Bally Mountain Vegetation Management Project

ENVIRONMENTAL ASSESSMENT

Cottonwood Field Office
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BLM

Cottonwood Field Office, Idaho

It is the mission of the Bureau of Land Management to sustain the health, diversity, and productivity of the public lands for the use and enjoyment of present and future generations.

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Cover Photo by Craig Johnson, BLM Wildlife Biologist (7/20/2006).

Table of Contents

Attachment (List of Maps)

List of Acronyms

ATV	All–terrain Vehicle
ba	basal area
BA	Biological Assessment
BLM	Bureau of Land Management
BpS	Biophysical Setting
CBH	Canopy Base Height
CFR	Code of Federal Regulations
CWCS	Idaho Comprehensive Wildlife Conservation Strategy
dbh	Diameter Breast Height
DFC	Desired Future Condition
EA	Environmental Assessment
EAU	Elk Analysis Unit
ECA	Equivalent Clearcut Area
EFH	Essential Fish Habitat
EHE	Elk Habitat Effectiveness
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FLMPA	Federal Land Policy Act
FMU	Fire Management Unit
FO	Field Office
FP	Forest Products
FRCC	Fire Regime Condition Class
FVS	Forest Vegetation Simulator
HUC	Hydrologic Unit Code
IDEQ	Idaho Department of Environmental Quality
IDFG	Idaho Department of Fish and Game
IDL	Idaho Department of Lands
IPIF	Idaho Partners in Flight
IWRB	Idaho Water Resources Board
LAU	Lynx Analysis Unit
LCAS	Lynx Conservation Assessment and Strategy
LWD	Large Woody Debris
MA–NLAA	May Affect, Not Likely to Adversely Affect
MII	May Impact Individuals
MOA	Memorandum of Agreement
NAAQS	National Ambient Air Quality Standards
NE	No Effect
NEPA	National Environmental Policy Act
NI	No Impact
NMFS	National Marine Fisheries Services
NOAA	National Oceanic Atmospheric Administration
NWRS	National Wild and Scenic Rivers System
OHV	Off Highway Vehicles
RRV	Outstanding Remarkable Value
PA	Proposed Action

PVG	Potential Vegetation Group
RCA	Riparian Conservation Areas
RMP	Resource Management Plan
ROD	Record of Decision
SINMAP	Slope Stability Model
TMDL	Total Maximum Daily Load
USDA	United States Department of Agriculture
USDI	United States Department of Interior
USFWS	United States Fish and Wildlife Service
VF	Forest Vegetation
VRM	Visual Resource Management
WEPP	Water Erosion Prediction Project
WF	Wildland Fire Management
WS	Wildlife and Special Status Wildlife
WSR	Wild and Scenic Rivers
WUI	Wildland–Urban Interface

1 INTRODUCTION

The Bureau of Land Management (BLM), Cottonwood Field Office, proposes to conduct vegetation treatments along with the associated reduction of hazardous fuels on 2,938 acres. The Bally Mountain Project Area (hereafter project area) is located on BLM and private lands south of Pinehurst, Idaho along the Little Salmon River and Highway 95 corridor in Idaho County (see **Attachment, Map 1**)[1]. This Environmental Assessment (EA) has been prepared for compliance with the National Environmental Policy Act (NEPA) to determine potential environmental consequences associated with the proposed vegetation management treatments and associated fuels reduction actions in the project area.

1.1 Purpose and Need

Action is needed to maintain forest vegetation communities within their natural range of variability in plant composition, structure, and function, and to reduce the fuel hazard and potential for stand-replacement wildfire in the wildland-urban interface in the Little Salmon River corridor.

Historically, most of the project area was dominated by open stands of fire resistant ponderosa pine, Douglas-fir, with some western larch and grand fir. These dry, open forests were maintained predominantly by frequent low severity surface fires, with mixed severity fires occurring on higher elevations and on northerly aspects. Although occasional stand replacement fires may have occurred, this was not the dominant fire regime.

Figure 1. Bally Mountain old growth stand

Due to a century of fire suppression in this area, surface and ladder fuels have accumulated beyond the historic range leading to the potential for more intense fire behavior. In the absence of disturbance, the encroachment of shade-tolerant Douglas-fir and grand fir had led to an overstocked condition with increased ladder fuels. The abundance of young seedling/saplings, as well as the lower limbs retained by these shade-tolerant species, provide a ladder for surface fire to reach the canopy fuels by torching and initiating crown fire behavior. Canopy closure has also increased, increasing the potential for crown fire spread.

[1] All maps are included in an Attachment to this Environmental Assessment.

The forest vegetation communities are not within the appropriate fire regime condition class (FRCC) due to past fire suppression practices. FRCC refers to the degree of departure from the natural fire regime and its subsequent effect on vegetation composition and structure on a landscape scale. Approximately 8 percent of the project area is FRCC 2 and 92 percent FRCC 3. An FRCC 2 is a moderate departure from the natural (historical) regime of vegetation characteristics; fuel composition; fire frequency, severity and pattern; and other associated disturbances. An FRCC 3 is defined as having high departure from the natural (historical) regime of vegetation characteristics; fuel composition; fire frequency, severity and pattern; and predispose the system to high risk of loss of key ecosystem components.

The project area is within the wildland-urban interface as identified in both the Idaho and Adams County Community Wildland Fire Protection Plans (Idaho County 2009b, Adams County 2004; Attachment, **Map 1**). There are several private homes and other structures scattered along the bottom of the slope, with additional opportunities for development at mid-slope locations.

The purpose of this project is to:

1. Reduce the hazard and potential for stand-replacement fire to protect resources and property in the wildland-urban interface (WUI)
2. Maintain or return vegetative communities to historic fire regimes (FRCC)
3. Manage for forest health and/or habitat diversity in the Little Salmon River drainage area for desired future conditions, emphasizing the retention of large tree size ponderosa pine; western larch; and/or Douglas-fir in dry conifer sites.
4. In the WUI, manage existing old growth stands to maintain and/or contribute to the restoration of pre-fire suppression characteristics.
5. Provide and maintain access to the project area for proposed hazardous fuel reduction and forest health management activities and future unplanned wildfire suppression activities.

This project proposes to reduce surface fuel loading and ladder fuels in the WUI and open up timber stands along prominent ridges and existing road systems. Proposed use of existing roads would provide opportunities for suppression actions in the event of future wildfires. Where mechanical treatments are not feasible, prescribed fire would be used to meet project objectives. This project would promote stands of fire-resistant ponderosa pine, western larch and healthy Douglas-fir and restore stands of old growth ponderosa pine in the Little Salmon River drainage. Forest stands would be more resilient to insects and disease through a combination of stocking control and sanitation. Returning fire as a disturbance agent to the landscape would maintain these open conditions and return this area to a frequent low-severity fire regime.

1.2 Relationship to Laws, Policies and Land Use Plans

The Federal Land Policy and Management Act of 1976 (FLPMA) requires an action under consideration be in conformance with the applicable BLM land use plan, and be consistent with other federal, state, local and tribal policies to the maximum extent possible.

1.2.1 BLM Land Use Plan Conformance

The proposed action is in conformance with the Cottonwood Resource Management Plan (RMP), as it was approved on December 21, 2009 (BLM 2009). As described and analyzed in this EA, the proposed fuels treatments, timber harvest, and restoration actions are consistent with the following decisions from the Cottonwood RMP.

Table 1. Cottonwood RMP Conformance

RMP Reference	Citation from 2009 Approved Cottonwood RMP	EA Section
Forest Vegetation (VF), p. 22	**Objective VF-1.1-**Manage for forest health and/or habitat diversity in DFC blocks (Map 3, Desired Future Condition Blocks) 1,000 or more forested acres.	1.1, 2.1, 2.2, 2.3, 3.2.1, 3.2.9 & 3.2.11
Forest Vegetation (VF), p. 22	**Action VF-1.1.1-**Design treatment project to enhance forest health and/or habitat diversity (consistent with **Appendix C**, Desired Future Conditions for Forest Vegetation/Wildlife Habitat).	1.1, 2.1, 2.2, 2.3, 3.2.1, 3.2.9 & 3.2.11
Forest Vegetation (VF), p. 22	**Action VF-1.1.2-**To the extent practicable, emphasize retention of large tree size ponderosa pine (*Pinus ponderosa*), western larch (*Larix occidentalis*), and/or Douglas-fir (*Pseudotsuga menziesii*) in dry conifer sites.	1.1, 2.1, 2.2, 2.3, 3.2.1, 3.2.9 & 3.2.11
Wildlife and Special Status Wildlife (WS), p. 26	**Action WS-1.5.4-**Manage wildlife habitats using established BMPs and guides for BLM sensitive species. Use a species habitat guild approach (e.g., riparian, old growth, canyon grasslands, etc.) for identification of desired conditions, conducting analysis, and developing project and activity design measures. Development of project design measures should include conservation and restoration measures for BLM sensitive species, while striving for appropriate habitat diversity and achievement of project objectives.	1.1,2.1 & 3.2.8-3.2.11
Wildlife and Special Status Wildlife (WS), p. 27	**Action WS-1.6.3-**Priority subwatersheds or areas where BLM programmatic management direction will support progress towards attainment of DFC for forest wildlife habitat vegetation includes BLM forested contiguous areas that are greater than 1,000 acres (**Appendix C**, Desired Future Conditions for Forest Vegetation/Wildlife Habitat; **Map 2**, Conservation and Restoration Watersheds).	1.1, 3.2.1, 3.2.9, 3.2.10 & 3.2.11
Wildland Fire Management (WF), p. 34	**Objective WF-1.2—**Reduce hazard and the potential for stand-replacement fire in areas identified as wildland-urban interface (WUI) and/or in municipal watersheds as follows (as identified in the fire management plan, community wildfire protection plans, or other hazard/risk assessment).	1.1, 2.1, 2.2, 2.3 & 3.2.2
Wildland Fire Management (WF), p. 34	**Action WF-1.3.1—**Increase the use of prescribed fire and fire managed for resource benefit activities in frequent fire regime groups (I, II, and III).	1.1, 2.1, 2.2, 2.3, & 3.2.2
Wildland Fire Management (WF), p. 35	**Objective WF-1.1—**Within municipal watersheds and WUIs, manage existing old growth stands to maintain and/or contribute to the restoration of pre-fire suppression characteristics.	1.1., 2.1, 2.2, 2.3, 3.2.1 & 3.2.2
Forest Products (FP), p. 36	**Action FP-1.2.1—**Develop silvicultural treatments that support DFC for those stands identified as Desired Future Condition Blocks on Map 1.	2.1, 2.2, 2.3, 3.2.1 & 3.2.2

The proposed treatments include developing silvicultural treatments to support progress towards attainment of desired future conditions (DFC) for forest wildlife habitat vegetation (Action WS-1.6.3. and Action FP 1.2.1). The project is being planned to use best management practices that protect soil and water and ensure reforestation for timber harvest activities (Objective FP-1.1), consistent with requirements of the Clean Water Act, Idaho State Water Quality Standards, Idaho Forest Practices Act of 1974, and Idaho Stream Channel Protection Act.

Consistent with the National Fire Plan, the BLM *North Idaho Fire Management Plan* (2005) recommends wildfire management objectives and fuels treatment strategies by Fire Management Units (FMU) that were incorporated into the 2009 Cottonwood RMP. The project area is in the Salmon FMU. The Salmon FMU is identified as a *high priority* for allocating prescribed fire and non-fire fuel reduction resources. Fuel treatment priorities include reducing stand densities and reducing ground, ladder, and surface fuels in and adjacent to WUI intermix (Objective WF-1.2).

1.2.2 Consistency with Pertinent Authorities

The BLM is planning the project for implementation in coordination with other agencies, including the affected counties and the Idaho Department of Environmental Quality (IDEQ), to minimize impacts of smoke on local communities and individuals.

The *Idaho County Revised Wildland-Urban Interface Wildfire Mitigation Plan* recommended objectives and fuels treatment strategies that the BLM would apply to the Bally Mountain Vegetation Management Project. The project area is located in the treatment areas south of Pinehurst. Goals and objectives include protection of people and structures, and increase firefighter safety by reducing the risk factors surrounding high risk communities in the WUI of Idaho County (Idaho County 2009a). The Proposed Action combines ongoing homeowner evaluations conducted by a joint Forest Service and BLM endeavor in the Salmon River corridor to promote fuels reduction in and around private homes.

The following table identifies elements of the human environment that are regulated by a statutory or regulatory authority that would be affected and are analyzed in chapter 3 of this EA, as well as those that BLM determined would not be affected and so are not discussed further in chapter 3 of this EA.

Table 2. Review of Statutory Authorities

ELEMENT/RESOURCE	Affected?	Comment
Air Quality	Yes	See Section 3.2.4 (Smoke Management)
Area of Critical Environmental Concern	No	No Areas of Critical Environmental Concern occur within the vicinity.
Cultural Resources (National Historic Preservation Act)	No	No cultural resources are known to occur within the project area. See Sections 3.2.14 (Cultural Resources) and Section 4.1 (Persons, Group and Agencies Consulted)
Environmental Justice (Executive Order 12898)	No	There are no minority or low income populations that would be disproportionately affected by the proposed action.
Farm Land-Prime/Unique	No	No prime or unique farmland is in the project area.
Floodplains (Executive Order 11988)	No	No floodplains would be impacted
Human Health & Safety	Yes	See Section 3.2.4 (Air Quality) and Section 3.2.16 (Socioeconomic)

ELEMENT/RESOURCE	Affected?	Comment
Migratory Birds (Executive Order 13186)	Yes	See Section 3.2.10
Native American Concerns	No	Coordination with the Nez Perce Tribe has not identified concerns See Section 4.1.2
Non-Native Invasive and Noxious Species (Executive Order 13112)	Yes	Timber harvest and prescribed fire actions will include measures to prevent the spread of weeds. See Section 2.1.5 and 3.2.13.
Threatened/Endangered Species (Endangered Species Act)	Yes	See Section 3.2.8 (Special Status Fish), 3.2.11 (Special Status Animal), and 3.2.12 (Special Status Plants).
Water Quality (Surface/Ground)	Yes	Clean Water Act, Idaho Forest Practices Act, and Idaho Stream Channel Protection Act requirements are applicable to this project. See Section 2.1 and 3.2.6 (Water Resources)
Wastes, Hazardous/Solid	No	No hazardous waste concerns have been identified.
Wetlands, Riparian Zones (Executive Orders 11988 and 11990)	Yes	See Section 3.2.6 (Water Resources), 3.2.8 (T&E Fish), and 3.2.9 (Wildlife). The project area includes riparian and wetland areas.
Wild & Scenic Rivers	Yes	No congressionally designated wild and scenic rivers are located in the project area, but 1.55 miles of Hazard Creek and 1.64 miles of Hard Creek have been determined as preliminary suitable for designation. See Section 3.2.7.
Wilderness	No	No wilderness areas occur within or near the project area.

1.2.3 Issues

Public scoping for this project was first conducted in October 2007, and then updated in August 2011. The BLM Interdisciplinary (ID) Team analyzed comments from the public and developed the list of issues and concerns raised about the proposed project. Many of the comments disagreed with, or debated the potential environmental impacts of, the Original 2007 Proposal. As such, they influenced the design and evaluation of two other alternatives.

The major and other issues carried forward in this document are grouped by resource and described using an issue statement, and a list of indicators that were used to determine/ measure the effects of the proposed activities. Chapter 2 includes a summary that compares the effects of the alternatives on these issues and their indicators.

- **Forest Vegetation Issue 1:** Proposed activities can affect vegetative conditions for forest cover types, and stand structure (size classes, density, and crown cover). Area is within a Desired Future Condition Block (DFCs). DFCs are based upon historic ranges of variability; currently excess of grand fir, medium size class stands, and stands that are too dense.
- **Forest Vegetation Issue 2:** Proposed activities can affect early seral old growth stands and attainment of DFCs.

- **Fuels Issue 2:** Proposed fuel/vegetation activities are not needed and ineffective in protecting homes. However, prescribed burning alone should be considered.
- **Transportation Issue 1:** Beneficial variables associated with roads include harvest of timber, recreation, fire management, and access to private inholdings.
- **Transportation Issue 2:** Undesirable consequences include adverse effects on hydrology and geomorphic features (such as debris slides and sedimentation), and habitat fragmentation.
- **Soils Issue 1:** The proposed vegetation/fuels activities may decrease long-term soil productivity directly affect other physical properties of that landscape and including watershed condition. Slope failure can occur in response to management activities, particularly roads.
- **Water Resources Issue 1:** Proposed vegetation treatment activities may increase water yield and change timing and duration of peak runoff, thereby decreasing stream channel stability.
- **Water Resources Issue 2:** Proposed activities may increase erosion and sediment yield, which could impair fish habitat, and affect 303(d) listed streams.
- **Fisheries Issue 1:** Proposed activities have the potential to cause increased sediment delivery to streams in the analysis area, decreasing quantity and quality of spawning, rearing, and over-wintering fish habitat for federally listed and BLM sensitive species.
- **Socio Economic Issue 1:** The cost of implementing a fuels/vegetation project compared to economic benefits is a concern.

The amount of fuels/vegetation treatment was not an issue that drew many public responses. Those received were one comment about structure protection is better served within 40 meters of structures, and others requesting that private lands be included. Therefore, the area of harvest fuel/vegetation treatment proposed in the alternatives is very similar. The differences focus more on the spatial orientation, inclusion of private lands and the relationship of effects to the issues above.

2 ALTERNATIVES

This chapter describes the Proposed Action, two additional action alternatives and a No Action alternative. The alternatives were developed to address a combination of resource issues and economic concerns as the result of scoping of the original proposal in since 2007. This included adjusting the spatial orientation of the proposed vegetation treatments mainly on the north end of the project, looking at helicopter logging and concerns for public and private use of roads in the Bally Mountain area. The project area is located east of the Little Salmon River, and accessed by U.S. Highway 95 as it follows the river. This chapter also describes alternatives that BLM considered but eliminated from further analysis in the next chapter of this EA. A summary comparison of the alternatives concludes this chapter.

2.1 Proposed Action

The Proposed Action alternative includes timber harvest and prescribed fire treatments on a total of 1,429 acres in the project area (**Map 2**). Under this alternative, the BLM would mechanically treat approximately 631 acres followed by prescribed burning to reduce the slash and meet desired future conditions for forest vegetation, consistent with the 2009 Cottonwood RMP, Actions VF-1.1.1 and VF-1.1.3 (page 22 and Appendix C). Of the 631 acres proposed for timber harvest, 53 acres would be in old growth stands as classified using criterion of Hamilton (1993). As noted in the RMP the old growth is not a separate class but are a part of the large tree component. This alternative would reduce the existing 195.5 acres of old growth stands in the project area by 5.3 acres. In addition to burning of slash in the harvest units, this alternative proposes to apply prescribed fire to the landscape to reduce surface and ladder fuels on approximately 798 acres.

Figure 2. Forested stand proposed for treatment

This alternative proposes to use existing roads, and the timber harvest activities would require construction of about 800 feet of permanent road and 1.37 miles of temporary road (Attachment, **Map 3**). Upon completion of the proposed treatments, the Cottonwood FO would update the travel and transportation management plans for the Bally Mountain area to open or close roads to public motorized use, and decommission roads not needed for management of the area.

2.1.1 Timber Harvest

Mechanical treatments would be primarily of two types, intermediate and regeneration harvest methods. Intermediate, in this case primarily low thinning (the removal of trees from lower crown classes or canopy layers) is used to modify the growth, quality, vigor, composition, or structure of a stand. Regeneration harvest methods include shelterwood, seed-tree, and uneven-aged harvest methods. Mechanical treatments would include 429 acres of thinning from below, 122 acres by irregular shelter wood, 36 acres of uneven-aged management, and 43 acres of seed tree cut with reserves. These treatments would be accomplished by commercial logging using tractor (291 acres), cable (238 acres), and helicopter (101 acres) yarding methods. Tractor skidding would not be used on sustained slopes greater than 40 percent.

2.1.2 Prescribed Fire

In addition to slash treatments, prescribed fire would be applied to the landscape to reduce surface and ladder fuels on approximately 798 acres, including private property within the project area. Of the 798 acres, 109 acres would be in old growth stands (**Map 2**). A low to moderate severity underburn would be used to gradually reduce the surface fuel loading over multiple applications with minimal damage to the trees we wish to retain. By expanding prescribed burn treatment onto private land, the Proposed Action alternative helps to reduce hazardous fuels closer to homes, as well as enhance the feasibility of safer and more effective control of prescribed burn treatments by utilizing existing roads, ridges, and drainages. The methods of prescribed burning that would be used to accomplish fuel load reduction include underburning of natural fuel accumulations and slash fuels from logging activity and machine pile burning for activity created fuels.

2.1.3 Roads

RMP designated existing roads in the project area includes approximately 5.1 miles that are open yearlong to public motorized use, and 3.2 miles closed yearlong to public motorized use. Another 15.3 miles of recently inventoried road is considered by default closed yearlong to public motorized travel. This alternative proposes alteration of some route designations. Upon completion of the proposed treatments, 5.0 miles of existing road would be open to motorized use yearlong, 10.9 miles of existing road would be closed to motorized use, and 7.7 miles of existing road would be decommissioned (**Map 3**). Legal access to the project area will remain unchanged. This alternative would require construction of about 800 feet of permanent road and 1.37 miles of temporary road, and approximately 580 feet of existing road would need major reconstruction.

2.1.4 Riparian Restoration

This alternative includes restoration treatments on a 4-acre forest type wetland including weed control, seeding, decommissioning of roads adjacent to pond/wetland, and planting riparian vegetation.

Figure 3. Large pond proposed for restoration

2.1.5 Environmental Design Features

All treatments proposed in this alternative would follow established agency management plans, policies, and procedures, including the Idaho Forest Practices Act (Idaho Administrative Code, Title 38, Chapter 13). The following design criteria would be implemented to avoid or minimize potential negative impacts to resources of concern:

Forest Vegetation

- Silvicultural prescriptions will be written for each unit, in accordance with the Cottonwood RMP guidance in Appendix C, Desired Future Conditions for Forest Vegetation/Wildlife Habitat (BLM 2009). This includes slash treatment and burn guidelines to meet desired stand conditions of species composition and structure and watershed sediment guidelines. These prescriptions emphasize retention of large early seral ponderosa pine, western larch and Douglas-fir where practicable.
- Prescribed burning will be designed and implemented with the intent of limiting tree mortality to less than 10 percent of the overstory. To mitigate prescribed fire-caused mortality to large diameter ponderosa pine trees initial entries with prescribed fire will be under high duff moisture contents, preferably 120% or higher.

Air Quality (Smoke Management)

- Cooperate with other land managers, including the State of Idaho, and the IDEQ to minimize air quality impacts from smoke on local communities and individuals.
- Conduct prescribed fires in accordance with the procedures outlined in the *Montana/Idaho State Airshed Group Operating Guide* (http://www.fs.fed.u/r1/fire/nrcc/smoke.html, August 2003).
- Apply management techniques to minimize smoke production and to enhance dispersion, including burning under optimum weather conditions, expanding the burning season, using backfires where applicable, burning small blocks, etc. These techniques are described in the Prescribed Fire Smoke Management Guide, published by the National Wildfire Coordinating Group (NFES No. 1279, PMS 420-1; 1985).
- Monitor weather and the burning and smoke dispersion conditions to assure air quality impacts remain within prescribed smoke management levels. A smoke monitoring system has been established that determines the need for restrictions on prescribed burning. If the monitoring unit forecasts ventilation problems, burning is either restricted by elevation or curtailed until good ventilation conditions return. The IDEQ uses the monitoring data to inform the public of high levels during burns, wildland fires, and other activities.

Soils and Water Resources

- No timber harvest in areas of high landslide hazard.
- Modify, via site specific mitigation measure(s), timber harvest or temporary road construction in areas of moderate landslide hazard with high risk as needed to protect slope stability. Examples would include, but not be limited to: modify basal area retention guides in harvest units as needed (leave more trees in designated sensitive areas, e.g., draw bottoms); require partial suspension on cable logging; construct and apply mulch or slash on yarding corridors where bare soil is exposed; and manage tractor logging activities to limit detrimental soil disturbance.

- Restrict activities when soils are wet to prevent resource damage (indicators include excessive rutting, soil displacement, and erosion).
- Prescribed burning should be of low enough severity to insure adequate duff retention to limit surface erosion. Only light low severity underburning on high landslide hazard areas.
- Construct slash filter windrows at the toe of fill slopes on newly constructed landings and roads concurrent with construction. Limit height of windrows to 3 feet. Provide breaks & limit length of windrow to allow easy passage of wildlife.
- Live rocking the approach and departure of existing stream crossing will be done as needed to reduce road surface erosion. Priority stream crossings that will be rocked/graveled (minimum of 100 feet each side of stream crossing) include the following: (1) new permanent road stream crossing; and (2) perennial stream crossing located immediately south of project area.
- Prepare and implement a Spill Prevention Control and Countermeasures Plan (40 CFR 112) that incorporates the rules and requirements of the Idaho Forest Practices Act Section 60, Use of Chemicals and Petroleum Products; and US Department of Transportation rules for fuel haul and temporary storage; and additional direction as applicable. Erosion control measures including removal of log culverts and construction of temporary cross drains, drainage ditches, dips, or berms will be required on all temporary roads before operations cease annually.
- Scarify non-excavated skid trails and landings that are compacted of entrenched 3 inches of more.
- Scarify and re-contour excavated skid trails and landings to restore slope hydrology and soil productivity.
- All temporary roads will be scarified and decommissioned (re-contoured). Obliterated temporary roads will include seeding with desirable species. Large woody debris will be placed on obliterated road after seeding. As needed, weed free much will be used for erosion control. This will be completed following the post-harvest activities and will be coordinated by the implementing resource.
- In the event of winter logging activities, snow plowing will maintain a minimum of two inches of snow on the road, leave ditches and culverts functional, side cast material will not include dirt and gravel, and berms will not be left on shoulder unless drainage holes are opened and maintained.
- Management activities within RCAs for the Little Salmon River, Hard Creek and Hazard Creek watersheds will be conducted in accordance with the Cottonwood RMP, Action VR-1.1.4, page 24 and Appendix D, Aquatic and Riparian Management Strategy (BLM 2009). Mechanical treatments will be buffered. Prescribed fire will not be ignited within a RCA, but may back into these areas under conditions where fire intensity will be low and burning will not result in extensive reduction in canopy cover or exposure of bare soil in these RCA buffer areas.

Invasive, Non-Native Species

- Treat existing weed infestations along access roads prior to project implementation.
- All off-road equipment must be cleaned of mud and debris before entering the treatment units.

- All rock used for road surfacing must be free of noxious weed seed. Borrow pits and stockpiles will not be used if it is determined they are infested with undesirable invasive plants.
- Disturbed areas should be inventoried for new weed introductions and treatment implemented one year post project and preferably two.
- Necessary soil disturbance that removes desirable vegetation will be revegetated with a perennial seed mix consisting of at least five different species of which 50% by weight must be native species. No less than 1 lb. per acre of each species will be included in the mix. Mix is to be certified noxious weed free. Target areas will be permanent and temporary roads, firelines and any log landing areas. Mix will be broadcast applied at the target rate of 10-15 lbs per acre. Acceptable species include those listed below. Seeding should be accomplished the first fall or spring after disturbance.

Species (N=native, I=introduced)	Species
Idaho Fescue, *Festuca idahoensis,* **N**	Thickspike Wheatgrass, *Agropyron,* **N**
Bluebunch Wheatgrass, *Pseudoroegneria spicata***, N**	Western Wheatgrass, *Pascopyrum smithii,* **N**
Mountain Brome, *Bromus marginatus***, N**	Intermediate Wheatgrass *Thinopyrum intermedium,* **I**
Snake River Wheatgrass, *Elymus wawawaiensis,* **N**	Sheep fescue, *Festuca ovina,* **I**
Streambank Wheatgrass, *Elymus lanceolatus,* **N**	Timothy, *Phleum pretense,* **I**
Sandberg Bluegrass, *Poa secunda,* **N**	Orchardgrass, *Dactylis glomerata,* **I**
Slender Wheatgrass, *Elymus trachycaulus,* **N**	Smooth Brome, *Bromus inermis,* **I**
Sherman Big Bluegrass, *Poa ampla,* **N**	Annual Rye, Lolium multiflorum, **I**
Tufted Hairgrass, *Deschampsia caespitosa,* **N**	

- All herbicide treatment will occur in accordance with the currently approved decisions for the Cottonwood Field Office.

Wildlife

- Retain snags and snag replacement green trees and use coarse woody debris in accordance with the Cottonwood RMP guidance in Appendix C, Desired Future Conditions for Forest Vegetation/Wildlife Habitat (BLM 2009) for silvicultural prescriptions.
- Maintain existing motorized vehicle restrictions within the area for wildlife security purposes. Do not allow contractors or their representatives to hunt or trap while using motorized vehicles on restricted routes. Use signs where needed to discourage public use of roads that are closed to public use, but open for logging use. Maintain existing public motorized vehicle restrictions on reconstructed roads during and after implementation of activities, and thereby maintain existing levels of access and wildlife security. Use signs where needed to discourage public use of closed roads that are used for logging.
- Provide a 450-foot non-disturbance and non-treatment buffer (10-15 acres) around occupied nests for Type 2 and 3 BLM sensitive raptor species. Provide a 300-foot buffer around occupied nest for all other raptors. Buffer size may be modified upon review by Area Biologist depending on potential for disturbance from an activity or project.

Aquatic and Riparian Habitat

- As described for Soil and Water Resources, apply RMP guidance to landslide prone areas; and streamside and wetland RCAs.
- No log or helicopter landings within RCAs.
- No fuel storage, equipment maintenance, or fueling within RCAs.
- Hand fire line only within RCA as approved by BLM Biologist.

Threatened and Endangered, and Sensitive Species

- During implementation notify BLM Biologist of threatened, endangered or sensitive species siting where upon appropriate conservation measures will be made.

2.1.6 Monitoring

The project would require on-going monitoring and maintenance based on site evaluations to determine effectiveness of the proposed harvesting and fuel reduction treatments, and the environmental design features described above. Implementation and effectiveness monitoring will be conducted to evaluate achievement of desired objectives for forest health and habitat diversity, soil and water resources, road closures, road decommissioning, fish habitat and riparian areas, and special status fish, wildlife, and plant resources.

2.2 Alternative 2 (Original 2007 Proposal)

Alternative 2 would mechanically treat approximately 649 acres followed by prescribed burning to reduce the slash (Attachment, **Map 4**), and apply prescribed fire to another 618 acres for a total treatment of 1,282 acres in the project area. Of the 649 acres, 48 acres would occur in old growth stands. This alternative would not reduce the existing 195.5 acres of old growth stands.

Timber Harvest
Mechanical treatments would include 491 acres of thinning from below, 122 acres by irregular shelter wood, and 36 acres of uneven-aged management. These treatments would be accomplished by commercial logging using tractor (336 acres), cable (238 acres), and helicopter (75 acres) yarding methods.

Aspen Regeneration
Additionally, 14 acres would be treated to encourage aspen regeneration using a combination of tree removal with tractor skidding, mechanical root stimulation, and prescribed burning. This unit may be subsequently fenced, to protect seedlings and suckers from browsing animals.

Prescribed Fire
In addition to slash treatments, prescribed fire would be applied to the landscape to reduce surface and ladder fuels on approximately 618 acres. Of the 618 acres, 109 acres would occur in old growth stands (Attachment, **Map 4**). A low to moderate severity underburn would be used to gradually reduce the surface fuel loading over multiple applications with minimal damage to the trees we wish to retain.

Roads
Implementation of Alternative 2 would require construction of about 800 feet of permanent road. This alternative also proposes 1.62 miles of temporary road, and 900 feet of major road reconstruction, including construction of a bridge. Upon completion, 5.1miles of existing road would be open to motorized use yearlong and 18.6 miles of existing road would be closed to motorized use (Attachment, **Map 5**).

The environmental design features described in section 2.1.5 for the Proposed Action would also apply to this alternative.

2.3 Alternative 3 (No Temporary Roads)

Alternative 3 responds to concerns expressed in scoping over possible sediment delivery from roads and erosion due to cable yarding on steep ground, and eliminates construction of all temporary roads. The mechanical and prescribed fire treatment proposed under this alternative would total about 1,289 acres. Due to concerns over ground-based mechanical treatments in a Riparian Conservation Area, the aspen restoration unit was also eliminated from this alternative. Additionally, this alternative includes treatments in old growth stands. This alternative would reduce the existing 195.5 acres of old growth stands by 5.3 acres.

Timber Harvest
Alternative 3 would mechanically treat approximately 663 acres followed by prescribed burning to reduce the slash (**Map 6**). Of the 663 acres, 53 acres would be in old growth stands. Mechanical treatments would include 491 acres of thinning from below, 122 acres by irregular shelter wood, 36 acres of uneven-aged management, and 9 acres of seed tree cut with reserves. These treatments would be accomplished by commercial logging using tractor (326 acres) and helicopter (337 acres) yarding methods.

Prescribed Fire
Prescribed fire would be applied to the landscape to reduce surface and ladder fuels on an additional 611 acres. Of the 611 acres, 109 acres would be in old growth stands (**Map 6**). A low to moderate severity underburn would be used to gradually reduce the surface fuel loading over multiple applications with minimal damage to the trees we wish to retain. Prescribed burn treatments would be revisited every 15-20 years as needed to maintain desired fuel loadings.

Roads
This alternative would require construction of about 800 feet of permanent road and 900 feet of major reconstruction, but no temporary road construction. Upon completion of this project, 4.9 miles of existing road would be open to motorized use yearlong, 8.1 miles of existing roads would be closed to motorized use, and 10.7 miles of existing roads would be decommissioned (**Map 7**).

The environmental design features described in section 2.1.5 apply to this alternative.

2.4 No Action

The No Action alternative represents the existing condition against which the action alternatives are compared. Under the No Action alternative, no forest vegetation treatments and associated fire management activities would occur.

2.5 Alternatives Eliminated from Further Analysis

This section describes alternatives considered and the reasons BLM eliminated the alternative from analysis in the next chapter of this EA.

2.5.1 No Prescribed Burning

This alternative would not meet the purpose and need of the project. Existing fuel loadings would not be addressed. Mechanical treatments create slash fuels adding to the existing surface fuel loading. Slash would be piled in the tractor yarding units only, due to slope limitations. Slash piles would require burning in order for fuel reduction objectives to be met. The remaining slash would increase potential fire severity and tree mortality due to future wildfire events, even in moderate conditions.

2.5.2 Prescribed Burn Only

Prescribed burn treatments alone would not meet the purpose and need of this project. Under this alternative, prescribed fire would be used as a broad scale fuel reduction tool, which is not fine-tuned enough to allow managers to pick which trees will be removed and which will be protected. Without mechanical thinning and removal of undesired species and subsequent slash removal, stand conditions would continue toward a less fire resilient landscape. Prescribed burning used alone to achieve desirable stand densities would take several decades, contributing to fuel loading in the short-term by killing trees and leaving all the material on the ground. These conditions would lead to the loss of the large diameter fire resistant ponderosa pine trees, a key ecosystem component.

2.6 Summary Comparison of Alternatives

The following sections summarize the proposed activities of the alternatives, and the effects of the treatments on the key resources issues as analyzed in the next chapter of this EA.

2.6.1 Proposed Treatments

The table below lists the acres of vegetation and miles of roads proposed for treatment under each of the action alternatives. The area of timber harvest and fuel treatments proposed in the alternatives is very similar. The differences focus on the spatial orientation of the harvest units and private lands proposed for inclusion in prescribed burns.

Table 3. Summary Comparison of Action Alternatives

	Proposed Activity	Proposed Action	Alternative 2 (Original 2007 Proposal)	Alternative 3 (No Temp Roads)
Acres of Treatment	Thinning	429.22	490.64	490.65
	Uneven-aged	36.066	36.06	36.06
	Irregular shelterwood	122.42	122.42	127.29
	Seed Tree w/ Reserves	42.81	0	8.96
	Tractor yard/excavator pile or biomass utilization/burn	291.01	336.10	325.50
	Cable yard/burn	238.45	237.88	
	Helicopter yard/burn	101.03	75.14	337.45
	Prescribed burn only	798.44	618.29	610.80
	Aspen restoration	0	14.33	0
	Riparian restoration	15.39	0	15.39
	TOTAL acres treated	**1,444.32**	**1,281.74**	**1,289.14**
	Bridge Construction	0	1	1
Miles of Treatment	Road closure	10.9	18.6	6.2
	Temporary road	1.37	1.62	0
	Permanent road	0.15	0.15	0.15
	Major Reconstruction	0.11	0.17	0.17
	Minor Reconstruction BLM	10.97	14.48	13.24
	Minor Reconstruction Private	0.68	0.95	0.71
	Road decommission	7.7	0	10.7
	TOTAL miles treated	**31.88**	**17.37**	**24.97**

2.6.2 Key Resource Issues and Treatment Effects

The effects of each of the action alternatives compared to the no action alternatives, as analyzed for each of the key resource issues and their indicators in the next chapter of this EA, are summarized below.

2.6.2.1 Forest Vegetation

Issue 1: Proposed activities can affect vegetative conditions for forest cover types, and stand structure (size classes, density, and crown cover). Area is within a Desired Future Condition Block (DFCs). DFCs are based upon historic ranges of variability; currently excess of grand fir, medium size class stands, and stands that are too dense.

Issue 2: Proposed activities can affect early seral old growth stands and attainment of DFCs.

Table 4. Forest Vegetation Effects

Indicator	Proposed Action	Alternative 2 (Original 2007 Proposal)	Alternative 3 (No Temp Roads)	No Action Alternative
Area dominated by grand fir and ponderosa pine (PP) cover type Measure = acres	137 increase grand fir 140 increase PP 165 increase herb cover	137 decrease grand fir 140 increase PP 122 increase herb cover	142 decrease grand fir 140 increase PP 136 increase herb cover	Grand fir 1,792.2 (61%) PP 646.4 (22%) Continued increase of grand fir and decrease of PP
Area dominated by medium size class stands and lack smaller size class stands, outside range of DFC. Measure = acres	165 increase seedling/sapling & small tree stands	122 increase seedling/sapling & small tree stands	136 increase seedling/sapling & small tree stands	Current medium – 1968.5; large to very large – 852.0; pole/other – 88.1 Size class diversity would decrease
Excessively high stand density, outside of historic range of variability	Basal area decrease on 631 acres.	Basal area decrease on 619 acres.	Basal area decrease on 658 acres.	Current basal area: 150-160 ft2 – 725 90-149 ft2 – 990 Basal area per acre would increase.

Indicator	Proposed Action	Alternative 2 (Original 2007 Proposal)	Alternative 3 (No Temp Roads)	No Action Alternative
Excessively high percent canopy cover classes, outside of historic range of variability. Measure = acres	241 increase 20-40% 369 increase 41-60% 208 decrease 61-80% 417 decrease 81-100%	286 increase 20-40% 331 increase 41-60% 215 decrease 61-80% 417 decrease 81-100%	286 increase 20-40% 355 increase 41-60% 215 decrease 61-80% 422 decrease 81-100%	Current canopy cover: 20-40% 159; 41-60% 294 61-80% 529 81-100% 1,680 Short-term increase in >60% class, leading to insect and disease or intense crown fire
Acres of Early Seral Old Growth stands.	190.2 acres (6.5%)	195.5 acres (6.7%)	190.2 acres (6.5%)	195.5 (6.7%)

2.6.2.2 Fuels

Issue 1: The proposed fuel/vegetation activities are needed to protect homes and natural resources in the area as well as attain DFCs. The current fuel structure is outside historic range of variability.

Issue 2: Proposed fuel/vegetation activities are not needed and ineffective in protecting homes. However, prescribed burning alone should be considered.

Table 5. Fuels Effects

Indicator	Proposed Action	Alternative 2 (Original 2007 Proposal)	Alternative 3 (No Temp Roads)	No Action Alternative
Surface Biomass (fuel loading) Measure = tons/acre or % change in tons/acre	20% decrease tons/acre Treated stands: 35% decrease after 1 treatment 42% decrease after 2 treatment	Similar to PA, but without treatment on private land.	Similar to PA, but without treatment on private land.	Current fuel loading; 7.9 to 37.5 tons/acre with a project area average of 25 tons/acre. Continued surface biomass accumulation.

Indicator	Proposed Action	Alternative 2 (Original 2007 Proposal)	Alternative 3 (No Temp Roads)	No Action Alternative
Canopy Base Height (CBH) Measure = % of project area	35% of project area CBH < 20 feet Treated stands only: 19% CBH < 20 feet 2% CBH < 6 feet	Similar to PA, but without treatment on private land.	Similar to PA, but without treatment on private land.	Currently 68% of project area has CBH < 20 feet and 30% has CBH < 6 feet Acres of low CBH would continue to increase.
Fire Type Measure = % of project area	Severe Wildfire: Crown 30%; Surface 70% Moderate Wildfire: Crown 13%; Surface 87%	Similar to PA, but without treatment on private land.	Similar to PA, but without treatment on private land.	Current Severe Wildfire: Crown 70%; Surface 30% Current Moderate Wildfire: Crown 34%; Surface 66%. Continued increase in ladder fuels and crown closure conditions leading to increased potential crown fire
Tree Mortality Measure = % of Basal area	Severe Wildfire: 67% average mortality 22% of project area >90% mortality Moderate Wildfire: 26% average mortality; 85% of project area <20% mortality	Similar to PA, but without treatment on private land.	Similar to PA, but without treatment on private land	Severe Wildfire: 82% average mortality 63% project area at risk to >90% mortality Mod Wildfire: 34% average mortality 24% project area at <20% mortality Dense stand conditions and increase in less fire resistant species would continue to move toward higher risk to fire caused mortality

2.6.2.3 Transportation

Issue 1: Beneficial variables associated with roads include harvest of timber, recreation, fire management, and access to private inholdings.

Issue 2: Undesirable consequences include adverse effects on hydrology and geomorphic features (such as debris slides and sedimentation), and habitat fragmentation.

Table 6. Transportation Effects

Indicator	Proposed Action	Alternative 2 (Original 2007 Proposal)	Alternative 3 (No Temp Roads)	No Action Alternative
BLM road reconstruction and use for forest and fire management treatments	13.28 miles, including 10.97 miles of minor reconstruction on existing BLM roads and 0.68 miles on private	17.37 miles, with 14.48 miles of minor reconstruction on BLM roads and 0.95 miles private.	14.27 miles, with 13.24 miles of minor reconstruction on BLM roads and 0.71 miles on private	0.0
Public motorized travel use of BLM roads after project completion	5.0 miles: Open, some alteration in route designation 10.9 miles: Closed, including some recently inventoried roads	5.1 miles: Open 18.6 miles: Closed, including recently inventoried roads	4.9 miles: Open 8.1 miles: Closed	5.1 miles: Open, no alteration 3.2 miles: Closed (2009) 15.3 miles: Closed (recently inventoried roads)
Temporary road construction and removal	1.37 miles	1.62 miles	0.0	0.0
Road decommissioning	7.7 miles; includes removal of poorly located or designed roads and stabilization of two road failure sites.	0.0 miles; however, closed roads will have physical barriers to motorized travel.	10.7 miles; includes removal of some well-designed roads and stabilization of one road failure site.	0.0 miles. Four existing road failure sites could continue as chronic sediment sources.

2.6.2.4 Air Quality

Issue 1: Proposed burning activities will produce undesirable amounts of smoke, posing a threat to human health and welfare, especially to local residents.

Issue 2: Smoke produced from proposed burning activities will impact visibility to highway 95 traffic, posing a threat to human health and safety.

