2.4.6). Alternative E does not include designation of a motorized trail system (DEIS Section 2.4.5) Effects analyses, including recreation and engineering/transportation, are summarized in Chapter 3 of the DEIS. Complete technical reports are available in the project record.
IDPR-9	Under the 50 inch designation, at least three different types of UTVs are being manufactured to 50 inches in width. The Polaris Trail RZR, the Arctic Cat Wildcat and the Honda Pioneer are all 50 inches wide. These UTV vehicles can operate on routes that are designated for 50 inches and less. Other, wider UTVs have much more limited opportunities.	D	Motorized vehicles that are 50 inches and less may use trails designated on the Motor Vehicle Use Map (MVUM) for vehicles 50 inches or less. Motorized vehicles that are wider than 50 inches may use open Forest Service Roads and any motorized trails that are designated for vehicles 60 inches or less on the MVUM.
IDPR-10	Alternative F designates 18.8 miles of 60-inch trails in the OHV Trail System. The OHV Trail System in Alternative F provides for better separation of motorized and non-motorized visitors. The slight decrease in mileage only eliminates one potential loop opportunity in the trail system. We would encourage the Boise National Forest to using Alternative F Trail System as the Designated Trail System in the Final EIS.	D	This is an accurate description of the motorized trail proposed in Alternative F (DEIS Section 2.4.6) The Record of Decision (ROD) will identify the Responsible Official's selected Alternative with rationale as to why that alternative will maintain or contribute to restoration of ecological conditions within the Becker Project Area while providing for a broad spectrum of multiple uses.

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IDPR-11	On Page 495, the DEIS displays a photograph of the Stargaze Yurt. The caption and the DEIS is incorrectly titles Stargazer Yurt throughout the document. Please change any references to Stargazer to Stargaze in the FEIS. This correction can easier be done through the Replace function in Microsoft Word.	D	The name of Stargaze Yurt will be corrected in the FEIS.
IDPR-12	Alternatives C and F would designate new Motorized Winter Closures that cover Whoop-Um-Up, Gold Fork and the Stargaze Yurt. One concern that we have is the joint use of the Whoop-Um-Up Parking Lot. Snowmobilers will need a designated route of the parking lot to access the groomed snowmobile trail system. Otherwise, the new closure areas will protect the existing ski trail groomed and ungroomed trail system. The map on in Appendix J should be updated to reflect that this new closure in only being proposed in Alternative C and F. Alternatives B, D, and E would not implement this closure, according to the DEIS Summary on Page 128.	D	Alternative C, E and F all propose the 3,309-acres of winter motorized closure (Please refer to DEIS Sections 2.4.3, 2.4.5, and 2.4.6. The Table on pg. 128 in the DEIS incorrectly indicates that Alternative E would not include the proposed motorized winter closure area and will be corrected in the FEIS. Between the draft and final EIS, updates were made to the proposed winter motorized closure area to exclude the existing motorized trail groomed OSV route that is located in the proposed closure area in the DEIS. Therefore a designated route to access the existing groomed OSV system from the trailhead would not be required. The new area for the proposed winter motorized closure is 3,215 acres. This update will be included in the FEIS for C, E, and F.
IDPR-13	Our staff reviewed the recreation analysis starting on Page 487. Our staff concurs with this analysis. The analysis falls a little short in describing the impacts that seasonally restricting access to both the Skyline and Stargaze Yurt will decrease revenue into our Park N' Ski Program. Less revenue will mean less grooming in the winter on the Idaho City Park N' Ski Trail System. In order to increase revenue, we strongly recommend that a year round designation be applied to Road 394B to facilitate vehicle access to the Skyline Yurt.	D	Additional discussion will be included in the Recreation section of the FEIS and supporting technical report to clarify the existing condition and impacts to recreation users and the revenue resulting from the road proposals. The Record of Decision (ROD) will identify the Responsible Official's selected Alternative with rationale as to why that alternative will maintain or contribute to restoration of ecological conditions within the Becker Project Area while providing for a broad spectrum of multiple uses.