Table 7. Air Quality Effects

Indicator	Proposed Action	Alternative 2 (Original 2007 Proposal)	Alternative 3 (No Temp Roads)	No Action Alternative
Particulate Matter (PM) from prescribed burning averaged over a 5-year implementation period. Measure = Tons/year PM from Wildfire Measure = tons/acre	PM 10 – 57 Tons PM 2.5 – 48 Tons Wildfire: PM10 – 0.08; tons/acre PM 2.5 – 0.07 tons/acre	PM 10 – 54 PM 2.5 – 45 Wildfire Smoke emission similar to PA	PM 10 – 54 PM 2.5 – 46 Wildfire Smoke emission similar to PA	Wildfire (tons/acre): PM 10 – 0.17 PM 2.5 – 0.14 Fuel loadings would continue to increase and wildfire emissions would continue at higher levels
Visibility Smoke would directly impact residents immediate of project area and may pool in valley bottoms at night creating poor visibility along Highway 95 corridor	Local residents and Highway 95 corridor may be impacted immediately following prescribed burns; Amount and duration should be limited by following appropriate management techniques	Similar to PA with 171 acres less of prescribed	Similar to PA with 178 acres less of prescribed burning	Fuel loadings would continue to increase and smoke from large wildfires would potentially impact visibility at larger scale and longer duration

2.6.2.5 Soils

Issue 1: The proposed vegetation/fuels activities may decrease long-term soil productivity directly affect other physical properties of that landscape and including watershed condition. Slope failure can occur in response to management activities, particularly roads.

Table 8. Soil Effects

Indicator	Proposed Action	Alternative 2 (Original 2007 Proposal)	Alternative 3 (No Temp Roads)	No Action Alternative
Soils (Compaction or Displacement)	Lowest impact to soil productivity and erosion due to reduced acreage of tractor logging and road construction	Highest impact on soil productivity and erosion due to increased acreage of tractor logging and road construction	Similar to Alt.2, but with 11 acres less of tractor logging and no temporary road construction	Previous road building, development, tractor logging, machine piling, and grazing have impacted soils in the project area. Slight natural recovery of surface layers of compacted soils.
Surface and Substratum Erosion	Intermediate effect when considering harvest, road construction, burning, and restoration effects	Highest effect due to increased tractor logging and no road decommissioning	Lowest effects due to no road construction and highest road decommissioning	Previous road building, development, tractor logging, machine piling, and grazing have impacted soils in the project area. Slight abatement as slow natural vegetation recovery occurs.

Indicator	Proposed Action	Alternative 2 (Original 2007 Proposal)	Alternative 3 (No Temp Roads)	No Action Alternative
Mass Erosion – Landslides Acres of treatment (harvest/rx burn) on terrain rated high and moderate hazard for landslide and miles temporary road on moderate hazard	130 Acres rx burn on high hazard 218 acres harvest moderate hazard 0.32 miles temp road moderate hazard. Highest level of risk of action alternatives.	103 Acres rx burn on high hazard 214 acres harvest moderate hazard; 0.17 miles temp road moderate hazard. Moderate level of risk compared to action alternatives.	103 Acres rx burn on high hazard 220 acres harvest moderate hazard 0.0 miles temp road moderate hazard. Lowest level of risk compared to action alternatives.	Landslide hazard in project area is approximately: 255 acres -high 1,191 acres - moderate; 1,465 acres - low (stable). Past events generally restricted to small scale-events with modest impacts. No change in level of risk.

2.6.2.6 Water Resources

Issue 1: Proposed vegetation treatment activities may increase water yield and change timing and duration of peak runoff, thereby decreasing stream channel stability.

Issue 2: Proposed activities may increase erosion and sediment yield, which could impair fish habitat, and affect 303(d) listed streams.

Table 9. Water Resource Effects

Indicator	Proposed Action	Alternative 2 (Original 2007 Proposal)	Alternative 3 (No Temp Roads)	No Action Alternative
Water Quantity, Peak flows and Water yield Measure = Change in Equivalent Clearcut Acres (ECA) for Hazard/Hard Creek and Little Salmon watersheds	ECA increase less than 0.5% in watersheds. Minor predicted peak monthly water yield increases because of the small size of the harvest units and the harvest methods	Similar to Proposed Action	Similar to Proposed Action	Existing ECA: Hazard/Hard Creek 21.4% Little Salmon 15.5%. No increase in ECA and water quantity, peak flows, water yield A severe wildfire could result in short-term but very high flows into streams, adversely affecting beneficial uses
Sediment Yield (Tons/sq. mi/year) Measure = Percent change	Hard Creek +4.8% Hazard Creek +2.9% Little Salmon+7.5%	Same as Proposed Action	Hard Creek +4.6% Hazard Creek +0% Little Salmon+6.7%	Existing Sediment Yield: Hard Creek 33.3 Tons Hazard Creek 24.8 Tons Little Salmon 25.3 Tons A catastrophic wildfire could result in a short-term but a very high flush of sediment into streams.

2.6.2.7 Fisheries

Issue 1: Proposed activities have the potential to cause increased sediment delivery to streams in the analysis area, decreasing quantity and quality of spawning, rearing, and over-wintering fish habitat for federally listed and BLM sensitive species.

Table 10. Fisheries Effects

Indicator	Proposed Action	Alternative 2 (Original 2007 Proposal)	Alternative 3 (No Temp Roads)	No Action Alternative
ESA-Listed: Sockeye Salmon, Fall Chinook	No Effect: Species No Effect: Critical Habitat	No Effect: Species No Effect: Critical Habitat	No Effect: Species No Effect: Critical Habitat	No Effect: Species No Effect: Critical Habitat A severe wildfire fire may result in adverse impacts to critical habitat.
ESA-Listed: Spring/Summer Chinnok, Steelhead Trout, Bull Trout	Likely to Adversely Affect Species and designated Critical Habitat.	Similar to Proposed Action	Similar to Proposed Action	No Effect: Species No Effect: Critical Habitat A severe wildfire fire may result in adverse impacts to critical habitat.
Idaho BLM Sensitive: Westslope Cutthroat Trout, Redband Trout, Pacific Lamprey	May impact individuals or habitat, but will not likely lead to a trend toward federal listing or cause a loss of viability of the population or species	Same as Proposed Action	Same as Proposed Action	No Impact A severe wildfire fire may result in adverse impacts to critical habitat.

2.6.2.8 Wildlife

Issue 1: Proposed activities have the potential to impact desired habitat conditions and security cover for Rocky Mountain elk.

Issue 2: Proposed activities have the potential to alter the amount of suitable wildlife habitat for federally listed and BLM sensitive species.

Table 11. Wildlife Effects

Indicator	Proposed Action	Alternative 2 (Original 2007 Proposal)	Alternative 3 (No Temp Roads)	No Action Alternative
Percent Elk Habitat Effectiveness (EHE) Long Term	54%	55%	54%	52%
Percent Elk Habitat Effectiveness (EHE) Short Term	44%	42%	43%	52%
ESA Listed – Canada Lynx	Not Likely to Adversely Affect	Same as Proposed Action	Same as Proposed Action	Limited Habitat, Not likely to occur
BLM Sensitive Species – See Section 3.2.11 for a complete list	May impact individuals or habitat but not likely to cause trend toward federal listing or reduce viability for the population or species	Same as Proposed Action	Same as Proposed Action	A severe wildfire fire may result in adverse impacts to individuals and their critical habitat.
BML Sensitive Species - California Myotis, Fringed Myotis	No Impact	No Impact	No Impact	Limited Habitat, Not likely to occur

2.6.2.9 Plants

Issue 1: Proposed activities have the potential to impact BLM sensitive plant species.

Table 12. Plant Effects

Indicator	Proposed Action	Alternative 2 (Original 2007 Proposal)	Alternative 3 (No Temp Roads)	No Action Alternative
BLM Sensitive Species - broad-fruit mariposa lily, Palouse thistle, and puzzling halimolobos	May impact individuals or habitat but not likely to cause trend toward federal listing or reduce viability for the population or species	Same as Proposed Action	Same as Proposed Action	No Impact A severe wildfire fire may result in adverse impacts to individuals and critical habitat.

2.6.2.10 Socio Economics

Issue 1: The cost of implementing a fuels/vegetation project compared to economic benefits is a concern.

Issue 2: Fuels/vegetation projects and associated sale of timber provide economic and socio-economic values and opportunities to local communities.

Table 13. Socio Economic Effects

<table>
<tr><th>Indicator</th><th>Proposed Action</th><th>Alternative 2 (Original 2007 Proposal)</th><th>Alternative 3 (No Temp Roads)</th><th>No Action Alternative</th></tr>
<tr><td>Net Costs per Acre: Cost-Revenue</td><td>($610)</td><td>($569)</td><td>($957)</td><td></td></tr>
<tr><td>Local employment</td><td colspan="3">Local employment would be directly impacted by all action alternatives. It is difficult to determine the extent of new jobs created, but with current unemployment at 14.1 percent in Adams County and 12.3 percent in Idaho County (Idaho Department of Labor, April 2011), employment opportunities that may result from project implementation include:
• fuels reduction (thinning, pruning, piling, and burning)
• forest products (including harvest, transportation and milling)
• reforestation (seedlings, planting)
• road construction/maintenance.</td><td>This alternative harvests no timber, generates no revenues, and incurs no expenses from fuels reduction treatments. No jobs or individual income are generated.</td></tr>
</table>

3 AFFECTED ENVIRONMENT AND EFFECTS OF ALTERNATIVES

This chapter characterizes the resources and uses that have the potential to be affected by the proposed action (section 3.1), followed by a comparative analysis of the direct, indirect and cumulative impacts of the alternatives (section 3.2). Direct effects are caused by the action and occur at the same time and place. Indirect effects are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Cumulative impacts result from the incremental impacts of the action when added to other past, present, and reasonably foreseeable future actions.

3.1 Scope of Analysis

Setting

The project area is located in the larger Little Salmon River subbasin. Land ownership within the project area is 2,347 acres BLM and 591 acres private. The project is bounded on the west by US Highway 95 or the Little Salmon River. The project lies in what is called the canyon reach specifically in the area north of Round Valley Creek between the Little Salmon River and Hard Creek. The elevation ranges from approximately 3,200 feet at the confluence of Hazard Creek and the Little Salmon River to 5,800 feet in the southeast corner of the project area.

The Little Salmon River basin is characterized by warm, dry summers and cold, moist winters. Most of the precipitation falls as snow with the greatest amounts of snow occurring on the eastern side of the basin. Climate varies with altitude. The lower elevations (i.e. the area near Riggins) are semi-arid while the higher elevations are sub-humid (IWRB 2001). Average annual precipitation ranges from less than 20 inches at Riggins to more than 50 inches at Brundage Mountain. Annual runoff averages 18 inches (BLM 2000). The Southern Forested Mountains ecoregion where the project lies has drought-prone granitic soils (IDEQ 2008).

The project area is dominated by grand fir habitat types on the northwest to northeast aspects and Douglas-fir habitat types elsewhere and includes 16 small perennial and intermittent streams, which flow into Little Salmon River, Hazard Creek, or Hard Creek. Within the project area, there are 18 acres of riparian habitat, 260 acres of Riparian Conservation Areas (BLM lands), and several small ponds. The project area provides important habitat for big game species such as Rocky Mountain elk, mule deer, and white-tailed deer.

3.1.1 Potentially Affected Resources and Uses

The resources and uses that are analyzed for direct, indirect and cumulative effects in the next section of this chapter (section 3.2) are summarized below, along with the geographic extent of the area studied.

Table 14. Affected Resources/Uses and Study Areas

Section #	ELEMENT/RESOURCE/USE	Study Area Name	Acres
3.2.1	Vegetation	Hard Creek, Hazard Creek and the Little Salmon River Watersheds (6th code HUCs)	66,784
3.2.2	Fuels	Project Area	2,938
3.2.3	Transportation	Project Area	2,938
3.2.4	Air Quality	Air Shed 15	1,636,220
3.2.5	Soil Resources	Project Area	2,938
3.2.6	Water Resources	Hard Creek, Hazard Creek and the Little Salmon River Watersheds (6th code HUCs)	66,784
3.2.7	Wild and Scenic Rivers	Project Area	2,938
3.2.8	Special Status Fisheries	Hard Creek, Hazard Creek and the Little Salmon River Watersheds (6th code HUCs)	66,784
3.2.9	Wildlife/Habitat	Project Area	2,938
3.2.10	Migratory Birds	Project Area	2,938
3.2.11	Special Status Animals	Varies depending on each species relative home range size and critical habitat niches(s)	
3.2.12	Special Status Plants	Project Area	2,938
3.2.13	Invasive, Nonnative Species	Project Area	2,938
3.2.14	Cultural Resources/Native American Concerns	Project Area	2,938
3.2.15	Visual Resources	Project Area	2,938
3.2.16	Socio Economic Resources	Idaho & Adams Counties	6,316,866

3.1.2 Related Past, Present and Reasonably Foreseeable Actions

As defined by NEPA regulations (40 CFR 1508.7), “Cumulative impacts result from the incremental impacts of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions.”

Past and Present, and Reasonably Foreseeable Future Actions

Human caused and natural events have had varying levels of impacts on the resources and values affected by the proposed vegetation project. There are currently no ongoing or planned projects on the Payette National Forest or state lands adjacent to or in proximity to the project area. The BLM had conducted small scale salvage removal of trees north of Hazard Creek and is in the preliminary stages of planning vegetation and fuels management activities across the Little Salmon River drainage. The majority of past timber harvest and road building that occurred on BLM lands occurred during the 1960s. The BLM acquired fee title (exchange) on approximately 634.5 acres (approximately 180 acres occur in project area) within the Hazard and Hard Creek drainages in December 1993, which had some timber harvest and road building occur prior to the exchange. Additionally, some local landowners continue to alter the fuels on their property and surrounding their private structures. Timber harvest and road building has occurred on private lands (private timber company) and state of Idaho lands located south of the project area. U.S. Highway 95 borders the project area on the west, and is the primary north/south Idaho highway.

Other past, present and reasonably foreseeable actions of BLM and others on public and private lands pertinent to the analysis of cumulative effects on affected resources or uses include future timber harvest, as well as timber harvest on private, state, and nearby Payette National Forest lands in the analysis area. Related road construction activities include road decommissioning as well as providing access for residential development, recreation use, fire suppression, , and restoration. The 1994 Corral wildfire occurred in upper Hazard Creek and upper Hard Creek, impacting the larger streams and riparian areas.

3.2 Effects of the Alternatives

The degree to which resources/uses may be affected by the proposed activities are discussed in the following subsections. Each subsection includes discussion of the:

(1) Affected Environment (current condition) of the resource or use
(2) Effects (direct and indirect) of each alternative
(3) Cumulative Impacts

3.2.1 Forest Vegetation

The geographic scope of the vegetation analysis considers the Little Salmon River-Round Valley, Hard Creek and Hazard Creek watersheds as a whole (66,784 acres). Very specific analysis for existing condition and direct and indirect effects of the alternatives is the 2,938-acre project area. Indicators are used to quantify effects on forest vegetation including; forest cover types and structure (size class, density, and crown cover).

Affected Environment

Plant communities in the analysis area can be seen as a mosaic of patches that change in composition, size, and position in relation to one another over time. Processes like fire, plant community succession, insect and disease activity, drought, and grazing all change the pattern that exists at any given time. Features such as climate, soil, slope, aspect, and elevation control the bounds within which patterns can change. The project area is dominated by grand fir habitat types on the northwest to northeast aspects and Douglas-fir habitat types elsewhere. Based upon field reconnaissance data the majority of the area would fall under one of three descriptions of LANDFIRE biophysical setting (BpS): 1) Northern Rocky Mountain Dry-Mesic Montane Mixed Conifer Forest – ponderosa pine/Douglas-fir, 2) Northern Rocky Mountain Dry-Mesic Montane Mixed Conifer Forest – grand fir, 3) Northern Rocky Mountain Dry ponderosa pine woodland savanna (Attachment, **Map 8**).

The Northern Rocky Mountain Dry ponderosa pine woodland savanna covers approximately 16.7% of the analysis area and 49.4% of the project area. The BpS disturbance description is as follows. Frequent, non-lethal surface fires were the dominant disturbance factor, occurring every 3-30 years. Median fire return intervals (MFI) were likely about 15 years. Mixed severity fires likely occurred about every 50 years depending on the vegetative state.

Western pine beetle (*Dendroctonus brevicomis*) can attack large ponderosa pine in any canopy density.

The Northern Rocky Mountain Dry-Mesic Montane Mixed Conifer Forest – ponderosa pine/Douglas-fir covers approximately 5.9% of the analysis area and 29.8% of the project area. The BpS disturbance description is as follows. Consists of Fire Regime Groups I and III with surface and mixed severity fires at varying intervals (MFIs range from 7-80yrs). Occasional replacement fires may also occur. Mixed severity fire increases and surface fires decrease at higher elevations.

Insects and disease play an important role, especially in the absence of fire. Bark beetles such as mountain pine beetle (*Dendroctonus ponderosae*), western pine beetle, and Douglas-fir beetle (*Dendroctonus pseudotsugae*) are active in the mid and late structural stage, especially in closed canopies. Weather related disturbances, including drought, tend to affect the late closed structure more than other structural stages. Root rot is a minor concern in the northern extent of this BpS. Mistletoe is present in the southern portion of this BpS and increases in occurrence with a lack of fire.

The Northern Rocky Mountain Dry-Mesic Montane Mixed Conifer Forest – grand fir covers approximately 15.8% of the analysis area and 4.2% of the project area. The BpS disturbance description is as follows. Fire regime group III, with stand replacing fires sometimes punctuated by mixed severity fires. Root disease and mountain pine beetle are very active in this BpS.

The project area appears to have not sustained a significant wildfire for several decades. Fire scars on large trees throughout the project area appear to be 70-90 years old.

Several of the entomological and pathological agents noted for the three BpS described above are noted in the project area as discussed below.

Fir Engraver (Scolytus)

The fir engraver is a native bark beetle with a one-to-two year life cycle that is a major pest of true firs throughout the west. Adults select green trees to nourish their larvae. Numerous attacks over the entire bole of the tree will result in the tree's death. However, the fir engraver often attacks a susceptible tree in lesser numbers resulting in top kill, branch killing or "patch killing" of scattered patches of cambium over the tree's surface.

Schenk et al. (1976) have shown that the presence of ocean spray (Holodiscus discolor) is strongly correlated with sites of high hazard for fir engraver. The stands in the project area sustain a large amount of ocean spray with 63% of the area being categorized grand fir habitat types. Later, Schenk et al. (1977) showed that overstocked grand fir stands represent the greatest threat to attack by beetle. As overstocking is relieved and the grand fir component is lessened, the risk of beetle infestation is reduced. Stands in the project area are dominated by grand fir. The maintenance of vigorous stands through the elimination of competitive stress, removal of dead and dying trees, is the best means of reducing beetle caused mortality.

Mountain Pine Beetle

Mountain pine beetle is a native bark beetle with a one-to-two year life cycle that affects ponderosa pine as well as other pines. Adults select green trees of sufficient size and phloem thickness to nourish their larvae. The pitch tubes on the bole and boring dust at the base of the tree are evidence of beetle entry. Beetles are subject to mortality from parasites, predators such as woodpeckers, cold winters, drying of the pine following infection, and resin from the host tree. In ponderosa pine stands, infestations tend to occur in second growth stands with basal area (ba) above 120; old growth trees with high risk rating and poor sites. Thinning can help reduce susceptibility to mountain pine beetle. Thinning to residual ba of 80 ft^2 per acre is recommended.

Pockets of mountain pine beetle killed trees have been noted in the project area primarily effecting the concentrations of large diameter ponderosa pine. Several pockets of large diameter ponderosa pine killed by mountain pine beetle have been salvage logged just north of the project area.

Douglas-fir Beetle

This is a native bark beetle that is not typically very aggressive and usually attacks wind thrown, fire-damaged trees or trees weakened by other pathogens or drought (Hagle et al. 1987; Schmitz and Gibson 1996). Where Douglas-fir occurs with early seral larch or pine, beetle activity would help maintain the early seral species. On grand fir habitat types, like those that dominate the project area, Douglas-fir beetle activity creates openings where more shade-tolerant species like grand fir will grow and push the stand more quickly toward late seral conditions and uneven aged stand structure (Hagle et al. 2000).

Observed pockets of Douglas-fir beetle in the watershed have been small and occur in areas where past fires were not stand replacing also resulting in Douglas-fir dwarf mistletoe in the large old Douglas-fir. These pockets of dwarf mistletoe have expanded due in part to selective logging and fire suppression activities. Trees greater than 24 inches diameter breast height (dbh) and dwarf mistletoe Hawksworth ratings of 5-6 are at high risk of attack by Douglas-fir beetle (Hessburg 1992).

Dwarf Mistletoe

Dwarf mistletoes are small, leafless, parasitic plants that extract water and nutrients from living conifer trees. The results of dwarf mistletoe infection are seen as reductions in reproduction, growth, longevity and quality. Damage first becomes evident when the crown is about half infected, and becomes increasingly severe as the infection intensifies to its culmination when the entire crown is infected and the tree dies. Douglas-fir dwarf mistletoe (*Arceuthobium douglasii*) and ponderosa pine dwarf mistletoe (*Arceuthobium campylopodum*) are the species most active in the project area.

These parasitic plants are native and have co-evolved with their hosts for millions of years. Ecological forces that have patterned the development of the host tree species have also played a role in influencing the distribution of dwarf mistletoes across the landscape. Fire is one of the forces that have significant effects on dwarf mistletoe population dynamics. In general, any fire event that kills host trees will reduce the population, at least in the short term. Large, complete burns will greatly reduce dwarf mistletoe populations across the landscape level. Small, "patchy" burns will temporarily reduce segments of dwarf mistletoe populations, but infected residuals that survive the fire provide a ready source of dwarf mistletoe seeds for infection of newly developing regeneration.

Both Douglas-fir and ponderosa pine dwarf mistletoes were observed throughout the project area especially adjacent to areas where past fires were not stand replacing or in multi-storied stands where dwarf mistletoe infected large old trees remained. These pockets of dwarf mistletoe have expanded due in part to selective logging and fire suppression activities. In areas where dwarf mistletoes affect species that are major serals, there will be a gradual shift in species composition on the site toward the more climax species. Ponderosa pine and Douglas-fir are the major serals on much of the project area, grand fir being the climax species. However, large numerous brooms on sites heavily infected with dwarf mistletoe can increase the flammability of the site, thus increasing the chance of a stand replacement fire which would result in returning the site to an early seral stage.

Because dwarf mistletoes require living hosts to survive and reproduce, their impacts can be effectively reduced through the use of silvicultural treatments that emphasize the removal of infected trees.

Root Diseases

Root diseases are fungi that can affect all sizes, ages and species of trees. In the watershed, grand fir and Douglas-fir are most highly susceptible and the prevailing root pathogens affecting them are armillaria and annosus root rots. With the continued exclusion of fire, loss of ponderosa pine will continue, grand fir and Douglas-fir will increase, and root disease will likely also increase. However this change is not toward conditions that are outside historic ranges. Where Douglas-fir has encroached on ponderosa pine stands, these will be more susceptible to root disease. Fire and root disease appear to have contributed historically to the maintenance of larch in mixed conifer stands. Without fire, root disease is unlikely to sufficiently limit grand fir competition leading to the eventual elimination of larch from the stand.

Root disease has probably increased a small amount in average severity. The older stands become and the more they shift toward grand fir, the more severe root disease will be. Root disease may have a more important role of impacting the area stands if ponderosa pine continues to be reduced and Douglas-fir and grand fir increase. It will affect canopy cover, cover types, size, and age distribution of trees, and timber productivity. The effects will be to create forest openings, favoring shrubs and regeneration of more susceptible grand fir or increased dominance by less susceptible species. Over the long-term, without fire or harvest to sustain less susceptible species, more stands will become susceptible.

Cover Types

The dominant cover type in the project area is Grand fir covering approximately 61%. The other dominant cover types are ponderosa pine and Douglas-fir covering approximately 22% and 28% of the project area, respectively. Western larch and spruce cover an additional 3% and 1%, respectively.

A combination of wildfire, intentional fire, timber harvest, fire suppression, and forest succession has shaped the existing pattern and composition of vegetation in the Little Salmon River watershed. The greatest changes from historic vegetation conditions in the project vicinity indicated by LANDFIRE Modeling and field data interpretation include:

- Declines in ponderosa pine-dominated communities due to harvest, fire suppression and forest succession.
- Increases in more shade tolerant tree species, such as grand fir, due to fire suppression and forest succession.
- Declines in shrubland, riparian shrub, and riparian meadow due to forest encroachment, agricultural conversion, wildland urban interface expansion, and forest succession.
- Whitebark pine has seriously declined from blister rust, fire exclusion and mountain pine beetle. This species does not occur within the project area, and will not be discussed further.
- Open stand conditions in all seral structural stages, seedling and sapling, pole stands, and medium-large trees stands have decreased. Snags and down wood, have increased because of fire suppression. Numbers of pole-medium trees have increased in most areas.
- Stands once dominated by ponderosa pine cover types meeting old growth (early phase) criteria of Hamilton (1993) are nearing extinction due to the first two items noted above and the dying of the older trees in these stands.

Structure

Size Class

Stand tree size varies depending on year of origin, tree species, growing conditions and successional stage. Stands that originate from a single event, such as a fire, tend to be made up of trees that are fairly even in size until a certain age at which the overstory begins to die out and smaller trees become established in the understory. In the absence of a stand replacing event such as fire or insect attacks, stands would continue to have small openings occur in the overstory canopy allowing for the initiation of smaller understory trees. Stands in the project area have not been subject to regeneration harvest practices or intense stand replacing fires. Fire scars are common in the stands within the project area on the older tree component, but not on the younger trees (<90 years old). The resultant stands size class distribution is illustrated in Figure 4. As shown stands dominated by medium sized trees (9"-20" diameter at breast height (dbh)) make up 67% of the project area. Twenty-nine percent of the project area is comprised of large to very large tree (>21" dbh) stands.

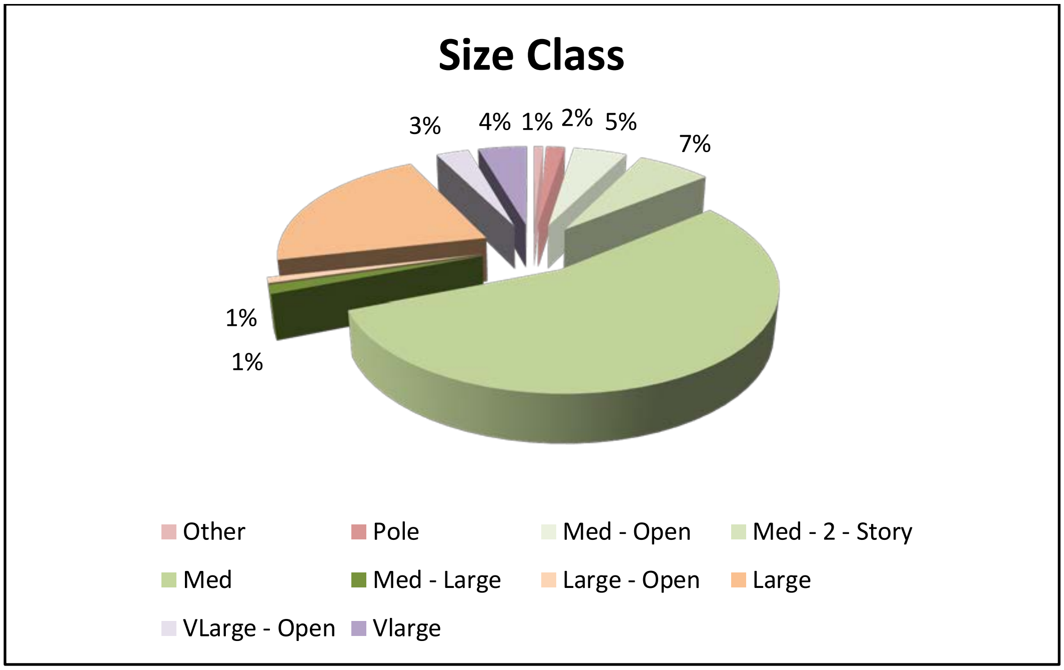

Figure 4. Project Area Size Class Distribution

Stand Density

Stand density, measured in basal area per acre, vary widely across the project area. Variations are due to elevation, aspect, soils and moisture, as well as stand history. Stand basal area was measured for stands in the project area with trees greater than five inches dbh. Stands with higher basal area are more susceptible to perturbations, including insect and disease outbreaks. Within ten years this material would end up as dead and down, increasing the potential for very intense fire scenarios with a high resistance to control. Per acre basal area in the project area ranges from 0 to 160 square feet. Approximately 38% of the project area is carrying greater than 90 square feet of basal area. This basal area range is higher than the recommended levels for maintaining stands at vigor levels not predisposing them to insect and disease.

Crown Cover
Stand crown cover is a function of tree size, species composition, and stand density. Crown cover illustrates how much of the forest floor would be sheltered from some environmental factors including light, precipitation, and temperature. It is also an indicator of stand susceptibility to intense fire behavior such as torching and crowning. Crown cover for the Little Salmon River and the project area (BLM and Private land) is shown in Attachment, **Map 9** and the project area is shown in Figure 5.

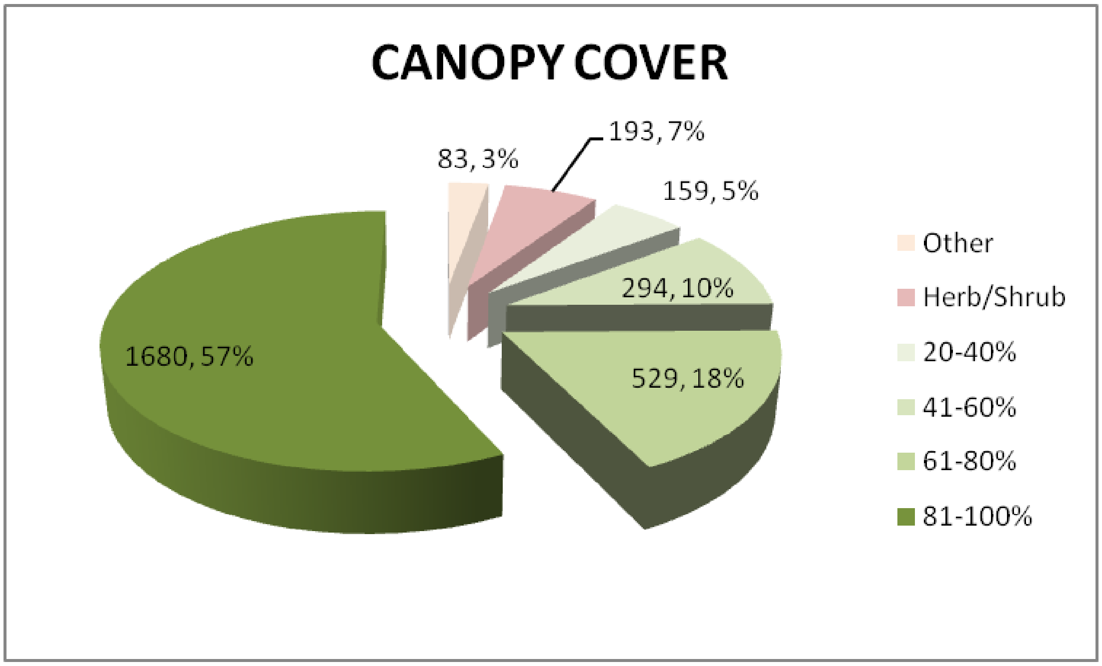

Figure 5. Project Area Percent Canopy Cover (acres, percent of area), both BLM and private lands.

Effects of Alternatives

Direct Effects-Cover Types

Common to All Action Alternatives

Direct effects on species dominance and cover type would vary by the type of harvest method, residual stand, and tree planting that would produce the desired future stand. The initial burning of those stands without timber harvest is likely to only have minor direct effects on species dominance of the current overstory. The outcome should be viewed in both the short-term (less than 10 years) and the long-term.

Proposed Action

Acres of herbaceous conditions would increase by approximately 165 acres that include areas of irregular shelterwood cuts and seedtree with reserve cuts. This short-term change would decrease as trees become reestablished on these acres and canopy closure excludes herbaceous ground cover. In the long-term these acres would move towards a mixture of Douglas-fir and planted ponderosa pine. Immediate change in grand fir cover types would be a reduction of approximately 137 acres (6%) and an increase of ponderosa pine dominated cover types of 140 acres (6%). This small amount of cover type change results from the fact that much of the timber harvest will be done through intermediate stand treatments and not regeneration treatments. There would be a reduction of approximately 4.5% of the grand fir and an increase of 3.5% of ponderosa pine species dominance.

Alternative 2 – Original 2007 Proposal

Effects from Alternative 2 would be similar to those described above for the Proposed Action alternative. This action alternative would have the least short-term increase in herbaceous cover due to the reduced acreage in shelterwood cuts and no seedtree with reserve cuts.

Alternative 3 – No Temporary Roads

Effects from Alternative 3 would be similar to those described above for the Proposed Action alternative. Impacts to dominance and cover type would also be similar to the Proposed Action alternative.

No Action

There are no direct effects to cover types associated with this alternative. Cover types in the project area would continue to change without direct intervention. Changes through time will vary depending on the intensity of disturbances such as fire, weather events, disease, and insect epidemics.

Indirect Effects- Cover Types

Proposed Action

Indirect effects would include enhancement of ponderosa pine, Douglas-fir and fire resistant western larch, and regeneration of ponderosa pine and western larch cover types in the project area. Increased vigor and resistance to damage from fire, insects and disease can be expected in other forest cover types in the project area. Openings created through removal and prescribed burning would create favorable conditions for establishment of fire resistant species such as ponderosa pine and western larch. Retention of ponderosa pine and western larch for seed and shelter trees should increase the percentage of these species in future stands. In areas where ponderosa pine and western larch are desired these species would be planted to assure reestablishment.

Alternative 2 – Original 2007 Proposal

Effects from Alternative 2 would be similar to those described above for the Proposed Action alternative. Indirect impacts to dominance and cover type would be similar to the Proposed Action alternative.

Alternative 3 – No Temporary Roads

Effects from Alternative 3 would be similar to those described above for the Proposed Action alternative. Indirect impacts to dominance and cover type would also be similar to the Proposed Action alternative.

No Action

Passive management is a conscious decision with short and long-term ecosystem consequences. Forest succession would continue and current desirable characteristics of these dynamic ecosystems may not remain intact. Processes would take place whether at the hand of man or randomly (as under the No Action alternative). Anticipated effects of processes that would occur with no human intervention can provide a benchmark against which to measure effects of active management.

In the absence of disturbances Forest Vegetation Simulator (FVS) modeling shows that grand fir cover types will increase. Susceptibility to insect attacks and root diseases affecting conifer species would be expected to increase. Mistletoe would predispose both the ponderosa pine and Douglas-fir to bark beetle attacks as well as increasing mortality directly. As grand fir and Douglas-fir continue to increase while ponderosa pine decreases, they would in time play host to their own disease and insect regimes.

Fire suppression would continue throughout the project area, allowing fuels to build up and further disrupting the natural fire disturbance pattern. The project area does allow for the use of wildland fire for resource benefits so low severity ground fire may occur in the project area. At some point, it is more likely that an intense fire would likely reestablish ponderosa pine dominance in areas where seed sources exist and mineral soil is exposed, creating favorable seedbeds for conifer reestablishment.

With current conifer stocking and growth rates, and increasing levels of insects and disease, the No Action alternative would not help attain RMP goals nor meet the purpose and need of this project. This alternative would not help achieve the RMP goal for desired future conditions particularly species composition. Under this alternative, no reduction would be made in total tree numbers or stocking levels of pest-prone tree species. Improvements such as reduction in susceptible species as well as enhanced growth and vigor of residual trees through timber harvest and prescribed burning would not be made to enhance forest health and ecosystem sustainability. Stocking levels of live trees would continue to increase while individual tree vigor would decrease, increasing susceptibility to damaging insects and disease. Early seral, shade intolerant trees such as ponderosa pine and western larch would decrease in numbers while the shade tolerant species such as grand fir would increase. The shrub, forb, and grass component of forest stands would continue to decline.

Forest stands where the principle species is Douglas-fir, grand fir, or Engelmann spruce are highly susceptible to outbreaks of defoliators such as western spruce budworm and Douglas-fir tussock moth. The following factors make forest stands within the analysis area particularly susceptible to defoliator attack.

Many forest stands are multi-storied. In a tussock moth, budworm or other defoliator infestation, the larvae feed on new growth of larger trees. As the caterpillars mature, they drop off the tree for a variety of reasons (wind, exhaustion of food supply, etc.). Landing on foliage suitable for foraging (such as Douglas-fir or grand fir) results in additional damage.

Root disease is apparent in portions of the project area. During a defoliator or bark beetle attack mortality is often first noticed in root disease centers because of the weakened state of the trees.

Increases in other insects such as fir engraver and Douglas-fir beetle often accompany a defoliator outbreak. Insects are often at endemic levels in the forest, but become more apparent and increase in numbers as a defoliator infestation progresses. Often these insects will "finish off" trees previously weakened by other pests or pathogens.

Any combination of the above listed factors could elevate the level of damage from defoliation to mortality. Additional mortality would add to fuel loads and increase the risk of stand replacement wildfire.

Direct Effects – Size Class

Proposed Action

Direct effects to tree size classes would include an increase in seedling/sapling, and small tree stands on approximately 165 acres for the Proposed Action, and 138 acres for alternative 3. This would be through the implementation of irregular shelterwood cuts, and seedtree cut with reserves treatments. Because the other treatments are intermediate stand treatments (thinning) with an emphasis on thinning from below there would be no change to the acres of other size class stands. However, within those stands the average size class distribution would increase as smaller stems are removed. Large trees of seral species (ponderosa pine and western larch) would be favored for retention in stands where they occur.

Table 15 illustrates those targets for desired forest conditions by potential vegetation group (PVG) as outlined in the Cottonwood RMP (2009). When compared to the existing stand conditions (Figure 4) there is a surplus of medium size class stands of approximately 30 percent. There is also a lack of smaller size class stands. As noted in the RMP the old growth is not a separate class but part of the large tree component. These stands would be the early phase which has seral species (ponderosa pine) in the overstory and climax tree species (Douglas-fir and grand fir) in an understory. Of the 195.5 acres categorized as old growth those proposed for timber harvest are 53.1 in the Proposed Action (Attachment, **Map 2**). Of these 5.3 acres would be seedtree with reserve cut in the Proposed Action thereby reducing the amount of early phase old growth. The other areas would be either thinned (25.7 acres) or uneven aged harvest (22.0 acres) with retention of most of the ponderosa pine large tree component . Therefore, the area with old growth characteristics would still fall within the ranges outlined in table 15. The area to be under burned for fuels reduction and some stand structure alterations include 109.3 acres of this stand type. The main effects of the burning on tree sizes would be to remove much of the seedling-pole sized trees within these stands. The acreage of this stand type would remain unchanged by under burning.

Alternative 2 – Original 2007 Proposal

The effects from Alternative 2 would be similar to those described above for the Proposed Action alternative, but would include an increase in seedling/sapling, and small tree stands on 122 acres (43 fewer acres) and 47.8 acres of timber harvest in old growth stands (5.5 fewer acres) with no seedtree with reserve cut treatments (Attachment, **Map 4)**.

Alternative 3 – No Temporary Roads

The effects from Alternative 3 would be similar to those described above for the Proposed Action alternative, but would occur on 658 acres (27 more acres; Attachment, **Map 6**).

No Action

Under the No Action alternative there are no direct effects to size classes.

Table 15. Potential Vegetation Group (PVG) Size

DBH	Tree Size	PVG-3	PVG-5
<=5	G/F/S/S	9	3-7
	Saplings	9	3-7
5-11	Small/Pole	18-27	4-22
12-19	Medium	23-36	7-30
>20	Large	20-41	15-84
	Old	10	10

Indirect Effects – Size Class

Proposed Action

Indirect effects associated with harvest and fuel reduction treatments would be increased growth and vigor, as well as resistance to damage from fire to remaining trees. Remaining trees in all size classes would benefit through reduced competition for sunlight, water, and nutrients.

Alternative 2 – Original 2007 Proposal

Effects from Alternative 2 would be similar to those described above for the Proposed Action alternative. Indirect impacts to size class would be similar to the Proposed Action alternative.

Alternative 3 – No Temporary Roads

Effects from Alternative 3 would be similar to those described above for the Proposed Action alternative. Indirect impacts to size class would be similar to the Proposed Action alternative.

No Action

Size class diversity would decrease as the percentage of shade tolerant grand fir and Douglas-fir continue to replace ponderosa pine in stands in the project area. A more layered stand structure uncommon in pre-settlement conditions with small and medium trees would dominate creating continuous fuel ladders, increasing the potential for severe fire. Large fire resistant ponderosa pine and western larch could eventually become extirpated in many stands due to stress induced by competition for water and nutrients, lack of suitable conditions for regeneration, or severe fire. In time, there is a high probability that a high intensity, stand replacement fire would occur, resulting in reestablishment of single size class stands in burned areas.

Direct Effects – Stand Density

Proposed Action

Direct effects would be reduced basal area density on approximately 631 acres in the project area for the Proposed Action through timber harvest. Understory burning for fuels reduction will reduce the basal area of trees greater than 5 inches dbh by only a minor amount.

Alternative 2 – Original 2007 Proposal

The effects from Alternative 2 would be similar to those described above for the Proposed Action alternative, but would occur on 649 acres (18 more acres).

Alternative 3 – No Temporary Roads

The effects from Alternative 3 would be similar to those described above for the Proposed Action alternative, but would occur on 658 acres (27 more acres).

No Action

There are no direct effects to density of stands associated with this alternative.

Indirect Effects – Stand Density

Proposed Action

Increased vigor and resistance to damage from fire, insects and disease would be expected for all tree species in the intermediate harvest and fuel reduction areas. In the regeneration harvest areas with fuels reduction, the openings would create favorable conditions for establishment of fire resistant species such as ponderosa pine and western larch. Retention of the healthiest ponderosa pine, Douglas-fir and western larch for seed and shelter trees without competition from other trees should increase the vigor of the residual stems prolonging their occupation of the site.

Alternative 2 – Original 2007 Proposal

The effects from Alternative 2 would be similar to those described above for the Proposed Action alternative.

Alternative 3 – No Temporary Roads

The effects from Alternative 3 would be similar to those described above for the Proposed Action alternative.

No Action

In the short-term, some of the ponderosa pine and Douglas-fir will continue to succumb to bark beetles and dwarf mistletoe generally in the larger trees. Therefore, in some stands basal area per acre would decrease. However, tree growth of smaller Douglas-fir and particularly grand fir would offset much of this decrease and ultimately create denser stands. In the long-term, barring fire, insect or disease epidemics, trees per acre would decrease as stands mature and competition results in stem exclusion. Also as trees become larger, basal area per acre would increase to the point that eventually creates conditions leading to some type of insect and/or disease perturbation.

Direct Effects – Crown Cover

Proposed Action

Direct effects to crown cover would occur on both the harvested acres and the under burned acres. Some residual canopy would occur on all treatment acres, there are no clearcuts. The reduction of area with greater than 80% cover would be 417 acres (14%). The area with 61-80% crown cover would decrease by 208 acres. Areas with 41–60% would increase by 369 acres. Areas with 21-40% would increase by 241 acres.

Alternative 2 – Original 2007 Proposal

The effects from Alternative 2 would be similar to those described above for the Proposed Action alternative.