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IDPR-14	We appreciate the time and effort that the planning team has made in meeting with our staff on this project. Everything that we requested in our scoping response made it within the range of alternatives. The final selected alternative will need some changes in order to best meet IDPR needs in the project area. If your staff has any questions about our comments, please contact me at (208) 514-2483. Jeff Cook, Outdoor Recreation Analyst Recreation Bureau	A,D	Thank you for your comments. We will contact IDPR if we have any questions.

Table 43 –Dick Artley Idaho Statesman Letter to the Editor (10/8/2015)

Comment Number	Comment Letter	Response Code	Forest Service Response
DA-1	Letter to the Editor (Idaho Statesman 10/8/15) Proposed timber sale Ms. Cecilia Seesholtz (the Boise National Forest supervisor) will be accepting public comments on the proposed Becker timber sale until Nov 2. The draft Environmental Impact Statement is available online or hardy by calling 208-373-4100.	D	A Notice of Availability (NOA) for the DEIS was published in the *Federal Register* on September 25, 2015 (Project Record). The publication date of the NOA in the *Federal Register* is the exclusive means for calculating the 45-day comment period for the DEIS. The Forest Service accepted comments on this project from 9/25/2015 to 11/9/2015 based on the publication date of the NOA in the Federal Register. The DEIS is available by request to the Boise National Forest and is available on the project web site at http://www.fs.usda.gov/project/?project=18922 .

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DA-2	The sale will log 6.8 square miles, with 28 percent of the logging planned to occur in Riparian Conservation Areas adjacent to sensitive streams.	D	The preferred alternative (Alternative C) proposes commercial treatment on approximately 4,425 acres or 6.9 square miles (DEIS Table 2-4). Of the area proposed for commercial vegetation treatments approximately 1,220 acres, or 28% of the area proposed for treatment, are located within RCAs (DEIS Table 2-4).This value represents the entire RCA acres as defined by the RCA descriptions in DEIS Figure 2-1. The actual commercial vegetation treatment acres in RCA would be expected to be less than the total RCA acres in the treatment units because commercial vegetation management is only proposed to occur in the areas between one and two site potential tree heights of perennial stream RCAs and no equipment would be allowed off of existing roads (DEIS, Figure 2-1 and Appendix C).
DA-3	About 0.6 miles of road will also be constructed close to the streams.	C,D	The preferred alternative (Alternative C) proposes approximately 0.6 miles of temporary road construction in the RCA (DEIS, Table 2-7). Project Design Feature TH-4 would require that temporary roads be decommissioned following completion of mechanical vegetation treatments (Section 2.4.7.12).
DA-4	The timber sale will be located in the Middle Crooked River watershed in the Idaho City Ranger District.	A	The Becker Integrated Resource Project is located in Middle Fork Crooked River subwatershed (HUC 17050110503) on the Idaho City Ranger District of the Boise National Forest (DEIS Section 1.2).
DA-5	Please be sure to comment of the Forest Plan amendment being proposed with this timber sale.	A	This comment is requesting the readers of this “Letter to the Editor” to comment on the project. No Forest Service response is required.

Comment Number	Comment Letter	Response Code	Forest Service Response
DA-6	The amendment will weaken the visual quality objectives for the areas that can be seen from Idaho 21. Dick Artley, U.S. Forest Service retired, Grangeville	D	All of the action alternatives proposed Forest Plan Amendments for visuals (DEIS Section 2.4.2.2). Amendment 1: Management Area 7 Forest Plan standard 0763 would be amended to include VQOs for the proposed motorized trail, over-snow trails, and non-motorized trails. Amendment 2: The VQOs along Highway 21 would be amended to allow for further achievement of Purpose #1. Project Specific non-significant Amendments and Corrections are included in Appendix I of the DEIS. DEIS Section 3.15 summarizes the effects analysis completed for the Scenic Environment. Project design features for Scenic Environment and Visual Quality (DEIS Section 2.4.7.10), Invasive Species (DEIS Section 2.4.7.5, Recreation (DEIS Section 2.4.7.9), Timber Harvest (DEIS Section 2.4.7.12), and Vegetation Management (2.4.7.14) would mitigate impacts to scenic resources. It is expected that the VQOs would be maintained with implementation of any of the Action Alternatives (DEIS Section 3.15).