Alternative 3 – No Temporary Roads

The effects from Alternative 3 would be similar to those described above for the Proposed Action alternative.

No Action

There are no direct effects to crown cover associated with this alternative.

Indirect Effects – Crown Cover

Proposed Action

Increased vigor and resistance to damage from wildfire, insects and disease would be expected for all tree species in the harvest and fuel reduction areas. There would be less interception of precipitation by tree crowns thus increasing moisture availability to the residual stand. Reduction of crown cover especially when combined with the reduction grand fir would make this stands more resilient to wildfires.

Alternative 2 – Original 2007 Proposal

The effects from Alternative 2 would be similar to those described above for the Proposed Action alternative.

Alternative 3 – No Temporary Roads

The effects from Alternative 3 would be similar to those described above for the Proposed Action alternative.

No Action

In the short-term the percentage of the area with greater than 60% crown cover would increase. These stands would become increasing susceptible to perturbations such as insect and disease and intense crown fires.

Cumulative Impacts

Common to All Action Alternatives

Cover Types, Size Class, and Stand Density

The Payette National Forest (the largest land owner in the area) currently has no planned activities in area of the project. Private landowners within the Little Salmon River subbasin will probably continue to change size classes on their ownerships; however, by what amount is unknown. Other activities and ongoing hazard tree removal and firewood cutting also have potential to affect forest size classes on additional acres in the drainage, but are unquantifiable. The BLM is in the very initial stages of considering similar vegetation and fuels treatments west of the Little Salmon River. The extent and location of potential treatments has not been identified and the timing of the project is very uncertain – a minimum of three years in the future. The changes in forest structures that are described under direct and indirect effects would add to the changes that have already occurred and would provide structure diversity to the landscape and also forest management options in the future.

Canopy Cover

Canopy cover would be reduced on approximately 625 acres in the Proposed Action, 632 acres in Alternative 2, and 646 acres in Alternative 3. Reductions in canopy cover on private lands within the analysis area are likely, but the timing amount is not quantifiable. The Payette National Forest has no projects scheduled in the analysis area. These alternatives would lower stand densities in less than 1% of the analysis area and 28% of the project area.

No Action

Wildfires start almost every year somewhere in the Little Salmon River subbasin. Fire spread depends on weather (i.e., temperature, wind, and relative humidity), topography, and fuel (i.e., fuel model, and fuel moisture). The longer fire or fuel management is absent from an area the greater the total biomass quantity and continuous fuel. When a wildfire starts these factors result in more intense fire behavior and increased resistance to control allowing larger fires. Fires with the higher intensities and increased area cause more vegetation to be damaged or destroyed. This includes large, old trees, which may have withstood fires for centuries.

The implementation of no action alternative, with current forest conditions (live and dead biomass) provides a greater risk of epidemic stand loss to diseases and insects. In these finite systems of moisture and sunlight only a certain amount of live biomass can be supported per acre. Consequently, the more individual trees on an acre, the smaller the allocation of water and the necessary elements per tree resulting in subsequent lower vigor and growth per individual tree. Plants produce different hormones and other chemicals when growing at various rates that affect the potential size of these plants. Plants that receive more moisture and sunlight grow faster and have the potential to achieve a larger size.

Insect infestation would increase with the no action alternative. Forest stands under stress have a higher potential to attract bark beetles. When trees are stressed they produce chemicals which are natural attraction signals to bark beetles. Bark beetles are a natural thinning agent and a necessary part of the ecosystem in creating habitat for certain wildlife species, and reducing stress for the remaining live trees. With the increase in vulnerable food supplies (stressed trees) insect populations can build to epidemic proportions. Epidemics of beetles can destroy even the healthiest trees due to mass attacks. Bark beetles can also carry spores that inoculate trees with saprophytic microorganisms that can weaken the bole and increases the rate of bole snap and decomposition. This effect would cause many trees (snags) killed by beetles to fall to the ground in a relatively short time decreasing their value for cavity nesters, and increasing the amount of fuel for high intensity wildfire.

Many of forest stands proposed for treatment in the project area are in a state of declining vigor. Trees are generally more susceptible to root rots and disease when at low vigor. With the selection of no action, tree vigor would continue to decline and would likely result in more tree deaths attributable to root rot, especially Douglas-fir and the more susceptible grand fir.

The dominance of the grand fir cover type could be expected to increase in the near term. In the absence of wildfire, it can be expected that grand fire would dominate the entire project area.

3.2.2 Fuels

The geographic scope of the fuels analysis is focused on the project area. Fuel treatments are designed to reduce surface fuel loading, remove ladder fuels, thin canopy fuels, and improve stand resiliency to future wildland fire by restoring open stands of larger diameter fire-resistant species. The following indicators were used to measure the effectiveness of the proposed treatments at achieving these objectives and to compare alternative: surface biomass, canopy base height, fire type, and tree mortality.

Affected Environment

Historically, the project area was dominated by open stands of fire resistant ponderosa pine, Douglas-fir, with mixed stands of western larch and grand fir occurring on the cooler, wetter aspects. These dry, open forests were maintained predominantly by frequent low severity surface fires, with mixed severity fires occurring on higher elevations and on northerly aspects. Although occasional stand replacement fires may have occurred, this was not the dominant fire regime (Agee and Skinner 2005, Graham et al. 2004).

Due to a century of fire suppression in this area, surface and ladder fuels have accumulated beyond the historic range leading to the potential for more intense fire behavior. In the absence of disturbance, the encroachment of shade-tolerant Douglas-fir and grand fir had led to an overstocked condition with increased ladder fuels. The abundance of young seedling/saplings, as well as the lower limbs retained by these shade-tolerant species, provide a ladder for surface fire to reach the canopy fuels by torching and initiating crown fire behavior. Canopy closure has also increased, increasing the potential for crown fire spread.

Frequent, low severity wildfires would have reduced the surface biomass, particularly in the litter layers, duff, and fine fuels (less than 3-inch diameter). In the past century, surface biomass has continued to build up faster than natural decomposition in the absence of fire. Increased stand densities of shade tolerant species has increased the production of woody material that regularly contributes to surface fuel loadings. Current fuel loadings would result in increased fire intensity, and resulting wildfire severity, across the project area.

Throughout the project area, there are a significant number of large diameter ponderosa pine trees, remnant of the historical frequent, low severity fire regime that maintained open stands of these seral species. While many of these trees are scattered throughout the project area, primarily on open ridges, there are 195.5 acres that meet seral old growth criteria. The very existence of these old trees is currently threatened by the risk of uncharacteristic wildfires.

Surface Biomass

Surface biomass represents the fuel loading that contributes to wildfire intensity and severity. Surface biomass is comprised of litter and duff, fine fuels such as grass and needles, small twigs and branches, and large diameter material in the form of downed logs and stumps.

Current conditions in the project area average over 25 tons per acre of surface biomass across the project area. Stand conditions range from 7.9 to 37.5 tons per acre. The higher fuel loads may contribute to high intensity wildfire with severe effects. Recent small fires occurring on or near the project area exhibited surface fire behavior that resulted in high mortality of the overstory trees due to bole and crown scorch from the high fire intensity burning of the high surface fuel loads.

In most stands, the majority of surface biomass can be found in the duff layer, comprising up to 60% of the total surface biomass. This organic material has built up very gradually over time in the absence of fire, as decomposition rates are slightly lower than fuel input. While the larger diameter fuels may build up rather quickly as trees and brush shed their dead material and snags fall, these fuels gradually break down and shift into the duff layer. Some stands have a large component of large diameter material on the surface, with 20-30% of the surface biomass in the >3" size class.

Due to the increased depth of surface biomass, surface fire would have greater amount of material to consume leading to increased fire intensities. Higher flame lengths would scorch the boles and crowns of large trees and increasing the likelihood of fire moving up into the canopy fuels. Long duration ground fires in the deep duff and litter layers may result in increased soil temperatures and tree root mortality. Increased crown, bole, and root damage may leave stressed trees vulnerable to insect attacks (Hood 2010). Increased duff consumption may leave large areas of mineral soil exposed, with reduced seed stock available for post fire regeneration.

Canopy Base Height

The height to the base of the canopy indicates the presence of seedling/saplings and brush in the understory, as well as the encroachment of shade-tolerant tree species that retain limbs low to the ground. Low canopy base height (CBH) values indicate the presence of ladder fuels that make the stand vulnerable to torching and crown fire initiation.

Canopy base height should be considerably higher than the height of expected flame lengths for a specified fuel bed in order to avoid torching and potential crown-fire initiation (Scott 2003, Scott and Reinhardt 2001). For many dry forests, this value may be 20 feet or more (Peterson et al. 2005). Agee et al. (2000) suggest that 6 ft CBH is associated with crown fire initiation with low to moderate foliar moisture content and 4 foot flame lengths, while 20 ft CBH requires 8 ft. flame lengths at low foliar moisture content. Stands with CBH values greater than 40 ft are at much lower risk to crown fire initiation. This analysis utilizes 6, 20, and 40 foot breaks as critical thresholds in canopy base height.

The current average CBH for the project area is approximately 16 feet above the ground, with stand conditions ranging from 2 feet to 57 feet. Approximately 68% of the project area currently has CBH values less than 20 feet, with 30% less than 6 feet.

Fire Type

Fire Type is classified as surface fire, passive crowning, active crowning, or conditional crowning. Surface fire moves through the available fuels on the surface, with limited opportunity to move up into the crowns of the stands. Passive crowning indicates the presence of surface fuel loading (surface biomass) and ladder fuels (low CBH) to allow surface fire to move up into the crowns, while active crown fire has all elements present (surface fuel loading, ladder fuels, and dense canopy fuels) for crown fire to establish and move to adjacent tree crowns. Stands classified as conditional crown fire type do not have the surface fuels loading or low CBH for crown fire to initiate, although high stand densities are present that would provide for active crown fire, under the condition that crown fire has already become established in adjacent stands.

Current stand conditions would contribute to passive crown fire on 56% of the project area, while only 30% would experience surface fire behavior under severe wildfire conditions. Additionally, 9% would lend itself to conditional and 4% to active crown fire behavior. The conditional crown fire stands are adjacent to stands that would exhibit passive crown fire, making them at risk to crown fire coming through the stand. Under moderate burning conditions, approximately 34% of the area would experience passive crown fire behavior, while 66% would experience surface fire behavior.

The combustion of canopy fuels creates fire brands that can be lofted and carried up to a mile or further downwind (Cohen 1999; Reinhardt et al. 2008). This makes crown fires difficult to control. Successful suppression efforts require bringing the crown fire back down to a surface fire where firefighters and equipment can fight the fire on the ground. Firefighters tend to focus suppression efforts along prominent ridge tops, waterways, and roads where terrain and fuel conditions allow moderate fire behavior. Current conditions would limit suppression options along the prominent ridge, making it difficult to control a wildfire directly above homes and the Highway 95 corridor.

Where these fire brands land, they can ignite surface fuels up to a mile or further downwind, including susceptible building materials of private structures in the WUI. Private homeowners need to prepare their homes for not only direct contact with surface and crown fire spread to their structures, but also to lofted embers that may fall on their roofs and other material.

Mortality

Tree mortality is used as a measure of fire severity, or stand resiliency, as it represents the ability of a stand to withstand, or succumb to a wildfire. Fire-caused mortality is based on the expected fire behavior, based on fuel loading, CBH, and stand densities, as well as tree species and size class.

Current conditions across the project area, as shown in the surface fuel loading and ladder fuels, as well as fire type, would result in uncharacteristically high mortality due to wildfire in both severe and moderate fire scenarios. Direct fire damage including percent crown volume scorched (Stephens and Finney 2002) and bark char have been shown to be key factors in predicting post fire tree mortality (van Mantgem and Schwartz 2003). Under severe wildfire conditions, the average potential mortality across the project area is estimated to be 82% of the existing basal area. Approximately 63% of the project area is currently at risk of over 90% mortality due to severe wildfires.

Under moderate burning conditions, the average mortality across the project area would be 32% of the existing basal area. Approximately 24% of the project area would experience less than 20% mortality, while 65% of the project area would experience 20-50% mortality due to moderate wildfires. This does not account for post fire stress and secondary mortality from insects and pathogens, which can be expected to increase post fire mortality.

Species characteristics, such as bark thickness, root depth, and canopy base height make species such as ponderosa pine and Douglas-fir trees fire resistant. The current fuel conditions in these stands, however, make these trees more susceptible fire-caused mortality. High surface fuel loadings at the base of these large trees increase the potential flame length, thus increasing the amount of crown and bole scorch. Combined with the steep slopes and the high temperatures typical of this area during fire season, increased flame lengths and fire intensities result in high tree mortality even to these large fire resistant trees.

In 2007, a 5-acre wildfire occurred within the project area, in proposed treatment unit 15. Although the fire exhibited only surface fire behavior, high fuel loadings and dense canopy resulted in high mortality of all size trees, all species (Douglas-fir and ponderosa pine) due to crown and bole scorch.

Effects of Alternatives

Surface Biomass

<u>Proposed Action</u>

This alternative would treat 627 acres with mechanical harvest, and 789 acres with prescribed burning only. All slash created from harvest activities would be treated by prescribed burning or piling and burning to mitigate short-term buildup of surface biomass. This alternative treats 168 acres on private land with prescribed burning, bringing the treatment and reduction in surface fuel loading close to several structures. In some cases, the treatment may be within 50 feet of private homes. This alternative eliminates harvest in units 7 and 8, but brings treatment closer to private structures with the addition of unit 15. The reduction of surface biomass in unit 15 would facilitate the prescribe burn on the ridge along the private property boundary and immediately above structures.

All acres would undergo a second treatment with prescribed fire within 15-20 years. In the treated stands, surface biomass is reduced by 35% in the first treatment and 42% after two treatments. While conditions continue to build up in the untreated acres, overall surface biomass would be reduced across the project area by 20%.

Surface biomass would be reduced across all size classes, although the greatest reduction in tons/acre tends to be in the litter and duff, which has the greatest amount of material present. Post treatment, the increase in surface biomass can be attributed largely to 3+ inch size class in the form of branch wood, with some tree mortality and snag fall contributing to the down wood. Prescribed burning is designed to consume much of the available fine fuels, while killing smaller trees in the understory and lower limbs of the retention trees. The resulting dead material would subsequently fall into the surface 3+ inch pool. These larger size fuels build up quickly post burn treatment, while the duff and litter layers build very slowly over time, indicating the need for periodic follow-up treatments with prescribed fire.

The fuels treatments would provide benefits at both the local site-specific level and the landscape level. In addition to the localized decrease of fuel loads and potential surface fire behavior, the position of the units along prominent ridgelines and road corridors would provide areas for safe and effective control opportunities for fire suppression efforts as well as prescribed burning activities (Agee et al. 2000; Martinson and Omi 2003).

Alternative 2 Original 2007 Proposal

The effects of alternative 2 would be similar to the Proposed Action alternative, but with 663 acres of harvest (36 acres more than Proposed Action), and 618 acres with prescribed burning only (171 acres less than Proposed Action). All slash created from harvest activities would be treated by prescribed burning or piling and burning to mitigate short-term buildup of surface biomass. All acres would undergo a second treatment with prescribed fire within 15-20 years. In the treated stands, surface biomass is reduced by 35% in the first treatment and 42% after two treatments. While conditions continue to build up in the untreated acres, overall surface biomass would be reduced across the project area by 20%.

Alternative 3 No Temporary Roads

This alternative is very similar to Proposed Action. The addition of unit 15 on the ridge above private property enhances fuel reduction treatment of the stand by mechanical harvest prior to burning.

No Action

Under the No Action alternative, continued fire exclusion and the current trend in fuel conditions would continue. Surface biomass would continue to build up gradually over time in all size classes, contributing to increased wildfire intensity and severity.

Canopy Base Height

Proposed Action

The average CBH value across the project area is raised over the 20-foot critical value, but with 46% of the project area remaining below 20 feet after the first treatment. While CBH is effectively raised in treated stands, conditions remain low in untreated stands. In addition, 171 acres of private property would be treated, raising the CBH above 20 feet on approximately 99 acres of private land. The other 69 acres of private land would likely experience increased undergrowth and tree regeneration after prescribed burn treatments, keeping CBH low.

Due to canopy removal and site preparation, tree regeneration and brush growth is enhanced by the initial treatment. A follow up underburn treatment 15 years later would raise the average CBH value for the entire project area to 30 feet, leaving 35% of the project area below 20 ft. Of the treated stands, only 19% remain below 20 feet after the follow up treatment, with only 2% under 6 feet. The continued low CBH in these stands is likely due to the increased regeneration of seedling and saplings into the understory after the prescribed burn, indicating a continued need for periodic treatment with prescribed fire.

Alternative 2 Original 2007 Proposal

The effects of treatments in alternative 2 would be similar to the Proposed Action with 171 fewer acres of prescribed burning.

Alternative 3 No Temporary Roads

The effects of treatments in alternative 3 would be very similar to the Proposed Action, with 178 fewer acres of prescribed burning.

No Action

Under the No Action alternative, stand conditions would continue on the current trend with increased acres of low CBH across the project area. These stands are and will continue to be at high risk of torching and crown fire behavior due to the presence of ladder fuels.

Fire Type

Common to all Action Alternatives

Peterson et al. (2005) performed an extensive review of scientific literature that supports the effectiveness of fuel treatments in reducing the probability of crown fire. Potentially effective techniques for reducing crown-fire occurrence and severity were found to include (1) increase canopy base height, (2) reduce canopy bulk density, (3) reduce forest canopy continuity, and (4) reduce surface fuel (Peterson et al. 2005).

Stephens and Moghaddas (2005) found that prescribed fire only and mechanical followed by prescribed fire treatments resulted in the lowest average fireline intensities, rate of spread, and predicted mortality. Prescribed fire is a useful tool that can effectively alter potential fire behavior by reducing surface and ladder fuels. Prescribed burning often directly consumes some of the lowest ladder fuels (shrubs, dead trees, needle drape, small trees) and scorches the lower branches of the overstory trees, effectively raising the live crown above the ground surface. Staged treatments of prescribed fire can effectively reduce fire hazard, particularly in open stands where canopy fuels are already low enough to inhibit crown fire spread (Agee and Skinner 2005).

Although thinning stands would reduce the potential for crown fire, opening up these stands to increase the wind exposure and temperature and lower relative humidity would potentially increase surface fire behavior. Thinning coupled with prescribed burning would reduce surface fuel loads in addition to removing ladder fuels and reducing canopy fuels. Raymond and Peterson (2005) found that increased fire behavior in these more open stand conditions would result in lower severity due to lower fuel accumulations and less likelihood of crown fire initiation and mortality. Additionally, Graham et al. (2004) found that increased solar radiation along with increased soil nutrient availability from prescribed burning would promote understory vegetation production in the form of forbs, grasses, and low shrubs. While these live fuels are still green, their higher foliar moisture would have a dampening effect on fire behavior (Agee et al. 2000), but once cured out would contribute to fire behavior.

The strategic location of the treatments provides for effective reduction in crown fire behavior along ridges and road systems that may be utilized for control lines in wildfire suppression efforts.

Proposed Action

The reduction of surface fuels through prescribed burning and piling and burning would reduce expected flame lengths while the removal of ladder fuels through thinning from below and prescribed burn treatments would and raise CBH. The result of this combination of treatments would be a decreased likelihood of torching and crown fire spread. Thinning of stand densities through proposed harvest treatments would decrease the likelihood of active crown fire spread by reducing canopy fuels (Graham et al. 2004).

By thinning followed by prescribed burning twice in a 15-year period, this alternative would effectively reduce potential crown fire to 30% of the project area wildfires burning under severe conditions. Similarly, the potential for crown fire under moderate wildfire conditions would be reduced to 13% of the project area. Additional reduction of crown fire to surface fire would occur on 35% of the treated private land under severe conditions and 49% under moderate conditions. Units 7 and 8 are eliminated in this alternative, but replaced with unit 15, which moves treatment closer to private homes. Mechanical harvest in unit 15 would facilitate the prescribed burn on the ridges directly above private houses by reducing surface, ladder, and crown fuels prior to ignition through mechanical treatments.

Alternative 2 – Original 2007 Proposal

The effects of alternative 2 would be very similar to the Proposed Action with 171 fewer acres of prescribed burning due to the elimination of treatment on private lands.

Alternative 3 – No Temporary Roads

The effects of alternative 3 would be very similar to the Proposed Action with 178 fewer acres of prescribed burning due to the elimination of treatment on private lands.

No Action

Under this alternative, the existing conditions can be expected to continue. As overstory tree species continue to convert from the fire resistant ponderosa pine and western larch toward less fire resistant fir and spruce species, increased crown closure and ladder fuels will increase the likelihood of crown fire initiation. Studies have shown that the no treatment option is ineffective in reducing fire behavior (Stephens and Moghaddas 2005).

Mortality

Proposed Action

This measure best captures the effectiveness of the combination of surface fuel reduction, thinning from below to remove ladder fuels, thinning canopy fuels, and leave tree size class and species preference (Agee and Skinner 2005; Raymond and Peterson 200; Stephens and Moghaddas 2005; Martinson and Omi 2003).

Average wildfire-caused mortality across the project area would decrease for both severe and moderate burning conditions. Under severe conditions, the average mortality would decrease from 82% to 67% after the second prescribed burn treatment. The biggest change is in the amount of area that would experience greater than 90% mortality, decreasing from 63% to 47% of the project area after the first treatment and 22% or the project area after the second prescribed burn treatment. Mortality is reported as a percent of the basal area within a stand (not number of trees). Treated stands would have lower basal area, with fewer small trees per acre, post treatment, thus overall mortality would be lower, focused primarily in smaller, less resistant trees. Due to thinning from below, average dbh would increase with fewer trees per acre. Basal area is concentrated in larger diameter size classes, so fewer trees are represented in the mortality. This alternative reduces mortality on 162 acres of seral old growth stands.

Under moderate conditions, average mortality is reduced from 32% to 26% after the initial treatment and 22% after the follow up treatment. The biggest change can be seen in the amount of area with less than 20% mortality, increasing from 24% to 85% of the project area after two treatments. Mortality would also be reduced under both severe and moderate fire scenarios on private land and near structures.

This analysis does not account for mortality from secondary effects such as stress, insects, and pathogens. Recent and ongoing research in the Northern Rockies and central Idaho by Jain and Graham (2007) suggests that, even a prescribed fire scenario under mild weather conditions may result in increased mortality to the desired leave trees than depicted in the analysis due to stress caused by killing the feeder roots that have moved up into the deep organic layers around the base of large diameter pine trees. Additional care must also be taken to ensure prescribed fire applications to these stands occur when conditions allow for dormant feeder roots to gradually move down into the organic soil.

Raymond and Peterson (2005) suggest that crown damage may be a better indicator of tree mortality than cambial damage under wildfire conditions, but the opposite may be true for prescribed fires, which may burn slower for, but may smolder for longer periods of time. Several studies have attributed large-diameter tree mortality to basal injury caused by duff mound smoldering. As recommended by Hood (2010) and Jain and Graham (2007), disturbing the organic material around the base of large diameter ponderosa pine trees through burning or mixing should be accomplished when temperatures of the lower duff layers are below 40ºF and lower duff moisture exceeds 100%. Several treatments may be necessary to encourage the root system development back into the mineral soil prior to prescribe fire applications.

Alternative 2 – Original 2007 Proposal

The effects of alternative 2 would be similar to the Proposed Action, but with 171 acres less of prescribed burning; 5 acres less of treatments in old growth stands; and 27 acres less of mechanical treatment prior to prescribed burning (Eliminates Unit 15).

Alternative 3 – No Temporary Roads

The effects of alternative 3 would be similar to the Proposed Action, but with 178 acres less of prescribed burning and 18 acres less of mechanical treatment prior to prescribed burning.

No Action

In the continued absence of fire, theses stand conditions would continue to move toward higher mortality. As overstory tree species continue to convert from the fire resistant ponderosa pine toward less fire resistant fir and spruce species, mortality would increase as these thin-barked, dense crowned, shallow rooted species are less able to withstand even low severity fires. Stephens and Moghaddas (2005) study results show that the no treatment option is ineffective at reducing fire behavior and mortality. Old growth stands would continue to be at high risk of mortality due to wildfire.

Cumulative Impacts

The cumulative effects analysis considers adjacent vegetation treatment projects outside the project area within the Hazard Creek, Hard Creek, and Little Salmon River – Round Valley Creek watersheds.

There are currently no ongoing or planned projects on the Payette National Forest or state lands adjacent to or in proximity to the project area. The BLM had conducted small scale salvage removal of trees north of Hazard Creek and is in the preliminary stages of planning vegetation and fuels management activities across the Little Salmon River drainage. Additionally, some local landowners continue to alter the fuels on their property and surrounding their private structures.

Common to All Action Alternatives

These alternatives all provide mechanical and prescribed fire fuel reduction treatments, differing in the amount and location of those treatments. These fuel reduction treatments can reduce the intensity and severity of a wildfire burning through those areas. How these treatments tie in with other projects on adjacent lands may enhance fire suppression efforts and decrease the overall wildfire severity. Any future development within the project area would benefit from reduced fire risk under the action alternatives because of the added fire protection these alternatives offer.

No Action

This alternative would have no immediate effect on fuel conditions in the project area. However, fuel loadings would continue to increase, increased stand density and ladder fuels would continue to lower canopy base heights, and less fire resistant species would dominate all stands. The result is that more of the project area could sustain fires with greater crown fire potential, and increased tree mortality. Over time fire suppression options would become even more limited, increasing the risk of property and resource damage, and firefighter and public injury.

Wildfire activity in the project area would be difficult to suppress along the ridge or roads above private structures, posing a great risk to private property and the highway 95 corridor. Fire activity and smoke would impact traffic safety on the highway and may require short– or long–term closures of the only road connecting north Idaho and South Idaho. Power and phone lines that feed the Salmon River corridor from above Riggins to below White Bird may also be disrupted for long periods of time.

3.2.3 Transportation

The transportation system analysis consists of both the road and trail systems, within the project area. Several indicators are used for roads to track the effects on the transportation system including; *Road Decommissioning, Conversion of Road Designation, Miles of Road (Permanent and Temporary).* The indicator for trails, *Miles of trails,* includes both summer trails and winter snowmobile trails.

Affected Environment

Logistically for management activities, access to the project area is on two roads off U.S. Highway 95 (Attachment, **Map 1**). The road entering the project area on the north end crosses private property. The BLM has a temporary non-public easement across this property. A portion of the road will include construction of a new road on the private property. Once the timber sale is complete, the easement expires. The term of the easement is 4 years from the date of sale. This could make logistics prohibitive for other project items such as prescribed burning.

A road that the BLM has a permanent non-exclusive easement with various ownerships including the Idaho Department of Lands accesses the southern end of the project.

The BLM lands in the project area have had very little active management applied to them in the last 25 years and in some areas the last 40 years. As noted above none of the primary access routes are owned or regularly maintained by the BLM. Secondary roads do exist within much of the project area where slopes are less than 50 percent.

The roads across BLM land within the project area are all historic roads that evolved through necessity or tradition. Many are serpentine roads a result of land ownership patterns and historic tractor logging practices. Although no routine maintenance has occurred on these roads, overall they are in very stable condition. However, there are four sites, three with inadequate drainage structures and one on unstable substrate, where substantial road failure has occurred. These failures appear to be many years old. One or two of the four would be treated as part of this project, dependent on which alternative is chosen.

Inventory for this project resulted in approximately 30.1 miles of existing road in the project area (excluding U.S. Highway 95). At the time of the Record of Decision (ROD) for the RMP many of the existing roads within the project area had not been mapped and therefore were not reflected as existing routes with designations of open or closed to motorized vehicles by the public in the RMP. Regardless of the physical condition of the route, i.e., passable by some type of motorized vehicle, newly mapped BLM routes in this project area are by default considered closed to public motorized vehicles. Therefore, the 15.3 miles shown in Table 16 is currently closed to public motorized vehicles. Table 16 summarizes the current state of the road system within the project area.

Table 16. Current Road Miles by Owner

Owner	Length of Existing Road (Miles) by Type			Percent of Total
	Road Open Yearlong per RMP*	Road Closed Yearlong per RMP*	Road Without RMP Designation	
BLM	5.1	3.2	15.3	78.4%
Idaho County	0.8			2.7%
Dept. of Trans.	0.1			0.3%
Private	3.2*	2.4*		18.6%

*Route Designations apply only to BLM roads – other ownerships reflect current status with no public easement by BLM

Existing private and IDL roads outside of the project area may be utilized. The BLM has permanent non-public access easements over the private roads. . The BLM also has a permanent non-public access easement over the Walton Trail road on IDL lands. Another side road off this easement will require a road maintenance agreement with IDL and is common to all alternatives. Additional roads that are needed for access but are not within the project area include:

- 0.7 miles of IDL roads Walton Trail (existing permanent easement)
- 0.2 miles of IDL road (no easement)
- 1.2 mile of private roads on PFPC McCall Investment LLC property (existing permanent easement).

There are no designated trails within the project area. Some ATV use occurs on the project area with access being primarily off the existing Walton Trail road and through private lands along U.S. Highway 95. The extent of this activity is unknown but it is recognized to occur particularly for big game hunting access. One road segment that is designated as closed in the RMP is currently being utilized as an ATV trail.

There is an increasing demand from user groups for motorized trail opportunities. A concern raised during scoping was that BLM would be reducing access.

Effects of Alternatives

<u>Common to All Action Alternatives</u>

Road Decommissioning, Conversion to Other Use, Closure

Roads analysis has identified a roads system needed for safe and efficient travel and for administration, utilization and protection. The alternatives analyzed consider opportunities for alterations in route designation (open versus closed to public motorized vehicles) as well as decommissioning. A detailed road designation table by road segment can be found in the project file and is reflected in **Maps 3, 5, and 7**.

Figure 6. Washed out road crossing that BLM would not use under the Proposed Action and Alternative 3 that could be closed to motorized use.

Existing roads that are no longer needed to meet resource management objectives are considered for decommissioning. Based on field information about the roads condition, a road to be decommissioned is targeted for either abandonment or some level of mechanical alteration. Roads abandoned are already stable and revegetating naturally. No physical work is required for abandonment, just a change in the database to reflect the fact that it no longer will be tracked as a road.

However, roads to be decommissioned will require some physical work in addition to the database change.

As noted previously despite lacking some physical impairment to travel or signage, a non-designated road in the RMP is considered closed to public motorized travel. As part of this project those routes newly designated as closed will be incorporated in the transportation database for the revised Travel Management Plan. Also on the ground impairment to travel could be obtained by the same activities used for decommissioning, but usually would be by some type of blockage of the entrance to the road.

Therefore, this project will include route designations to be made as part of the decision for those roads occurring on BLM.

Proposed Action

The Proposed Action has 7.7 miles of road decommissioning. This is fewer than Alternative 3. Therefore, this alternative would incur less cost in road decommissioning treatments; provide reasonable access for forest and fire management while removing poorly located or designed roads. This includes segments with RMP designations as open, closed and newly designated closed roads. There would be some alterations in open road orientation, and a minor reduction of open road miles. Both previously RMP designated and newly designated closed roads will have physical barriers to motorized travel. (See Table 17; Attachment, **Map 3**).

Alternative 2 – 2007 Original Proposal

Alternative 2 does not include any miles of decommissioning. Those roads on the north end of the project lack permanent administrative or public access. The owner controlling access to these roads maintains locked gates, and is unwilling to grant easements to the BLM. Those roads on the south end of the project have administrative access only, although there are currently no locked gates or signage preventing public ingress. In addition, many road segments throughout the project have revegetated to the point where vehicle traffic is not possible or limited to ATVs, and are expected to become fully impassable in the near future. Therefore, this alternative does not propose decommissioning of any roads. However, both previously RMP designated and newly designated closed roads will have physical barriers to motorized travel. (See Table 17; Attachment, **Map 5**).

Alternative 3 – No Temporary Roads

Alternative 3 has the largest number of miles of road decommissioning. Therefore, this alternative would incur the greatest cost in road decommissioning treatments; provide reduced access for forest and fire management while removing some well-located and designed roads. This includes segments with RMP designations as open, closed and newly designated closed roads. There would be some alterations in open road orientation, and a minor reduction of open road miles. (See Table 17; Attachment, **Map 7**).

Table 17. Road Decommissioning, Conversion, and Designation Changes

Item	Proposed	Alternative 2	Alternative 3
Decommissioned Miles	7.7	0.0	10.7
Conversion to ATV Trail Miles	0	0	0
Open to Motorized Travel Miles	5.0	5.1	4.9
Road Closure Miles	10.9	18.6	8.1

Permanent and Temporary Road Miles

The following actions have direct and indirect effects to watershed, fisheries and wildlife and are reflected in the impacts analysis in those sections. The road usage outlined in this analysis are for both timber harvest and fuels reduction work. The differences between alternatives are twofold. First Alternatives 2 and 3 differ in logging systems being utilized on steep slopes with no cable yarding in Alternative 3 with little difference in harvested acres and location. The Proposed Action differs significantly from both 2 and 3 in that different areas are being harvested thereby reducing the amount of existing road needed as well as no construction of a new bridge. As shown in Table 18 total miles of road by alternative are Proposed Action: 13.28 miles; Alternative 2: 17.37 miles, and Alternative 3: 14.27 miles. The design features regarding roads noted in section 2.1.5 apply.

Permanent Road Construction

There is only one permanent road proposed in all the action alternatives (Table 18). This would be on private property on which the BLM has a temporary easement. It is needed to access the northern portion of the project area. Other possible routes were explored. These other routes included bridging Hazard or Hard Creek on the north or constructing a long upper slope road from the south. Both of these were dropped from consideration due to conflicts with other resource values and expense.

Temporary Road Construction
The Proposed Action and Alternative 3 were developed in part to address concerns over the amount of road usage in the Proposed Action as well as ground based yarding systems. All temporary roads would exist for 1-4 years. Following decommissioning (full removal of the road template), a corridor through the trees would remain for several years until new trees grow up on the site. There are specific Environmental Design Features (See 2.1.5) that avoid and mitigate some of the impacts dealing specifically with soils and sediment issues. Table 18 illustrates the miles of temporary road by action alternative.

Minor and Major Reconstruction/Maintenance
Field surveys were conducted to determine the condition of the roads in the project area and the maintenance needs required to prepare the roads for access to the treatment areas. As stated earlier most of the roads are in stable condition despite a lack of maintenance. Therefore, most of the existing roads require only minor reconstruction or maintenance. However, as stated previously some road failure areas would be treated. The first is a section requiring new road alignment (0.11 miles) as well as drainage structure construction. This is common to all the action alternatives. The second again would require new road alignment (0.06 miles) and a bridge. Table 18 illustrates these actions by ownership in the project area.

Table 18. Road and Bridge Construction

Item	Proposed Action	Alternative 2	Alternative 3
Permanent Road Construction Private (Miles)	0.15	0.15	0.15
Major Reconstruction BLM (Miles)	0.11	0.17	0.17
Bridge Construction BLM	0	1	1
Minor Reconstruction BLM (Miles)	10.97	14.48	13.24
Minor Reconstruction Private (Miles)	0.68	0.95	0.71
Temporary Road Construction on BLM (Miles)	1.37	1.62	0.0

No Action

Under the No Action alternative, the road system, in the area would remain unchanged in the short-term. The four sites where substantial road failure has occurred, although somewhat over grown, would remain as chronic sediment sources. Through the lack of maintenance, encroaching vegetation would continue ultimately making more roads impassable to vehicles. Also existing routes without designations in the ROD would remain so until an RMP amendment is completed.

Miles of Trails

Common to All Action Alternatives

The miles of roads currently passable and utilized by to the public would change under all action alternatives. There would be a no net increase in designated trails open to motorized Off Highway Vehicles (OHV). Some roads currently being utilized as trails will either be decommissioned or closed and thereby reduce public access by motorized vehicles. Table 17 reflects the impacts of decommissioning and closures on OHV use in the project area.

No Action

The miles of trails available to the public would not change under this alternative.

Cumulative Impacts

The cumulative impacts of proposed road actions vary by alternative. In all action alternatives there will be a net gain of permanent road on private land unless the landowner eventually decommissions that 0.15 miles. There would be no other gain of roads.

There are cumulative impacts of decommissioning. First is that there would be fewer roads on the landscape for both the Proposed Action and Alternative 3. This action would take some roads that are currently open, and/or closed to all motorized use by the public and remove them entirely from future consideration in transportation planning.

The combination of decommissioning and the of recommendations in this document to change road designation would allow amending the RMP in accordance with planning and travel management/planning regulation to proceed separate from the forest management decision to implement this project. When the Federal Register notices (NOI to amend RMP and/or close roads to public use) are published, this EA could be used (referenced).

3.2.4 Air Quality (Smoke Management)

The analysis area for air quality includes the project area and the airsheds immediately surrounding it that may potentially be affected by smoke emissions. The project area is located in Idaho Airshed No. 15. The analysis of air quality includes identifying the adjacent and downwind airsheds of concern (Class I and non-attainment areas) and comparing the amounts of smoke and particulate matter to be produced as a result of the fuels treatment activities associated with each alternative. The analysis includes discussion of the consequences of wildfire in regards to air quality.

Affected Environment

The Bureau of Land Management is a party to the North Idaho Smoke Management Memorandum of Agreement (MOA), which initiated the joint smoke management program with the state of Montana through the Smoke Management Monitoring Unit located in Missoula, Montana. This MOA can be found in the project file. The Operating Guide for the Montana/Idaho Smoke Management Group is based upon the Environmental Protection Agency Interim Air Quality Policy on Wildland and Prescribed Fires. The Smoke Monitoring Unit coordinates prescribe burn activities through meteorological scheduling in order to ensure that cumulative air quality impacts are minimized.

Air quality impacts due to prescribed fire smoke result from a combination of emission production and atmospheric dispersion (Sandberg et. al 2002). Dispersion is dependent on meteorological conditions including seasonality, large-scale prevailing wind patterns, atmospheric stability, and local terrain-influenced weather patterns. The Smoke Monitoring Unit utilizes dispersion forecasts as a tool for making daily burn recommendations to members of the MT/ID Smoke Management Group.

The Clean Air Act requires that the Environmental Protection Agency (EPA) identify pollutants that have adverse effects on public health and welfare and to establish air quality standards for each pollutant. Each state is also required to develop an implementation plan to maintain air quality. The EPA has issued National Ambient Air Quality Standards (NAAQS) for sulfur dioxide, carbon monoxide, ozone, nitrogen dioxide, lead and particulate matter 10 microns in diameter or smaller (PM 10) and 2.5 microns and smaller (PM 2.5; Table 19). Idaho maintains similar standards for these pollutants.

Table 19. National Ambient Air Quality Standards for PM 10 and PM 2.5

		NAAQS
PM 10	24-hour average	150µg/m^3
	Annual arithmetic Mean	revoked
PM 2.5	24-hour average	35µg/m^3
	Annual arithmetic Mean	15µg/m^3

(2007 revision, 40 CFR Part 51)

Air quality associated with the Bally Mountain Project analysis area is generally considered good to excellent most of the year. Local adverse effects result from dust from native-surfaced roads and smoke from prescribed burning, agricultural burning, and wildfires. Due to active fire suppression, current smoke emissions are significantly reduced from historical averages, especially during the wildfire season (Quigley and Arbelbide 1997).

The Bally Mountain Project analysis area is unclassified, but is considered to be in compliance with the NAAQS. The closest non-attainment areas include the McCall 16 miles to the southeast, Salmon over 100 miles east, and Missoula approximately 140 miles to the northeast. The average large-scale airflow is generally from a westerly direction throughout the year.

The Selway-Bitterroot Wilderness, 70 air miles to the northeast, and the Hells Canyon National Recreation Area, 11 air miles to the west, are the closest Class I areas to the Bally Mountain Project analysis area. Class I areas receive the highest levels of protection under the Prevention of Significant Deterioration (PSD) program. All other areas, including the Bally Mountain Project analysis area, are designated Class II areas.

Effects of Alternatives

Common to All Action Alternatives

All action alternatives would require prescribed burning to reduce fuel loadings to an acceptable level. The resulting smoke would affect air quality. Fugitive dust generated from road related activities and increased vehicle traffic from logging operations would also temporarily affect air quality.

The action alternatives differ only slightly in the amount of particulate matter produced by prescribed burning (Table 20).

Indirect effects would be a long-term decrease in fuel loading following implementation of prescribed burning. Therefore, there is likely to be a decrease in particulate matter emissions and the impairment of visibility from wildfires when they occur (See Table 21).

Table 20. Approximate Annual Smoke Emissions (tons) from Prescribed Burning Over a 5-year Implementation Period by Alternative

	Proposed Action	Alternative 2	Alternative 3
PM 10	57	54	54
PM 2.5	48	45	46

During ignition operations, daytime heating as well as the heat created by the burn itself will lift smoke above the ridge with prevailing winds carrying the smoke northeast away from any impact zones. Local residents and the Highway 95 corridor may be impacted in the evenings immediately following prescribed burn operations, as large diameter fuels continue to smolder and downslope/down valley winds push residual smoke into the valley bottoms. The amount and duration of these smoke impacts should be limited by limiting the acres burned at one time, by scheduling ignitions early in the day to allow for more complete combustion during daytime conditions, and by planning the ignition to occur prior to a precipitation event that would extinguish the residual fire.

Successful implementation of any prescribed burning in this project area will require close coordination with state highway patrol to manage traffic during periods of low visibility.

No Action

There would be no direct effects on the existing condition of air quality from this alternative because no prescribed burning would occur. No particulate matter would be produced and visibility would not be impaired due to prescribed burning.

Indirect effects would be that fuel loadings continue to increase and wildfires would continue to occur. Wildfires tend to burn much larger acreages than controlled prescribed fire does. Also, wildfires are not planned around other wildfire events or meteorological conditions that would allow for dispersion and transport away from impact zones. Wildfire occurrence without previous fuel reduction is likely to produce two to four times greater particulate matter emissions than would be generated by prescribed fire (Quigley and Arbelbide 1997).

Table 21. Smoke Emissions (tons/acre) Produced from Potential Severe Wildfire Under Existing Fuel Loadings Compared to Reduced Fuel Loadings After Treatment*

	Existing fuel loading	Reduced fuel loading
PM 10	0.168	0.083
PM 2.5	0.143	0.070

*modeled results from First Order Fire Effects Model

Smoke from wildfires would directly impact residents in the immediate area due to steep canyon terrain and diurnal wind patterns that shift to downslope/down canyon light winds in the evening. Nighttime inversions would cause smoke to pool in the valley bottoms creating poor visibility and traffic concerns along U.S. Highway 95.

Cumulative Impacts

The cumulative effects area for air quality is Airshed 15. Consideration of cumulative effects for air quality takes a different approach than for other resources. Past activities in the analysis area don't necessarily require consideration, except in the sense that use of existing roads and facilities may contribute to fugitive dust levels as described above. Present use of and activities in the analysis area are continuing with a current assessment of good to excellent air quality.

All action alternatives would affect air quality. The Proposed Action would produce slightly higher emissions than Alternatives 2 and 3. The Proposed Action would have the most effect on air quality because it has the highest total acres to be treated and produces the most total quantity of particulate emissions. Locally adverse and cumulative impacts to air quality could be expected if extensive prescribed burning occurred under any of the action alternatives, particularly if that burning occurred in conjunction with on-going wildfires or other prescribed burning activities in and adjacent to the airshed. Other potential prescribed burning projects that could have an impact are listed in the beginning of this chapter (description of the past, present and foreseeable future actions). However, design measures and procedures outlined in the North Idaho Smoke Management Memorandum of Agreement are intended to increase the efficiency and effectiveness of communications about, and coordination of, prescribed burning to avoid adverse cumulative effects.