Table 44 – Jean Public Comment Letter (jeanpublic1@yahoo.com)

Comment Number	Comment Letter	Response Code	Forest Service Response
JP-1	-1. ban all logging ban all toxic pestices and all that you use are toxic and polluting ban hunting ban trapping ban new road take otu of service some unused roads ban all grazing, minindg and drilling save, protect and respect the open space, nature and wild animals and birds tha tlive on our open sace that belongs to325 million people. do the broad outreach that nepa requires. this kind of email does not reach enough of the 325 million peole who own this land communally.this comment is for the public record. please receipt. jean public jeanpublic1@gmai.com	A,D	Thank you for your comment. A complete descriptions of the action alternatives analyzed in detail are available in Chapter 2, section 2.4 of the DEIS. This project does not propose hunting or trapping, grazing, mining or drilling activities. Summaries of the effects analyses, including noxious weed treatment, wildlife resources, and transportation, completed for this project are located in Chapter 3 of the DEIS. Complete technical reports for each resource analyzed are available in the project record. The public notification(s) for this project included parties that indicated through the scoping process that they were interested in receiving information on this project. At the time the DEIS availability notifications were sent out there were 45 parties on the hard copy mailing list and 255 parties on the e-notification list. A Notice of Availability was published in the Federal Register on 9/25/2015 and a legal notice was published in the *Idaho Statesman* (newspaper of record) on 9/25/2015. Additionally, project information including the DEIS are available on the project web page http://www.fs.usda.gov/project/?project=18922.

Table 45 – Boise Cascade Comment (Lindsay Warness)

Comment Number	Comment Letter	Response Code	Forest Service Response
BCLW- 1	**Boise Cascade** 1917 Jackson Ave .. La Grande, OR 97850 T 541-962-2000 F 541-962-2035 Boise Wood Products November 3, 2015 Cecilia Seesholtz Forest Supervisor, Boise National Forest 1249 South Vinnell Way, Suite 200 Boise, ID 83709-1663 Comments-intermtn-boise-idaho-citv@fs. fed.us Re: Becker Integrated Resource Project Dear Cecilia Seesholtz, Thank you for the opportunity to provide comments on the Draft Becker Integrated Resource Project on behalf of Boise Cascade. Boise Cascade manufactures engineered wood products, plywood, lumber, and particleboard and distributes a broad line of building materials, including wood products manufactured by the company's wood products division. The company is headquartered in Boise, ID, and operates mills that depend on wood produced from the National Forests.	A	Thank you for reviewing the Becker Integrated Resource Project DEIS. This comment describes the mission of the Boise Cascade and no response is required.

BCLW-2	At this time Boise Cascade supports Alternative D because it meets the purpose and need of the project and also contributes to the • Please explain why the Forest Service is only proposing a maximum of 4,531 acres of commercial treatment in the project area? Please explain why the other acreage in the project area is considered unsuitable for timber harvest.	D	The initial Becker project area was thoroughly analyzed over a period of several years by various Idaho City District specialists including Fuels, Timber and Silviculture. The project area was expanded in 2014 to include Pike's Fork to the east and Lamar Creek to the south. At that time, the South Zone Silviculturist and acting Timber Management Assistant conducted a field reconnaissance and data review of the additional areas. Much of the Pike's Fork watershed contains 30 to 40 year-old plantations. The accessible stands in this watershed were found to have low potential for commercial harvest due to low volume per acre and the need for extensive road reconstruction and maintenance to facilitate treatment. The north end of Pike's Fork was burned in the Sawmill Fire in 1989 and contains numerous 20 to 25 year-old plantations. In the Lamar Creek area the Timber and Silviculture specialists identified 183 acres of commercial harvest potential which were added to Alternative D. The area North of Highway 21 between Lamar and Edna creeks was found to have limited access and low commercial volume. Information on the process that was followed to identify additional treatment areas is available in the Forested Vegetation technical report in the project record. Field notes and photos from vegetation field reconnaissance will be included in the project record. The proposed treatments and prescriptions were established to meet the purposes of the vegetation treatments, specifically Purpose 1, while complying with Forest Plan Standards and Guidelines. A Stewardship proposal will be completed that could allow the Forest Service to supplement timber stand improvement projects within the project area. Refer