3.2.5 Soils

The study area for soils, including landslide hazard, includes the project area, bounded by Hard Creek to the east, the Little Salmon River to the west, and Hazard Creek to the north.

Affected Environment

The following soils discussion summarizes soil survey information from the United States Department of Agriculture website (http://websoilsurvey.nrcs.usda.gov/app/). The soils within the project area are generally silt loams and gravelly loams, listed below in descending order of percentage within the project area (map unit symbols 59, 106, 69, 66 and 116). It is important to note the erosion hazards described below refer to off-road and off- trail areas after disturbance activities that expose the soil surface. "The soil loss is caused by sheet or rill erosion in off-road or off-trail areas where 50-75 percent of the surface has been exposed by logging, grazing, mining, or other kinds of disturbance." Timber harvest effects on erosion are small in comparison to the effects of the road system used to support the timber harvest. Megahan et al. (2001) summarizes the reported soil disturbance from various logging systems in the Pacific Northwest and British Columbia; he found an average of 21 percent from tractor logging, 13 percent from ground cable logging, 8 percent for skyline logging, and 4 percent for aerial logging.

<u>59-Jughandle-Suttler association.</u> This unit makes up roughly the southern half of the project area. This association consists of very steep soils on mountainsides, with slopes of 40-90 percent. The soil is deep and well drained. It formed in volcanic ash and residuum from granitic rock. Typically the surface layer is brown loam, about 11 inches thick, grading with depth into sandy loam. Decomposing granitic gneiss is at a depth of 41 inches. Permeability is moderately rapid. Runoff is very rapid and the hazard of erosion is very severe.

<u>106-Spokel-Suttler association</u>. This association consists of very steep soils on canyon sides, with slopes of 40-90 percent. This unit occurs mostly in the northern half of the project area, on both the Hazard Creek side (east) and along the Little Salmon (west side). The soil is deep and well drained. The soil formed in residuum and colluvium from granitic rock.

<u>66-Klickson-Rock outcrop complex.</u> This complex consists of very steep, north-facing soils and rock outcrop on canyon sides, with slopes of 40-90 percent. The Klickson cobbly loam makes up about 45 percent of this complex. The soil is deep and well drained. It formed in loess and colluviums from basic igneous rock. The surface layer is brown cobbly loam about 15 inches thick. Typically, this soil is underlain by a very cobbly clay subsoil layer at a depth of about 36 inches. Permeability is generally moderate, where present; the clay subsoil layer has a moderately slow permeability. Runoff is very rapid and the hazard of erosion is very severe. The rock outcrop consists of Columbia River Basalt or Seven Devils Volcanics.

<u>69-Klickson-Wapshilla association</u>. This association consists of very steep soils on sides of mountains and canyons, with slopes of 40-90 percent. This association is about 40 percent Klickson silt loam and 40 percent Wapshilla cobbly loam. Included are small areas of rock outcrop. The Klickson soil formed in loess and residuum from basic igneous rock. The surface layer is brown silt loam and cobbly loam about 9 inches thick. Typically, this soil is underlain by a very cobbly clay subsoil layer at a depth of about 36 inches. Permeability is generally moderate, where present; the clay subsoil layer has a moderately slow permeability. Runoff is very rapid and the hazard of erosion is severe.

Potential for Damage by Fire

Ratings indicate the potential for damage to nutrient, physical and biotic soil characteristics by fire. Potential for damage by fire, as defined in the soil survey, "involve an evaluation of the impact of prescribed fires or wildfires that are intense enough to remove the duff layer and consume organic matter in the surface layer. The ratings are based on texture of the surface layer, content of rock fragments and organic matter in the surface layer, thickness of the surface layer, and slope."

Within the project area, all of the soil types have a "low" rating for potential damage by fire, with the exception of unit 106, which rates as "moderate". "Low" indicates that fire damage is unlikely. Good performance can be expected, and little or no maintenance is needed. "Moderate" indicates that fire damage can occur because one or more soil properties are less than desirable. Fair performance can be expected, and some maintenance is needed.

Soil compaction and displacement

Most soils in the project area have surface layers formed in volcanic ash-influenced loess derived from the eruption of Mt. Mazama, and are very easy to compact or displace at any moisture content (Page-Dumroese 1993). Soil response to disturbance depends not only on soil type, but topographic setting and slope hydrology. Landforms have characteristic slope shape, steepness, and stream dissection, which affect erosion and sediment delivery to streams. The three dominant landtypes within the project area, as described in the Payette National Forest Land Systems Inventory include: strongly-dissected mountain slope land, moderately dissected mountain slopes, and convex slopes.

Previous road building, development, tractor logging, machine piling, and grazing have impacted soils in the project area. Displacement reduces plant growth where topsoil and organic matter are removed.

Mass Erosion

Mass Wasting – Landslides

Mass wasting (e.g., a landslide), a category of natural landscape processes, occurs when large masses of soil are rapidly displaced downslope. Naturally occurring landslides function to deliver important aquatic habitat components to streams, such as spawning gravel and large woody debris. Landslides are episodic events and may be associated with rain-on-snow events, such as the January 1997 storm that caused many landslides in the Little Salmon River subbasin.

Mass wasting in the general project area includes slumps, creep, debris avalanches or flows and debris torrents. Landslides can also result in on-site loss of soil productivity, as surface soils are translocated down slope.

Land disturbances that change the hydrologic regime (e.g., reduced transpiration following timber harvest or fire) may increase the occurrence of mass wasting and harm aquatic habitats. In addition to the land clearing and soil compaction associated with roads, construction of improper road alignments may undercut the base of unstable slopes. Where roads intercept and concentrate surface runoff and subsurface flow, water may be diverted to hillsides causing soil saturation and slope failures. Finally, if culvert or other drainage structures become plugged with sediment and debris, road fill can be washed out and cause mass wasting.

Where mass wasting occurs near streams, the risk of sedimentation impacting aquatic habitat is far greater than were mass wasting occurs on hill slopes away from the channels that deliver sediment to streams. Sediment delivered to streams may comprise fine sediments, which could have negative impacts, or larger rock and large organic debris, which could enhance stream habitat complexity.

Natural soil-mass-movements on forested slope in the Western United States can be divided into two major groups of closely related landslides (Megahan and King 2004). The landslides of most importance include (1) debris slides, debris avalanches, debris flows, and debris torrents; and followed by (2) creep, slumps, and earth flows. Each type requires the presence of steep slopes, frequently in excess of the angle of soil stability (Megahan and King 2004). All characteristically occur under high soil moisture conditions and usually develop or are accelerated during periods of abnormally high rainfall. Further, all are encouraged or accelerated by destruction of the natural mechanical support on the slopes.

Timber harvest, fuel treatments and roads occurring on steeper slopes, may contribute at varying levels to initiation and acceleration of soil mass movements. Vegetation treatments contribute to mass wasting occurrences through: (1) destruction of roots, the natural mechanical support of slope soils, (2) disruption of surface vegetation cover which alters soil water distribution, and (3) road building or existing roads causing slope failures resulting largely from slope loading (from road fill and sidecasting), oversteepended bank cuts, and inadequate provision for road drainage (Chatwin et al. 1994).

Landslide hazard is variable within the project area, and instances of mass erosion have occurred in harvest units or along roads, (including several small slumps along the Hard Creek Road, near the Hazard Creek confluence), as well as under natural conditions. Field reconnaissance indicates past mass wasting has been generally restricted to small scale-events with modest impacts. Mass erosion is the movement of large bodies of soil under the effect of gravity. Movement may be accelerated by high moisture levels, undercutting of toe slopes, or loss of tree rooting strength, among other factors (Chatwin et al. 1994). Landslides here include slumps, creep, debris avalanches or flows and debris torrents. Landslides can result in on-site loss of soil productivity, as surface soils are translocated down slope. Sediment delivered to streams may comprise fine sediments, which could have negative impacts, or larger rock and large organic debris, which could enhance stream habitat complexity.

A plot of known landslides, together with output from the slope stability model (SINMAP) was acquired from the Payette National Forest. These were used as an initial screen to rate landslide-prone hazard areas as low, moderate, or high, based on geologic materials, slope gradient and shape, thickness of soil mantle, and other factors (Attachment, **Map 10**). Within the project area there are approximately 255 acres of high, 1,191 acres of moderate, and 1,465 acres considered low (stable). The following table illustrates the number of acres as modeled by SINMAP by alternative.

Table 22. Landslide-prone Acres by Alternative

Rating	Proposed Action				Alternative 2				Alternative 3			
	Mechanical			Burn Only	Mechanical			Burn Only	Mechanical			Burn Only
	Cable	Heli	Trac		Cable	Heli	Trac		Cable	Heli	Trac	
High	15	2	1	130	20	1	1	103	0	22	1	103
Mod	123	55	40	394	119	44	51	317	0	174	46	310
Low	84	44	250	266	99	30	298	190	0	142	278	189

The map shows proposed treatment units and temporary roads together with the plotted known landslides and high landslide hazard from the model output. With only a few exceptions, the harvest units do not encompass computer modeled high-hazard areas other than isolated 30 meter pixels. SINMAP is a good initial screen but does not provide the accuracy of a site-specific field inspection (Dixon, personal communication 2011). For example, in areas such as unit 3 (in the southern part of the project area) the map indicates a portion of the unit as high hazard. This, and other potentially high landslide hazard areas, would be field inspected by a specialist with slope stability expertise. If confirmed as high hazard, the area would be excluded from mechanical treatments. Though SINMAP provides a good initial screen, field inspection is also necessary as unstable areas will sometimes occur in areas rated as moderate. Watershed specialists, timber sale layout and marking crews are taught to recognize unstable areas in the field and avoid these areas in the project layout.

Several of the prescribed burn only areas (e.g., adjacent to Hard Creek) include mapped high-hazard areas, primarily due to steep slopes. However, a light intensity underburn (estimated to remove about 5 percent of the existing canopy) would have less effect on increasing landslide risk than logging, since more trees (root strength) would be retained. These prescribed burn units would also be evaluated by a specialist with slope stability expertise.

Road construction is the main destabilizing activity related to forest management actions. Megahan et al. (1978) found that 58% of management-related landslides were related solely to roads, while forest vegetation removal accounted for only 9% of landslides. Roads in combination with logging or wildfire accounted for 88% of all management-related landslides. Gucinski et al. (2001) identified several studies where landslide erosion from roads was one to several orders of magnitude higher than forest vegetation management. Existing roads in the project area to be used as part of implementation have been in place for many years. With the exception of four short (each less than 80 feet) sections they are stable even where mapped as existing on high landslide prone. Three of the road failures were the result of water being concentrated on the road surface or the action of water undercutting the road. Treatment for one or two of these failures would be a part of this project, dependent on which alternative is chosen as described in the transportation section.

Effects of Alternatives

Soils

Proposed Action

Construction of permanent and temporary roads would have the greatest impact on soils, followed by tractor, cable and helicopter logging. Megahan et al. (2001) summarizes the reported soil disturbance from various logging systems in the Pacific Northwest and British Columbia; he found an average of 21 percent from tractor logging, 13 percent from ground cable logging, 8 percent for skyline logging, and 4 percent for aerial logging. Prescribed burning generally would have a much lower impact. Temporary roads would contribute most to cumulative erosion per acre of ground disturbance, but erosion would decline to negligible levels after decommissioning. This alternative would have the lowest impact on soils of the action alternatives, due to the reduced relative acreage of tractor logging and road construction.

Alternative 2 – Original 2007 Proposal

This alternative would have the highest impact on soils of the action alternatives, due to the increased relative acreage of tractor logging and road construction. Impacts to soil productivity and erosion would be more due to increased tractor logging acres.

Alternative 3 – No Temporary Roads

The short-term effects from Alternative 3 would be similar to those described above for the Proposed Action alternative in the short term, with approximately 1.2 less miles of road construction in the Little Salmon face drainage. In the longer term, Alt 3 has 0.7 miles less road in the Hard Creek and Little Salmon drainages.

No Action

Under the No Action alternative**,** no soil compaction or displacement would occur as a consequence of road construction, timber harvest, or fuel reduction activities. Existing soil compaction and displacement would persist with very slight natural recovery of surface layers of compacted soils.

If wildfire occurred, mechanized suppression activities and subsequent salvage logging could create severe soil impacts, depending on fire characteristics and administrative decisions. The continued accumulation of dead and down fuel loads could contribute to increased potential for locally severe fire effects on soil, including physical alteration of soil structure and development of hydrophobic layers, but compaction and displacement from a potential natural wildfire are not likely.

Direct - Surface and Substratum Erosion

Proposed Action

The Proposed Action would have an intermediate effect on surface erosion and substratum erosion of the action alternatives, considering harvest, road construction, burning, and restoration effects.

The proposed road restoration would reduce surface and substratum erosion problems on some existing roads, and other sites, particularly on steep skid trails. The Proposed Action proposes the most restoration and treats the most acres (10) on highly erodible substrata.

Alternative 2 – Original 2007 Proposal

This alternative would have the highest impact on surface erosion and substratum erosion of the action alternatives, due to the increased relative acreage of tractor logging and road construction. Impacts to surface erosion would be more due to increased tractor logging acres.

Alternative 3 – No Temporary Roads

The effects from Alternative 3 would be similar to those described above for the Proposed Action alternative, but would result in less surface erosion and substratum erosion, considering harvest, road construction, burning, and restoration effects.

No Action

Under the No Action alternative, surface and substratum erosion processes would continue on roads, skid trails, and landings with slight abatement as slow natural vegetation recovery occurs. Erosion from harvest units would continue to decline to negligible. No new management sources of surface or substratum erosion would occur, so the net trend would be reduced management-derived erosion. However, no soil or watershed improvement activities would occur, so the long-term upward trend would be slow.

If a wildfire were to occur, consequent surface soil erosion would range from negligible to severe, depending on location, size and severity of burn, soil disturbance associated with suppression, salvage logging, or burn rehabilitation activities, and interaction of watershed response with the existing transportation system. Although the scope of such impacts is not foreseeable, given the uncertainties of fire ignition and burning weather, data displayed in the Fuels Section displays an increasing risk of stand replacing fire. The continued accumulation of dead and down fuel loads could contribute to increased potential for locally severe burning behavior, which could increase the likelihood of surface erosion, but this may be similar to risks associated with logging and prescribed burning on areas proposed for treatment.

Indirect - Surface and Substratum Erosion

Common to All Action Alternatives

The relative ranking of likely indirect effects by alternative is (least to greatest effects): No Action, Alternative 3, Proposed Action, and Alternative 2. All action alternatives would implement design criteria and mitigation measures to minimize rill erosion and sloughing on road cut slopes, and develop burn prescriptions to minimize erosion on harvest units.

Indirect effects of soil surface and substratum erosion include effects to vegetation and hydrologic processes. Surface erosion removes the soil materials with the greatest ability to hold moisture and nutrients, potentially resulting in greater drought stress, poorer growth, and susceptibility to pathogens or fire. Since volcanic ash is not easily replaced, these effects may be very long lasting. Certain species have a greater competitive advantage in eroded soils, like knapweed or lodgepole pine, so that shifts in plant community composition and consequent disturbance regimes like erosion or fire, could occur. Eroded surface and substratum material may be delivered to streams and have consequences to water quality, stream temperature, quality of fish habitat, and channel morphology.

Eroded surface soil, where it is derived from volcanic ash influenced loess, is irretrievable and irreversible. Residual soil materials would develop into topsoil over several decades to hundreds of years, but this material may lack the moisture holding properties of volcanic ash.

Direct - Mass Erosion

The indicators used to compare the alternatives are shown in Table 23 below. All harvest treatments will be avoided on high hazard areas. In moderate hazard areas (with low to moderate relative risk) management actions are designed with review and guidance of appropriate resource specialists. Limited practices may include but are not limited to: reducing yield or basal area removal of forested vegetation, increased rotation lengths, selective harvest with partial suspension yarding, relocating existing or proposed road alignment, improving road drainage design, etc.

Table 23. Direct Effects - Landslide-prone

Indicator	Proposed Action	Alternative 2	Alternative 3	No Action Alternative
Acres of Harvest on High Landslide Hazard	0	0	0	0
Acres of Harvest on Moderate Landslide Hazard	218	214	220	0
Acres of Prescribed Burn on High Landslide Hazard	130	103	103	0
Miles of Temporary Road on High Landslide Hazard	0	0	0	0
Miles of Temporary Road on Moderate Landslide Hazard	0.32	0.17	0	0

Proposed Action

This alternative has the highest risk of all the action alternatives when compared to the No-Action Alternative. There is no temporary road construction or harvest occurring on high hazard areas. However, there are more acres of altered vegetation through prescribed burning on high hazard areas and more miles of temporary road on moderate hazard areas associated with the alternative.

Harvest done with cable - in moderate hazard areas would be done with partial suspension where possible. By suspending logs in the air, soil disturbance and potential changes to surface drainage from skid corridors are greatly reduced. Prescribed burning will be constrained to 5-10 percent overstory mortality, to help preserve root strength. Together these practices will help maintain slope stability.

No roads proposed for decommissioning under any alternative are on land mapped as high landslide hazard, but local road and slope failures would be identified and treated as roads are decommissioned. The Proposed Action would include the potential to stabilize local mass erosion sites on 7.7 miles of road to be decommissioned.

Alternative 2 – Original 2007 Proposal

This alternative has a lower risk than the Preferred Alternative. It has less acres of altered vegetation through prescribed burning on high hazard areas and fewer miles of temporary road on moderate hazard areas. However, it would not include the potential to stabilize existing failure areas or reduce the risk of potential local mass erosion by proposed decommissioned roads.

Alternative 3 – No Temporary Roads

This alternative would have no risk associated with miles of temporary road on moderate hazard areas, as no temporary roads would be constructed. Also, there would be 10.7 miles of road to be decommissioned.

No Action

Under the No Action alternative, mass erosion processes would remain a slight factor in soil processes in the project area. Mass erosion from natural causes would continue at small scales and infrequent rates. Mass erosion from past management activities would continue at a very localized scale and declining rate as old roads are stabilized and harvest units are revegetated. No new management sources of mass erosion would occur from this alternative, so the net trend would be reduced management- caused mass erosion.

If a wildfire occurred, consequent mass erosion could range from negligible to modest, depending on location, size, and severity of burn, soil disturbance associated with suppression, salvage logging, or burn rehabilitation activities, and interaction of watershed response with the existing transportation system. The scope of such impacts is not foreseeable, given the uncertainties of fire ignition and burning weather.

The continued accumulation of dead and down fuel loads could contribute to increased potential for locally severe burning behavior, which can increase the likelihood of mass erosion in steep draws, drainage headlands, and on steep, wet lower slopes because rooting strength would be lost, and more moisture available.

Cumulative Impacts

Common to All Action Alternatives

Project design features and restoration can reduce the likelihood of effects to productivity, diversity, and weed susceptibility. Additional soil restoration associated with decommissioning of old roads would also reduce the extent of cumulative effects within the project area. Cumulative effects are directly related to the scope of timber harvest and mechanical fuel reduction activities, road construction, and soil restoration, including road decommissioning. The relative ranking of likely cumulative effects by alternative from least to greatest effect is Alternative 3, Proposed Action, and Alternative 2. Effects from permanent road construction are considered long-term, though sediment yield will typically drop substantially after one year as cutslopes and fillslopes revegetate. Similarly, temporary roads and restoration activities will have a short-term impact of 2-5 years after obliteration due to vegetative recovery.

Activities that cause soil compaction and displacement may have cumulative effects on soil porosity, water holding capacity, aeration, and long-term productivity, with repeated entries. Cumulative effects may also occur at the landscape level, where large areas of compacted and displaced soil affect vegetation dynamics, runoff, and water yield regimes in a sub-watershed. This can increase sediment yield to streams by overland transport from compacted areas or gullying.

Activities that result in soil surface and substratum erosion may have cumulative effects on water holding capacity, nutrient pools and retention, and long-term productivity, with repeated entries. Past activities considered in cumulative effects are mining, timber harvest and road construction on soils susceptible to erosion. No repeated entries into previously harvested areas are proposed for this project so cumulative effects at the harvest unit scale should be negligible.

As noted, landslides are episodic events and may be associated with rain-on-snow events, such as the January 1997 storm that caused many landslides in the Little Salmon River subbasin. Of the 17 landslides mapped in the project area, seven are clustered in the areas mapped as high hazard on previously logged private ownerships. Another five occur in moderate hazard areas previously logged again on private ownerships. The other five mapped landslides occur in non-logged areas with 1 high hazard, 2 moderate hazard and 2 low hazard sites. Therefore, 71% of the mapped landslides occurred on previously logged sites where mitigation efforts were minimal given the standards of the time. Although there is increased risk associated with any of the action alternatives, the limited practices should minimize initiation of landslides and effects on other resources.

Although it cannot be quantified, it is anticipated that road construction, development and timber harvest on private lands within the watershed will continue. These source areas contribute to loss of soil productivity. As private landowners are not required to file for permits prior to activity, the foreseeable cumulative effects from these private land activities is difficult to quantify. Based on past harvest levels, past road construction, and associated erosion and mass wasting, it is assumed that sediment delivery from these activities would not exceed pre-Forest Practice Act (1974) levels when standards were lower.

3.2.6 Water Resources

Affected Environment

Water Quality

The project area is located in the Little Salmon River subbasin, including portions of the Hard Creek and Hazard Creek Conservation Watersheds (2009 Cottonwood Resource Management Plan; Table 24; Attachment, **Maps 11 and 12**). The Little Salmon River subbasin includes a total of 372,500 acres with a total of 16,344 acres (4%) on BLM lands. The mainstem of the Little Salmon River flows from an elevation of 6,280 feet to 1,800 feet at its confluence with the Salmon River (river mile 86.7). Hard Creek drains from an elevation of 7200 feet down to an elevation of 3280 feet at its confluence with Hazard Creek near stream mile 0.9. Hazard Creek watershed-drains from an elevation of 8,767 feet to 3,160 feet at its confluence with the Little Salmon River near river mile 19.5. One reach from the 303(d) list of water quality-limited streams and water bodies was identified in the project area by Idaho Department of Environmental Quality's 2002/2003 Integrated 303(d) / 305 (b) Report, which includes an update of 303(d) listed streams approved by the Environmental Protection Agency (EPA) in December 2005. The Little Salmon River segment from Round Valley to the Salmon River is listed as water quality-impaired for temperature and sediment. (IDEQ, 2002/2003 Integrated 303(d)/305(b) Report).

Table 24. Watersheds within Bally Mountain Project Area

Sub-watershed	Area (acres)	Project acres within watershed	Percent of watershed
Little Salmon River	368,640 (576 sq mi)	1,910	0.52
Hard Creek	24,053	894	3.7
Hazard Creek	27,865	134	0.48

The project area includes a total of 15.1 miles of rivers and streams; of which approximately 7.83 miles of small perennial and intermittent streams flow into Little Salmon River, Hazard Creek, or Hard Creek. In addition, there are 18 acres of riparian habitat, 260 acres of Riparian Conservation Areas (BLM lands), and several small ponds.

The Little Salmon River adjacent to the project area has been impacted by encroachment of U.S. Highway 95, as well as timber harvest, grazing, and rural development. Land use practices in the Upper Meadows area (i.e., irrigation diversions and livestock grazing) have resulted in elevated water temperatures that affects downstream aquatic habitats utilized by ESA-listed fish in the Little Salmon River (USDA Forest Service 2003; BLM 2000). The highest water temperatures in the Little Salmon River subbasin are found in the Upper Meadows area (USDA Forest Service 2003).

Hazard Creek is an important tributary to the Little Salmon River with regard to water quality. It contributes cold water to temperature-limited salmonids in the Little Salmon River during the summer (Apperson 1998). The Hazard-Hard Creek complex provides a sustained contribution of cold water that supports downstream salmonid habitat (IWRB 2001).

Timber harvest within the subbasin has occurred on Federal, State, and private lands. Forest canopy cover functions in the hydrologic cycle to moderate precipitation runoff by intercepting and transpiring water (e.g., snow regimes). Removal of the forest canopy can result in increased water yield and hydrograph modification (e.g., increased peak flows, particularly in areas subject to rain-on-snow events). An indicator of the overall relative risk of impact to the hydrologic functions of a forested watershed may be calculated as the equivalent clearcut area (ECA). Values generated by this method are combined with other information, such as stream condition and channel type, to interpret the potential effects of proposed land management activities. The Forest Service has conducted ECA analysis for several watersheds, which occur within the analysis area and identified an ECA of 21.4 percent for Hazard Creek (USDA Forest Service 2003). It should be noted that sub-watershed may have high ECAs while other sub-watersheds within the same watershed have low ECAs. For example, the Upper Hazard Creek and Upper Hard Creek sub-watersheds have very high ECAs, well over 30 percent, which are primarily attributed to wildfires (USDA Forest Service 2003). Therefore, risks of impacts to hydrologic functions in these upper sub-watersheds are much greater than in the lower sub-watersheds of Hazard and Hard Creeks (USDA Forest Service 2003). The Forest Service evaluated ECA for the Middle Little Salmon River at 15.5 percent (USDA Forest Service 2003). Water quality is generally rated good in the project area for Hazard and Hard Creeks, while the Middle Little Salmon River has impaired water quality for water temperature and sediment (USDA Forest Service 2003).

Little Salmon River

The project area includes 4.9 miles of the lower Little Salmon River. The Little Salmon River is comprised of two assessment units; the upper Little Salmon River, which meanders through wide low-gradient meadows, and the lower Little Salmon River (24 miles) which flows through a more confined canyon, with a steeper gradient. Recent and past flood events have contributed to adverse channel and riparian impacts. The lower canyon river reaches are in a state of disequilibrium while the river adjusts by reworking alluvial deposition and builds new stream banks. The upper valley reaches have a large amount of unstable stream banks, primarily attributed to cattle grazing. The erosion hazard is high along the Little Salmon River from Round Valley Creek to Rattlesnake Creek.

Road density in the Little Salmon River subbasin varies from very low in the Rapid River drainage (0 to less than 0.5 road miles per square mile) to very high in the Little Goose Creek watershed (6.78 road miles per square mile).

Hazard and Hard Creeks

The project area includes 2.5 miles of stream reaches within Hazard and Hard Creeks. An erosion inventory of the Forest Service managed lands showed that 35.6% of that area was erosion sensitive partly attributable to the granitic soils of the Idaho Batholith in which the watershed lies. A large number of the sub-watersheds are roadless and undeveloped; however, sediment production within the sub-watersheds has been accelerated in some areas through human-related activities such as roads, timber harvest, livestock, mining, and recreation. Specifically, the headwaters area of the Hazard Creek watershed burned in 1989, 1992, and 1994; and salvage logging took place in 1996, 1997, and 1998.

Road densities within the drainages are separated into lower and upper sections for both Hazard Creek and Hard Creek. Upper Hazard Creek (22.94 square miles) has a road density of 0.90 miles of road per square mile (20.69 miles of road), and Lower Hazard Creek (20.4 square miles) has a road density of 0.81 miles of road per square mile (16.62 miles of road), with 24% and 21% within RCAs, respectively. Average road density for the entire drainage is 1.16 miles of road per square mile. Density of roads on landslide prone areas (slopes over 60%) are 0.75 mile of road per square mile (2.41 miles) in Upper Hazard Creek and 0.20 mile of road per square mile (1.05 miles of road) in Lower Hazard Creek.

Upper Hard Creek (13.83 square miles) has a road density of 1.03 miles of road per square mile (14.25 miles of road), and Lower Hard Creek (23.92 square miles) has a road density of 1.8 miles of road per square mile (43.16 miles of road) with 38% and 19% within RCAs, respectively (USDA-FS 1998). Average road density for the entire drainage is 1.78 miles of road per square mile. No roads occur on landslide prone areas (slopes over 70%) in Upper Hard Creek and 0.60 mile of road per square mile (4.03 miles of road) in Lower Hard Creek.

Effects of Alternatives

Water Quantity, Peak flows and Water yield

Common to All Action Alternatives

Removal of forest canopy by timber harvest, road construction or natural processes (such as wildfire) can affect the quantity and timing of stream flow. The proposed change to ECAs is relatively minor in the three USGS designated River Basins (6^{th} code HUCs) partially encompassed by the project area (see map 11). Under all action alternatives, the ECA increases would be minor in the three affected 6^{th} code HUCs watersheds due to the relatively small percentages of the project area within the larger HUCs (0.52 % of Hazard Creek, 3.7 % of Hard Creek, and 0.48 % of the Little Salmon). Overall, changes to ECA would be negligible at a watershed level and would be expected to be less than 0.5 percent and any changes would not affect Hazard Creek, Hard Creek, and Little Salmon River channel conditions. Changes to small tributary ECAs (e.g., first and second order tributary streams) within the project area and potential impacts to channel conditions are discussed below in more detail.

Similarly, predicted peak monthly water yield increases for all action alternatives are minor because of the relatively small size of the harvest units and the harvest methods (which include low severity burning). There would be no large openings created by clearcuts, therefore, changes to snow accumulation patterns, snowmelt rates, and flow regime should be minor. The increases in ECA would be largely offset by planting and natural recovery through vegetation regrowth in all watersheds. Seventeen smaller tributary drainages were analyzed for ECA, as shown in the following table and referenced in **Map 12**.

As part of the water and fisheries resources analyses for the proposed Bally Mountain project, 17 first or second-order drainages were delineated on a 7.5 minute topographic map. Although most are steep, non-fish bearing channels, they have the potential to deliver sediment to the Little Salmon River and Hard Creek. In addition, there are private residences located at the base of the slope adjacent to a few of the channels.

A conservative estimate of existing ECA, as well as post-project ECA, was calculated for each of the 17 drainages. The existing condition ECA assumed all existing road prisms were the same width and unvegetated. Actually, many of the old roads and fill slopes are overgrown and partially recovered with natural revegetation.

A conservative value of 20% ECA was chosen as a threshold for further review. There is much debate in the literature about acceptable levels of ECA, but most studies agree that 15-20 percent is low enough to show minimal, if any, channel degradation from increased flows (Grant et al. 2008).

Table. 25. Drainage ECA and Channel Stability (see Map 12)

Drainage #	Area (Acres)	Proposed Action (ECA %)	Alternative 2 (ECA %)	Alternative 3 (ECA %)	No Action (ECA %)	Channel Stability
1	317	11	11	11	1	Good
2	153	21	21	21	5	Fair-Good
3	86	19	19	18	5	Fair-Good
4	104	24	23	23	8	Poor-Fair
5	73	5	6	6	2	Good
6	208	11	15	15	4	Poor
7	128	24	12	14	3	Fair
8	61	30	29	28	14	Good
9	72	12	12	11	1	Fair-Good
10	255	15	15	15	10	Fair-Good
11	38	3	3	3	1	Fair
12	49	1	1	1	1	Poor
13	55	1	1	1	1	Poor
14	73	7	7	7	7	Fair
15	25	20	20	20	6	Fair
16	70	27	27	28	3	Poor-Fair

*Channel stability was rated (ranging from Poor to Excellent) and evaluated using methodology described in Pfankuch (1978).

There are six drainages that have an estimated post-project ECA at 20 percent or higher. A qualitative assessment was made of the risk of channel (and property) impacts, including debris torrents, as well as sediment delivery to fish bearing streams for these six drainages. Methods used included aerial photo interpretation, as well as field inspection of channel stability, slope steepness, and past landslide activity in the area.

Based upon this assessment five of the six drainages were determined to be at low risk to impacting human health and safety, property and of delivering sediment to the fish bearing streams. Channel stability ratings of these drainages was fair-good. Harvest units tend to be located along lower gradient sections often in the upper reaches of these drainages or in drainages with historically low surface flow. All RCAs are buffered from mechanical treatments.

One drainage (4) as shown on Map 12 is of concern for all action alternatives. ECA was computed at 24 percent. There are three mapped landslides within the sub-basin. Two of these landslides originated in areas with no previous timber harvest or roads. Referring to the map, this basin is drained by two intermittent channels. In 1997, a debris torrent occurred in the north channel upstream of a private residence. The channel stability of the north channel is rated as poor. Therefore, canopy cover reduction in the drainage area of this north channel could alter the runoff patterns and increase risk of additional debris torrents. Based on this risk, basal area retention(number of trees left standing) in unit 6b will be increased by either adjusting the unit boundary and reducing the total number of trees removed to maintain an ECA below 15%, or, by dropping unit 6b from the project altogether (Design Feature 2.1.5).

Research on basin response to clearcutting concluded that although small, frequently occurring events were increased, "major flood flows are apparently not increased" (Megahan et al. 2001). They found that although peak flows increased up to 90 percent for the smallest peak events on the small clearcut watersheds, effects decreased as flow events increased and were not detectable for flows with two-year or greater recurrence intervals (Ice and Stednick 2004). A large body of research also indicates there is hydrologic recovery over time as vegetation re-establishes in openings.

No Action

Under the No Action alternative, the status quo remains. Although predicting when a wildfire might occur or its magnitude cannot be completed accurately, the risk of wildfire would remain. A severe wildfire could result in short-term but very high flows into streams, adversely affecting beneficial uses.

Sediment Yield

Changes in sediment yield values within the project area for the proposed action over the time period affected by the project are summarized in Table 26 below. The surface erosion potential for the proposed treatments was estimated using the Water Erosion Prediction Project (WEPP) computer model. Several Forest Service WEPP online interface tools were used as a means to compare sediment delivery from physical disturbances such as road construction and decommissioning, timber harvesting, and prescribed burning. The model and supporting documentation can be found at: http://forest.moscowfsl.wsu.edu/fswepp/.

The WEPP model is a physically based soil erosion model that provides estimates of soil erosion and sediment yield considering site-specific information about soil texture, climate, ground cover, and topographic settings (Elliot et al. 2000). Harvest and prescribed fire prescriptions, temporary and new road construction, road decommissioning and post-harvest activities are modeled and discussed.

Overall, long-term sediment reductions from the proposed road closures and decommissioning would improve water quality and stream channel conditions meet the intent of the TMDL and move the streams toward improving conditions of beneficial uses.

Sediment inputs to stream channels occur as a complex series of pulses that are delivered and stored within low order, high gradient stream channels. Sediment accumulates for centuries within these channels before being transported or “flushed” downstream by episodic events with large increases in water yield (Kirchner et al. 2001). Large scale stand replacing fires followed by floods would be considered episodic events. Transport of sediment plays a fundamental role in the natural function of forested watersheds. In excess, suspended sediment degrades aquatic and fish habitat, disrupts hyporheic (the saturated sediment environment below a stream that exchanges water, nutrients, and fauna with surface flowing waters) connection , enhances the transport of pollutants, and increases treatment costs associated with municipal water withdrawal (Rehg et al. 2005). Forests generally have very low erosion rates unless they are disturbed (Elliot et al. 2000).

Common disturbances include timber harvest operations, roads, prescribed burning, and wildfires. Impacts which include soil erosion from these activities typically last 2-5 years before rapid revegetation covers the surface with protective plant litter (Elliot 2011, personal communication). However, not all impacts to soil erosion are short lived. A poorly-maintained permanent road could remain as a long-term sediment source.

Sediment Effects from Roads

For the Proposed Alternative, 0.15 miles of new road and 1.37 miles of temporary road are proposed for construction to facilitate vegetation treatments. The majority of the temporary road construction occurs at midslope or is near ridge tops. No temporary road construction would occur within RCAs. No roadwork would occur on landtypes with “high” mass failure potential. All road construction would follow BMPs and design measures described in Section 2.1.5 of this document.

The newly constructed temporary roads would only slightly increase road densities for approximately five years until they are obliterated. Upon the completion of the harvest, treatments and post-harvest treatments and subsequent road decommissioning and closures there would be an overall decrease in road densities. This lower road density, especially within RHCAs, would help decrease the effects of roads on flows and decrease the likelihood of contributing sediment into stream networks. Reducing fuel load build up and/or managing overstocked timber stands would reduce risk from effects of high intensity wildfires within the cumulative effects area (see Fuels section 3.2.2). The proposed action would treat more fuels and therefore would do more to reduce wildfire effects risks to watershed resources overall.

Effects to Sediment from Vegetation Treatments

Timber harvest prescriptions include design features and BMPs to minimize soil disturbance (see Design Feature 2.1.5) and to protect soil and water. Timing restrictions would ensure activities would only occur when soils are not saturated. One purpose of vegetative treatments is to move composition and structure toward more natural conditions. Resilient vegetative conditions would help to maintain stable hydrologic conditions throughout the project area.

Sediment delivery rates from the Proposed Action harvest and post-harvest treatment activities are reflected in the WEPP sediment runs.

Table 26. WEPP Predicted First Year Increased Sediment Yield Rates in Tons/square mile/year (WEPP sediment runs are based on 30 years of climate data)

Drainage	Background Sedimentation Rate (average annual)	Proposed Action (additional)	Alternative 2 (additional)	Alternative 3 (additional)	No Action High Intensity Wildfire	Probability of Sediment Delivery
Little Salmon River	25.3	7.5	7.5	6.7	941	23%
Hazard Creek	35.3	4.8	4.8	4.6	1,235	23%
Hard Creek	24.8	2.9	2.9	0	947	10%

Proposed Action

Much of the proposed 1.37 miles of temporary road construction is located relatively high on the slope, where long slope distances to the Little Salmon River and generally straight to convex shaped slopes are factors that reduce sediment delivery efficiency to stream channels. Overall sediment impacts from road construction will be reduced due to minimal live water crossings on the new roads, construction of slash filter windrows on steeper side slopes, and gravelling the approach and departure of existing stream crossings. Slash filter windrows have been tested and proven to intercept 75 to 100% of sediment eroding from road fills (Megahan and King 2004). Rocking of live water crossings would reduce road surface erosion an estimated 79% at stream crossings (Burroughs and King 1985).

The increase in sediment production due to soil disturbance associated with road decommissioning would be short-term, as impact levels have been shown to drop to near zero by the third year due to vegetative recovery (Megahan and King 2004). Also, this increase would occur at least one year after the peak increases from new road construction and harvest activities. Road decommissioning will not have a significant adverse impact on sediment yield and water quality in the first year, and will have a net reduction in sediment yield from year two forward.

The predicted increase in unrouted sediment yield (sediment delivered to the stream channel) would be short-term as impacts from road construction and harvest typically decrease substantially after the first year. As with changes to water yield, sediment impacts would be relatively minor under all action alternatives in the three affected 6th code HUCs watersheds due to the relatively small percentages of the project area within the larger HUCs (0.52 % of Hazard Creek, 3.7 % of Hard Creek, and 0.48 % of the Little Salmon).

WEPP modeling results predict that five years following completion of the project, including road decommissioning, water quality impacts would decrease slightly below existing conditions. This is due to obliteration of some existing roads, as well as drainage improvements to some remaining roads.

Reducing fuel load build up and/or managing overstocked timber stands would reduce risk from effects of high intensity wildfires within the project area (see fuels report). This alternative would treat more fuels and therefore would do more to reduce wildfire effects risks to watershed resources (increased sedimentation).

Alternative 2 – Original 2007 Proposal

The short-term effects from Alternative 2 would be similar to those described above for the Proposed Action alternative. Over the long term (five years or more) this alternative would result in the least reduction in road density of all the action alternatives, particularly in the Hard Creek and Little Salmon drainages.

Alternative 3 – No Temporary Roads

This alternative would have less soil disturbance due to no proposed road construction or cable yarding compared to the other action alternatives. This alternative produces the least amount of sediment, particularly in Hazard Creek. Long-term (post project) road densities would be slightly lower than the Proposed Action and substantially lower than Alt 2.

No Action

Under this alternative, the status quo remains. Although predicting when a wildfire might occur or its magnitude cannot be completed accurately, the risk of wildfire would remain. A catastrophic wildfire could result in a short-term but a very high flush of sediment into streams, particularly in the Hard and Hazard Creek watersheds, adversely affecting beneficial uses. Also, no existing roads would be decommissioned and the associated watershed and soils benefits from treating these chronic sediment sources would not be realized.

Cumulative Impacts

Numerous research studies have documented that forest roads are usually the leading contributor of sediment to stream channels (Megahan and King 2004). Forest roads can be chronic sources of sediment because; road construction, use, and maintenance compact soils, reduce infiltration, intercept and concentrate surface and subsurface runoff, and limit growth of vegetation. Road ditches can be a direct conduit of sediment from ditch and road erosion into live water bodies. Also, roads can increase the frequency and magnitude of mass wasting (i.e. landslides) by one of several ways; improper alignment can undercut the base of unstable slopes, roads can intercept, divert, and concentrate runoff to sections of the hillside that are unaccustomed to overland flow causing soil saturation and slope failures, and culverts and other drainage structures can become plugged with debris and the subsequent flow over the road surface can cause failures (Megahan and King 2004).

3.2.7 Wild and Scenic Rivers

Affected Environment

The BLM coordinates management of river segments that may be suitable for congressional designation in the National Wild and Scenic Rivers System (NWSRS) with the State of Idaho and the U.S. Forest Service, in accordance with the Memorandum of Understanding with Forest Service and State of Idaho (1991) and state water planning. The Idaho Water Resources Board (IWRB) completed the Comprehensive Water Plan – Part B on the Little Salmon River Basin in October 2001. The state plan designated Hazard and Hard creek as a Recreational River. To fulfill the BLM's obligations under Section 5(d)(1) of the Wild and Scenic Rivers Act, the BLM completed eligibility and suitability determinations of river segments within the planning area for the Cottonwood RMP. BLM's determinations were to not recommend the preliminary suitable 1.55-mile Hazard Creek and the 1.64-mile Hard Creek recreational segments for congressional designation (BLM 2009, Actions WR-1.2.4 and 1.25).

Protective management of the river segments that is coordinated with the IWRB on BLM-administered lands is in accordance with the following guidelines:

- Approve no actions altering the free-flowing nature of the suitable segment through impoundments, diversions, channeling, or installing riprap.
- Approve no actions that will measurably diminish the stream segments identified as outstanding remarkable value(s) (ORV's).
- Approve no actions that will modify the setting or level of development of the suitable river segment to a degree that will change its identified Recreational classification.

The ORVs identified for Hazard Creek & Hard Creek are scenic and geological.

Effects of Alternatives

<u>Common to All Action Alternatives</u>

The project area is near Hazard and Hard Creek. However, none of the actions proposed in any of the alternatives are going to affect the segments, which are designated as scenic and geological ORVs, nor are any of the actions going to alter the free flowing nature of the streams or allow any development to change the recreational classification.

The use of prescribed fire would result in line, color, and texture contrasts to the scenery. In general, these contrasts would be of small scale associated with the landscape and regrowth of vegetation should blend back the impacts the following year. As regrowth of grasses and shrubs occurs, the prescribed fire's visual effects could change, adding greater visual diversity to the landscape. In the long-term, the action alternatives would improve scenic quality by increasing vegetative diversity and age class and allowing for natural ecological change.

No Action

Under the No Action alternative, there would be no direct effect on the Wild and Scenic Rivers resources of the project area. In the long-term, the No Action alternative could decrease the variability in vegetative type and age class, decreasing scenic diversity. If in the absence of fuels reduction, a wildland fire occurs within the project area, the landscape character could be greatly altered with an extensive loss of existing vegetative cover. Appropriate management response would be taken for wildland fires. Successful suppression would reduce the size of the area affected; however, if the fire out-paces suppression efforts a large area could potentially be affected. Ground disturbing fire suppression activities would result in line and color contrasts and changes in the character of the landscape.

Cumulative Impacts

There would be no cumulative effects to WSR. The management protections of ORVs would be met.

3.2.8 Fisheries, Aquatic Habitats, and Special Status Species

The analysis area for fisheries, aquatic habitats, and special status species includes the Little Salmon River – Round Valley Creek, Hazard Creek, and Hard Creek watersheds (**Maps 11, 12, and 13**). The Little Salmon River subbasin provides aquatic habitat for 17 fish species, including 14 native species (three of which are anadromous species) and three introduced species (Forest Service 2003). Special status fish occurring within the analysis area include three Endangered Species Act (ESA) – listed species and three BLM sensitive fish species. The Soils and Water Resources sections of this chapter (Sections 3.2.5 and 3.2.6) includes information pertinent to this analysis for aquatic species and habitats.

Figure 7. Little Salmon River, about 0.5 mile upriver from mouth of Hazard Creek.

ESA-listed Fish

ESA-listed fish occurring within the Bally Mountain project and analysis area include spring/summer Chinook salmon (*Oncorhynchus tschawytscha*), steelhead trout (*Oncorhynchus mykiss*), and bull trout (*Salvelinus confluentrus*). These species occur in the Little Salmon River, Hazard Creek, and Hard Creek. Refer to **Map 13** for fish distribution and a fish passage barrier map. Protection of these species afforded by the ESA (Section 7(a)(2)) requires the BLM to ensure that all actions authorized or funded by the agency are not likely to jeopardize the continued existence of the species, or result in destruction or adverse modification of critical habitat of listed species. For more detailed information regarding ESA-listed fish, and their habitats occurring within the project analysis area, refer to the Biological Assessment (BA) of the Bally Mountain Vegetation Management Project (BLM 2012).

Snake River spring/summer Chinook salmon and **steelhead trout** are under the jurisdiction of National Oceanic Atmospheric Administration, National Marine Fisheries Service (NOAA Fisheries or NMFS). The Snake River spring/summer Chinook salmon was listed as threatened on May 22, 1992 (57 FR 14653). Critical habitat was designated for spring/summer Chinook salmon on December 28, 1993 (58 FR 68543), effective on January 27, 1994, and includes the Little Salmon River, Hazard Creek, and Hard Creek. Spring/summer Chinook salmon use the Little Salmon River as a juvenile and adult migration corridor, and to a limited extent for juvenile rearing habitat. Hazard and Hard Creek have documented spawning and juvenile rearing by spring/summer Chinook salmon.

Steelhead trout in the Snake River basin were listed as threatened on October 17, 1997 (62 FR 43937). Critical habitat for Snake River Basin steelhead trout was designated on September 2, 2005 (70 FR 52630) and includes the Little Salmon River, Hazard Creek, and Hard Creek. Steelhead trout use the Little Salmon River as a juvenile and adult migration corridor, for adult over-wintering, limited spawning occurs, and for juvenile rearing habitat. Steelhead trout use tributary streams providing suitable and accessible stream habitat for spawning and/or juvenile rearing.

Bull trout is under the jurisdiction of U.S. Fish and Wildlife Service (USFWS). On July 10, 1998, the USFWS listed the Klamath and the Columbia River population segment of the bull trout as threatened (63 FR 31647). Bull trout critical habitat was redesignated on November 17, 2010 (75 FR 63898). The Little Salmon River, Hazard Creek, and Hard Creek are designated as bull trout critical habitat below barrier falls. Bull trout use the Little Salmon River as a migration corridor and adult and subadult foraging habitat. Within the Little Salmon River subbasin; Rapid River, Boulder Creek, Hazard Creek, and Hard Creek provide suitable habitat for bull trout spawning and/or juvenile rearing.

Pursuant to Section 305(b)(2) of the Magnuson-Stevens Act, Federal agencies must consult with NOAA Fisheries regarding any actions authorized, funded, or undertaken, or proposed to be authorized, funded, or undertaken that may adversely affect Essential Fish Habitat (EFH) for Chinook salmon within the Little Salmon River subbasin. The Magnuson-Stevens Act, Section 3, defines EFH as “those waters and substrate necessary for fish for spawning, breeding, feeding, or growth to maturity.” Federal agencies may incorporate an EFH Assessment into ESA Biological Assessments.

BLM-Sensitive Fish

There are three BLM sensitive fish species identified as occurring within the project and analysis area (see Map 13). These species are westslope cutthroat trout (*Oncorhynchus clarki lewisi*), redband trout (*Oncorhynchus mykiss* spp.), and Pacific lamprey (*Lampetra tridentata*). Sensitive species are managed to ensure that BLM actions will not contribute to a trend toward federal listing or cause a loss of viability to the population.

Westslope cutthroat trout use the Little Salmon River as a migration corridor and adult foraging and rearing habitat , and to a lesser extent is used for juvenile rearing. Spawning generally occurs in a few Little Salmon River tributary streams (e.g., Trail Creek, Squaw Creek) providing suitable habitats, and migratory fish may spawn in lower reaches of the same streams used by resident fish. Hazard and Hard Creek are used by the westslope cutthroat trout primarily for adult foraging and such use is very low because the Little Salmon River subbasin has very low populations of fluvial (migratory) or resident populations.

Redband trout (non-anadromous rainbow) in the Upper Columbia River basin have been divided into two groups. One group evolved in sympatry with steelhead trout, and the other allopatric, or those which evolved outside the historical range of steelhead trout. The Little Salmon River is used as a migration corridor by redband trout and is also used for juvenile rearing. Spawning and primary juvenile rearing occurs in tributary streams providing suitable and accessible stream habitat. Hazard Creek and Hard Creek are used by redband trout for spawning and rearing. Within the project area these redband trout have evolved in sympatry with steelhead trout because they are downstream of partial/full barrier falls and cascades.

Pacific lamprey adults enter freshwater (Columbia River) between July and September and migrate over 400 miles to Idaho. They spawn in sandy gravel immediately upstream from riffles between April and July and die soon after. Eggs hatch in two to three weeks and the ammocoetes (larval lamprey) spend up to six years in soft substrate as filter-feeders before emigrating to the ocean. They remain in the ocean for 12 to 20 months before returning to freshwater to spawn. Diatoms appear to be a primary food supply for ammocoetes. The Little Salmon River, Hazard Creek, and Hard Creek provide suitable habitat for Pacific lamprey in stream and river reaches that are downstream of fish passage barriers.

RMP Management Guidance and Strategies

The Cottonwood RMP Aquatic and Riparian Management Strategy provides guidance and programmatic direction for watersheds, riparian, and aquatic habitats (BLM 2009, Appendix D). This strategy also provides for the establishment of Riparian Conservation Areas (RCAs), and management emphasis for aquatic and riparian dependent resources, which is described as:

- 300 feet on each side of the stream channel for fish-bearing streams
- 150 feet on each side of the stream channel for permanently flowing non-fish-bearing streams and from the edge of water body for ponds, lakes, reservoirs, and wetlands >1 acre
- 100 feet on each side of the stream channel for seasonally flowing or intermittent streams and wetlands <1 acre in size.

The Cottonwood RMP identifies Hazard Creek and Hard Creek as Conservation watersheds that have aquatic/watershed processes and functions in a relatively undisturbed and natural landscape setting. Management strategies emphasize allowing natural disturbances, but active management is sometimes required to conserve these physical and biological processes and patterns.

Little Salmon River General Habitat Conditions

A survey of the mainstem Little Salmon River conducted in 1965 by Welsh et al. found the spawning habitat in the mainstem river below the barriers (river mile 21) had been altered by erosive floods, gravel deposition, and channel changes due to road construction. At that time it was determined that the Little Salmon River did not offer good Chinook salmon production potential. The middle section of the mainstem, from the barrier to Sixmile Creek, was determined to have a low value for potential spawning habitat due to the low percentage of riffles, poor spawning gravels, slow velocities, and inadequate cover and resting pools. A five-mile stretch from Sixmile Creek to the U.S. Highway 95 Bridge appeared to offer the best potential for Chinook salmon production. In the remaining 10 miles of mainstem above the bridge, potential use was thought to be limited by low summer flows to the section below Mud Creek (Welsh et al. 1965).

Three barrier falls occur in the Little Salmon River between stream mile 24.1 and 24.6, these falls limit upriver fish passage (Attachment, **Map 13**). No recent or formal historic documentation exists for spring/summer Chinook salmon using streams above river mile 24 in the Little Salmon River. Welsh et al. (1965) reports that no known passage by salmon or steelhead exists above the Little Salmon River falls. Road/highway construction along the Little Salmon River in the vicinity of the falls has encroached on stream channel and riparian habitats, which may contribute to fish passage problems in this segment of the river.

The mainstem Little Salmon River downstream from river mile 24 has limited amounts of good Chinook salmon spawning habitat, due to the dominant large sized substrate. The steeper stream gradient and high flushing flows do reduce sediment deposition, however, high discharge also "flushes" smaller sized suitable salmonid spawning gravels. Limited suitable gravels that do occur are primarily in deposition areas along the river margins or behind boulders. These gravel deposition areas also have potential for increased fine sediment and may be highly "cemented" and/or compacted.

The Little Salmon River drainage experienced a rain on snow event in early January 1997. This event resulted in severe flood events and debris torrents in some watersheds, including the Little Salmon River (Little Salmon River – Round Valley Creek HUC) and the lower portion of the Hazard Creek and Hard Creek drainages. The debris torrents started at about the 5,000 feet elevation level and scoured the small 1st to 3rd tributary streams delivering sediment, large woody debris (LWD), and various sized substrate, rocks, and woody debris, down to Little Salmon River, Hard Creek, and Hazard Creek. The same early January 1997 event also resulted in landslides that also impacted streams. The watersheds affected by the 1997 event have experienced recovery and flushing of deposited sediment and improved channel conditions has occurred, however, some legacy effects still exist such as unstable banks and flood scouring effects to channels.

Primary limiting factors for fish production in the Little Salmon River are elevated summer water temperatures, lack of good quality pools, and channel and streambank scouring (flood damage). Private land development and U.S. Highway 95 have encroached on river channel and riparian habitats.

Table 27 is a summary of substrate monitoring (deposited sediment) evaluated at permanent monitoring stations that were updated or field verified (2006 – 2010) for the Little Salmon River, Hazard Creek, and Hard Creek. The Little Salmon River station located at river mile 19.9 is approximately 0.4 mile upriver from the mouth of Hazard Creek. The Hazard Creek and Hard Creek monitoring stations are located immediately upstream from the mouth of these drainages.

Table 27.Deposited Sediment for Little Salmon River, Hazard Creek, and Hard Creek

Stream/River	Monitoring Station Location	Cobble Embeddedness	Percent Fines By Depth Spawning Gravels (% Less 6.3 mm)	Percent Surface Fines
Little Salmon River	RM 19.9	34.0%	30.6 %	6.1%
Hazard Creek	SM 0.1	33.1%	22.2%	1.2%
Hard Creek	SM 0.05	37.1%	20.6%	2.8%

Cobble embeddedness levels result in suboptimal conditions for winter rearing habitat, primarily by limiting available habitat for juvenile fish using interstitial spaces (e.g., spaces between cobble/boulders) that occurs in stream bottom substrate. The percent fines by depth (e.g., fine sediment in spawning gravels) indicate relatively good conditions for Hazard Creek and Hard Creek, and low fair to poor conditions for Little Salmon River. Increased levels of sediment in spawning gravels have adverse effects on fish egg incubation and emergence of fish fry from the gravels after hatching.

Table 28 identifies the time of year when each species/lifestage is present within the project analysis area (Little Salmon River Subbasin).

Table 28. Occurrence of ESA-Listed and BLM Sensitive Fish Species Lifestages

Lifestage	Sp/Summer Chinook Salmon	Steelhead Trout	Bull Trout	Westslope Cutthroat Trout	Pacific Lamprey
Adult Migration	APR-JUL Little Salmon R.	AUG-APR Little Salmon R.	JUN-AUG Little Salmon R.	JUL-OCT Little Salmon R.	JUL-OCT Little Salmon R.
Adult Spawning	AUG-SEP Trib. Streams	MAR-JUN Trib. Streams	Late AUG-SEP Trib. Streams	MAR-JUN Trib. Streams	APR-JUL Little Salmon R. Trib. Streams
Adult Overwintering	N/A	NOV-MAR Salmon River	NOV-MAR Salmon River	NOV-MAR Little Salmon R.	NOV_MAR Little Salmon R.
Adult & Subadult Rearing	N/A	N/A	YEARLONG Salmon R. & Trib. Streams	YEARLONG Little Salmon R. Trib. Streams	N/A
Incubation & Emergence	SEP-MAY Trib. Streams	MAR-JUN Trib. Streams	SEP-MAY Trib. Streams	MAR-JUN Trib. Streams	APR-JUL Little Salmon R. Trib. Streams
Juvenile Rearing	1 Year Tributary Streams	1-3 Years Trib. Streams	2 - 3 Years Trib. Streams	1 - 3 Years Trib. Streams	4-6 Years Little Salmon R. Trib. Streams
Smolt Emigration	APR-JUL	APR-JUL	N/A	N/A	APR-JUL

Hazard Creek General Habitat Conditions

Figure 8. Hazard Creek falls fish passage barrier

Within the Little Salmon River subbasin, the Hazard Creek watershed is rated as a priority/special emphasis watershed for spring/summer Chinook salmon, steelhead trout, and bull trout. The drainage provides spawning and rearing habitat for spring/summer Chinook salmon and steelhead trout. Bull trout use the stream for subadult/adult rearing. A full passage barrier (falls) is located at stream mile 3.7 which restricts listed species habitat to the lower reaches of the stream (**Map 13)**. Adfluvial bull trout have been transplanted in three mountain lakes in the upper drainage. The success of these transplants is unknown, but appears that no viable population resulted from this transplant effort. Other fish found in the drainage include rainbow/redband trout, cutthroat trout, brook trout, and whitefish.

Hazard Creek is a fifth order stream comprised of A and B channel types. A-type channels have gradients greater than 4% and have confined alluvial channels. B-type channels have gradients from 1.5 to 4.0% and have moderately confined channels. Table 29 below summarizes Hazard Creek fish habitat parameters.

Table 29. Habitat Analysis for Hazard Creek (Reaches 1-3, Stream Miles 0.00 - 2.37)[1]

Habitat Potential	Cobble Embed.	Spawning Gravels %<6.3	Pool Rif. Ratio	Summer Temp. C°	Active Debris & Pot. Debris 100m.	Pool Qual.	Instream Cover	Bank Cover	Bank Stab.
Natural	<22%	<19%	1:4	<=16	25+/60+	5.0	11%+	5%+	95%+
Exist.	28-34%	22-34%	1:10	17	1/10-15	4.6	14%	5%	100%
%Nat.	60%	60%-80%	70%	80%	60%/60%	80%	100%	100%	100%

[1] Stream survey conducted is a modified Hankins and Reeves survey protocol (1988) (Johnson 1994, BLM 1993, field verified during 2009).

The primary limiting factors for fish production in Hazard Creek include: deposited sediment (primarily cobble embeddedness), elevated summer water temperatures, and limited amounts of good quality spawning gravels. Natural barriers restrict ESA-listed species use to a small percentage of suitable habitat.

Hard Creek General Habitat Conditions

Within the Little Salmon River subbasin, the Hard Creek watershed is a priority/special emphasis watershed for spring/summer Chinook salmon, steelhead trout, and bull trout. The lower reaches of the drainage provide spawning and rearing habitat for spring/summer Chinook salmon and steelhead trout. Bull trout use the stream for subadult/adult rearing. Other fish found in the drainage include rainbow trout, cutthroat trout, and brook trout. A partial/full barrier restricts spring/summer Chinook salmon and bull trout fish passage at stream mile 0.6 on Hard Creek (Attachment, **Map 13**). A full passage barrier for steelhead trout occurs at stream mile 4.7 on Hard Creek (Attachment, **Map 13**). Past fish population monitoring studies conducted by BLM have documented Chinook salmon, steelhead trout, and redds in the lower reach of Hard Creek.

Hard Creek is a fourth order stream comprised of A and B channel types. Table 30 below summarizes Hazard Creek fish habitat parameters.

Table 30. Habitat Analysis for Hard Creek (Reaches 1-5, Stream Miles 0.00 - 2.96) [1]

Habitat Potential	Cobble Embed.	Spawning Gravels %<6.3	Pool Rif. Ratio	Summer Temp. C^o	Active Debris & Pot. Debris 100m.	Pool Qual.	Instream Cover	Bank Cover	Bank Stab.
Natural	<22%	<19%	1:4	<=16	25+/60+	5.0	11%+	5%+	95%+
Exist.	38%	21-31%	1:10	16-17	1/23	4.7	9%	2%	97%
%Nat.	60%	60%-80%	70%	80%	60%/70%	80%	90%	80%	100%

[1] Stream survey conducted is a modified Hankins and Reeves survey protocol (1988) (Johnson 1994, BLM 1993, Field Verified 2009).

Primary limiting factors for fish production in Hard Creek include: deposited sediment, elevated summer water temperatures, limited large woody debris (LWD), and limited amounts of good quality spawning gravels. Natural barriers restrict listed species use to a small percentage of suitable habitat.

Effects from Alternatives

The following indicators were used to evaluate existing fish habitat and watershed conditions and to compare alternatives. The indicators are change in sediment/stream substrate condition, large woody debris, water quality/temperature, water yield, RCA and stream channel function, and watershed condition.

Sediment/Stream Substrate Condition

Additional information and analysis regarding direct and indirect effects to this indicator is found in the Soils and Water Resources section (Section 3.2.5 and 3.2.6). Short-term "pulse disturbance" increases in turbidity and sediment would result from project implementation for most actions, however, restoration efforts would focus on long term reductions in chronic or "press disturbance" sediment. "Pulse disturbance" such as most fires, floods, and some droughts are within the range of natural disturbances to which an ecosystem is adapted, are temporary in time and often patchy in space, and natural recovery is usually possible without assistance. "Press disturbance" alters the long-term resilience of an ecosystem, like sediment from permanent roads or channel alteration from mining or grazing. The "press disturbance" described in this assessment are generally chronic, often widespread (e.g., roads), and may exceed the capacity for recovery without assistance. Surface erosion and sediment delivery to streams would be expected to be near pre-project conditions within one to two years after project implementation, with gradual improving reductions occurring in the long term.

Salmonids are typically negatively affected by increasing amounts of sediment (Bjornn and Reiser 1991). A review of studies related to the effects of fine sediment on salmonids by Chapman and McLeod (1987) concluded that survival to emergence decreases as fine sediment increases in the spawning gravels, the loss of pool volume due to sediment deposition reduces the suitability of a stream for adults, macroinvetebrates decrease in biomass and diversity, and winter carrying capacity decreases. Sedimentation of deep pools and coarse substrate limits the physical space available to juvenile fish for rearing and overwintering. The summer or winter carrying capacity of a stream for fish declines when sediment fills the interstitial spaces of the substrate (Bjornn and Reiser 1991).

Fine sediment (less than 6.33 mm) deposited in spawning areas can trap or smother eggs and embryos, reducing reproductive success of spawning adults. In spawning areas, egg deposition, development, and survival become limited when sediment fills the spaces between gravel, preventing the flow of oxygen and the flushing of metabolic wastes.

Common to All Action Alternatives

Field verification from 2006 through 2010 has been used to delineate perennial, intermittent, and ephemeral streams, seeps, springs, and bogs to ensure all appropriate areas are included and protected in designated and mapped RCAs. Channelized flow can travel in excess of 1,000 feet (Belt et al. 1992). Action alternatives have identified that no timber harvest would occur in the RCA buffers, these buffers are very effective for filtering any potential erosion/sediment attributed to land management activities from reaching streams. However, even though these RCA buffers are very beneficial, they cannot completely eliminate the risk of channelized sediment from reaching streams.

Established RCAs widths are expected to effectively protect streams from non-channelized sediment. Road maintenance activities and/or reconstruction occurring within RCAs would be potential erosion and sediment sources. However, implementation of erosion/sediment control measures would minimize potential for adverse effects. A review by Belt et al. (1992) of studies in Idaho and elsewhere concluded that non-channelized sediment flow rarely travels more than 300 feet and that 200–300 foot riparian "filter strips" are generally effective at protecting streams from non-channelized sediment flow. In a review of past studies, Broderson (1973) noted that a stream buffer width of 200 feet had been found to control overland flows of sediment under the most extreme conditions. Negligible or discountable amounts of sediment would be expected to reach channels.

Action alternatives modeled erosion/sediment effects to cobble embeddedness, surface fines, and fines by depth (spawning gravels) is expected to be negligible. Existing substrate conditions and trends are expected to continue for Little Salmon River, Hazard Creek, and Hard Creek.

Action alternatives affecting mass erosion and sediment processes have the ability to directly or indirectly affect water quality and fish habitat in the short-term and long-term. Some levels of risk may exist from vegetation/soil disturbance actions in areas mapped as moderate or high hazard for landslides (see **Map 10**). Prescribed burning will be low intensity to minimize mortality to overstory trees, which provide for slope stability in areas mapped as moderate or high hazard for landslides. Also project design measures have been developed to minimize or avoid potential risks (See Section 2.1.5). Refer to Soils Section 3.2.5 for additional background and analysis information regarding mass erosion and Bally Mountain Project management actions.

Prescribed fire would not be ignited within the RCAs, but would be allowed to back into these riparian zones. Prescribed fire backing into the riparian zones may result in a short-term increase in erosion/sediment delivery to streams and river.

A short-term spike from restoration and timber harvest/fuel treatments would occur. A long-term reduction of baseline sediment yield from chronic sediment sources would result from restoration activities (e.g., road decommissioning, wetland restoration) and aid in recovery of watershed and aquatic conditions.

Primary restoration benefits and reduction in sediment would occur in the Little Salmon River face drainages and Hard Creek watershed. Restoration actions include decommissioning roads and closing roads to public motorized use. In addition, the wetland restoration project would improve wetland/aquatic values associated with a five acre pond/wetland and adjacent lands; the total project area is 15 acres.

Fuel treatments would reduce the risk of a severe wildfire, which could cause erosion and sediment; the degree of erosion and sediment would be dependent on size and severity of the fire.

Winter rearing (cobble embeddedness) is a limiting factor for fish production within the analysis area. Sediment analysis conducted specifically in regards to winter rearing habitat and comparison of alternatives has predicted the Proposed Action and Alternative 2 would have the largest modeled negative changes to winter rearing habitat from increased sediment. However, surface erosion and sediment delivery to streams would be expected to be near pre-project conditions within one to two years after project implementation, with gradual improving reductions occurring in the long-term. Refer to the Water Resources Section 3.2.6 or modeled WEPP predictions of increased sediment that would occur from alternative implementation in the Little Salmon River, Hazard Creek, and Hard Creek drainages. It is expected that increased erosion/sediment would be negligible and no changes to monitored substrate conditions would be detectable at permanent monitoring stations (see Table 30 above).

Because of the large amount of vegetation, treatments and roadwork (minor reconstruction and maintenance) are in land types that are landslide prone; an inherent risk exists for any actions that may contribute to any potential for mass wasting events. Prescribed burning is proposed to occur on high and moderate hazard areas, and mechanical vegetation treatments occur in moderate hazard areas. Potential effects from a large-scale mass wasting event would have adverse effects on aquatic habitats.

Project design measures have been incorporated to minimize or avoid potential for mass wasting; however, all risks cannot be avoided completely. For example, prescribed burning of high hazard areas, will be low intensity and overall minimal mortality of overstory trees is predicted (<5%). If a large landslide or debris torrent occurred, there would be potential direct and/or indirect effects to water quality (e.g., turbidity, sediment), food base, desired aquatic habitat conditions, and spawning and rearing habitat.

Roads Decommissioned and Proximity to a Stream Channel

Common to All Action Alternatives

Roads can affect streams directly by accelerating erosion and sediment loading, altering channel morphology, and by changing the runoff characteristics of watersheds. These processes interact to cause secondary changes in channel morphology. All of these changes affect fish habitat (Furniss et al. 1991). The bare, compacted soils on roads exposed to rainfall and runoff are a potential source of surface erosion. Roads and ditches form pathways for sediment transport to stream channels (Chamberlin et al. 1991). Permanent and temporary road construction proposed under various alternatives are small-scale (0 to 1.62 miles temporary and 0.15 mile permanent) and are expected to result in short term negligible amounts of erosion and sediment.

Roads within 100 feet of a stream channel (approximately one tree height) can negatively affect sedimentation, stream shading, large woody debris contributions, and pool frequency (Spence et al. 1996). The decommissioning of roads could increase sediment erosion and delivery in the short-term, but is expected to result in unquantified long-term reductions of sediment delivery to Hard Creek, Hazard Creek, and the Little Salmon River.

Large Woody Debris

Large woody debris (LWD) is one of the most important sources of habitat and cover for fish populations in streams (MacDonald et al. 1991). LWD increases fish habitat complexity, which helps ensure that cover and suitable habitat can be found over a wide range of flow and climatic conditions (MacDonald et al. 1991). Large wood has a major impact on channel forming in smaller streams (Sullivan et al. 1987). The location and orientation of LWD can influence channel meandering and bank stability (Swanson and Lienkaemper 1978; Cherry and Beschta 1989). LWD is often the most important structural agent forming pools in small streams (MacDonald et al. 1991). Bilby (1984), and Rainville et al. (1985) found that 80 percent of pools in small streams in Washington and the Idaho Panhandle respectively, were wood associated. LWD also influences sediment transport in streams by forming depositional sites (MacDonald et al. 1991). Wood was responsible for storing half the sediment in several small streams in Idaho (Megahan and Nowlin 1976). LWD can also provide storage sites for leaves, twigs, and other organic material (MacDonald et al. 1991). In small streams in forested areas, this fine organic material can provide the bulk of the energy and materials entering into aquatic food web (MacDonald et al. 1991).

LWD is a component of habitat quality and complexity and is also an important contributor to stream productivity, cover, and food production for fish and other aquatic organisms. Large wood in the streams also contributes to channel stability in small, low order streams, and is thus an important element even in streams where fish are not present. Under natural conditions, large wood is contributed to streams from the surrounding riparian areas as trees fall over and may be recruited slowly over time or in large numbers over a short period of time. The latter often occurs in response to a significant disturbance event, such as wildfire or an extreme weather event where floods or debris torrents wash large amounts of material into the stream. Stream restoration for LWD deficient streams often includes felling trees into streams, hauling LWD to the stream, and selective placement in the stream.

The amount of LWD in a stream is usually measured in the field during stream surveys by counting the number of large woody pieces present in the stream. Future woody debris recruitment is estimated by counting the number of trees in the riparian area that could fall into the stream.

Increases in water yield and high flood flows have the potential to scour stream channels and streambanks. These increased stream flows also may potentially move and flush embedded or anchored LWD from a stream reach. LWD may be moved downstream to a larger stream or river reaches where LWD may not have the same important function for instream cover.

Most woody debris recruitment in this landscape comes from the streamside zone. Within the Bally Mountain Project area, past landslides and debris torrents have impacted tributary streams, and the Little Salmon River, Hazard Creek, and Hard Creek.

Robison and Beschta (1990) found that when the distance from a tree to a stream was more than one effective tree height, the probability of the tree contributing LWD approached zero. The effectiveness of riparian forests along stream channels to deliver LWD is low at distances greater than one tree height away from the channel (McDade et al. 1990). Habitat analysis tables above summarize LWD conditions for Hazard Creek and Hard Creek, overall, LWD conditions are low-fair to fair for these streams. Because of the large size of the Little Salmon River and past flood events LWD is lacking and is rated as being in poor condition for specific Little Salmon river reaches.

Common to All Action Alternatives

Research indicates that with the established RCA buffers provide for protection of riparian habitats and large woody debris recruitment. Harvest activities would be expected to have discountable or no effects on LWD recruitment. Because no timber harvest would take place within any RCAs under all action alternatives, harvest activities would be expected to present a negligible risk of retarding attainment of temperature or LWD RMOs or causing adverse impacts to this management indicator. Overall, existing improving conditions and trends would be expected to continue within the project area.

Potential impacts from fire backing down into the riparian areas include potential tree mortality, which would contribute LWD to small tributary streams, Hazard Creek, and Hard Creek. Overall, effects to LWD would be expected to be minimal from prescribed burning occurring in RCAs. If trees were killed, such would result in potential increased LWD recruitment to stream channels, such effects would be negligible with planned low intensity prescribed fire backing into RCAs.

Decommissioning roads in riparian habitats and riparian restoration actions would result in long-term improvements for LWD recruitment. Alternative 3 has the highest level of road decommissioning and the Proposed Action has the highest amount of prescribed burning, these activities would be expected to have the highest potential for increasing LWD recruitment.

The alternative actions (e.g., prescribed burning, road decommissioning) which affect riparian condition and LWD processes have the ability to directly or indirectly to affect instream cover conditions and pool quality and quantity.

The wetland/riparian (pond) restoration project involves planting of trees and shrubs within the RCA adjacent to the pond. The proposed wetland/riparian restoration project would improve LWD recruitment in the long term, which would improve complex vegetation structure (shrubs/trees) adjacent to the pond. Overall, the restoration project would be beneficial to aquatic/riparian dependent species utilizing the area.

No Action

Potential LWD recruitment would continue from natural mortality or landslide events, and it is expected that LWD conditions would continue to improve over time within the analysis area.

The risk of a severe wildfire would increase over time in the absence of vegetation treatments. With severe wildfire, there are risks associated with impacts to riparian trees, which would affect LWD in the short- and long-term. Generally, with stand replacing fires, fire-killed trees would provide an abundance of LWD as trees fall into the stream. Overall, a severe fire would also result in a loss of live trees, shrubs, and ground cover; which provide for channel and slope stability. Consequently, a severe fire may result in adverse impacts to stream channel from channel and streambank erosion and scouring and slope instability.

Water Quality

Water quality includes factors that lead to a 404(d) listing (temperature, turbidity, etc.). Those factors are addressed in Water Resources (Section 3.2.6). In addition, toxics (e.g., fuels, oil, herbicides, etc.) can enter waterways and affect habitat for aquatic and riparian dependent species.

Toxics

A spill hazard exists wherever roads are near streams or road drainage enters streams (Furniss et al. 1991). Fuel spills may negatively affect a fish-bearing stream biologically through direct poisoning of fish and invertebrates, a food source. Fuels and fuel oils are moderately to highly toxic to salmonids, depending on the concentration and exposure time (Gutsell 1921). Free oil and emulsions may adhere to gills and interfere with respiration and heavy concentration of oil can suffocate fish. The fate of oil in water includes spreading, movement, evaporation, solution, emulsification, photo-chemical oxidation, microbial degradation, sedimentation, and hydrocarbons deposited in sediments which may persist for long periods (Saha and Konar 1986). Herbicide applications within riparian areas and RCAs are at highest risk for chemicals reaching streams.

Potential risks for introduction of toxic materials do occur from implementation of action alternatives; however, design measures minimize or avoid risks. This assessment does not include predictions of the amount of toxic materials entering streams. The project proposal identifies measures that minimize potential risks of toxic materials entering streams. Overall, project design measures regarding timber harvest, prescribed burning, road construction, fuel storage, herbicide application, and emergency spill plan will reduce risks to a low probability for introduction of hazardous materials to waterways and minimize or avoid potential for adverse impacts.,

Water Temperature

Stream temperatures are the net result of a variety of transfer processes, including radiation inputs, evaporation, convection, conduction, and advection (Brown 1983). Removal of vegetation along streams may result in instream temperature increased during summer months, and in the loss of insulating vegetation that can contribute to colder winter stream temperatures. Water temperature influences the metabolism, behavior, and mortality of fish and other organisms in their environment (Mihurksy and Kennedy 1967).

Unsuitable temperatures can lead to disease outbreaks in migrating and spawning fish, altered timing of migration, and accelerated or retarded maturation. Unsuitable temperatures can also force adult and rearing juvenile fish to find thermal refuge in tributaries where there may be increased risk of predation and/or competition for food, potentially affecting a fish's fitness, thus its survival going into winter. Fish can often survive short durations of temperatures above or below their preferred range, growth is reduced at low temperatures because all metabolic processes are slowed, and at high temperatures, because most or all food must be used for maintenance (Bjornn and Reiser 1991).

Measured buffer strip shading shows that a buffer strip 85 feet wide shades a stream as well as an average undisturbed canopy in late successional old growth forests in the Western Cascades (Steinblums 1977). In a study of small streams, Brazier and Brown (1973) found the maximum shading ability of the average buffer strip was reached with a width of 80 feet.

Colder water temperatures due to loss of insulating vegetation can lead to the formation of frazil or anchor ice on stream bottoms. Incubating embryos can be killed when frazil or anchor ice forms in streams and reduces water interchange between stream and redd (Bjornn and Reiser 1991). Flood scouring events have resulted in localized reaches of the Little Salmon River being prone for the formation of frazil and anchor ice conditions.

Generally spawning temperature is not as high of a concern for steelhead and redband/rainbow trout, which spawn in the spring, or bull trout, which spawn in the in the fall when stream temperature are typically cooler. High summer temperatures can affect summer rearing habitat for all federally listed or BLM sensitive fish species, and the spawning success for spring/summer Chinook salmon that spawn in August to mid-September.

Potential increases in stream temperature are addressed by assessing the degree of activities in riparian areas that may result in increased or decreased solar radiation to streams. No timber harvest is proposed in RCAs.

Common to All Action Alternatives

Toxic materials used under the action alternatives include fossil fuel derivatives, including diesel fuel, hydraulic fuel, various petroleum-based lubricants, gasoline, and herbicides.

The two factors determining the degree of risk from toxic materials are the toxicity of the chemical and the likelihood that non-target organisms would be exposed to toxic doses (Norris et al. 1991). Toxicity alone does not make a chemical hazardous; exposure to a toxic dose must also occur. Chemicals may enter water by one or more of the following routes: direct application, drift, and mobilization in ephemeral stream channels, overland flow, and leaching (Norris et al. 1991).

In addition to proposed actions (buffers, avoidance of high risk landslide prone areas, etc.) project measures identified in the above Section 2.1.5 Environmental Design Measures (see Soil and Water Resources and Aquatic and Riparian Habitat) identify actions to avoid or minimize adverse impacts to water quality. No helicopter landings would be authorized within RCAs. In addition, fueling and storage of fuels is addressed with specific Bally Mountain Project design measures. Transport of fuels is regulated through project design measures that minimize the risk of accidents or accidental introduction of these materials to streams. Therefore, the risk of fuel delivery to streams is considered extremely unlikely to occur.

The Bally Mountain Project design measures identified for equipment fueling and maintenance would minimize the risks associated with accidents, spills, or introduction of fuels to fish bearing waters. Therefore, the risk of fuel delivery due to fueling and maintenance of equipment to streams is considered low risk.

No Action

Under this alternative, no use of herbicides, fuels, or any fire suppression chemicals is proposed above current levels. The risk of these materials entering streams would remain unchanged from the existing condition. All herbicide application would be in accordance with BLM's multi-year program submittal and Section 7 consultation. Application of herbicides within riparian areas and RCAs would be ground based and risks would be at low levels to aquatic organisms and non-target vegetation.

Temperature

Common to All Action Alternatives

Since harvest of timber within streamside RCAs is not proposed under any of these alternatives, the risk of adverse effect on stream temperature is discountable, or extremely unlikely to occur. Riparian restoration actions and decommissioning of roads within RCAs and riparian areas result in improved shading and riparian conditions in the long-term.

While there are no plans to ignite prescribed fire within the RCAs, there would be some effect from fire backing down into these areas. Consequently, some riparian habitats would be impacted and potential for minor tree mortality would occur in riparian area from burning activity, which would be expected to have negligible effects to shading in small tributary streams, Hazard Creek, Hard Creek, and Little Salmon River. It is acknowledged, that a risk does occur with prescribed burning and unplanned for moderate or high intensity fires would increase mortality of overstory trees in RCAs and riparian areas. Prescribed burn design measures will be for low intensity burns to minimize overstory mortality.

Under the various alternatives, up to two new stream crossings are proposed to be constructed, which would have minor effects to riparian vegetation at these locations (non-fish bearing streams). One stream crossing would occur for a new permanent road (all Alternatives) and one stream crossing would be for an existing road that had the culvert washed out previously (Alternative 2 and 3). These actions would result in long-term effects at the stream crossing, but would be localized and would result in overall negligible effects to riparian habitats, shading, and water temperature.

Tree cutting for the temporary road would not occur within the RCA of any stream or river, consequently no tree shading or water temperature effects are expected to occur to streams from this action.

<u>No Action</u>

Under this alternative, stream temperatures within the analysis area would remain unchanged over the short-term. Some improvement may occur over time as vegetation recovers in areas where shade has been reduced from past activities. These areas include flood damaged segments of the Little Salmon River that scoured channels and impacted riparian habitats and a few other streams within the project area (small tributary non-fish bearing streams) that experienced flood damage, debris torrents, or landslides. Road encroachment in riparian areas has also reduced shrub and trees shading potential along some stream reaches (e.g., Little Salmon River Highway 95, road paralleling lower reach of Hazard Creek).

Lack of vegetation treatments may contribute to continued accumulation of fuels, potentially resulting in more severe wildfires, which, depending on size, severity, and location, could affect water temperature. Effects would be dependent on amount of stand replacing fire that occurred within riparian habitats and changes resulting to shading.

Water Yield

Changes to water yield have direct and indirect effects to soils and water resources and are also discussed in those sections (Sections 3.2.5 and 3.2.6).

Increased water yield is one indicator used to assess potential effects among the alternatives, and it is a rough predictor of potential changes in channel condition and instream habitat. Increases in water yield may indirectly affect fish habitat through increased bank erosion, channel down cutting, increased accumulation of larger streambed materials, reduction in number of pools, overall reduction of habitat complexity, and changes in number, size, or frequency of LWD. ECA is a term used to describe the total area within a watershed that does or would exist in a clearcut condition. The results of the water yield analysis included in the Water Quality Section are used for analysis of potential impacts to fish habitat.

ECA thresholds are identified to provide a conservative approach to water yield that would avoid the following undesirable effects on stream habitat condition: accumulation of streambed materials (aggradation), channel braiding, channel down cutting, and increased bank erosion. The above may collectively or singularly contribute to increased width/depth ratio, decreased number of pools, decreased pool quality, and overall simplification of instream habitat (Chamberlin et al 1991). ECA thresholds and existing channel conditions were evaluated for larger 6th code HUCs and also for the smaller non-fish bearing tributaries occurring within the project area (see Water Resources Section 3.2.6).

Increases in water yield are highly variable in time and space because they are dependent on climate, topography, soils, vegetation, and other environmental factors. This high degree of variability makes it difficult to quantifiably determine an outcome as a result of timber harvest activities. Stream channel types and stability rating were used in conjunction with percent increases in ECA to assess the risk that project associated water yield increases may cause channel changes.

Stream channel stability is determined through an inventory procedure developed by Pfankuch (1978). He developed a procedure to assess entire channel systems within a watershed, and to use the results in conjunction with other hydrologic analyses. Stream channels are rated based on their ability to withstand increase in stream discharge associated with decreases in the density and areal extent of vegetation. A stream with a "poor" rating has a higher risk of sustaining damage from increased peak discharge than a stream rated "good" or "excellent".

Common to All Action Alternatives

The results of the water yield analysis included in the Water Resources Section 3.2.6 are used for analysis of potential impacts to fish habitat. Because of the elevation zone of the project area, and historic rain on snow events causing landslides and debris torrents, several streams within the project area have had high flow scouring events which contribute large amounts of sediment to fish bearing streams. However, none of the action alternatives propose increases in water yield that is expected to result in channel degradation or long-term impacts to fish habitat.

ECA would increase as a result of implementation of the action alternatives. Road decommissioning and soil restoration contribute to a reduction in compaction, thus improving infiltration and reducing surface runoff. This effect would be most pronounced in Alternative 3 and least in Alternative 2. The Cottonwood RMP set a 15 percent ECA as a threshold level requiring additional assessment. ECA would increase 1 – 2 percent for the action alternatives. Stream channel evaluation conducted from 2006 through 2010 found that most tributary streams within the project area are stable and resilient, and capable of withstanding predicted increases in water yield (see Table above 25). Several streams were determined to have a poor rating because of historic scouring events and degradation to channel and riparian habitats. ECA increases attributed to action alternatives would be one percent or less for the watersheds within the analysis area. The small first and second order tributaries (total 17) occurring within the project area would not exceed 30 percent ECA under any of the action alternatives (see Water Resources Section 3.2.6, Table 25). Several small tributaries would have ECA increased, which would experience some changes in water yield. Within these drainages, proposed vegetation treatments are not expected to increase ECA to adverse levels and would minimize potential for adverse effects to channel stability from action alternatives.

Fuel treatments would reduce the risk of a severe wildfire, which would have effects on ECA. ECA effects would be dependent on tree mortality, severity of fire, and size of fire, which is not predictable. If a large fire occurred, ECA adverse effects would result in potential adverse channel effects. In summary, fuel treatments would have negligible effects on ECA for larger watersheds (Little Salmon River, Hazard Creek, and Hard Creek), but would have varying effects on small tributary streams (see above discussion).

No Action

Under this alternative, ECA and any changes in water yield from past activities would continue to recover, except for areas affected by land uses that result in soil compaction, such as past tractor logging, dozer piling, and log landings. These areas are affected by low soil infiltration rates and may not recover in the absence of soil and other watershed restoration efforts. In addition, existing roads would continue to contribute towards ECA, and recovery, if any, would occur extremely slowly in the absence of road decommissioning and soil restoration. Lack of vegetation treatments may contribute to continued accumulation of fuels, potentially resulting in more severe wildfires, which, depending on size, severity, and location, could result in significant water yield changes. Significant water yield changes could result in adverse effects on fish habitat not fully recovered from past impacts.

The benefits of this alternative, with respect to ECA and water yield, include no short-term changes in ECA and thus, no potential short-term changes in water yield and fish habitat condition.

Riparian Conservation Areas and Streamside Function

The most common biological features establishing or affecting the relationships of channel and valley slope have been native pioneer species of riparian vegetation (Smith and Prichard 1992). High energy runoff and its associated transported sediment have been moderated by dissipation, through spreading across floodplains, vegetative entrapment, development of sinuous meander patterns, and seasonal recharge of ground-water aquifers and riparian bank storage. Healthy riparian areas are noted for having adequate vegetation, landform, or large woody debris to dissipated energy during high-flow events, limit erosion, and improve water quality. Healthy riparian and wetland areas also filter sediment and capture bedload, which aids floodplain development and enhances flood-water retention and ground-water recharge. In addition, healthy riparian–wetland areas also produce diverse ponding and channel characteristics that provide habitat necessary for fish production, waterbird breeding, and wildlife habitat (Prichard et al. 1996).

Erman et al. (1977) reported that the composition of benthic invertebrate communities in streams with buffers greater than 100 feet were indistinguishable from those in streams flowing through unlogged watersheds.

Road construction have been the most significant land use influences on riparian habitats and stream channels within the analysis area, and is followed by livestock grazing within some subwatersheds. Roads have encroached on riparian areas and stream channels. Road fords, bridges, and culverts exist at stream crossings, and these stream crossings alter stream channels and may be a chronic erosion and sediment source.

Common to All Alternatives

Since harvest of timber within streamside RCAs is not proposed under any of these alternatives, the risk of adverse effect on riparian habitat is discountable, or extremely unlikely to occur. Riparian restoration actions and decommissioning of roads within riparian areas would improve conditions in the long-term.

Prescribed burns would have some effect on stream channel function from fire backing down into riparian areas, but would be expected to have negligible effects to small tributary streams, Hazard Creek, and Hard Creek.