Comment Number	Comment Letter	Response Code	Forest Service Response
			to Table 3-165 for financial assessment for all alternatives.
BCLW-3	• Boise Cascade supports Alternative D because it best meets the purpose and need restore the forests to a non-lethal and mixed1 fire regime. It also best meets the purpose and need to support the local and regional economies.	D	The ROD will identify the Responsible Official's selected Alternative with rationale as to why that alternative will maintain or contribute to restoration of ecological conditions within the Becker Project Area while providing for a broad spectrum of multiple uses.

BCLW-4	• The proposed diameter limits in any of the alternatives are not justifiable through science and should not be written into the NEPA. It has been shown that the diameter of a tree does not necessarily correlate to the age of the tree. The silviculturalist should be making these decisions on a stand by stand basis and choosing the most appropriate/best trees to leave on the landscape. Diameter limits do not work and should be removed from every alternative.	C, D	DEIS Table 2-6 summarizes the diameter cut limits by vegetation treatment, location and tree species for Alternatives B, C, D, and F needed to meet restoration objectives. In the FEIS the diameter cut limits discussion will be clarified to outline the purpose of diameter limits: 1) diameter limits were set for the purpose of modeling effects of treatments; 2) designed to achieve silvicultural restoration objectives; 3) diameter limits represent a combination of design features and silvicultural prescriptions; and 4) that some diameter limits may be implemented without exception, e.g. RCA diameter limits, and others may be modified during implementation if the silviculturist, in coordination with other resource specialists, determines that actual stand conditions vary form modeled stand data and the diameter limits are not necessary to meet restoration objectives. Alternative E was designed with the 18' diameter limits. Alternative E is the only alternative that applies a maximum diameter limit for all species (18.0" d.b.h.). Alternative E was developed in response to specific comments during the scoping phase requesting that an 18.0" diameter limit be imposed on all treatments and all species to protect large trees (Section 2.4.5). Species and stand specific diameter limits are included as part of Alternatives B, C, D and F (Section 2.4.7.14, design feature VM-3) in order to meet the desired condition or to comply with Forest Plan Standards, Guidelines and project Design Features. Design Feature VM-3 will be clarified in the FEIS to indicate that it would not be applied to Alternative E. A 20.0" diameter limit was established for ponderosa pine trees for all alternatives except Alternative E (DEIS Table 2.6 and Section 3.2.5.7 Silvicultural

Comment Number	Comment Letter	Response Code	Forest Service Response
			Prescription). The rational for this diameter limit is that large ponderosa pine trees are relatively rare throughout the project area. Where large ponderosa pine trees exist, there is generally a need to retain those trees to maintain the stand(s) in large tree size class, to provide for future large snags and CWD, to maintain the integrity of existing tree clumps or to comply with Forest Plan standards VEST03, WIST08 and WIST09. The objectives of the treatments in the nonlethal fire regime are to promote ponderosa pine while reducing other, less fire resistant species such as Douglas-fir, lodgepole pine and subalpine fir. The Zone Silviculturist determine during field reconnaissance that Purpose 1 can be achieved without removing large (> 20.0" d.b.h.) ponderosa pine trees.
BCLW-5	• As evidenced by the Clear Creek Project, the proposed diameter limits were ineffective and required the Forest Service to revise the decision to meet the purpose and need.	C,D	Refer to response to BCLW-4.

Comment Number	Comment Letter	Response Code	Forest Service Response
BCLW-6	• Boise Cascade does not support Alternative E or F because of the inclusion of diameter limitations and the use of helicopter logging in these alternatives. Helicopter logging is prohibitively expensive and the small amount of wood products being removed will not support the economics behind this removal. Use of helicopter logging will prevent the Forest Service from achieving the desired future condition for this project area.	C,D	Please refer to response to BCLW-4. Complete descriptions of Alternatives E and F are in the DEIS Section 2.4.5 and 2.4.6. DEIS Section 3.16 includes a summary of the Socioeconomics analysis completed for this project. DEIS Table 3-165 compares Alternative E and F to the analyzed Alternatives. The Socioeconomics Technical report is available in the project record. The ROD will identify the Responsible Official's selected Alternative with rationale as to why that alternative will maintain or contribute to restoration of ecological conditions within the Becker Project Area while providing for a broad spectrum of multiple uses.

Comment Number	Comment Letter	Response Code	Forest Service Response
BCLW-7	• The removal of only 3,000 board feet per acre seems to be very low, especially in the variety of stand types that are on proposed for treatment. I suggest that the Forest Service be more aggressive in implementation to reduce densities, create needed openings and increase the growth of the remaining trees. Removing more can help to reset the trajectory of the stand and also provide more income to the Forest Service to accomplish more work on the ground. It is also not economical for the operator to only take 3,000 board feet on average. This number, while appropriate in the dry forest type in some instance, is not appropriate for the more productive areas.		DEIS Section 3.16 includes a summary of the Socioeconomics analysis completed for this project. DEIS Table 3-165 compares the timber sale economics of the analyzed Alternatives. The Socioeconomics Technical report is available in the project record. Becker Integrated Resource Project area has a mix of vegetation types that fall in the non-lethal, mixed1, mixed2 fire regimes including PVGs 1, 2, 3, 4, 7 and 10 as described by the Forest Plan Appendix A (DEIS Section 3.2.3.2). Please refer to DEIS Table 3-2. DEIS Section 3.2.5 describes the affected environment for forested vegetation. Past sales on the District average between 3,000-3,500 board feet per acre, including Star Ranch, 49er, Mores South Stewardship, and Glide Stewardship. These sales included areas with drier forest types. Proposed treatments would meet vegetation management objectives as stated in the Forest Plan. The Becker Integrated Resource Project Forest Plan Consistency Table is available in the project record.

BCLW-8	• Please consider different prescriptions for the timber harvesting. It seems that the focus of many prescriptions is understory removal. I encourage the Forest Service to consider utilizing different types of prescriptions such as overstory removal, free thinning, skips/gaps or shelterwood/regeneration harvests. We need to have options for management in the future and using a variety of prescription types will provide options.	D	Proposed treatments and silvicultural prescriptions were developed to meet Purpose 1 in both the nonlethal and mixed1 fire regimes while complying with all Forest Plan standards and guidelines, and project design features (DEIS Section 3.2.5).The proposed treatments include thinning with product removal, mixed treatment with product removal, thinning with optional product removal and thinning with no product removal. The silvicultural term for thinning with product removal and mixed treatment with product removal is “commercial thinning” which is an intermediate treatment that allows a wide range of application and determination of which trees would be removed. Much of the project area has had even-aged silvicultural treatments in the past including overstory removal and shelterwood-regeneration harvests. Additionally, large areas were affected by wildfires in the 1989 Lowman Complex (Gold Fork and Sawmill Fires). Most of the stands that had a regeneration harvest system or impacted by fire were planted or allowed to regenerate naturally and are currently comprised of 30 to 50 year-old seedling to medium sized trees (approximately 70% of the forested stands Forested Vegetation Technical Report section 5.1). As a result, it was determined that there is no need to implement regeneration types of treatments at the stand level. As the sub-stand level, allowing for creation of canopy gaps (openings) up to 5 acres would be implemented to achieve specific objectives (e.g., reduce dwarf mistletoe or remove shade tolerant species) and to begin to convert to an uneven-aged silvicultural system where appropriate “Free Thinning” is defined by the Society of American Foresters as the removal of trees to control stand spacing and favor desired trees, using a combination of thinning criteria without regard to crown position

Comment Number	Comment Letter	Response Code	Forest Service Response
			(reference – Dictionary of Forestry). By describing the treatments as "Thinning with Product Removal", free thinning concepts can and will be incorporated into the stand prescriptions and marking guides where appropriate. It is true that many of the stands will be thinned from below especially those proposed for Thinning with No Product Removal. The project silviculturist determined that this would be the best option for transitioning the stands towards the desired conditions including reduction of risk of uncharacteristic disturbance and development of large tree structure and old forest attributes.