Action alternatives identify one to two new stream crossings proposed for construction, which would have localized effects to RCAs and stream channels at these locations (non-fish bearing streams). The proposed permanent road includes approximately 300 feet of road construction/re-construction within the RCA, which would have localized effects to channel and riparian habitats. Rocking and graveling approaches to new stream crossing, slash filter windrow installations, and seeding/mulching of crossing would minimize adverse effects, however, localized long term negligible effects to riparian habitats would occur at the crossings.

Proposed temporary roads under the action alternatives do not occur in RCAs. Tree cutting for the temporary road would not occur within the RCA of any stream or river. Therefore, no RCA, riparian, or stream channel effects are expected to occur from the action alternatives proposed temporary road construction.

Under the Proposed Action and Alternative 3 the wetland/riparian restoration project would result in long term beneficial effects to a four acre pond/wetland habitat and adjacent RCA. The restoration project is approximately 15 acres in size and would improve habitats in the area with the decommissioning of the roads in the RCA, riparian tree/shrub plantings, and seedings. This would be beneficial to aquatic/riparian dependent species that utilize and prefer or utilize these habitats (e.g., amphibians, water birds, big game, upland game, etc.).

Aspen restoration of approximately 14 acres would involve a portion of the project that occurs in the RCA of several small pond/wetland areas. Restoration of decadent or establishment of new aspen stands would result in small localized beneficial effects to the RCA and wildlife species that prefer these habitats. However, within the aspen restoration area aspen are lacking and restoration would need to include timber harvest, burning, and establishment of aspen (e.g., suckers, plantings). Because to the lack of existing aspen clones in the area, site preparation and establishment of aspen may have fair probability of success at best. Active treatments for aspen restoration in RCA would have short term negligible adverse impacts, prior to establishment of desired vegetation.

Watershed Condition

Common to All Action Alternatives

Various watershed road density criteria have been used to assess watershed condition. Local guidelines have been developed that suggest less than one mile of road per square mile (mi/mi^2) is one indicator of good watershed condition, 1–3 mi/mi^2 is moderate and greater than 3 mi/mi^2 is poor condition (NOAA-NMFS 1998). Road density changes at a 6^{th} code HUC level for all action alternatives are low. Post-project prescription watershed condition categories (NOAA-NMFS 1998), based on road density would not change (good and fair condition ratings).

The lowest road densities result from Alternative 3, which has the most aggressive road decommissioning. Of the action alternatives, Alternative 2 decommissions the least amount of road and results in the highest remaining road density. The preferred alternative identifies that 7.7 miles of road would be decommissioned, and 3.43 miles would occur in Round Valley Creek – Little Salmon River HUC; 4.26 miles would occur in Hard Creek HUC, and 0.5 mile would occur in Hazard Creek HUC. Alternative 2 identifies no road decommissioning and Alternative 3 identifies 10.7 miles of road would be decommissioned.

Other indicators of watershed condition include road densities in RCAs, road density in landslide prone areas, road streams crossings, and ECA. Action alternatives have various levels of proposed road decommissioning, and such actions would occur in three 6^{th} code HUCs. Localized short term effects (low adverse) and long term effects (beneficial) would occur to watershed condition from decommissioning of roads in RCAs or areas at risk for landslides, but the amount would not change the overall watershed condition rating. Refer to Soils and Water Resources Sections (3.2.5 and 3.2.6) for additional analysis regarding ECA and road decommissioning.

No Action

Under this alternative, the vegetation treatments would not be conducted and the watershed conditions would remain the same and current conditions and trends would continue. The current watershed conditions are affected by the timber harvest occurring on surrounding Forest Service, State, and private lands; the 1994 Corral wild fire in Hazard and Hard Creek watersheds; and mass erosion events; and flood events. The 1994 Corral fire has had effects on ECA for the upper Hazard Creek and Hard Creek watersheds.

Cumulative Impacts

The cumulative effects analysis area for sediment and substrate is the Little Salmon River – Round Valley Creek, Hazard Creek, and Hard Creek watersheds.

Roads Decommissioned and Proximity to a Stream Channel

Discountable or negligible effects are expected to occur to sediment/substrate conditions from proposed actions. It is unlikely that the proposed activities would contribute to cumulative effects of past, present, and foreseeable future management actions for sediment/substrate conditions within the cumulative analysis area.

Large Woody Debris

The existing condition of this indicator reflects a long history of human development in this watershed. Riparian encroachment by roads has affected streamside conditions in the watersheds, including large woody debris. The presence of streamside roads generally results in the permanent removal of large woody debris, sometimes all the debris, that otherwise could be recruited into streams. Riparian areas throughout the watershed have been affected by past streamside road construction, mining activities, residences, domestic livestock grazing, and timber harvest. Rural home construction and development has encroached on riparian habitats, particularly along the Little Salmon River corridor. The continued existence of streamside roads generally translates into reduced ability of stream to recruit wood.

The action alternatives are unlikely to contribute to reduction of LWD, when considered cumulatively with past contributors to the degraded condition. With the exception of two new stream crossings; no additional streamside roads would be constructed adjacent to or cross any streams. No tree harvest would occur within any RCAs and no LWD would be removed from channels. Implementation of restoration actions, specifically streamside road decommissioning and riparian restoration is expected to contribute to improvement of LWD over time. In addition, increased natural LWD recruitment is expected to continue, even in the absence of restoration.

Discountable or negligible effects are expected to occur to LWD conditions from all action alternatives. It is unlikely that the proposed activities would contribute to cumulative effects of past, present, and foreseeable future management actions for LWD within the cumulative analysis area. Overall, none of the alternatives will substantially increase or decrease LWD recruitment. Consequently, the cumulative impact of the project on LWD will be negligible.

Water Quality

In combination with past, present, and foreseeable future actions, risks do occur for an accidental hazardous material spill or toxic materials reaching live waters, consequently streamside uses of toxic material in close proximity to riparian areas and streams have higher risks. However, safe guard measures generally are used when using large quantities of hazardous or toxic materials.

The potential for the introduction of toxic materials reaching aquatic habitats has been previously discussed. In summary, they include: mining operations, herbicide application, use and storage of fuels and petroleum products, and fire suppression chemicals.

Effects from implementation of all action alternatives are unlikely to contribute to increased risks to water quality from toxic materials, even when considered cumulatively with past, ongoing, and foreseeable actions.

Temperature

A variety of projects and other activities that could affect riparian conditions and improved shading of streams within the analysis area include public land timber harvest and fuel treatments, private land restoration actions, private land timber harvest and road construction, livestock grazing, and firewood cutting.

Domestic livestock grazing continues to occur within the watersheds on private, Forest Service, State, and BLM lands. Private land grazing is prevalent in the upper meadows area of the Little Salmon River. Grazing on BLM and Forest Service lands within the watersheds has been conducted at levels to minimize or reduce effects to riparian vegetation and ESA-listed fish. Some private land grazing still occurs at levels that result in localized adverse impacts to riparian vegetation and streambanks, which have direct and indirect effects on water temperature (i.e., upper Little Salmon River meadows).

Effects from implementation of all action alternatives in combination with past, present, and foreseeable future actions are not expected to adversely affect water temperature within the analysis area. Implementation of restoration actions, specifically streamside road decommissioning and riparian restoration is expected to contribute to improved riparian conditions, and improvements to water temperature. In addition, natural recovery to riparian areas and improved shading would also occur.

Overall, negligible effects are expected to occur to water quality/temperature conditions from proposed action alternatives with the implementation of design measures. It is unlikely that the proposed activities would contribute to cumulative effects of past, present, and future management actions for water quality/temperature within the cumulative analysis area.

Water Yield

Timber harvest, road construction, fires, and development activities have the ability to affect ECA conditions in the analysis area watersheds. Water yield refers to stream flow quantity and timing and is a function of water/soil/vegetation interactions. Changes in amount or distribution of vegetation can affect water yield by changing rates of interception and infiltration, evapotranspiration, and alter shading. These factors affect the accumulation and melt rates of snow packs and how rainfall is processed, which have an effect on the timing and total amount of water yield that flows off the landscape. Determining the ECA, which represents the extent of forest canopy opening from fire, harvest, and roads, can assess changes in amount and distribution of vegetation. Compacted soils and road systems (watershed networks) can also have an effect on the timing and amount of runoff. Increased runoff and peak flow may be associated with stream downcutting, bank instability, and deposition of sediment in low-gradient stream reaches and can cause alteration of riparian function and lower the quality of fish habitat.

ECA will be above 15% for the Middle Little Salmon River, Hazard Creek, and Hard Creek. Surveys conducted 2006 through 2010 field season, documented for most streams, overall channel stability ratings of high fair to good and predicted increases in water yield are not expected to result in adverse impacts to the channels. Several small tributary streams were determined to be at risk from increased water yields because of poor channel stability ratings.

Implementation of the action alternatives, when combined with the past, present, and reasonably foreseeable projects, would increase ECA by less than 0.5 percent in 6th code HUC watersheds (i.e., Middle Little Salmon River, Hazard Creek, and Hard Creek) affected by the Bally Mountain Project. Small first and second order non-fish bearing tributary watersheds occurring within the project area would not exceed 30 percent under any alternative. Therefore, negligible effects are expected to occur to water yield conditions from proposed actions. It is unlikely that the proposed activities would contribute to cumulative effects of past, present, and foreseeable future management actions within the cumulative analysis area.

Riparian Conservation Areas and Streamside Function

Domestic livestock grazing occurs within the watersheds on private, Forest Service, and BLM lands. Private land grazing is prevalent in the upper meadow areas of the Little Salmon River. Grazing on BLM and Forest Service lands within the watershed has been conducted at levels to minimize or reduce effects to riparian vegetation or ESA-listed fish. Some private land grazing occurs at levels that impact riparian vegetation and stream banks (e.g., upper Little Salmon River meadows area).

Implementation of the action alternatives, when combined with the past, present, and reasonably foreseeable projects, would not contribute to long-term adverse impacts to riparian habitats and stream channels. No tree harvest would occur within any RCAs. Implementation of restoration actions, specifically streamside road decommissioning and riparian restoration would improve riparian habitats over time. In addition, some natural improvements in riparian habitats are expected to continue, even in the absence of restoration.

Watershed Condition

The changes in road density from the action alternatives in combination with the past, present and foreseeable future actions at the watershed level are negligible. Consequently, no adverse cumulative effects would be expected to occur from implementation of any of the alternatives.

Effects to ESA-listed and BLM Sensitive Fish Species

Refer to the following Table 31, for a summary of determinations for ESA-listed fish species and critical habitats. A Biological Assessment has been prepared in cooperation with the U.S. Fish and Wildlife Service and NMFS for the proposed project (BLM 2012). For more specific and additional information regarding effects to ESA-listed fish species and critical habitats refer to the referenced BA.

Table 31. ESA-Listed Species, Critical Habitat, and BLM Sensitive Fish Determination

Species Status	No Action	Proposed Action	Alternative 2	Alternative 3
Sockeye Salmon *Endangered*	NE (Species) NE (CH)	NE (Species) NE (CH)	NE (Species) NE (CH)	NE (Species) NE (CH)
Fall Chinook Salmon *Threatened*	NE (Species) NE (CH)	NE (Species) NE (CH)	NE (Species) NE (CH)	NE (Species) NE (CH)
Spring/Summer Chinook Salmon *Threatened*	NE (Species) NE (CH)	MA-LAA (Species) MA-LAA (CH)	MA-LAA (Species) MA-LAA (CH)	MA-LAA (Species) MA-LAA (CH)
Steelhead Trout *Threatened*	NE (Species) NE (CH)	MA-LAA (Species) MA-LAA (CH)	MA-LAA (Species) MA-LAA (CH)	MA-LAA (Species) MA-LAA (CH)
Bull Trout *Threatened*	NE (Species) NE (CH)	MA-LAA (Species) MA-LAA (CH)	MA-LAA (Species) MA-LAA (CH)	MA-LAA (Species) MA-LAA (CH)
Westslope Cutthroat Trout	NI	MII	MII	MII
Redband Trout	NI	MII	MII	MII
Pacific Lamprey	NI	MII	MII	MII

ESA-Listed: NE=No Effect; MA-NLAA="*May Affect, Not Likely to Adversely Affect*"; MA-LAA="*May Affect, Likely to Adversely Affect*"
Critical Habitat: CH
Idaho BLM Sensitive: NI=No Impact; MII="*May impact individuals or habitat, but will not likely lead to a trend toward federal listing or cause a loss of viability of the population or species*".

A "*likely to adversely affect"* determination was made for Essential Fish Habitat (EFH) (see analysis rationale for listed fish). Pursuant to section 305(b)(2) of the Magnuson-Stevens Act, Federal agencies must consult with NOAA Fisheries regarding any of their actions authorized, funded, or undertaken, or proposed to be authorized, funded, or undertaken that may adversely affect EFH. The Magnuson-Stevens Act, section 3, defines EFH as "those waters and substrate necessary for fish for spawning, breeding, feeding, or growth to maturity". This BA incorporated an EFH Assessment into the analysis.

Concerns for landslides and debris torrents have been identified within the project area. All harvest treatments will be avoided on high hazard areas. In moderate hazard areas (with low to moderate relative risk) management actions are designed with review and guidance of appropriate resource specialists. Limited practices may include but are not limited to: reducing yield or basal area removal of forested vegetation, increased rotation lengths, selective harvest with partial suspension yarding, relocating existing or proposed road alignment, improving road drainage design, etc. There no temporary road construction will occur in high hazard areas. Prescribed burning will occur on areas identified as high hazard for landslides. Prescribed burning will be low intensity and

overstory mortality is expected to an average of no more than five percent (range 1 – 10 percent). This will minimize risk of landslide initiation.
No roads proposed for decommissioning on areas mapped as high landslide hazard, but local road and slope failures would be identified and treated as roads are decommissioned. Implementation of the proposed action would include the potential to stabilize local mass erosion sites on 7.7 miles of road to be decommissioned.

The primary rationale supporting the "*likely to adversely affect*" determinations for ESA-fish, designated critical habitats, and EFH is in regards to the large size of the proposed vegetation treatments (1,428 acres) proximity to high value aquatic habitats (i.e., Little Salmon River, Hazard Creek, and Hard Creek), sensitive landtypes, and the amount of vegetation treatments that would occur on moderate and high risk landslide prone areas. Project design measures have been incorporated into all treatments, roadwork, and restoration to avoid or minimize potential for adverse effects occurring from erosion/sediment and mass wasting events. However, it is acknowledged that this general area of the Little Salmon River drainage occurs in an area with sensitive soils/land types, climatic events, and has been subject to past events that have resulted in flood damage and mass wasting events. Even though risks for mass wasting may be low from project related actions, the potential effects from mass wasting or debris torrents may be substantial if such occurs.

The project objectives are to reduce fuel loading and threats from large scale stand replacing wildfires, which would have major adverse impacts to aquatic habitats if such occurred within the project area. A severe fire, dependent on size could potentially have significant adverse effects from increased mass wasting, landslides, and debris torrents and the direct and indirect effects to fish and aquatic habitats..

3.2.9 Wildlife

Wildlife species were evaluated in relation to available habitat quality and quantity occurring within the project area. Where appropriate the analysis area was extended to the watershed level (6^{th} code HUCs). The analyses for wildlife species and habitats are summarized for habitat fragmentation/connectivity, snags and large down wood, and four generalized wildlife species habitat guilds based on predominant habitat associations or dependency relationships. The four specific wildlife habitat associations and guilds include: (1) riparian/aquatic dependent; (2) fire/early seral dependent; (3) late seral/old growth associated; and (4) security dependent.

Outputs from the habitat suitability index model for north Idaho (Leege 1984) were used to analyze summer elk habitat within the project area. The analysis of effects on elk is based on the proposed modification to the current condition of elk habitat quality and security in the Bally Mountain Project Elk Analysis Unit (EAU).

The scope of this analysis and extent of cumulative effects varies depending on each species relative home range size and critical habitat niches(s). For certain species, the amount (acres) of potentially suitable habitat that would be modified will be the primary indicator for analysis and will be addressed for each alternative. Direct, indirect and cumulative effects will be addressed predominantly within the project area, and where applicable extend beyond the project area to the sub-watershed or watershed level.

Affected Environment

The most common wildlife habitats within the project area are mid-aged to mature mixed conifer stands. Common overstory trees within the project area include Douglas-fir, ponderosa pine, and grand fir. Table 32 identifies Forested Potential Vegetation Groups (PVG) found within the project area.

Table 32. Potential Vegetation Groups in Bally Mountain Project Area

Potential Vegetation Groups	
PVG 2	Warm Dry Douglas-Fir/Moist Ponderosa Pine
PVG 3	Cool Moist Douglas Fir
PVG 4	Cool Dry Douglas Fir
PVG 5	Dry Grand Fir
PVG 6	Cool Moist Grand Fir

Table 33 summarizes the stand structure characteristics occurring within the project area.

Table 33. Stand Structure – Tree Diameter or Size

Stand Structure	Acres	Percentage
Grass/Forb/Shrub/Seedling	88	3%
Sapling		
Small Trees		
Medium Trees	1,998	68%
Large Trees	852	29%
Old Growth[1]	(195.5)[1]	(7%)[1]
Other	29	1%
TOTAL	2,908	100%

[1]Old growth is a component of, and not in addition to, the large tree component

Due to its high productivity and structural diversity, aspen is capable of supporting the broadest array of plant and animal species of any forest type in the West, and is considered second only to riparian areas in its support of biodiversity (Chong, et al. 2001). Aspen can support diverse grass, forb, and shrub species and, therefore, habitat for a wide variety of bird, mammal, and arthropod species (Mueggler 1985). However, aspen has decreased throughout the Intermountain West during the 20th century, and aspen-dominated acreage within the five national forests of Utah has declined by 50% or more in recent decades (e.g., see Fig. 1 in Kay and Bartos 2000). This decline is of special concern, as aspen does not commonly reproduce from seed and thus loss of an aspen clone may be the loss of a long-standing aspen presence not easily recovered. Within the project area aspen is lacking and consists of a few scattered trees and very small clones.

Habitat Fragmentation and Connectivity

Habitat fragmentation is the breaking up of wildlife species' habitat into discontinuous parcels, particularly for species that have difficulty moving from one of those parcels to another. Historically habitats have been fragmented by wildfire, insect and disease and other disturbance processes. Native wildlife species have adapted to a landscape with a high degree of fragmentation, abundant edge and a variety of patch sizes, the result of natural processes and topography.

Habitat connectivity is the degree to which the landscape facilitates wildlife movement and ecological processes. Historically, habitats have not been connected due to natural disturbances (i.e., fire history, natural barriers).

In the project area, as a result of natural processes and topography, wildlife species have adapted to a landscape with a high degree of fragmentation, abundant edge, and a variety of patch sizes. The watersheds and landscapes within the project area have been altered to varying levels by past natural and human actions. Past human and natural activities include: U.S. Highway 95 and private residences along the Little Salmon River corridor; large stand replacing fires (i.e., upper Hazard Creek and Hard Creek watersheds); timber harvest; and fire exclusion. Effects of fragmentation on wildlife dispersal or movement between various habitat elements (water, forage, winter/summer range, breeding areas) are not known to have significantly affected the viability of any wildlife species within the project area or watershed analysis area.

Other than high volume roads and large stand replacing fires; fire exclusion has created the greatest effects by allowing development of dense multi-canopied forests that have created conditions not preferred by some wildlife species. Effects of fragmentation on wildlife dispersal or movement between various habitat elements (water, forage, winter/summer range, breeding areas) are not known to have affected the viability of any wildlife species within the project area and Little Salmon River – Round Valley Creek, Hazard Creek, and Hard Creek watersheds analysis area.

Habitat connectivity can have positive and negative considerations. Connectivity is important for some wildlife species to move on the landscape. However, habitats that have not been connected due to fire history, natural barriers, etc. that are allowed to become connected (through fire exclusion for example) may allow wildlife, plants, insects and disease to interact in negative ways. Invasive wildlife species and noxious weeds increase their ranges by using these artificial connections on the landscape. These connections may influence how insects and disease interact with and affect habitats.

Snags and Large Down Wood

Snags, broken-topped live trees, downed logs, and other woody material are required by a wide variety of wildlife species for nesting, denning, roosting, perching, breeding, and cover. The number, species, size, and distribution of available snags strongly affect snag-dependent wildlife (Bull et al. 1997). Although smaller creatures can use many sizes of dead trees, larger birds and mammals require larger snags and down logs. Large diameter logs provide long-term habitat structures. In the project area, large western larch, ponderosa pine, and Douglas-fir snags are the most valuable for snag-dependent species.

Downed trees and other woody material are also important for many species (Bull 2002). Downed logs and stumps provide resting and denning for species hunting below the snow in winter (Buskirk and Ruggiero 1994) and are used as travel cover. Pine marten and lynx dens are associated with down logs. Amphibians and reptiles use large woody debris for shelter and breeding sites (Bull et al. 1997). Down wood also provides habitat for insects and other invertebrates that form an important forage base for larger species. Large diameter logs provide long-term habitat structures.

The Cottonwood RMP identifies desired range of snags, coarse woody debris, and green tree snag replacement per acre for each PVG. Based on the PVGs occurring within the project area, following is a summary of the desired range of snags per acre, coarse woody debris, and green tree snag-replacement guidance (BLM 2009; Table 34). Overall, there are abundant small to medium sized snags in the project area, however, many stands do not have desired number of large sized snags (> 20 inches dbh). Some stands are also lacking desired large sized green tree snag-replacement (i.e., 4 trees/acres ≥ 20 inches dbh) and large sized coarse woody debris (largest size class best, preferably over 15 inches dbh).

Table 34. Desired Ranges of Snags, Coarse Woody Debris, and Green Tree Snag-Replacement (BLM 2009)

Snags/Woody Debris	Desired Range[1]	Comments
Snags per Acre	2 – 9 snags	Prefer larger size diameter snags, >20 inches dbh. Minimum height of 30 feet.
Coarse Woody Debris, Tons per Acre	4 – 14 tons	Coarse woody debris decay class I and II, >75% comprised of woody debris >15 inches diameter.
Green Tree Snag Replacement per Acre	6 – 15	Preference for retention trees > 20 inches dbh. Maintain minimum of 2 – 4 large diameter trees (>20 inches dbh) per acre for replacement snags. Retain sufficient number of live trees for long-term replacement of snags, including those with broken tops, cavities, lightning scars, and dead portions as future recruitment.

[1]The desired ranges depicted in this table is not meant to provide an even distribution of snags across every acre in the forested landscape, but to provide numbers that serve as a guide to approximate an average condition at the stand levels or project area. Exceeding these numbers does not depict adverse conditions, and would provide benefits.

Wildlife Habitat Guilds

There are four habitat guilds within the project area based on habitat associations or dependency relationships. These include: (1) riparian/aquatic dependent; (2) fire/early/seral dependent; (3) late seral/old growth associated; and (4) security dependent. The old growth stands in the project area are described as seral old growth ponderosa pine and primarily occur in dry grand fir habitats.

The project area provides important habitat for big game species such as Rocky Mountain elk, mule deer, and white-tailed deer. Other big game species, which may utilize the project area include mountain lion, black bear, bighorn sheep, and moose.

Riparian/aquatic dependent

The project area is adjacent to/bordering 4.8 miles of the Little Salmon River, 2.2 miles of Hard Creek, and 0.9 mile of Hazard Creek. Within the project area occur 17 small first and second order intermittent and perennial streams (8.6 miles - non-fish bearing) flow into the Little Salmon River, Hard Creek, or Hazard Creek (**Map12**). Several small ponds/wetlands that occur within the project area provide some unique and valuable wildlife habitats. Within the project area an estimated 33 acres of riparian habitat occur and 6-9 acres of wetlands (primarily associated with ponds).

The Little Salmon River, Hazard Creek, and Hard Creek channels adjacent to project area are predominately moderate gradient B, with steep gradient tributary streams. These streams are perennial or intermittent non-fish bearing and A channel types. Several small ponds/wetlands occur within the project area. Most of the larger streams and riparian areas (i.e., Little Salmon River, lower Hazard Creek, and lower Hard Creek), have been impacted to varying degrees, primarily by roads, home construction, and natural events such as floods (e.g., early January 1997 rain on snow event caused flooding, debris torrents, and landslides - Little Salmon River, lower Hazard Creek, and lower Hard Creek) and wildfire (e.g., upper Hazard Creek and upper Hard Creek–1994 Corral Fire).

Riparian habitats provide an important habitat or critical habitat component for many wildlife species, such as amphibians. The larger pond in the project area is utilized by waterfowl, shore birds, and a variety of wetland/riparian dependent species. Riparian corridors also provide connectivity and travel corridors for a variety of wildlife.

Default RCA buffers (BLM 2009) have been established for the rivers, streams, and wetlands/ponds occurring within the project area. Within the project area (BLM lands) approximately 310 acres occur within RCAs.

Late Seral/Old-Growth Associated

Timber harvest and fire suppression have negatively impacted late seral/old growth dependent species the most within the analysis area; however impacts have been beneficial to many early seral species. In the project area, intermediate-aged stands have since moved into late-seral or old growth conditions. Old-growth stands primarily occur in ponderosa pine stands (i.e., seral old growth) within the project area.

Fire suppression and forest management have affected stand composition and structure in the lower and mid elevations and drier forests, where frequent low-intensity fires had historically maintained stands of large-diameter ponderosa pine within the dry conifer habitat types. With fire suppression, the more shade-tolerant Douglas-fir and grand fir have established in the understory (and in the overstory in some areas), and stands have become more dense and more susceptible to disease and stand-replacing fires. Forest management effects in the lower montane zone are most noticeable for old forest (i.e., old single-stratum and old multi-strata), where timber harvest has been the primary cause of a 33 percent reduction in this structural stage (USDA FS, 2003).

Early Seral

Timber harvest, fire exclusion, and wildfires have had various effects on early seral habitats within the project area and larger landscape analysis area (e.g., watersheds). Within the project area, the majority of stands are mid-aged forested stands, and early seral stands comprise a small portion. However, at the larger watershed level, early seral stands are more prevalent, primarily as a result of the large 1994 stand replacing wildfire (Corral Fire) which burned in upper Hazard and Hard Creeks. The Corral Fire is estimated to have resulted in stand replacing fire of over 30 percent of the upper Hazard and Hard Creek watersheds. Timber harvests on adjacent private lands have also created early seral stands.

Security Dependent Species

Security dependent species are primarily affected by human disturbances, such as roads, hunting, residences, livestock grazing, and various recreational activities. Within the project area 95% of the total roads had been developed by the mid-1980s. Although road closures and decommissioning efforts have reduced vehicular and human disturbances, vulnerability to hunting and similar impacts remains. The only existing BLM designated motorized vehicle closure in the project area includes the main road and spur roads from ridge top, going east to the BLM/FS boundary near Hard Creek (BLM 2009; Appendix O). Motorized access from the south end of the project area provides access to the Little Salmon/Hard Creek ridge top/divide (motorized vehicle closure east of ridge). Within the project area many of the roads are not available for public motorized use because they are overgrown with vegetation (shrubs/trees), are blocked by rocks/small slides, or are not accessible to the public because of inter-mixed private lands (need private land owner permission). Roads not identified as "open" for motorized travel are designated by default as being closed to motorized travel (BLM 2009).

Rocky Mountain elk are a security dependent species and summer range habitat is present within the project area. The quality of summer elk habitat and whether the habitat is capable of sustaining or increasing elk populations is rated through the use of the *Guidelines for Evaluating and Managing Summer Elk Habitat in Northern Idaho* (EHE) model (Leege 1984). When all habitat factors are in optimum abundance and distribution, habitat would be rated 100% of potential elk use. The percentage value refers only to habitat quality and not to actual elk use. Currently, the EHE for the project area is 52%. The analysis of progressive road-density related effects on wildlife through time are illustrated by the elk summer habitat analysis. The primary factors decreasing habitat quality are: 1) road density and roads open to vehicle use, 2) size and distribution of hiding and thermal cover, and 3) size and distribution of forage areas.

Effects of Alternatives

<u>Common to All Action Alternatives</u>

Habitat fragmentation/connectivity, snags and large down wood, and four generalized species habitat guilds based on predominant habitat associations or dependency relationships, (i.e., riparian/aquatic dependent, fire/early seral dependent, late seral/old-growth associated, and security dependent) were used to analyze the action alternatives for wildlife species and habitats, and elk habitat (security dependent). Management actions will have varying levels of disturbance, displacement, and potential injury/mortality to wildlife species utilizing habitats in the short term during project implementation. Long-term effects will be dependent on species specific preferred habitats and critical habitat niches (e.g., nesting, young-rearing, denning sites, etc.) maintained post-project.

Habitat Fragmentation and Connectivity

All action alternatives are very similar for timber harvest acres and only vary by 32 acres between the highest (Alternative 3) and lowest (Proposed Action), however, the Proposed Action would prescribe burn 180 to 187 more acres than Alternatives 2 and 3. Timber harvest and prescribed burning would result in more open canopy stands, which would fragment the landscape and affect immobile, small-ranging species the most. However, no large openings would be created; therefore, timber harvest and prescribed burning would result in negligible effects to habitat fragmentation and connectivity at the project and landscape level.

Fragmentation of habitats used by small bodied, relatively immobile, and relatively small home range species such as amphibians, reptiles, and small mammals may be affected by the proposed actions in treatment areas. Affects to mobile, wide-ranging species such as mountain lion and elk, would be less affected. Species using complex vertical and horizontal habitat structure would experience simplification of habitat in treated areas, such as some of the forest type raptors and birds. Simplification of stand structure would occur with vegetation treatments.

Action alternatives identify road decommissioning and riparian/wetland restoration actions would have localized direct and indirect habitat connectivity benefits within the project area. Such actions would allow for reduced disturbance potential in localized areas due to a decrease in motorized vehicle use and “open” road densities.

In the RCA, no treatment buffers would protect riparian habitats and provide connectivity. However, prescribed burns would be allowed to back into riparian habitats, which would affect stand structure in these areas. Prescribed burning would be low intensity, no direct ignition would occur in RCAs, and limited amount of firelines would be constructed in RCAs and such would be reviewed by Area Biologist prior to construction to avoid adverse effects to riparian vegetation; which would minimize risks to cover and riparian connectivity habitats from adverse prescribed fire soil/vegetation impacts. Some short-term disturbance and displacement to wildlife species would occur from project implementation, but overall habitat connectivity would be maintained. Opening up stands would reduce some hiding and security cover, and primary effects would occur from such treatments that are adjacent to roads open for motorized use.

Vegetation treatments would reduce fuel loading in the project area, thus reducing risks for stand replacing fires. The size and effect of fires to habitat fragmentation and connectivity is unknown. Large severe stand replacing fires could result in patch size and opening that is uncharacteristic and result in adverse effects to connectivity and cause habitat fragmentation. The effects of such fires occurring within the project and adjacent areas is unknown for all the action alternatives, however, risks for stand replacing fires within the project area should be reduced with fuel treatment projects.

Snags and Large Down Wood

All action alternatives are very similar for timber harvest acres and only vary by 32 acres between the highest (Alternative 3) and lowest (Proposed Action), however, the Proposed Action would prescribe burn 180 to 187 more acres than action alternatives 2 and 3. Long-term results of all action alternatives are similar, as they would create small canopy openings, which would alter the amount of vertical and horizontal habitat structure or habitat complexity. However, no large openings would be created; therefore, timber harvest and prescribed burning would result in negligible effects to snags and large down wood. Adherence to guidance for snags, snag replacement, and large coarse woody debris would minimize potential for adverse effects.

Treatments that include green and dead tree harvest to improve forest health, reduce the incidence of insects and disease, or reduced fuel buildup would reduce habitat for many snag dependent species. Not only would the habitat they are using be modified, it would also increase the patchiness of the remaining habitat. Harvest of large diameter ponderosa pine (>20 inches dbh) would reduce potential for future snag replacement for the most desirable type of snags within the project area.

Numbers of snags are expected to decrease with the action alternatives as snags would be lost as hazard trees and through damage by logging operations. Many snags felled during harvest activities for safety reasons are often ones in an advanced state of decay. Felling these snags can provide down woody material and subsequent nesting, resting, cover, and foraging areas for a variety of wildlife species. Some snags will be created from the burning of harvesting slash where fuel loads are concentrated. However, more snags are generally lost than created during harvest operations when compared to fire. It is important that sufficient amounts and size classes of snags are left in clumps or as individuals to meet the needs of snag-dependent wildlife species and to add diversity to the landscape. The snag management protocol would be implemented and standards for snag retention would be met or exceeded. Therefore, timber harvest and prescribed burning would result in negligible effects to snag-dependent wildlife species. Timber harvest actions that maintain larger sized diameter trees such as ponderosa pine (preferred snag tree) will be beneficial for snag dependent species.

Public firewood gathering and reduction of snags potentially used for roosting can be expected to occur along roads. However, this is not expected to result in the loss of species viability for snag dependent species since snags would still be present in unmanaged stands away from roads. In addition, with the decommissioning and closures of existing roads to public motorized use, the impacts of snag losses along roads would be lessened.

Habitat Guilds - Riparian/Aquatic Dependent

Watershed restoration actions (e.g., road decommissioning), road use/maintenance and construction, and other vegetation treatments would initially add modest levels of sediment to streams, elevating impacts related to sediment and water quality in the short term.. The effects would be relatively minimal in terms of impacts to aquatic wildlife species and their habitats.

RCA no-treatment buffers would protect riparian habitats used for feeding, resting, and reproduction. However, prescribed burning would be allowed to back into riparian habitat, resulting in localized effects to. Prescribed burning would be low intensity, no direct ignition would occur in RCAs, and no firelines would be constructed in RCAs; which would minimize risks to riparian habitats from adverse prescribed fire soil/vegetation impacts. Planned burning that proposed would be low intensity, however, unplanned for moderate and high severity unplanned prescribed burning within RCAs would have potential adverse effects to habitats and species utilizing the areas, particularly less mobile species such as amphibians and reptiles, nesting birds, small mammals, etc.

Vegetation treatments would reduce fuel loading in the project area, reducing risks for stand replacing fires in riparian habitats.

Under the Proposed Action and Alternative 3 the wetland/riparian restoration project would result in long term beneficial effects to a four acre pond/wetland habitat and adjacent RCA. The restoration project is approximately 15 acres in size and would improve habitats in the area with the decommissioning of the roads in the RCA, riparian tree/shrub plantings, and seedings. This would be beneficial to aquatic/riparian dependent species that utilize and prefer or utilize these habitats (e.g., amphibians, water birds, big game, upland game, etc.).

Aspen restoration of approximately 14 acres would involve a portion of the project that occurs in the RCA of several small pond/wetland areas. Restoration of decadent or establishment of new aspen stands would result in small localized beneficial effects to the RCA and wildlife species that prefer these habitats. However, within the aspen restoration area aspen are lacking and restoration would need to include timber harvest, burning, and establishment of aspen (e.g., suckers, plantings). Because to the lack of existing aspen clones in the area, site preparation and establishment of aspen may have fair probability of success at best. Active treatments for aspen restoration in RCA would have short-term negligible adverse impacts, prior to establishment of desired vegetation.

Fire/Early Seral Dependent

Under all action alternatives, timber harvest and prescribed burning would increase open canopies and mosaics, which may provide additional “edge” habitat for species. In addition, action alternatives would have the initial effect of potentially reducing local fire intensity risks where fuels are removed, resulting in uncertain levels of both positive and negative effects to various fire/early seral dependent species. Overall, habitat quality would improve for early seral dependent species such as the olive-sided flycatcher. Implementation of the action alternatives would create an additional 165 acres of early seral habitat with implementation of the Proposed Action and Alternative 3, and 122 acres with Alternative 2. Timber harvest activities would result in more open canopy, which would create areas more responsive to improved forage conditions with the opening up of timber stands and increases in shrub, forb, and grass production. Short-term beneficial effects would occur (e.g., 5 – 15 years), but with stand succession would decline slightly over time (natural succession). Stand treatments are primarily occurring in mid-age and mature stands, followed to a lesser extent in old growth stands. Treatments that open up stands the most would be beneficial to early seral dependent species.

Late Seral/Old-Growth Associated

Action alternatives would impact old growth and large tree stands to varying levels. Harvest of some large legacy trees (e.g., ponderosa pines >20 inches dbh) in these stands will change stand structure conditions and future large desired snag density/snag recruitment. Timber harvest of large legacy trees within these stands will occur, primarily to reduce infestations of mistletoe. Timber harvest will occur in 48 to 53 acres of old growth under the action alternatives.

Prescribed burning would occur in 109 acres under each of the action alternatives. The reduced acreage of old growth stands within the project area is 5.3 acres for two of the alternatives. See Table 3 for comparison of action alternatives.

Vegetation treatments would reduce fuel loading in the project area, reducing the risk for stand replacing fires occurring in old growth stands. See fuels section 3.2.2 for a more complete analysis risks to these stands. Fire could have varying levels of positive and adverse effects to large tree and old growth stands, dependent on fuel loading and severity of the fire. Prescribed burning in old growth and large tree stands is expected to result in minimal mortality to trees larger than 20 inches dbh.

Timber treatments and prescribed burning would result in short term disturbance and displacement of wildlife species utilizing these stands. Suitable "untreated areas" would be available for use within the project area and general analysis area.

Security Dependent

All action alternatives identify a limited number of roads proposed for decommissioning and closure to public motorized use, which would be beneficial for security dependent species by reducing potential disturbance, displacement and mortality and improving forage production. Currently, most of these roads identified for decommissioning have restricted public access because of private ownership control of access and/or they are overgrown with shrubs and trees. Alternative 2 identifies the most road miles identified for closure to motorized use (18.6 miles); however, this alternative does not identify any roads for decommissioning. Alternatives 3 and the Proposed Action are very similar, and identify a combination of road closures and road decommissioning that total 16.9 miles in both alternatives.

Although temporary road construction would occur in order to access some harvest units, these temporary roads would be decommissioned and would not contribute to long-term motorized access and security reduction. Temporary roads would be closed (when not being used for project implementation) to public motorized vehicle use, reducing potential human impacts. Short-term disturbance and displacement to wildlife would occur during project implementation and associated use of temporary roads.

Summer elk habitat

All action alternatives would slightly improve elk habitat conditions long-term in the project area EAU, due mostly to modest reductions in open motorized road and trail access and improved forage production. Moderate levels of harvest, followed predominantly with prescribed burning for fuel reduction to remove logging slash, would help stimulate regeneration of nutritious forage plants important to elk nutrition. However, timber harvest and fuels treatments along roads would reduce elk hiding and security cover; and effects would primarily occur along roads that are open to motorized vehicles.

As vegetative treatments are implemented in the project area, human-elk interactions are likely to increase. To minimize this impact, existing access restrictions will be maintained within the analysis area. All temporary roads created for timber harvest activities and identified for closure or decommissioning would be closed to public motorized use when not being used for project implementation. In the long-term, road densities would decrease as roads are decommissioned. Moist sites, such as wet meadows, ponds, seeps, and springs, are important to elk and would be protected by RCA buffers as part of project implementation.

Overall, all action alternatives are very similar, with Alternative 2 having the most long-term benefits with closure of more roads to motorized use in the long term. Table 35 shows the new EHE numbers, which were calculated as a measure of the effects of each action alternative on summer elk habitat.

Table 35. Percent Elk Habitat Effectiveness (EHE) for the Bally Mountain Project Elk Analysis Unit (EAU) and Alternatives

Elk Analysis Unit	Existing Condition	Proposed Action	Alternative 2	Alternative 3
Bally Mountain EAU (Long-Term)	52%	54%	55%	54%
Bally Mountain EAU(Short-Term) Project Implementation	52%	44[1]	42[1]	43[1]

[1]Prediction of short-term EHE that would occur with all temporary roads constructed and timber harvest and fuel reduction related activity occurring at the same time. All timber harvest related roads are temporary and would be decommissioned and obliterated after timber harvest and fuel treatments are completed.

No Action

Habitat Fragmentation and Connectivity and Snags and Large Down Wood

Under this alternative, existing conditions would remain. Specifically, insects and disease would continue affecting wildlife habitats; natural canopy gaps in mixed conifer habitat would create openings where shrubs, forbs, and grasses could respond to available sunlight and moisture; and the natural succession process from tree regeneration of early seral species such as ponderosa pine to advanced and later succession regeneration of shade tolerant species such as grand fir and Douglas-fir would occur; and the level of patchiness in the watershed would persist until a stand-replacing fire or other management action(s) take place.

Insects and disease would continue affecting wildlife habitats, especially at the project and watershed area. Existing conditions and trends for wildlife habitat would continue and such changes would be slow and incremental at the project and watershed scale. Canopy gaps in mixed conifer habitat would create areas where shrubs, forbs, and grasses would respond to available sunlight and moisture. Following this response, tree regeneration of early seral species such as ponderosa pine would occur. With advanced and later succession regeneration of shade tolerant species such as grand fir and Douglas-fir would occur. Species that prefer mature tree stands would be benefitted with successional advancement.

There would be no vegetation treatments associated with hazardous fuels reduction. Thus, the size and severity of any potential wildfire event is unpredictable and would depend on fire suppression effectiveness, topography, fuel loading, and weather conditions.

Consequently, potential post-fire conditions would result in an increase in snags, which would be beneficial to early seral and snag dependent species; natural fire could also eliminate live tree habitats important to many wildlife species, particularly old growth associated species. In addition, the chances of mortality to riparian dependent species may increase, particularly species that are not so mobile (e.g., salamanders, frogs, western toad) and habitat losses due to wildfires, particularly if such fires affected large percentages of a drainage, and associated riparian and aquatic habitats.

Habitat Guilds - Riparian/Aquatic Dependent

This alternative would likely have no measurable cumulative impacts on habitats or species. Existing conditions and trends would be expected to continue for riparian habitats. As riparian stands mature and decline with their associated fuel-buildups, more severe localized fire risks may occur. Such risks may increase the chances of mortality to riparian dependent species, particularly species that are not so mobile (e.g., salamanders, frogs, western toad) and to habitat losses due to wildfires, particularly if such fires affected large percentages of a drainage, and associated riparian and aquatic habitats. Whether these effects would extend outside the project or analysis area is uncertain.

Fire/Early Seral Dependent

This alternative would allow cumulative fuel-loading to occur unabated, which could initially be harmful to some species. Eventually the accumulations and continuity of fuels may encourage larger acreages to burn and to regenerate which would result in outcomes beneficial for most fire/early seral species to mixed degrees. Whether these effects would extend outside the project or analysis area is uncertain. Some of these species also require interspersions of mid-seral/mature forest cover (e.g., edge habitats) with early seral habitat, so benefits to some species may be limited. Species such as black backed woodpecker would be benefitted with wildfire, while other species would have adverse effects, which is dependent on interspersion of mature/early seral habitats.

Late Seral/Old-Growth Associated

No harvest of larger diameter trees or legacy trees (larger than 20 inches dbh) would occur. Succession may result in more large tree stands becoming old growth stands in the long term within the project area. This alternative would initially have no direct impacts on large tree stands, late seral or old growth habitats, but would allow cumulative fuel-loading to occur unabated.

In the absence of disturbances shade-tolerant Douglas-fir and grand fir would continue to increase, ponderosa pine would decrease, and stands would continue to become denser and more susceptible to disease and stand-replacing fires. Insects and disease would have varying levels of impact on mature/old growth stands. Effects would include increased risks for fire losses of late seral and old growth habitats in patterns and patch sizes at scales that may be outside historical norms. The effects may potentially be negative for some species. Whether these effects would extend outside the project or analysis area is uncertain.

Security Dependent

Under this alternative, existing moderately high open road densities, access, and human intrusion effects would continue within the analysis area. Current risk levels of wildlife disturbance, displacement and potential mortality would remain unchanged in developed areas. No short-term disturbances from project implementation would occur and existing conditions and trends for security dependent species and habitats would continue.