Comment Number	Comment Letter	Response Code	Forest Service Response
BCLW-9	• Please consider taking some larger trees to offset the cost of removing the excess fuels on the landscape. Larger trees are more valuable and removing a few may be the difference between an economical sale and the need for appropriated dollars to complete the needed treatments. There are 3,192 acres identified in all alternatives that are considered thinning with no product removal. In the description of this prescription, the Forest Service states that they will remove trees that are less than 12" dbh. Please explain why these stands have no commercial product removal. Boise Cascade has re-tooled our operations to be able to accept some smaller diameter trees and merchandise these trees appropriately. I encourage the Forest Service to re-evaluate these stands for optional wood products removal.	C, D	Please see response to BCLW-4. Removal of large trees was considered where doing so would contribute to the desired condition and comply with Forest Plan standards, specifically VEST03 (Retain forest stands that meet the definition of a large tree size class), WIST08 (Retain forest stands[2] that meet the definition of old forest habitat for the applicable PVG) and WIST09 (Management actions within large or medium-size class forested stands (Appendix A definition) that have the species composition required to achieve old forest habitat for the applicable PVG (Appendix E definition) shall contribute to or not preclude restoration of old forest habitat). For example, larger Douglas-fir would be removed in nonlethal fire regime stands to reduce competition to ponderosa pine and/or reduce dwarf mistletoe infected trees. Larger Douglas-fir trees would be removed from stands in the mixed1 fire regime to reduce dwarf mistletoe infection and Douglas-fir beetle risk. The 3,192 acres with no product removal were field verified and it was determined that non-commercial treatment is the best treatment option for several reasons. These stands generally have a low merchantable volume per acre, are inaccessible to harvest equipment or would require extensive road construction and reconstruction that the viability of commercial harvest. Refer to DEIS Section 3.2.5.2.

[2] Forest Stand—A contiguous group of trees sufficiently uniform in age class distribution, composition and structure, and growing on a site of sufficiently uniform quality, to be a distinguishable unit, such as mixed, pure, even-aged, and uneven-aged stands. A stand is the functional unit of silviculture reporting and record-keeping. Stand may be analogous to Activity Area. In the Intermountain Region, contiguous groups of trees smaller than 5 acres are not recorded or tracked. (Definitions, FSH 2470, 08-13-2004.)

BCLW-11	• Boise Cascade supports the treatments in the riparian management areas. These areas are incredibly important and in order to maintain them, the density needs to be reduced to promote a healthy, vigorous riparian area. This summer we saw multiple instances where fire destroyed the riparian area because of the density. These areas need to be protected and reducing the fire danger in them is appropriate.	D	The Becker Project does not propose activities that treat riparian vegetation. However, treatments proposed in adjacent upland vegetation communities that transition to riparian conservation areas defined by this project (DEIS Section 2.4.2.1, DEIS Figure 2-1, DEIS Appendix C) are designed to provide integrity and resiliency to those riparian areas when subjected to natural disturbances. DEIS Section 1.4.1 described the vegetation restoration Purpose and Needs in the Non-lethal and Mixed1 fire regimes. The objective of these treatments (commercial and non-commercial vegetation management) is to reduce stand densities, promote individual tree growth and development of large size class trees, promote desired species composition, reduce dwarf-mistletoe-infected trees, and begin to develop the desired stand structure in terms of age/size class distribution and horizontal aggregation (DEIS Section 3.2.5.2 and 3.2.5.5) . Mechanical thinning and prescribed fire activities in these transition zones are intended to establish vegetation structure and function that maintains or improves energy flows and ecological processes between the upland terrestrial and valley bottom riparian/aquatic settings (DEIS section 1.4.1.1.). Commercial vegetation treatment is only proposed within the second site potential tree height of perennial stream RCAs (DEIS Figure 2-1 and DEIS Appendix C). Equipment would not be allowed in the RCA but must operate from existing roads. Upland vegetation located within the second site potential height area of the RCAs is assumed to be similar to the upland vegetation located outside the RCA and differs from the riparian vegetation near stream channel zone(DEIS Section3.2, 3.8, and 3.9). Therefore, the need for treatment within the second