Summer Elk Habitat

Increases in cover would occur with forest successional development in localized areas, which could result in a decrease in suitable forage areas, while elk security and cover would increase. This alternative would also have the greatest fuel buildup, risks for more severe fires and, consequently, the post-fire conditions which would result in early seral habitats and improved forage conditions. No reduction of hiding or security cover along roads open to motorized use would occur.

Cumulative Impacts

All cumulative impacts would be scattered across the entire project area and the three watersheds, which include the Little Salmon River – Round Valley Creek, Hazard Creek, and Hard Creek watersheds. These watershed are located within a much larger landscape; the Little Salmon River subbasin.

<u>Common to All Action Alternatives</u>

Habitat Fragmentation and Connectivity

Past timber harvest activities have created a patchy landscape across the watershed, which has likely resulted in larger wildlife home ranges than would be the case in unlogged habitats. Larger home ranges affect the energy reserves of wildlife species as they must travel greater distances for their daily needs.

At the watershed and landscape level, habitats and forested corridors would remain available and function as habitat linkages/corridors. U.S. Highway 95 would continue to alter travel corridor habitat use along the Little Salmon River. Public and private land timber harvest, road construction, home construction, and natural events (e.g., wild fire, insect, disease, flood events, etc.) would also have varying effects to habitat fragmentation and connectivity.

Negligible and minor effects are expected to occur to habitat fragmentation and connectivity within the cumulative analysis area from implementation of proposed actions. It is unlikely that the proposed action alternatives would contribute to cumulative effects of past, present, and foreseeable future management actions on habitat fragmentation and connectivity within the analysis area.

Snags and Large Down Wood

Throughout the West, densities of large-diameter snags (>21 inch dbh) have been reduced in areas with a history of timber sales (Hann et al. 1997; Hessburg et al. 1999; Quigley et al. 1996). Fire suppression efforts, salvage of insect-infested trees, firewood harvest, and harvest of dead and dying trees have reduced the habitat potential for species relying on dead and downed wood. Wildlife species impacts from the action alternatives in combination with past, present, and reasonably foreseeable future actions within the project area and analysis area watersheds appear negligible at the project area. However, timber harvest treatments would result in reduction and of snags and large down woods in the harvest unit, however, acceptable amounts would be maintained at the landscape area, but not for every treated acre.

The number and distribution of snags would be affected by harvesting activities, prescribed burning, firewood cutting, and natural disturbances (i.e., wildfires). Some of these snags would fall and provide much needed ground structure and habitat. With fire suppression and succession, the density of snags may have increased, but the size of the snags has decreased in more managed areas (e.g., development, timber harvest - public and private lands), which may not be beneficial to many wildlife species that depend on or prefer large-diameter snags and logs. Activities that reduce the potential for wildfire and insect outbreaks reduce habitat for many snag dependent species, which in turn affects population levels. Projects within and adjacent to the watershed analysis area that could impact habitats utilized by wildlife species include: target fuel loading and bug-infested trees, post and pole gathering, firewood cutting, road maintenance, and fire suppression. Many past timber activities left few snags on the landscape that could be utilized for foraging, nesting/resting, or drumming sites. In localized areas (action areas) that have had timber harvest or development occur; snag dependent wildlife populations could decline as a result of past, present, and reasonably foreseeable future actions.

The action alternatives would provide for long-term snag retention. The activities proposed in the project area would result in low adverse effects to snags and large down wood.

Negligible and minor effects are expected to occur to snags and down wood within the cumulative analysis area (e.g., project and watershed level). It is unlikely that the proposed activities would contribute to cumulative effects of past, present, and future management actions on snags and down wood within the cumulative analysis area.

Riparian/Aquatic Dependent

Action alternatives in combination with the past, present, and foreseeable future actions would have localized direct and indirect cumulative beneficial and negative effects on riparian and aquatic habitats, which may be utilized by riparian dependent species. Actions in the RCAs and riparian areas, such as prescribed burning may have localized short term adverse effects, particularly from disturbance and displacement and habitat alterations, overall such are considered negligible for the project area.

Timber harvest and salvage logging, grazing, insect and disease epidemics, fires, fire suppression, and road construction and maintenance can cumulatively affect riparian/aquatic habitats and dependent species through soil compaction, changes in vegetative cover, altering stream channels, or by changing the quantity and quality of water flowing into wet meadows. Although historical fires often burned riparian habitats at lower severity, advanced succession and increased fuel loading would increase risk for more severe fires within riparian habitats, which may affect dependent species habitats, water quality and quantity. Fire suppression has created denser forests, which tend to burn hotter, and hotter fires tend to be more destructive.

Negligible and minor effects are expected to occur to riparian/aquatic dependent species and habitats within the cumulative analysis area. It is unlikely that the proposed action alternatives would contribute to cumulative effects of past, present, and foreseeable future management actions on riparian/aquatic dependent species and habitats within the cumulative analysis area (e.g., project and watershed level).

Fire/Early Seral Dependent

Action alternative treatments would cause openings sooner than allowing the openings to occur through natural attrition from dead or dying trees, and insect/disease infestations. Fuels reduction and timber harvest activities would alter the amount of horizontal and vertical habitat structure or habitat complexity in treated areas verses untreated areas.

Action alternatives would result in post-fire habitat losses; however, they would create early seral habitats. Such losses add moderately to cumulative losses of existing and potential future black-backed woodpecker habitat related to previous harvests, and post-disturbance harvest projects as well as reasonably foreseeable harvests on private and public lands in the analysis area. While losses of existing and future post-fire habitat opportunities would result from this project, the loss would be relatively minor and inconsequential in the cumulative analysis area.

Activities that reduce the potential for wildfire and insect outbreaks reduce habitat for post-fire or early seral dependent species, which in turn affect population levels for early seral habitat dependent species. Past timber harvest activities have created a patchy landscape across the watersheds, which have likely resulted in increased early seral habitat, which has improved forage for elk, deer, and moose.

Past, present, and foreseeable future fuel treatments and timber harvest on public and private lands have created or would continue to create early seral habitat in the cumulative analysis area. Forest successional advancement would reduce the value of early seral habitats to dependent species with growth of trees from early seral to mature stands, and associated increased canopy cover.

Negligible and minor effects are expected to wildlife habitat guilds (i.e., fire/early seral dependent species) and preferred habitats within the cumulative analysis area. It is unlikely that the proposed activities would contribute to cumulative effects of past, present, and future management actions on fire/early seral dependent species and habitats within the cumulative analysis area.

Late Seral/Old-Growth Associated

Timber harvest and road construction have reduced the amount and continuity of mature and old growth habitat across the analysis area. In addition, past actions frequently targeted medium and large trees and valuable ponderosa pine and western larch snags, left few snags or legacy trees, and little down wood (e.g., managed areas). These actions have left fewer appropriate stands and individual trees that could be used by mature or old growth forest dependent species. As these older harvest units have begun to mature, they are devoid of the structures that could be utilized by old growth dependent species.

Action alternatives will have varying effects to old growth and potential old growth stands. Some clusters of planned project harvest units, in conjunction with the interruption of fuels created by previous harvest units, may impart some measure of fire risk reduction to old growth patches. If old growth habitats in the cumulative analysis area are partially lost to stand replacing fires in the near future, old growth conditions would still remain distributed across the Forest Service lands in the subbasin in the remaining watersheds and habitat for old growth associated species, as well as other wildlife species, would be managed to maintain viable populations of wildlife species. Private land timber harvest and development areas would be more prone to actions impacting old growth and potential old growth within the analysis area.

Past, present, and foreseeable future fuel treatments and timber harvest on public and private lands have created or would continue to impact old growth and potential old growth stands in the cumulative analysis area. Large stand replacing fires have replaced large tree stands in the upper Hazard Creek and Hard Creek drainages. An abundance of early seral habitats exists for the analysis area, and reductions in mature and old forest stands would be detrimental. Proposed activities would contribute to cumulative effects of past, present, and future management actions on late seral and old growth dependent species and habitats within the cumulative analysis area. Overall, timber harvest would result in more “open” mature timber stands.

Security Dependent

Roads are a major factor cumulatively influencing wildlife habitat and use patterns, particularly for species preferring areas undisturbed by humans or are a hunted population. Without roads, human use of the cumulative effects analysis area would be very limited. Wildlife habitats and wildlife use patterns would be dictated by natural processes (e.g., weather, fire, insects and disease). Human disturbance to wildlife species would likely be similar to that of large wilderness areas.

Research focusing on the influence of open roads on wildlife species in the 1970’s and 1980’s revealed the effects of roads on big game species (Leege 1984). In the 1980s and 1990s, road construction was mitigated by implementing road restrictions. The focus recently has been to decommission roads, thus reversing the cumulative effects of human access into wildlife habitats. The Proposed Action and Alternative 3 would decommission a limited amount of roads within the cumulative effects analysis area; thus increasing habitat security by decreasing human-interactions and impacts.

Cumulative effects of past incremental road development in the analysis area include variable effects to wildlife such as direct habitat loss; disturbance; displacement; vehicle-induced mortality; human hunting and trapping mortality; habitat fragmentation; edge effects; and noxious weed spread.

Negligible and minor effects are expected to security dependent species and preferred habitats within the cumulative analysis area. It is unlikely that the proposed activities would contribute to cumulative effects of past, present, and future management actions on security dependent species and habitats within the cumulative analysis area.

Summer Elk Habitat

Past fires, fire suppression, and timber harvest across the analysis area have resulted in a complex matrix of forested interior habitat, edge, ecotones (overlap of adjoining communities), and openings in various stages of succession. Past timber harvest converted hiding and thermal cover into seedling stands, some of which have progressed to sapling hiding cover; narrowed or severed forested connections; and removed hiding and screening cover along open and closed roads. The Bally Mountain Project EAU includes private lands, which have higher road densities, higher levels of timber harvest, and more home development than EAUs occurring on adjacent Forest Service lands. EHE would improve slightly in the long term within the project area from BLM action alternatives, primarily from actions that close roads to motorized use; however, future private land development, logging and road construction may be expected to result in some additional declines to EHE within this EAU. Numerous recreational opportunities across the project and analysis area, including big game hunting and use of roads open to motorized vehicles, can cause displacement, disturbance, or mortality of elk.

<u>No Action</u>

Special Habitat Guilds and Dependent Species

Under this alternative, there would be positive cumulative impacts on post-fire and early seral dependent species habitat availability because it would increase the overall risks of eventual fire spread. The continued accumulation to fuel loading caused by fire exclusion in combination with the past, present, and foreseeable future actions would have varying effects on special habitat guilds and dependent species. Effects of a potential future wildfire and effects to special habitat guilds is dependent on the scope and magnitude of the fire.

The No Action alternative would have no significant short-term direct or indirect effects on habitat fragmentation/connectivity, snags/large woody debris, riparian, early seral, late seral/old growth, and security habitats and dependent species. However, effects on these habitats and dependent species from past, current, and foreseeable future timber harvest, human disturbance, development, residences, livestock grazing, recreation, or other activities would occur. Overall, current condition and trends would continue for special habitat guilds and dependent species within the project and analysis area.

Discountable effects are expected to occur to these special habitat guilds and dependent species from the No Action alternative. It is unlikely that the proposed activities would contribute to cumulative effects of past, present, and future management actions on the dependent species and their preferred habitats within the analysis area.

3.2.10 Migratory Birds

Affected Environment

All migratory birds are protected under the 1918 Migratory Bird Treaty Act (16 USC 703), as well as the Neotropical Migratory Bird Conservation Act (16 USC Chapter 80). Executive Order 13186, *Responsibilities of Federal Agencies to Protect Migratory Birds* requires the BLM and other federal agencies to work with the U.S. Fish and Wildlife Service (USFWS) to improve protection for migratory birds. Migratory birds occur within the CFO. Idaho Partners in Flight (IPIF) has identified 243 species of birds that breed in the State of Idaho. Of these species, 119 are considered Neotropical migrants.

Neotropical migrant birds utilize coniferous forest habitats of the U.S. during the summer breeding season, but migrate to southern latitudes to spend winters as far south as Mexico and South America.

Fragmentation of nesting habitat is also theorized to increase rates of migrant bird nest predation and brood parasitism by other species. Small, isolated forest patches, particularly in forests of the eastern U.S. are considered at greatest risk. In contrast, natural fire regimes and topographic diversity in the western U.S. combined in the past to produce a temporally dynamic, naturally fragmented landscape compared with the previously extensive and relatively homogenous eastern deciduous forests. Timber harvest and fire suppression activity have nevertheless altered the natural landscape of western forests (Dobkin 1994).

Idaho Partners in Flight (2000) identified four high-priority habitats in Idaho, which also include important habitats for migratory birds and include riparian, low-elevation, mixed conifer; grasslands; and ponderosa pine. Three of these habitats occur in the project area, which includes: (1) riparian habitat; (2) ponderosa pine habitat; and (3) low elevation mixed conifer habitat. The representative high priority bird species chosen for this analysis are also discussed as BLM sensitive species.

For the riparian habitats, 2 of the 13 priority species that may occur include the dusky and willow flycatchers. The willow flycatcher will serve to represent the riparian habitat, and this species is a BLM Idaho sensitive species. Refer to willow flycatcher discussion and analysis that is included in the Threatened, Endangered, and BLM Sensitive Wildlife Section, for analysis of direct and indirect effects to the species and habitats.

Four of nine high-priority species, representing the low-elevation, mixed-confer habitat, include northern goshawk, Williamsons’s sapsucker, sharp-shinned hawk, and brown creeper. The northern goshawk and Williamson’s sapsucker were chosen to represent this habitat class; both of these species are BLM Idaho sensitive species. Refer to northern goshawk and Williamson’s sapsucker discussion and analysis that are included in Threatened, Endangered, and BLM Sensitive Wildlife Section, for analysis of direct and indirect effects to the species and habitats.

The white-headed woodpecker and flammulated owl are two high-priority species in the ponderosa pine habitat and both were chosen to represent this habitat class, both of these species are BLM Idaho sensitive species. Refer to flammulated owl and white-headed woodpecker discussion and analysis that are included in Threatened, Endangered, and BLM Sensitive Wildlife Section, for analysis of direct and indirect effects to the species and habitats.

3.2.11 Threatened, Endangered, and BLM Sensitive Wildlife

Affected Environment

Two Threatened and two Candidate species are listed under the Endangered Species Act and may occur on lands managed by the Cottonwood Field Office (Table 36). In addition, 27 BLM Idaho sensitive species (and habitats) occur or potentially occur within the Cottonwood Field Office management area (Table 37). BLM Manual 6840, *Special Status Species Management*, requires that sensitive animal species be managed with the same level of protection as candidate species, to avoid being listed as threatened or endangered in the future. Species were dismissed from further analysis if habitat was not present in the project area, or if the species is protected by regulation, policies, laws, or project design criteria to the extent that there would be no effect; effect would be unlikely; or the effects would be undetectable (Table 36 and 37). One federally-listed species, Canada lynx (*Lynx canadensis*) and 16 BLM sensitive species were retained for further analysis. For additional detailed information and analysis regarding Canada lynx, refer to the BA that was prepared in coordination with USFWS for the Bally Mountain Vegetation Management Project (BLM 2012).

Table 36. Federally-Listed Species Summary and Determination

Species	POTENTIAL OCCURRENCE IN PROJECT AREA				
	Potentially Present?		Potentially Affected?		Determination[1]
	Species	Habitat	Species	Habitat	
ESA-Listed					
Canada Lynx *Lynx candensis*	Not likely to occur	Limited	No	Yes	NLAA
Northern Idaho Ground Squirrel *Spermophilus brunneus brunneus*	No	No	No	No	NE
Candidate					
Yellow Billed Cuckoo *Coccyzus americanus*	No	No	No	No	NI
Wolverine *Gulo gulo luscus*	No	No	No	No	NI

[1]NLAA="May Affect – Not Likely to Adversely Affect"; NE=No Effect; NI=No Impact

Table 37. BLM Sensitive Species Summary and Determinations

Species	POTENTIAL OCCURRENCE IN PROJECT AREA				
	Potentially Present?		Potentially Affected?		Determination[1]
	Species	Habitat	Species	Habitat	
Gray Wolf *Canis lupus*	Yes	Yes	Yes	Yes	MI
Fisher *Martes pennanti*	Yes	Yes	Yes	Yes	MI
California Myotis *Myotis californicus*	Not likely to occur	Limited	No	No	NI

Species	POTENTIAL OCCURRENCE IN PROJECT AREA				
	Potentially Present?		Potentially Affected?		Determination[1]
	Species	Habitat	Species	Habitat	
Fringed Myotis *Myotis thysanodes*	Not likely to occur	Limited	No	No	NI
Townsend's Big Eared Bat *Plecotus tonsendii*	No	No	No	No	NI
Coast Mole *Scapanus orarius*	No	No	No	No	NI
Bald Eagle *Haliaeetus leucocephalus*	Yes	Yes	Yes	Yes	MI
Peregrine Falcon *Falco peregrinus anatum*	Not likely to occur	Limited	No	No	NI
Northern Goshawk *Accipiter gentilis*	Yes	Yes	Yes	Yes	MI
Prairie Falcon *Falco mexicanus*	No	No	No	No	NI
Flammulated Owl *Ottus flammeolus*	Yes	Yes	Yes	Yes	MI
American White Pelican *Pelecanus erythrorhynchus*	No	No	No	No	NI
Harlequin Duck *Histrionicus histrionicus*	No	No	No	No	NI
Lewis Woodpecker *Melanerpes lewis*	Yes	Yes	Yes	Yes	MI
White-headed Woodpecker *Picoides albolarvatus*	Yes	Yes	Yes	Yes	MI
Willamsons's Sapsucker *Sphyrapicus thryoideus*	Yes	Yes	Yes	Yes	MI
Mountain Quail *Oreotys pictus*	Yes	Yes	Yes	Yes	MI
Olive-sided Flycatcher *Contopus borealis*	Yes	Yes	Yes	Yes	MI
Hammond's Flycatcher *Empidonax hammondii*	Yes	Yes	Yes	Yes	MI
Willow Flycatcher *Empidonax traillii*	Yes	Yes	Yes	Yes	MI
Calliope Hummingbird *Stellula calliope*	Yes	Yes	Yes	Yes	MI
Brewer's Sparrow *Spizella breweri*	No	No	No	No	NI
Common Garter Snake *Thamnophis sirtalis*	Yes	Yes	Yes	Yes	MI
Coeur d'Alene Salamander *Plethodon idahoensis*	No	No	No	No	NI
Idaho Giant Salamander *Dicamptodon*	Yes	Yes	Yes	Yes	MI
Western Toad *Bufo boreas*	Yes	Yes	Yes	Yes	MI
Woodhouse Toad *Bufo woodhousii*	No	No	No	No	NI

[1]NI=No Impact; MI=May impact individuals or habitat but not likely to cause trend toward federal listing or reduce viability for the population or species.

Federally-listed Species Retained for Detailed Analysis

Canada Lynx

The final rule listing Canada lynx as a threatened species in the contiguous Unites States was published on March 24, 2000 (FR, Volume 65, No. 58). The *Lynx Conservation Assessment and Strategy* (LCAS) (Ruediger et al. 2000) was developed by the USDA Forest Service, USDI Fish and Wildlife Service, USDI National Park Service, and USDI Bureau of Land Management. LCAS was developed to provide a consistent and effective approach to conserve Canada lynx on federal lands in the contiguous United States.

The Bally Mountain Project area occurs within a Lynx Analysis Unit (LAU) and contains suitable lynx habitat that would be affected by vegetation treatments. Table 38 below summarizes potential and suitable lynx habitat occurring within the Hazard Creek LAU.

Table 38. Hazard Creek Lynx Analysis Unit – Suitable Habitat Summary

Total Acres	BLM Total Acres (%)	Total Potential Suitable Habitat Acres	BLM Potential Habitat Acres (%)	Total Suitable Habitat Acres (%)	BLM Suitable Habitat Acres (%)
51,899	1,138 (2%)	12,460	125 (1%)	5,938 (48%)	125 (1%)

In Idaho, lynx are most often found in areas above 4,000 feet in elevation, and in Engelmann spruce (*Picea engelmannii*)/subalpine fir forests (Koehler and Brittell 1990). Important habitat features include den sites and foraging habitat. Den sites are typically located in hollow logs or rootwads within mesic, mature or old growth coniferous forest (Koehler and Brittell 1990). Lynx foraging habitat corresponds with snowshoe hare habitat, because the hare is the lynx's favored prey. Snowshoe hare are most abundant in seedling/sapling lodgepole pine (*Pinus contorta*), subalpine fir, and Engelmann spruce forest stands. Snowshoe hares are the primary prey of lynx, comprising 35-97% of the diet throughout the range of the lynx (Koehler and Aubry 1994). Other prey species taken by lynx include red squirrels, grouse, flying squirrels, ground squirrels, mice, voles, porcupines, beaver, and ungulates as carrion or occasionally as prey (O'Donoghue et al. 1998; Koehler 1990; Brand and Keith 1979; Brand et al. 1976; Nellis et al. 1972; Van Zyll de Jong 1966; Saunders 1963).

Although lynx have sometimes been portrayed as a late-successional forest species, lynx appear to be more closely associated with a mosaic of late- and early-successional states (Koehler and Aubry 1994). Suitable western mountain habitats for lynx are more fragmented and restricted in extent compared to Canada and Alaska habitats where high quality habitats are more prevalent. These habitat differences may be key to explaining why population strongholds are limited to Canada and Alaska boreal forests. Providing protected areas in optimal western mountains lynx habitat may be important for lynx persistence (Ruggiero et al. 1994), however, the Bally Mountain Project area contains no large amounts of high quality or optimal boreal forest habitats (e,g., subalpine/Engelmann spruce habitats).

Lynx are considered relatively tolerant of human presence and activities. Preliminary information (Ruediger et al. 2000) suggests that lynx may not avoid roads, except at high traffic volumes. Therefore, at this time, there is little compelling evidence to recommend management of road density to conserve lynx.

In order to comply with the standards and guidelines outlined in the LCAS, several important landscape vegetation limitations must be followed when conducting timber harvest and fuel reductions in designated lynx habitats. LAUs must maintain at least 10 percent denning habitat, unsuitable acres cannot exceed the 30 percent maximum threshold of total lynx habitat within an LAU, and no more than 15 percent of the suitable lynx habitat can be converted to unsuitable habitat within a decade.

Suitable lynx habitat was primarily impacted by the severe wildfire that occurred in upper Hazard Creek and upper Hard Creek in 1994, regeneration of conifers (17 years since fire) in these areas has improved suitability of lynx habitat in these areas. Some of these areas that were burned are now providing good snowshoe hare habitat.

The project area occurs in a LAU that currently has more than 10 percent denning habitat and is over the unsuitable habitat threshold with 52%. The large amount of unsuitable habitat is attributed to the large stand replacing fire that occurred in upper Hard Creek and Hazard Creek in 1994 (Corral Creek Fire). For this reason, since denning habitat is relatively abundant, and unsuitable habitat acres (before planned harvest), are above LCAS thresholds, the action alternatives will only impact 50 acres of suitable habitat, which is negligible at the LAU level, even if thresholds have been exceeded. Primary potential lynx habitat occurs in the upper Hazard Creek and Upper Hard Creek watershed, primary lynx habitat (e.g., Engelmann spruce/subalpine fire) and not in the Bally Mountain Project area.

The entire Bally Mountain Vegetation Management Project occurs within a Wildland Urban Interface (WUI) area. The Approved Cottonwood RMP (USDI-BLM 2009, Appendix F) includes the following regarding fuel treatments that occur in LAUs and WUIs and provides guidance when the 30 percent threshold is exceeded and fuel projects contributes additional acreage that are unsuitable:

(a) If more than 30 percent of the lynx habitat in a Lynx Analysis Unit is currently in a stand initiation structural stage that does not yet provide winter snowshoe hare habitat, then no additional habitat may be regenerated by vegetation management projects.
(b) Fuel treatment projects that create stand initiation structural stage will be included in the 30 percent calculation – meaning if a fuel treatment within the Wildland Urban Interface (WUI) creates more than 30%, then other projects that want to regenerate more would have to be modified or deferred until the standard can be met.
(c) Cumulative total of fuel treatments projects that do meet the vegetation standards shall not exceed 6% of mapped lynx habitat in the Lynx Analysis Unit amendment area (Defined in the Draft Northern Rockies Lynx Amendment). This standard applies to all vegetation management project and fuel treatment projects outside the WUI.

Effects of Alternatives

The primary analysis criterion for lynx would be related to vegetation treatments that convert suitable lynx habitat to unsuitable conditions, which would primarily attributed to treatments that modify the structure and mosaic of forested areas. Suitable foraging habitat for lynx should be designed to maintain or enhance habitat for snowshoe hare and alternate prey (e.g., squirrels). Suitable snowshoe hare habitat has a dense horizontal cover of conifers, just above the snow level in winter. This structure may occur either as regenerating seedling/sapling stands, or as understory layer in older conifer stands. As discussed below, a minor amount of suitable lynx habitat will be impacted by the action alternatives.

<u>Common to All Action Alternatives</u>

BLM action alternatives are similar, and will treat a small amount of suitable lynx habitat, overall, minor effects to foraging or denning habitat are expected to occur. In all the action alternatives, treatments would not be implemented in RCAs. These stands would continue to provide potential travel habitat.

Timber harvest and silvicultural prescriptions would move treated stands into more open stands with less ladder fuels in the long-term, thus having some minor effects to suitable lynx habitat, travel habitat. and potential alternate prey foraging areas within the LAU.

In mixed conifer stands, thinning treatments would retain large trees and improve growing conditions for those trees remaining after harvest. Most large diameter logs would be left on site, and smaller diameter logs may be left in select areas in some units.

The temporary increase in human activity as a result of project implementation would increase the possibility of human-lynx interactions and could disturb, displace, or disrupt individual lynx in the project area. Temporary roads would be closed (when not being used for project implementation) to public motorized vehicle use, reducing potential human impacts. All temporary roads used for project implementation would be decommissioned after treatments are completed. No long-term adverse harassment or potential for mortality is anticipated to result from project implementation. Action alternatives would slightly improve habitat security compared to no action alternative, by reducing motorized access within the analysis area.

All action alternatives would treat approximately 5 acres of lynx denning habitat and 25 acres of lynx foraging habitat, which would contribute to a very minor decline in suitable habitat within a LAU that has exceeded threshold levels. Specifically prescribed burning, timber harvest and silvicultural prescriptions would produce more open stands with reduced ladder fuels in the long-term, thus resulting in minor losses of suitable lynx habitat within the LAU. In addition, riparian restoration, road closures, and road decommissioning would provide long-term benefits to connectivity within and between suitable lynx habitat and LAUs. RCA buffers will protect suitable habitat and travel corridors in these areas.

Because the vegetation management project area occurs in a WUI and is a fuel treatment project, the approved Cottonwood RMP (BLM 2009) does allow for such treatments to exceed the 30 percent threshold and it will not exceed 6 percent of mapped lynx habitat in the LAU. This project area has the potential to affect 0.005 percent of the suitable habitat within the LAU and is not expected to adversely affect connectivity between suitable lynx habitats occurring within and between LAUs. Within the Hazard Creek LAU the majority (over 99 percent) of the suitable and potential lynx habitat occurs on Forest Service lands, and the majority of these habitats occur in the higher elevation middle and upper portions of the Hazard Creek drainage.

A Biological Assessment (BA) for the Bally Mountain Project (BLM 2012) has been prepared in cooperation with U.S. Fish and Wildlife Service for the “may affect” determination for the Canada lynx. Refer to the referenced BA for additional information and analysis regarding Canada lynx.

<u>No Action</u>

No vegetation treatments would occur with this alternative, and the overall existing condition would remain unchanged, at least in the short-term. With no action, early seral structure would continue succeeding to older stages and fires risks will increase. Denning habitat would be maintained in LAU, which is above the 10 percent required minimum identified in LCAS (Ruediger et al. 2000).

With continued fire suppression and no vegetative treatments, seedling and sapling trees would eventually grow out of the reach of snowshoe hares, and self-pruning would reduce the amount of horizontal cover. Consequently, the amount and distribution of available lynx foraging and snowshoe hare habitats would continue to decline in some of the stands. Open patches would decrease in size and in growth fills and matures in old openings. Stands with small to large-sized trees would continue to mature, providing potential denning and travel habitat for lynx. However, within the upper portion of the LAU that had stand replacing wildfire, given enough time, these stands could develop gaps and microsites that would provide suitable areas for hares and therefore potential foraging habitat for lynx. In summary, succession would result in improvement of the denning/foraging habitat mosaic important to lynx in upper Hazard and Hard Creek drainages.

Cumulative Impacts

The cumulative effects analysis area for Canada lynx is the 51,899-acre Hazard Creek LAU. The LAU includes the Hazard Creek drainage and the majority of lynx habitat occurs on Forest Service lands.

Potential for past future management actions on BLM and private lands affecting suitable lynx habitat are negligible because a very small amount of potential and suitable lynx habitat occurs on these lands. The majority of lynx habitat within this LAU occurs on Forest Service lands and is relatively undeveloped. Consequently, no adverse cumulative effects would be expected to occur from implementation of any of the alternatives.

The action alternatives would result in a small reduction of suitable lynx habitat. However, such effects result in discountable decreases of suitable habitat within the LAU.

Any decreases of potential or existing suitable habitat for lynx, which would result from this project would be negligible. Areas may burn by wildfires and become high quality post-fire habitat in the future; therefore, the relative amount of anticipated lynx habitat predicted to be increased from management treatments is relatively minor within the LAU and relatively inconsequential.

Activities that reduce the potential for wildfire and insect outbreaks reduce habitat for lynx in very small localized areas. A large amount of acreage in the upper portion of the watershed have burned reducing the amount of suitable habitat, these areas are becoming preferred lynx habitat with succession, providing suitable habitat for snow shoe hare. However, advancement of forest succession will result in areas becoming unsuitable as trees mature and canopy cover increases. With continued management emphasis on returning fire (both natural and prescribed) to the landscape, and early seral conditions, habitat conditions for the lynx will improve.

The determination for Canada lynx is "*may affect – not likely to adversely affect*" for all action alternatives.

No Action

The no action alternative could in effect, have positive and negative effects from lack of or fire effects on suitable habitat for lynx. Absence of fuel reduction would add cumulatively to overall risks of eventual fire spread, which could create post-fire and early seral habitats preferred by lynx after seedlings and saplings have grown enough to provide suitable habitats for snowshoe hare. Successional advancement for some stands would result in mid-aged and mature stands with high canopy cover, resulting in loss of suitable foraging habitat for lynx.

ESA-Listed and Candidate Species Dropped from Detailed Analysis

Northern Idaho Ground Squirrel

The northern Idaho ground squirrel was listed as Threatened on April 5, 2000 (65 Federal Register 17779-17786). On July 28, 2003, the USFWS Region 1 approved a Recovery Plan for this species (USFWS 2003). This plan provides direction for recovering the northern Idaho ground squirrel under the ESA. The ultimate goal of the recovery plan is to increase the population size and establish a sufficient number of viable metapopulations of northern Idaho ground squirrels so that this subspecies can be delisted. This subspecies will be eligible for delisting when populations are self-sustaining, secure, and meet the criteria listed in the Recovery Plan.

The northern Idaho ground squirrel prefers dry, rocky, sparsely vegetated meadows surrounded by ponderosa pine (*Pinus ponderosa*) or Douglas fir (*Pseudotsuga menziesii*) at elevations of 3,800 to 5,200 feet. Its present range is north of Council, Idaho, extending to the Boulder Creek drainage. No known populations are documented as occurring on BLM lands within the Little Salmon River subbasin. BLM lands do provide suitable habitat for the species (e.g., vicinity of New Meadows), however, to date have no documented occurrences of northern Idaho ground squirrel on BLM lands.

No known occurrences have been documented of northern Idaho ground squirrel and no suitable habitat occurs within the project area. A "*no effect*" determination has been made for northern Idaho ground squirrel.

Yellow-Billed Cuckoo

The yellow-billed cuckoo in the western United States was accorded candidate status in July 2001 (FR 66:38611 – 38626). Yellow-billed cuckoos prefer riparian areas with dense stands of cottonwood (*Populus* spp.) and willow (*Salix* spp.). In northern and central Idaho there have been four records of yellow-billed cuckoo documented reports over the last century. In southwestern Idaho, the yellow-billed cuckoo has been considered a rare, sometime erratic, visitor and breeder in the Snake River valley. Less than 15 sightings have been recorded during the past 25 years. No recent confirmed observations for yellow-billed cuckoo exist for the Cottonwood Field Office management area. The Little Salmon River does have cottonwood stands occurring within riparian areas, however, these stands do not provide good habitat and are small in size. The project area does not provide optimum habitat for yellow-billed cuckoo. RCA buffers will protect existing riparian habitats from adverse modification. A "*no impact*" determination was concluded for the yellow-billed cuckoo.

Wolverine

The wolverine in the western United States was accorded candidate status on December 14, 2010 (FR 75:78030 – 78061). In the western United States, wolverines are restricted to high mountain environments near treeline, where conditions are cold year-round and snow cover persists well into the month of May. Deep, persistent, spring snow is required for successful wolverine reproduction because female wolverines dig elaborate dens in the snow for their offspring. These den structures are thought to protect wolverine kits from predators and the harsh conditions of alpine winters. Wolverines live in remote and inhospitable place, at high elevations away from human populations. Wolverines naturally occur at low densities, and are rarely encountered where they do occur. The project area does not provide optimum habitat for wolverine and no recent sightings have been reported for the project/analysis area. A "*no impact*" determination was concluded for the wolverine.

BLM Sensitive Species Retained for Detailed Analysis

Gray Wolf

The analysis area for the gray wolf is the 2,938-acre project area and the summer elk habitat evaluation unit. Refer to the *Idaho Comprehensive Wildlife Conservation Strategy* (CWCS; IDFG 2005) for habitat, ecology and other information.

Three aspects of wolf habitat in the project area were reviewed: security of dens and rendezvous sites, prey base (elk), and security from human disturbances and harm. The project area is suitable wolf habitat and wolves may use the project area. No denning or rendezvous sites are known to occur in the project area. The closest known den site is located 5 miles from the project area. However, proximity of the project area and related activities are not expected to interfere with denning or rearing at this location.

Prey base is assumed sufficient to support wolves if elk habitat effectiveness desired conditions are maintained. Elk Habitat Effectiveness (EHE) in the project area is currently 52%.

An important effect on gray wolf recovery in Idaho is incidental mortality from shooting and vehicle-strikes. The probability of wolf mortalities increases with increased road access and creating open areas where animals can be easily seen. It is currently legal to hunt or trap wolves in Idaho (designated areas only) in accord with State regulations. The majority of access routes into the project area are restricted for public vehicle motorized use. Highway 95 that borders the west boundary of the project area provides potential for vehicle-strikes.

Fisher

The analysis area for the fisher is the 2,938-acre project area including the old growth/mature forest stands affected by the proposed project. Fishers are wide-ranging forest predators that prefer late seral, mesic, (moist) forest habitats (Idaho Department of Fish and Game, 1995). The CWCS (IDFG 2005) summarizes fisher habitat in Idaho as a mosaic of mesic conifer, dry conifer, and subalpine forests. Mature and older forests are used during summer; early seral and late successional forests are used in the winter. Current distribution of fishers in North American is substantially fragmented compared to their historical (pre-European) distribution. Across the species' range, fisher populations declined in the early twentieth century, probably due to a combination of over trapping, predator poisoning, and habitat loss from settlement, logging and forest fires (Heinemeyer 1994). No fisher trapping is currently allowed in Idaho, but animals are occasionally caught incidental to trapping for our species.

There are approximately 852 acres in the project area modeled as suitable fisher habitat, which includes large tree/mature and old growth stands. Fishers are closely associated with forested riparian areas which are used extensively for foraging, resting, and travel corridors. There are about 397 acres of RCAs and approximately 45 acres of riparian habitat within the project area. Highway 95 is the west boundary of the project area and presents the greatest mortality risk to fishers crossing the highway to use habitats along the west side of Little Salmon River.

Bald Eagle

The analysis area for bald eagle is the 2,938-acre project area. Bald eagles are known to use the Little Salmon River corridor lands during the winter, however, such use would be incidentally or at very low levels within the project area. Primary use would occur at lower elevations in the Little Salmon River subbasin. Large trees and snags in the project area may be used by bald eagles as perches. Bald eagles are not known to nest in the Little Salmon River subbasin.

Northern Goshawk

The analysis area for northern goshawk includes the 2,938-acre project area. In northern Idaho and western Montana, goshawks nest in stands or groups of trees in the mature to over-mature age classes principally on the mid to lower third of slopes. Douglas-fir and Western larch are preferred nest tree species (Hayward and Escano 1989). In Idaho, Northern goshawks (*Accipiter gentilis*) are typically found in montane coniferous forest, where they occupy relatively large home ranges of 1,988 to 9,638 acres in size (Patla et al. 1995). Goshawks prey on a variety of medium-sized forest birds and small mammals. Pole stage or larger stands open enough to permit unimpeded flight are suitable for feeding (Hayward et al. 1990). However, foraging habitat may be as closely tied to prey availability as to particular habitat composition or structure (Patla et al. 1995).

Recent studies suggest that goshawks may not be as tied to old growth forests as previously thought. McGrath et al. (2003) indicate that old growth forest structures are not useful in predicting goshawk nesting habitat. In the northern Rockies, goshawks are often associated with mature forests, not necessarily old growth forests (Squires and Ruggerio 1996, Clough 2000).

Flammulated Owl

The analysis area for flammulated owl includes the 2,938-acre project area. Flammulated owls are known to occur on the project area during the breeding season (May to mid-October). Flammulated owls are secondary cavity nesters and are dependent on cavity excavators, such as pileated woodpeckers. In Idaho, the flammulated owl occupies older ponderosa pine, Douglas-fir, and mixed coniferous forests (Idaho Department of Fish and Game 1997).

Lewis Woodpecker

The analysis area for Lewis woodpecker includes the 2,938-acre project area. Lewis's woodpeckers are considered burn specialist for their use of snags as nest trees in post-burn areas dominated by ponderosa pine (*Pinus ponderosa*) and riparian areas dominated by cottonwood (*Populus* spp.;Vierling 1997; Linder and Anderson 1998; Saab and Vierling 2001; and Gentry and Vierling 2007). Lewis's woodpeckers are considered burn specialist for their use of snags in post-burn areas (Saab and Dudley 1998, Saab and Vierling 2001). Breeding habitat for Lewis's woodpecker is characterized by an open canopy, brushy understory, available perch sites and abundant insects (Bock 1970; Linder and Anderson 1998; and Sabb and Dudley 1998). While a certain number of trees are necessary for nesting and perching sites, a closed canopy forest is not suitable due to reduced visibility, limited room for aerial maneuvers, and retarded shrub development (Bock 1970 and Saab and Dudley 1998).

White-headed Woodpecker

The analysis area for white-headed woodpecker includes the 2,938-acre project area. White-headed woodpeckers primarily occupy low-to-mid-elevation, multi-storied open stands of mature and large, late seral ponderosa pine, including large snags (Wisdom et al. 2000, Frederick and Moore 1991). This species generally prefers to use large-diameter ($\geq$ 21 inch dbh) snag classes for nesting and foraging in greater proportion than available (Bull et al. 1997; Dixon 1995a; Dixon 1995b; Frederick and Moore 1991; Ritter 2000; and Wisdom et al. 2000). They feed on seeds and insects extracted from the bark of trees. They are dependent on mature and older ponderosa pine as a source of seeds for winter survival (Garret et al. 1996). Partially cut stands with moderate to heavy stocking of large pine trees, or open forested lands with remnant, large-size pine can provide suitable nesting and foraging habitat (Ritter 2000). Road access and cutting of large snags for firewood may have adverse effects in localized areas.

Williamson's Sapsucker

For this analysis, Williamson's sapsucker nesting habitat was defined as forested stands with large trees (greater than 15 inches) and canopy cover greater than 60%. Foraging habitat consists of nesting habitat, plus pole-sized trees (greater than 5 inches dbh) or larger with canopy cover greater than 25 percent.

Williamson's sapsucker habitat use in Idaho is found in montane coniferous forests, especially fir and lodgepole pine (Groves et al. 1997). Williamson's sapsuckers are primary excavators creating nest and roost sites for themselves and other cavity-dependent species in forested habitats. They forage by pecking, gleaning, and feeding at sap wells during the breeding season (Crockett and Hadow 1975; Jackman 1975; Bull et al. 1986). Ants may comprise 86% of the birds' food. They also eat white wood-boring larvae and moths of spruce budworms. In Colorado, upon first arriving on the breeding grounds, Williamson's sapsuckers fed primarily on the sap and phloem of live conifers (Stallcup 1968; Crockett 1975). Crockett (1975) observed each pair establishing four to five sap trees during the breeding season, noting that sap trees were significantly smaller in height and diameter compared to what was available.

They nest in cavities in standing snag/hollow trees; sometimes returning to the same tree, but not the same cavity, year after year (Groves et al. 1997). Williamson's sapsuckers seem to be severely restricted to large diameter trees and snags for their nest requirements, except when nesting in aspen. Bevis (1994) reported the mean dbh of nest trees as 92 cm (n=4); three were in live western larch and one was in a Douglas-fir snag. In Oregon, Bull et al. (1986) observed Williamson's sapsuckers nesting primarily in grand fir forest types, in large snags (mean dbh=70 cm). They nested in both dead (51%) and live tree (49%); mostly in western larch (62%). They are considered a poor excavator and the trees selected for nests had advanced heart rot (64% had broken tops) with most of the snags having died in the past three years.

Mountain Quail

The analysis area for mountain quail includes the 2,938-acre project area. In Idaho, mountain quail have a range restricted mostly to areas of west-central Idaho, with remnant population strongholds occurring in the lower canyon reach of the Little Salmon River subbasin (Vogel and Reese 2002).

Mountain quail breed and winter in shrub-dominated communities. Mountain quail may move to high elevation, forested habitats during the summer (Herman et al. 2002). Mature quail eat most plant material, whereas invertebrates are very important food items for chicks. Seed heads and bulbs are important food in Idaho (Ormiston 1966), as are perennial forbs and mast-producing shrubs (Reese et al. 1999).

Habitat loss and degradation from forest succession reservoir construction, wildfire, weed invasion, livestock grazing, and human developments are all important limiting factors in some areas (Gutierrez and Delehanty 1999). Limited availability of shrubby habitats within a matrix of grasslands and forest restricts mountain quail in many interior populations to narrow strips, rather than broad expanses of mountain shrub habitat common in populations west of the Sierra-Cascade Crest (Brennan 1990). Critical factors affecting habitat and that ultimately may be responsible for the decline of mountain quail in Idaho include: (1) loss of wintering areas along creeks and riparian shrub communities due to the development of hydroelectric dams along the Snake River and tributaries, (2) agricultural development along the Snake River corridor, and (3) excessive cattle grazing that degrades creek-side shrub communities (Brennan 1990, 1994). Road building, ranchettes, and housing development in and near shrubby draws, and accompanying activities including predation by dogs and cats, are additional concerns leading to further fragmentation and degradation of mountain quail habitat in Idaho (Odell and Knight 2001; Maestas et al. 2003).

Interspecific competition with California quail and chukars, introduced around 1950, also may be a limiting factor.

Olive-sided flycatcher
For this analysis, olive-sided flycatcher nesting habitat was defined as forested stands with trees greater than 10 inches dbh and canopy cover 10–25%. Foraging habitat consists of shrublands, all seedling/sapling stands (early seral), and all other forest stands with a canopy cover less than 25%.