Comment Number	Comment Letter	Response Code	Forest Service Response
			site potential tree height area of the RCA is similar to the need for upland vegetation restoration outlined in Section 1.4.1 in order to meet Purpose 1.
BCLW-12	• I am concerned with the emphasis on large old structure. Please explain how these treatments will create a variety of structural stages on the landscape such as stand initiation? The purpose and need discusses breaking up the landscape to reduce homogeneity. Reducing homogeneity means a variety of treatments to develop a variety of structure on the landscape. The forest cannot be all large and old structure, there many animals that require habitat that is not large and old structure.	D	The 2010 Forest Plan (USDA Forest Service 2010a) recognizes that there is a deficit of large tree size class as well as old forest habitat across the Forest. Becker is representative of the lack of that condition. There are no stands in the project area that meet the definition of Old Forest Habitat (DEIS Section 3.2.6.1). The Becker project area is surrounded by areas that have had severe disturbance in recent years (The Rabbit Creek Fire and the Lowman Complex) that have resulted in large areas in early seral condition (i.e. grass/forb/shrub/seedling [GFSS]). Furthermore, regeneration harvests in the 1950s and 1960s within and adjacent to the Becker project area are now in the small to medium tree size classes. The result of past management and disturbance is that there is an abundance of stands in the GFSS, small and medium tree size classes within the Becker project area and Cumulative Effects Area while there are too few stands in the large tree size class (DEIS Section 3.2). The proposed treatments will promote small scale heterogeneity within stands by reducing stand density, promoting the desired species for the fire regime (e.g. ponderosa pine in PVG 1 and 2 and Douglas-fir in PVG 3, 4 and 7), creating small openings (up to 5 acres in size) and by implementing understory burning. The Forested Vegetation Technical Report is available in the Project Record.

BCLW-13	• I suggest that the Forest Service analyze alternative prescriptions such as overstory removal or shelter/seed tree prescriptions. This will create more heterogeneity on the landscape and break up the continuous canopy cover.	C,D	Proposed treatments and silvicultural prescriptions were developed to meet Purpose 1 in both the nonlethal and mixed1 fire regimes while complying with all Forest Plan standards and guidelines, and project design features (DEIS Section 3.2.5).The proposed treatments include thinning with product removal, mixed treatment with product removal, thinning with optional product removal and thinning with no product removal. Mixed treatment is a commercial thinning with creation of openings up to 5 acres in size. Overstory removal was not considered as a silvicultural technique because it would result in noncompliance with several Forest Plan standards, specifically VEST03 (Retain forest stands that meet the definition of a large tree size class), WIST08 (Retain forest stands[3] that meet the definition of old forest habitat for the applicable PVG) and WIST09 (Management actions within large or medium-size class forested stands that have the species composition required to achieve old forest habitat for the applicable PVG shall contribute to or not preclude restoration of old forest habitat). The Becker Forest Plan Consistency Table is available in the Project Record. Shelterwood and Seed Tree silvicultural systems are even-aged management systems. In order to achieve the desired condition of large size-class stands and for the development of Old Forest Habitats it will be necessary to manage stands in the nonlethal and mixed1 fire regimes with an uneven-aged silvicultural system. This would allow for continuous retention of large tree clumps and patches with the development of small scale openings for regeneration. DEIS Section 3.2 summarizes the analysis completed for Forest Vegetation for this Project. The Forested

Comment Number	Comment Letter	Response Code	Forest Service Response
			Vegetation Technical Report is available in the Project Record.
BCLW-14	• Thank you for including the economic infrastructure that is needed to complete this project. I appreciate the inclusion of the Oregon counties that will ultimately use the material from this sale to create value added materials.	D	DEIS Section 3.16 includes a summary of the Socioeconomics analysis completed for this project. The Socioeconomics Technical report is available in the project record.
BCLW-15	• Boise Cascade supports the use of temporary roads to facilitate management on the ground. I suggest that the Forest Service work to put these temporary roads on old road templates a much as possible. In describing how they will be used, please ensure that there is a description of the construction and rehabilitation of these roads to alleviate the concern that these roads will be a permanent feature on the landscape.	C,D	Of the 6.5 miles of temporary road proposed, 3.3 miles occur on existing road templates. Of these, 1.5 miles are on existing road templates which are coincident with non-motorized trail segments. See DEIS Section 3.6.5.2, Table 3-111 of the DEIS for a temporary road summary by Alternative. The temporary road segments which are coincident with non-motorized trail would be converted back to non-motorized trail use as directed in Design Feature RE-1 9 (DEIS Section 2.4.7.9). For temporary roads that are not coincident with non-motorized trail segments, Design Feature TS-7 addresses the reclamation of temporary roads following their use. The process requires full recontouring of the road prism back to natural ground lines and the placement of clearing slash over the disturbed area. In addition, seed and mulch would be applied to start the revegetation process (DEIS Section 2.4.7.13).

[3] Forest Stand—A contiguous group of trees sufficiently uniform in age class distribution, composition and structure, and growing on a site of sufficiently uniform quality, to be a distinguishable unit, such as mixed, pure, even-aged, and uneven-aged stands. A stand is the functional unit of silviculture reporting and record-keeping. Stand may be analogous to Activity Area. In the Intermountain Region, contiguous groups of trees smaller than 5 acres are not recorded or tracked. (Definitions, FSH 2470, 08-13-2004.)

Comment Number	Comment Letter	Response Code	Forest Service Response
BCLW-16	• When designing commercial treatments for the project area, please concentrate on commercial sawlogs that will help to pay for additional treatments.	C,D	Please see response to BCLW-4.
BCLW-17	• It is appropriate to concentrate on retaining the early seral species, however, please also consider structural stages. Is the area deficit in a specific type of structure such as stand initiation? If so, please evaluate how to put this back on the landscape because this stage provides valuable habitat for multiple animals and should be a high priority for this project area.	D	Please refer to BCLW-12.
BCLW-18	• Please be sure to include the beneficial effects to the human environment that the implementation of this project will have. Many times I read the Environmental Impact Statements they do not emphasize the benefits of the project, the main focus is the detrimental effects.	D	DEIS table 2-5 provides a comparison of the alternatives analyzed in detail by Purpose and Need. Chapter 3 of the DEIS discloses the effects of each alternative by resource area. Technical reports completed for each resource are available in the project record. The ROD will identify the Responsible Official's selected Alternative with rationale as to why that alternative will maintain or contribute to restoration of ecological conditions within the Becker Project Area while providing for a broad spectrum of multiple uses.

Comment Number	Comment Letter	Response Code	Forest Service Response
BCLW-19	Thank you again for the opportunity to comment. I look forward to seeing outcomes of this project. Please feel free to contact me if there is any way that I can assist the Forest Service in creating a project that will benefit the three "legs of the stool'', ecological, social and economic. Many times the analysis is skewed toward the ecological benefits, please ensure that social and economic benefits are outlined properly to ensure a balanced project that will not only benefit the ecology of the project area but also the socio-economic needs of the communities. Regards, Lindsay Warness Forest Policy Analyst Boise Cascade, LLC 1917 Jackson Ave. La Grande, OR 97850	D	Thank you for your comments. We will contact you if we have any questions regarding your comments. Purpose and Need 4 (DEIS Section 1.5.4) describes the project purpose to support Local and Regional economies. DEIS Section 3.16 includes a summary of the Socioeconomics analysis completed for this project. DEIS Table 3-165 compares the timber sale economics of the analyzed Alternatives. The Socioeconomics Technical report is available in the project record. The ROD will identify the Responsible Official's selected Alternative with rationale as to why that alternative will maintain or contribute to restoration of ecological conditions within the Becker Project Area while providing for a broad spectrum of multiple uses.