The analysis area for olive-sided flycatcher includes the 2,938-acre project area. Olive-sided flycatchers are found in forests and woodlands (especially in burned-over areas with standing dead tress) such as subalpine coniferous forests, mixed forests, and borders of lakes and streams (Groves et al. 1997). They generally breed in montane and boreal forests in the mountain west of North America, as well as throughout the boreal forests of Canada (Kaufman 1996). Olive-sided flycatchers are most often associated with forest openings, forest edges near natural (i.e., meadows, wetlands, canyons, rivers) or man-made openings, or open/semi-open stands with a low percentage of canopy closure (Kaufman 1996; Altman 1997). Hutto and Young (1999) found olive-sided flycatchers were more abundant in early post-fire habitats than in any other major cover type. They had similar occurrence in seed tree cover types, and were only slightly less common in clear-cut and shelterwood cover types. They occur more frequently in disturbed than in undisturbed forests in the northern Rocky Mountains. In Douglas-fir forests of west-central Idaho, olive-sided flycatchers were found to be more abundant in forest types created by logging methods such as diameter-cut and single tree selection that retained residual medium and large trees (moderate to high canopy height) and low canopy closure (Medin 1985; Medin and Booth 1989). In northwestern Montana, Tobalske et al. (1991) found olive-sided flycatchers to be more abundant in logged (clear-cut and partial cut) than in unlogged forest.

Olive-sided flycatchers have been classified as common in spruce and aspen forest types, uncommon in mixed conifer, ponderosa pine, pine-oak, and cedar-hemlock forest types, and rare in lodgepole pine and pinyon-juniper (Hejl et al. 1995). In the northern Rockies, Hutto (1995) found that among undisturbed types, olive-sided flycatchers occurred most often in spruce-fir, marsh-wetland, and mixed conifer types, with some occurrence in riparian shrub, cedar hemlock, Douglas-fir, lodgepole pine, and ponderosa pine types. Although olive-sided flycatchers are more common in disturbed, early successional types, they appear to require residual large snags and/or live trees for foraging and singing perches (Altman 1997).

Hammond's Flycatcher
The analysis area for Hammond's flycatcher includes the 2,938-acre project area. In preliminary results of Idaho-Montana study, Hammond's flycatchers were found to be old-growth associated in Douglas-fir/ponderosa pine forests (Groves et al. 1997).The following information about this species was from http://bna.birds.cornell.edu/bna/species/109/articles/introduction (accessed May 2, 2011). Hammond's Flycatcher is a common but poorly known migratory species that breeds in mature coniferous and mixed forests of western North America. This species frequently nests high in conifers, saddling its nest on a horizontal limb well away from the main trunk. This species prefers mature and old-growth coniferous forests, generally stands of more than 10 hectares [25 acres] and a minimum age of 80 to 90 years. The project area provides suitable habitat for Hammond's flycatcher.

Willow Flycatcher
The analysis area for willow flycatcher includes the 2,938-acre project area. The willow flycatcher is a migratory bird that breeds over a large portion of North American. Winter habitat is tropical, from Central Mexico to Columbia (Idaho Partners in Flight 2000). Found in thickets, scrubby and brushy areas, open second growth, swamps, and open woodlands (Groves et al. 1997). In Idaho study of riparian birds, willow flycatchers were intermediate in association with mesic and xeric willow habitats (Groves et al. 1997). Willow flycatchers breed in riparian habitat that has a mid-story cover layer of shrubs within 5-6 feet of the ground (Idaho Partners in Flight 2000). They nest in edge habitats of large, continuous shrub patches juxtaposed with open areas. The project area does provide suitable habitat (e.g., riparian areas, wetlands, ponds, etc.) for willow flycatcher, but optimum habitat conditions are limited.

Calliope Hummingbird
The analysis area for Calliope hummingbird includes the 2,938-acre project area. Found in mountains (along meadows, canyons and streams), in open montane forests, and in willow and alder thickets (Groves et al. 1997). The following information about this species was from http://bna.birds.cornell.edu/bna/species/135/articles/introduction (accessed May 3, 2010). The calliope hummingbird is the smallest long-distance migrant in the world. Breeding habitats include shrub-sapling habitats 8 to 15 years following logging or fire; aspen thickets, often along running streams, and in open montane forests; late shrub-sapling habitats 14 to 16 years after burning and clear-cutting, respectively; regrowth after deforestation; willows along drainages, lodgepole pine; and birch and maple draws. They defend a territory of 0.5 to 0.75 acres. Previously treated habitats in and near the project area may be suitable breeding habitat for calliope hummingbird.

Common Garter Snake
The analysis area for common garter snake includes the 2,938-acre project area. Common garter snakes are almost always found in and around marshes, lakes, and meadows where they feed on amphibians and fish. They are also found along slow-moving creeks and sloughs. These snakes are generally found around water; however, the majority of small tributary streams within the project area are steep gradient and fast-moving. The project area has several small ponds and wetlands that provide preferred habitats for common garter snake. Common Garter Snake inhabit virtually any type of wet or moist habitat throughout its range, but regional populations exhibit different preferences (Groves et al. 1997). This species is most common in wet meadows and along water courses, but it can be found far from water in open valleys and in deep coniferous forests (Nussbaum et al. 1983).

Idaho Giant Salamander
The analysis area for Idaho giant salamander includes the 2,938-acre project area. Idaho giant salamander larvae usually inhabit clear, cold streams, but are also found in mountain lakes and ponds. Adults are found under rocks and logs in humid forests, near mountain streams, or on rocky shores of mountain lakes (Groves et al. 1997). The occurrence of Idaho giant salamander has been documented within the Little Salmon River subbasin. Adults eat terrestrial invertebrates, small snakes, shrews, mice, and salamanders (Groves et al. 1997). The salamander hibernates/aestivates. Breeding occurs in spring and fall.

Western Toad

The analysis area for western toad includes the 2,938-acre project area. Western toads are strongly associated with wetlands, but toads may use forested terrestrial habitats outside of breeding and over-wintering periods (Keinath and McGee 2005). Bull (2006) found toads in Oregon traveled nearly 4 miles from breeding areas and most traveled over 1 mile. Uplands in the project area are considered marginal habitat because of dense canopy cover. Approximately 75% of the project area has moderate to high tree canopy cover. Bull (2006) found toads preferred open forests with high prey (ants and beetles) availability. In all of Bull's (2006) study areas, toads selected south-facing slopes. Most of the project area is on south-facing slopes. Toads preferred open sites to forested settings. Ground cover at selected sites had more rock, water, and forbs with fewer logs and less bare ground than random sites in the study area. Toads in Bull's (2006) study found refuge in rocks (31%), burrows (18%), logs (17%) and stumps, root wads or bark (6%).

The western toad will breed in a large variety of natural and artificial aquatic habitats, from the shallow margins of lakes and ponds to roads side ditches. It does not seem to matter if the sites have tree or shrub canopy cover, coarse woody debris, or emergent vegetation. Adult females may lay their eggs at depths of 5 centimeters to 2 meters (depths over one meter are rare) in the same location within sites each year. Adult toads can be found in forested areas, wet shrublands, clearcuts, and meadows. They appear to favor dense shrub cover, perhaps because it provides protection from desiccation and predators. Hibernation sites generally are deep enough to prevent freezing, and moist enough to prevent desiccation

Effects of Alternatives

Gray Wolf

Based on available information, the analysis criteria for wolves and their habitat for this project is relative impact on ungulate prey (elk) and EHE.

Common to All Action Alternatives

Timber harvest and burning in some stands would reduce available cover and connectivity, causing a slight short-term reduction in EHE. However, in these areas long-term habitat improvement from road closures, road decommissioning, prescribed burning, and opening of canopy cover; would be expected to increase the prey base for gray wolf. Creating early seral communities would improve habitat for prey species such as elk and deer, where security and cover is provided in the long-term.

The temporary increase of human activity in the planning area associated with harvest and vegetative treatments could increase the possibility of human-wolf interactions. The construction and use of temporary roads and reconstructed roads could temporarily displace wolves and/or their prey. Disturbance of individuals during project implementation would not cause, or is unlikely to cause injury or decrease productivity, by substantially interfering with normal breeding, feeding, or rearing behavior. All current motorized access closure would be maintained as part of the proposed project. Temporary roads would be closed (when not being used for project implementation). Road decommissioning would help reduce human intrusion long-term.

Based on the nature and duration of the proposed project, the mortality risk for wolves would remain low. No known key wolf critical habitat niche areas, such as den sites, rendezvous sites, or whelping sites would be affected within or outside the project area.

No Action

Under the no action alternative, moderate levels of motorized access would continue to limit elk habitat effectiveness. In the long-term, the no action alternative would increase the probability that untreated sites would add cumulatively to overall fuel loads increasing the total acres with high fuel loading. As a result of fuel continuity, more extensive and severe fires may become more likely which may have adverse effects on elk hiding cover (refer to the fire effect analysis for more details). Stand-replacing fires would result in an increase of early seral habitats and improved forage production for prey species such as elk and deer.

Fisher

Based on best available information, the analysis criteria for fisher will be the extent to which each alternative: 1) Conserves or protects the integrity of late seral habitats; 2) The amount of habitat modified by each alternative; and 3) The degree to which each alternative provides security by limiting mortality risks from incidental trapping, because densities of accessible roads and trails facilitates human access.

Proposed Action

The Proposed Action would include timber harvest treatments of medium and large tree stands on approximately 413 acres. Timber harvest will include intermediate stand treatments with an emphasis on thinning from below. There would be no change to acres of size class; however, these stands would have a reduction in canopy cover (e.g., more open stands). Implementation of the Proposed Action would result in a reduction of 165 acres of medium/large tree stands and 5.3 acres of old growth stands; which potentially would impact 170.3 acres of fisher habitat by reducing the amount of preferred habitat conditions and stand structure (e.g., late seral stand structure).

Alternative 2 – Original 2007 Proposal

The effects of Alternative 2 would be similar as described in the Proposed Action, but would include timber harvest treatments of medium and large tree stands on approximately 479 acres; a reduction of approximately 122 acres of medium/large tree stands and 0.0 acres of old growth stands; which potentially would impact 122 acres of fisher habitat.

Alternative 3 – No Temporary Roads

The effects of Alternative 3 would be similar as described in the Proposed Action, but would include timber harvest treatments of medium and large tree stands on approximately 445 acres.

No Action

Under the no action alternative, habitats would continue to be altered by natural events such as succession and potential wildfire. As local stands mature and decline with their attendant fuel-buildups, thereby increasing the likelihood of a stand-replacing fire. Stand-replacing fires could potentially reduce mature and old growth habitat across the project area, depending on the size and severity of the disturbance. Similarly, fuel loads along streams and RCAs would continue to increase and may expose these environments to intense fires. An increase of large logs on the ground due to fire or insects could provide denning structures and cover for fisher and several prey species, but these areas are likely to be avoided until the living canopy cover again exceeds 40%.

In general, mature, high-canopied habitat would increase and small-tree winter habitat would decrease as forest succession continues to fill in understories and increase stand canopy closure. In RCAs, trees killed by insects and other successional processes would fall to the ground and into streams enhancing structural diversity in these areas. In summary, if a severe wildfire occurred resulting in stand replacement of mature forest stands (increased amounts of early seral habitats), such would have adverse effects to fishers which would be dependent on scope and magnitude of the fire. As mid-aged stands advance in succession to mature stands, such would be beneficial to fishers.

Bald Eagle

The primary analysis criteria for the bald eagle is the protection, enhancement, and maintenance riparian areas and aquatic habitats, particularly along Little Salmon River, Hazard Creek, Hard Creek, and the large pond.

Common to All Action Alternatives

Protection of RCAs (riparian conservation areas), would provide for maintenance of mature, old growth, and potential old growth stands within these areas. Prescribed fire would not be ignited within the RCAs, but would be allowed to back into these riparian zones. While there are no plans to ignite prescribed burns with the RCAs, there would be some effect from fire backing down into these areas, consequently some small, negligible amount of tree and shrub habitat could be lost. Prescribed burn prescriptions would be designed to minimize potential for large tree mortality; however, some mortality would be expected to occur. Within the uplands, there would be fewer large snags post treatment and some of the existing snags would be felled during implementation. The objective of the project is to reduce risk of wildfire; therefore the potential for fire-killed snag creation would be reduced when compared to the No Action alternative. Treatments would also reduce the potential effects of insect/disease in treated areas, thus reducing snag creation by this process. Overall, treated areas would provide sufficient large tree snag habitat within the project area to accommodate existing low levels of bald eagle use.

Disturbance of individuals during project implementation may occur but would not cause injury or substantially interfere with normal feeding behavior. Any bald eagle nest sites would be protected with appropriate buffers so that disturbance or displacement would not occur during active nesting periods. Currently, no nesting documented for analysis area, consequently, no effects to bald eagle nest sites would occur.

Timber harvesting at or near bald eagle foraging or perch sites can directly disturb or displace birds. Some larger trees (various species), in mixed conifer stands are planned for harvest in all action alternatives in the uplands. Timber harvest in old growth stands and mature/large tree stands would occur; which would impact potential nesting habitat in upland areas. Most trees harvested would be in medium size classes.

No Action

Bald eagle winter habitat or potential nesting habitats would continue to be altered by natural events such as succession and potential wildfire because no vegetation management actions would take place at this time. Snag and large down wood habitat components would remain available as trees die (and fall) from natural causes. A wildfire and/or insect and disease activity would likely leave behind greater numbers of snags than exist now. Ongoing fire suppression reduces likelihood of snag creation by fire. As local stands mature and decline with their attendant fuel-buildups, lethal, more severe fire risks would become more prevalent. Such risks would increase the chances of late seral habitat losses to wildfires.

Northern Goshawk

Proposed Action

The Proposed Action could directly impact patches of mature mixed conifer habitats, large tree/mature stands, and existing old growth stands, or patch sizes. Old growth habitat connectivity would remain consistent within historical patterns by retention of riparian corridors.

Regeneration harvest and thinning can impact goshawks by removing suitable nesting habitat, although it can also create forest edges and in some cases smaller openings that goshawks could use for foraging. The proposed project design spreads potentially affected acres across the entire project area. As a result, most resident goshawks are likely to experience some habitat loss at a small or site-specific scale. Project activities near an active nest site could cause temporary avoidance or abandonment, depending on the length and intensity of activity. However, project design measures identify the protection of active nest sites from disturbance, which will minimize potential for adverse effects.

Proposed treatments would break up the fuel patterns, which in turn could reduce the likelihood of severe fire effects within the project area and effects to goshawk habitat. Proposed Action would include timber harvest treatments of medium and large tree stands on approximately 413 acres, which will have intermediate stand treatments with an emphasis on thinning from below. There would be no change to acres of size class; however, these stands would have a reduction in canopy cover (e.g., more open stands). Implementation of these alternatives would result in a reduction of 165 acres of medium/large tree stands and 5.3 acres of old growth stands; which potentially would impact 170.3 acres of preferred goshawk nesting habitat.

Alternative 2 – 2007 Original Proposal

The effects of Alternative 2 would be similar as described in the Proposed Action, but would include timber harvest treatments of medium and large tree stands on approximately 479 acres; a reduction of approximately 122 acres of medium/large tree stands and 0.0 acres of old growth stands; which potentially would impact 122 acres of northern goshawk nesting habitat.

Alternative 3 – No Temporary Roads

The effects of Alternative 3 would be similar as described in the Proposed Action, but would include timber harvest treatments of medium and large tree stands on approximately 445 acres. A reduction of preferred northern goshawk nesting habitat would occur, which would be similar to the proposed action.

No Action

No direct effects to old growth stands, replacement old growth stands, or any mixed conifer stands will occur, thus existing old growth habitat patch sizes and connectivity will be maintained. Existing goshawk habitat would not be harvested under this alternative. In general, nesting habitat would increase and foraging habitat would decrease as forest succession continues to fill in understories and increase stand canopy closure.

Natural fuel buildup would occur as stands mature and decline from age and outside agents such as beetles. As a result of this buildup, lethal, stand-replacing fires could become more prevalent (refer to fire effects analysis for additional details). Stand-replacing fires could potentially reduce nesting habitat across the project area. However, the size and severity of the disturbance could either eliminate or create the various elements of goshawk habitat.

Flammulated Owl

Common to All Action Alternatives

The action alternatives could directly impact patches of mature mixed conifer habitats, large tree/mature stands, and existing old growth stands, or patch sizes. Old growth habitat connectivity would remain consistent within historical patterns by retention of riparian corridors.

Regeneration harvest and thinning can impact flammulated owls by removing suitable nesting habitat. A reduction in mature or over mature forest habitats, or large diameter ponderosa pine and Douglas-fir would reduce habitat quality for the flammulated owls. The proposed project design spreads potentially affected acres across the entire project area. As a result, most flammulated owls, which may occur within the project area may potentially experience some habitat loss at a small or site-specific scale. Project activities near an active nest site could cause temporary avoidance or abandonment, depending on the length and intensity of activity.

Timber harvesting or fuel treatments at or very near flammulated owl nest sites can directly disturb or displace birds, potentially impacting nest success and future nesting. Some larger trees (various species), in mixed conifer stands are planned for harvest in all action alternatives. Timber harvest of old growth stands and mature/large tree stands would occur; which would impact potential nesting habitat. Old growth and mature tree stands in RCAs would be protected in the project area. Most trees harvested would be in medium size classes.

Protection of nest sites and surrounding forest vegetative conditions is done principally through nest site mitigation. All action alternatives would provide protection with a no-harvest buffer around each active nest discovered during occupancy.

Refer to goshawk various alternative (preferred alternative, alternative 2, and 3) vegetation treatment effects to old growth and mature timber stands which are described above, which would have similar effects to preferred flammulated owl habitats.

No Action

Overall, current conditions and trends would continue for preferred flammulated owl habitats. More stands would have successional advancement to large tree and old growth stands. Natural fuel buildup would occur as stands mature and decline from age and outside agents such as beetles. As a result of this buildup, lethal, stand-replacing fires could become more prevalent (refer to fire effects analysis for additional details). Stand-replacing fires could potentially reduce nesting habitat across the project area. However, the size and severity of the disturbance could either eliminate or create the various elements of flammulated owl habitat. Loss of the large tree component of these stands would be detrimental for flammulated owl reproduction.

Lewis Woodpecker and White-headed Woodpecker

Proposed Action

The Proposed Action could directly impact patches of mature mixed conifer habitats, large tree/mature stands, and existing old growth stands, or patch sizes. Old growth habitat connectivity would remain consistent within historical patterns by retention of riparian corridors.

Regeneration harvest and thinning can impact the woodpecker s by removing suitable nesting habitat (large ponderosa pine and potential snag habitat), although it would also create more open canopy cover which would be beneficial to the woodpeckers. The proposed project design spreads potentially affected acres across the entire project area. As a result, both woodpeckers, which may occur within the project area may potentially experience some habitat loss at a small or site-specific scale. Project activities near an active nest site could cause temporary avoidance or abandonment, depending on the length and intensity of activity.

Proposed treatments would break up the fuel patterns, which in turn could reduce the likelihood of severe fire effects within the project area and effects to woodpecker habitat. However, it also noted that wild fire may be beneficial with the creation of snags and more open canopy cover within the project and analysis area. Timber harvest that creates more open canopy cover, while maintain large live ponderosa pine and snags would be beneficial to the species.

Proposed Action would include timber harvest treatments of medium and large tree stands on approximately 413 acres, which will have intermediate stand treatments with an emphasis on thinning from below. There would be no change to acres of size class; however, these stands would have a reduction in canopy cover (e.g., more open stands). Implementation of these alternatives would result in a reduction of 165 acres of medium/large tree stands and 5.3 acres of old growth stands; which potentially would impact 170.3 acres of woodpecker nesting habitat.

More open canopy cover of ponderosa pine stands would be beneficial to woodpecker a, however, loss of large ponderosa pine and potential snag habitat would be detrimental.

Alternative 2 – 2007 Original Proposal

The effects of Alternative 2 would be similar as described in the Proposed Action, but would include timber harvest treatments of medium and large tree stands on approximately 479 acres; a reduction of approximately 122 acres of medium/large tree stands and 0.0 acres of old growth stands; which potentially would impact 122 acres of woodpecker nesting habitat.

Alternative 3 – No Temporary Roads

The effects of Alternative 3 would be similar as described in the Proposed Action, but would include timber harvest treatments of medium and large tree stands on approximately 445 acres.

No Action

Natural fuel buildup would occur as stands mature and decline from age and outside agents such as beetles. As a result of this buildup, lethal, stand-replacing fires could become more prevalent (refer to fire effects analysis for additional details). Stand-replacing fires could potentially reduce nesting habitat across the project area. However, the size and severity of the disturbance could either eliminate or create the various elements of woodpecker habitat. Loss of the large tree component of these stands would be detrimental for woodpecker reproduction.

Williamson's Sapsucker

The analysis criteria for Williamson's sapsucker is the degree to which each alternative maintains and protects mature mixed conifer stands preferred for future nesting habitat.

Proposed Action

Maintaining tall, prominent trees and snags would mitigate possible negative effects from implementing action alternatives. Nesting birds may be directly harmed if nest trees are removed. Spring burning would increase the risk of directly harming individual nesting birds and may jeopardize nest success.

The Proposed Action can impact Williamson's sapsuckers by removing suitable nesting habitat, as well as snags and down wood used for foraging. The proposed project design spreads potentially affected acres across most of the analysis area. As a result, most resident Williamson's sapsuckers would be likely to experience some habitat loss at a small or site-specific scale.

Silvicultural treatments that encourage the development of large trees (greater than 21 inches dbh) over the project area would benefit Williamson's sapsucker nesting habitat. However, any harvest activity that would reduce canopy closure below 50 percent would reduce the potential for those stands to be used as nesting habitat.

No harvest activities would take place in RCAs, so these stands would remain relatively intact and available for potential Williamson's sapsucker nesting habitat. The disturbance from roadwork and the edge effects created by the roads would probably not be of sufficient magnitude to change the suitability of these stands for nesting Williamson's sapsuckers.

In mixed conifer or other vegetation types, thinning prescriptions that leave greater than 25 percent canopy closure with adequate snags and down wood; such treatments would continue to provide foraging suitable foraging habitat for Williamson's sapsuckers. Thinned stands could maintain or create more favorable conditions over time for Williamson's sapsuckers as these stands develop structural diversity. Silvicultural prescriptions that retain many or all of the larger (greater than 20 inches), wind-firm trees in ponderosa pine, Douglas-fir and mixed conifer stands, would maintain and improve these stands as potential Williamson's sapsucker foraging and nesting habitat.

Proposed treatments would break up the fuel patterns, which in turn could reduce the likelihood of severe fire effects within the project area and effects to Williamson's sapsucker habitat. Proposed Action would include timber harvest treatments of medium and large tree stands on approximately 413 acres, which will have intermediate stand treatments with an emphasis on thinning from below. There would be no change to acres of size class; however, these stands would have a reduction in canopy cover (e.g., more open stands). Implementation of these alternatives would result in a reduction of 165 acres of medium/large tree stands and 5.3 acres of old growth stands; which potentially would impact 170.3 acres of Williamson's sapsucker nesting habitat.

Alternative 2 – 2007 Original Proposal

The effects of Alternative 2 would be similar as described in the Proposed Action, but would include timber harvest treatments of medium and large tree stands on approximately 479 acres; a reduction of approximately 122 acres of medium/large tree stands and 0.0 acres of old growth stands; which potentially would impact 122 acres of Williamson's sapsucker nesting habitat.

Alternative 3 – No Temporary Roads

The effects of Alternative 3 would be similar as described in the Proposed Action, but would include timber harvest treatments of medium and large tree stands on approximately 445 acres.

No Action

Natural fuel buildup would occur as stands mature and decline from age and outside agents such as succession, potential wildfire and insects/disease. Existing Williamson's sapsucker habitat would not be harvested under this alternative. No direct effects to old growth stands would occur, thus existing mature and old growth habitat patch sizes and connectivity would be maintained for nesting habitats. A wildfire and/or insect and disease activity would likely leave behind greater numbers of snags than exist now but would also reduce canopy cover that may create less favorable conditions.

In general, nesting and foraging habitat would increase as forest succession continues to fill in understories and increase stand canopy closure. Indirect effects of the no action alternative may increase future risks to foraging habitat and some old growth or mature stands and a subsequent reduction of nesting habitat from more severe fires occurring with accumulation of fuels.

Mountain Quail

The analysis criteria includes actions that impact riparian/shrub areas and forested shrub communities; road building and timber harvest potential effects to habitat fragmentation; and timber harvest and fuel treatments that affect nesting habitats and mountain quail during the nesting period

Proposed Action

No harvest activities would take place in RCAs, so these stands would remain relatively intact and available for potential mountain quail nesting habitat.

Proposed treatments would break up the fuel patterns, which in turn could reduce the likelihood of severe fire effects within the project area and effects to mountain quail habitat. Proposed Action would include timber harvest treatments of medium and large tree stands on approximately 413 acres, which will have intermediate stand treatments with an emphasis on thinning from below. There would be no change to acres of size class; however, these stands would have a reduction in canopy cover (e.g., more open stands). Implementation of these alternatives would result in a reduction of 165 acres of medium/large tree stands and 5.3 acres of old growth stands; which potentially would impact 170.3 acres of mountain quail habitat with the opening up of canopy cover and reduction of understory vegetation and shrub cover for mountain quail in the short term. Shrub cover would increase in the r in the long-term.

Prescribed burning would reduce shrub cover in the short term, but shrub cover would increase in the long term and be beneficial to mountain quail. Timber harvest activities and prescribed burning during nesting periods may result in disturbance, displacement, and some mortality to mountain quail.

Road decommissioning and closures and the pond riparian restoration project would be beneficial to mountain quail and habitats.

Alternative 2 – 2007 Original Proposal

The effects of Alternative 2 would be similar as described in the Proposed Action, but would include timber harvest treatments of medium and large tree stands on approximately 479 acres; a reduction of approximately 122 acres of medium/large tree stands and 0.0 acres of old growth stands; which potentially would impact 122 acres of mountain quail habitat with the opening up of canopy cover and reduction of understory vegetation and shrub cover for mountain quail in the short term. Shrub cover would increase in the long-term.

Alternative 3 – No Temporary Roads

The effects of Alternative 3 would be similar as described in the Proposed Action, but would include timber harvest treatments of medium and large tree stands on approximately 445 acres.

No Action

Natural fuel buildup would occur as stands mature and decline from age and outside agents such as beetles. As a result of this buildup, lethal, stand-replacing fires could become more prevalent (refer to fire effects analysis for additional details). Stand-replacing fires could potentially reduce canopy cover, resulting in a loss of shrubby-conifer habitat across the project area. Such risks would increase the chances of mountain quail mortality and habitat losses to wildfire.

Succession would result in an increase in shrubs and conifers, which would create more favorable conditions for mountain quail.

Olive-sided Flycatcher

Proposed Action

Treatments that include tree harvest to improve forest health and reduce the incidence of insects and disease increase suitable nesting and foraging habitat for olive-sided flycatchers. Not only would the habitat they are using be modified, it would result in increases in suitable habitat under all alternatives.

It is expected that adequate residual large snags and/or live trees for foraging and singing perches will be maintained across the project area. Research has found that tall canopy height, low canopy cover, and clearcuts have been beneficial to olive-sided flycatchers. The silvicultural treatments would result in an increase in suitable habitats. Nesting birds may be directly harmed if nest trees are removed. Spring burning would increase the risk of directly harming individual nesting birds and may jeopardize nest success.

Proposed treatments would break up the fuel patterns, which in turn could reduce the likelihood of severe fire effects within the project area and effects to olive-sided flycatcher habitat. Proposed Action would include timber harvest treatments of medium and large tree stands on approximately 413 acres, which will have intermediate stand treatments with an emphasis on thinning from below. There would be no change to acres of size class; however, these stands would have a reduction in canopy cover (e.g., more open stands). Implementation of these alternatives would result in a reduction of 165 acres of medium/large tree stands and 5.3 acres of old growth stands; which potentially would impact 170.3 acres; which would be beneficial to olive-sided flycatcher with the reduction of canopy cover.

Alternative 2 – 2007 Original Proposal

The effects of Alternative 2 would be similar as described in the Proposed Action, but would include timber harvest treatments of medium and large tree stands on approximately 479 acres; a reduction of approximately 122 acres of medium/large tree stands and 0.0 acres of old growth stands; which potentially would impact 122 acres which would be beneficial to olive-sided flycatcher with the reduction of canopy cover.

Alternative 3 – No Temporary Roads

The effects of Alternative 3 would be similar as described in the Proposed Action, but would include timber harvest treatments of medium and large tree stands on approximately 445 acres.

No Action

Natural fuel buildup would occur as stands mature and decline from age and outside agents such as beetles. As a result of this buildup, lethal, stand-replacing fires could become more prevalent (refer to fire effects analysis for additional details). Stand-replacing fires could potentially reduce canopy cover, resulting in a loss of shrubby-conifer habitat across the project area. Such risks would increase the chances of mountain quail mortality and habitat losses to wildfire. Succession would result in an increase in shrubs and conifers, which would create more favorable conditions for olive-sided flyctcher.

Hammond's Flycatcher

The analysis criteria for Hammond's flycatcher is the degree to which each alternative maintains and protects mature mixed conifer stands preferred for future nesting habitat.

Proposed Action

The Proposed Action could directly impact patches of mature mixed conifer habitats, large tree/mature stands, and existing mature and old growth stands, or patch sizes; and simplifying potential habitat. Old growth habitat connectivity would remain consistent within historical patterns by retention of riparian corridors.

Regeneration harvest and thinning can impact Hammond's flycatcher by removing suitable nesting habitat. The proposed project design spreads potentially affected acres across the entire project area. As a result, most Hammond's flycatchers which may occur within the project area may potentially experience some habitat loss at a small or site-specific scale. Project activities near an active nest site could cause temporary avoidance or abandonment, depending on the length and intensity of activity.

Proposed treatments would break up the fuel patterns, which in turn could reduce the likelihood of severe fire effects within the project area and effects to Hammond's flycatcher habitat.

Proposed Action would include timber harvest treatments of medium and large tree stands on approximately 413 acres, which will have intermediate stand treatments with an emphasis on thinning from below. There would be no change to acres of size class; however, these stands would have a reduction in canopy cover (e.g., more open stands). Implementation of these alternatives would result in a reduction of 165 acres of medium/large tree stands and 5.3 acres of old growth stands; which potentially would impact 170.3 acres of nesting Hammond's flycatcher habitat.

Alternative 2 – 2007 Original Proposal

The effects of Alternative 2 would be similar as described in the Proposed Action, but would include timber harvest treatments of medium and large tree stands on approximately 479 acres; a reduction of approximately 122 acres of medium/large tree stands and 0.0 acres of old growth stands; which potentially would impact 122 acres of Hammond's flycatcher nesting habitat.

Alternative 3 – No Temporary Roads

The effects of Alternative 3 would be similar as described in the Proposed Action, but would include timber harvest treatments of medium and large tree stands on approximately 445 acres.

No Action

Natural fuel buildup would occur as stands mature and decline from age and outside agents such as beetles. As a result of this buildup, lethal, stand-replacing fires could become more prevalent (refer to fire effects analysis for additional details). Stand-replacing fires and/or insect and disease activity would likely leave behind greater numbers of snags than exist now but would also reduce canopy cover in mature timber stands that may create less favorable conditions for this flycatcher.

Willow Flycatcher

The primary analysis criteria for willow flycatcher are the protection, enhancement, and maintenance of riparian and shrub patches.

Common to All Action Alternatives

All action alternatives would have direct and indirect effects on the willow flycatcher, particularly actions affecting riparian and aquatic habitats. Such actions include riparian restoration, decommissioning of roads in RCAs, and stream road crossings. Short term low adverse effects would occur from soil and vegetation disturbance within riparian areas or adjacent to riparian/aquatic habitats. Long-term benefits would occur to willow flycatchers utilizing riparian areas and stream bottoms, primarily from reduced potential for severe intensity wildfires. No timber harvest is proposed to occur in RCAs, which would provide for the primary protection of primary habitats associated with wet meadows, riparian areas, streams, ponds, spring, and seeps.

Prescribed fire would not be ignited within the RCAs, but would be allowed to back into these riparian zones. While there are no plans to ignite prescribed fire burns within the RCAs, there would be some effect from fire backing down into these areas, thus some small amount of tree and shrub habitat and nest of riparian nesting birds would be lost. Upland actions associated with the project would be expected to place willow flycatchers at some indirect or direct risk for harm to individuals that may be present during treatments and loss of habitats. Indirect effects may occur from upland treatments that affect habitat for prey species utilizing shrub habitats.

In the short term, some riparian habitat could be reduced, thus reducing nesting habitat in a patchy mosaic. In the long-term, however, the shrub layer would return to near pre-treatment levels, with willow flycatcher habitat remaining fairly constant at the landscape level.

All action alternatives identify restoration actions, which would result in some beneficial effects to riparian and aquatic habitat within the project area with the reduction of fuel loading and risks associated with stand replacing fires and adverse effects to riparian habitats. Timber harvest activities and prescribed burning during nesting periods may result in disturbance, displacement, and potential mortality to willow flycatchers.

Action alternative specific road decommissioning and closures and the pond riparian restoration project would be beneficial to willow flycatcher and preferred habitats.

No Action

From a habitat standpoint, there would be no adverse direct or short-term effects to riparian habitats, as conditions would be expected to remain relatively constant. A continuing buildup of fuels in these areas would lead to an increased risk of uncharacteristic wildfire. For riparian dependent bird species, the effects of such a fire (would likely last for about 10 to 15 years (dependent on burn severity), before the area would have enough plant re-growth to provide adequate habitat for riparian-dependent bird species.

Calliope Hummingbird

The primary analysis criteria for calliope hummingbird are the protection, enhancement, and maintenance of riparian and shrub patches. The calliope hummingbird is associated with riparian, open montane forests, and willow/alder thickets; primary concern for impacts is associated with direct and indirect effects to these habitats and disturbance during breeding and nesting periods.

Proposed Action

The Proposed Action would have direct and indirect effects on riparian habitats and suitable upland forest habitats for the calliope hummingbird. Such actions include timber harvest, fuel treatments, riparian restoration, decommissioning of roads in RCAs, and stream road crossings. Short-term low adverse effects would occur from soil and vegetation disturbance within riparian areas or suitable upland open montane/shrub habitats. No timber harvest is proposed to occur in RCAs, which would provide for the protection of habitats associated with wet meadows, riparian areas, streams, ponds, spring, and seeps.

Prescribed fire would not be ignited within the RCAs, but would be allowed to back into these riparian zones. Therefore, there would be some effect from fire backing down into these areas, thus some small amount of tree and shrub habitat and nest of riparian nesting birds would be lost. Upland actions associated with the project area would be expected to place calliope hummingbird at some indirect or direct risk for harm to individuals that may be present during treatments and loss of habitats. Indirect effects may occur from upland treatments that affect preferred habitats.

In the short-term, some riparian and shrub habitats would be reduced, thus reducing nesting habitat in a patchy mosaic. In the long-term, however, the shrub layer would return to near pre-treatment levels, with calliope hummingbird habitat remaining fairly constant at the landscape level.

All action alternatives identify restoration actions, which would result in some beneficial effects to riparian and aquatic habitat within the project area with the reduction of fuel loading and risks associated with stand replacing fires and adverse effects to riparian habitats. Timber harvest activities and prescribed burning during nesting periods may result in disturbance, displacement, and potential mortality to calliope hummingbirds.

Action alternative specific road decommissioning and closures and the pond riparian restoration project would be beneficial to willow flycatcher and calliope hummingbird and their preferred habitats.

Upland actions associated with the project would be expected to place calliope hummingbirds at some indirect or direct risk for harm to individuals that may be present during treatments and loss of habitats. Indirect effects may occur from upland treatments that affect preferred habitats. Proposed Action would include timber harvest treatments of medium and large tree stands on approximately 413 acres, which will have intermediate stand treatments with an emphasis on thinning from below. There would be no change to acres of size class; however, these stands would have a reduction in canopy cover (e.g., more open stands), which potentially would impact 170.3 acres of nesting habitat with the reduction of understory trees and shrubs. These habitats would improve with increase of shrub cover succession taking place in the more open stands.

Alternative 2 – 2007 Original Proposal

The effects of Alternative 2 would be similar as described in the Proposed Action, but would include timber harvest treatments of medium and large tree stands on approximately 479 acres; a reduction of approximately 122 acres of medium/large tree stands and 0.0 acres of old growth stands; which potentially would impact 122 acres of nesting habitat.

Alternative 3 – No Temporary Roads

The effects of Alternative 3 would be similar as described in the Proposed Action, but would include timber harvest treatments of medium and large tree stands on approximately 445 acres.

No Action

From a habitat standpoint, there would be no adverse direct or short-term effects to riparian habitats, open mountain forest stands, or willow/alder thickets as current conditions and trends would continue. A continuing buildup of fuels in these areas would lead to an increased risk of uncharacteristic wildfire. For riparian dependent bird species, the effects of such a fire (would likely last for about 10 to 15 years (dependent on burn severity), before the area would have enough plant re-growth (e.g., shrubs) to provide adequate habitat for the calliope hummingbird.

Common Garter Snake and Idaho Giant Salamander
The primary analysis criteria are protection, enhancement, and maintenance of meadows, riparian areas, and aquatic habitats for the common garter snake and the Idaho giant salamander. Uplands are also used by common garter snakes and Idaho giant salamander, particularly in areas adjacent to RCAs and riparian habitats.

<u>Common to All Action Alternatives</u>

All action alternatives would have direct and indirect effects on the common garter snakes Idaho giant salamander, particularly actions affecting riparian and aquatic habitats. Such actions include riparian restoration, decommissioning of roads, road construction, and road stream crossings. Short-term negligible adverse effects would occur from soil and vegetation disturbance within riparian areas or adjacent to aquatic habitats. No timber harvest or fuels treatments are proposed to occur in RCAs, which would provide for the protection of primary habitats associated with wet meadows, riparian areas, streams, ponds, spring, and seeps.

The common garter snake typically is associated with riparian and aquatic habitats, but will also use terrestrial habitats such as coniferous forests; consequently upland treatments could have direct and indirect effects on common garter snakes and habitats. The Idaho giant salamander occurs in well-forested areas where there is abundant moisture throughout the year. Adults may found in water or on land under logs, bark, rocks and other objects, usually in damp situations not far from a perennial cold stream. Indirect effects from upland actions can also affect water quality and occupied habitats used by Idaho giant salamanders.

Prescribed fire would not be ignited within the RCAs, but would be allowed to back into these riparian zones. Therefore, there could be riparian habitats impacted. Upland actions associated with the project would be expected to place these species at some indirect or direct risk for harm to individuals that may be present during fuel treatments and temporary loss of preferred habitats and reduction of cover. Indirect effects may occur from upland treatments that affect water quality or provide habitat for prey species.

In the short-term, some riparian habitat could be impacted from prescribed fire and some riparian habitats would be a patchy mosaic of burned and unburned. In the long-term, however, the shrub layer and riparian habitat would return to near pre-treatment levels, with common garter snake and Idaho giant salamander habitat remaining fairly constant at the landscape level.

All action alternatives identify restoration actions, which would result in long-term beneficial effects to riparian and aquatic habitat within the project area, such as road decommissioning and riparian/pond restoration project.

<u>No Action</u>

The No Action alternative would have no immediate, direct negative or positive impacts on the common garter snake and Idaho giant salamander or their habitat. As local stands mature and decline with their associated fuel buildups, more severe localized risks would occur. Such risks may increase the chances of individual mortality and habitat losses due to wildfires, particularly if such fires affected riparian and aquatic habitats, particularly if such fires affected large percentages of a drainage and its associated riparian and aquatic habitats. Successional advancement would improve some riparian habitats.

Western Toad

The primary analysis criteria for western toad are protection, enhancement, and maintenance of riparian and aquatic habitats, which is critical to reproduction. Western toads also use upland habitats the majority of the time, consequently upland treatments would have direct and indirect effects on western toads.

<u>Common to All Action Alternatives</u>

Proposed actions include riparian restoration, decommissioning of roads, road construction, road maintenance, and stream crossing within riparian areas. Short-term negligible adverse effects would occur from soil and vegetation disturbance within riparian areas or adjacent to aquatic habitats. Long-term benefits would occur to toad habitat with re-vegetation occurring. No timber harvest or fuels treatments are proposed to occur in RCAs, which would provide for the primary protection of reproduction habitat associated with streams, ponds, spring, and seeps.

Prescribed fire would not be ignited within the RCAs, but would be allowed to back into these riparian zones. Therefore, there could be riparian habitats impacted. Upland actions associated with the project would be expected to place the western toad at some indirect or direct risk for harm to individuals that may be present during fuel treatments and temporary loss of preferred habitats and reduction of cover. Indirect effects may occur from upland treatments that affect water quality or provide habitat for prey species. Bull (2006) notes that reducing coarse woody debris to implement fuel reduction may have negative consequences to western toads. Reducing large down woody debris reduces substrates necessary for some prey species (ants and beetles) and reduces availability of refuge sites used by toads. Toads use squirrel burrows as refuge sites. Fuels treatments may negatively affect squirrels using the area, thus indirect effects may occur from a reduction of squirrel burrows which provide refuge areas for toads.

In the short-term, some riparian non-breeding habitat could be reduced from prescribed fire and some riparian habitats would be a patchy mosaic of burned and unburned. Regeneration harvest with underburning removes overstory trees and ground cover, resulting in warmer and drier exposed soils. Intermediate harvest and burning would retain most of the larger overstory trees, leaving ground-level habitat more protected, with better daytime refugia sites for toads. Based on this species' ability to occupy a wide variety of habitats, western toad use could still occur, although at lower levels. In the long-term, however, the shrub layer and riparian habitat would return to near pre-treatment levels, with western toad habitat remaining fairly constant at the landscape level.

Upland actions such as road construction, road decommissioning, timber harvest, fuels reduction actions, and post-harvest slash treatments would be expected to have discountable direct and negligible indirect effect on western toad reproductive habitat. However, action alternatives do treat the upland areas to varying degrees, which may place toads at some direct risk for harm to individuals that may be present, including minor potential indirect impacts on riparian habitat conditions from changes due to off-site generated silt and water quality impacts.

Implementing the watershed improvement projects associated with the action alternatives would cause a temporary increase in sediment short-term, but there would also be a long-term reduction in sediment. It is not expected that increases in sediment levels would adversely affect western toads, but it is reasonable to think that improvements to overall watershed quality and, particularly riparian habitats, would be beneficial to reproduction for the western toad.

Salvaging dead and dying trees and merchantable green trees would help reduce the risk of high-intensity, large-scale fires in the project area. Fuel loading within RCAs would continue under all action alternatives and could expose toads and toad habitat to intense fires; however, by reducing fuel loads outside of RCAs, fires might not be as destructive to moist environments as under the No Action alternative.

No Action

The No Action alternative would have no immediate, direct negative or positive impacts on the western toad or its habitat. As local stands mature and decline with their associated fuel buildups, more severe localized risks would occur. Such risks may increase the chances of individual mortality and habitat losses due to wildfires. Western toad habitat effects from fire may cause loss of shrubs providing security cover, which would result in toads being more susceptible to predation. Successional advancement would improve some riparian habitats.

Cumulative Impacts

Gray Wolf

All action alternatives would have moderate immediate cumulative effects because harvest would be directly added to the road density, harvesting, human disturbances, and other vegetation impacts imposed by past management. Long- term cumulative effects may be less impactive than the no action alternative because of fuel reduction and staged regeneration of harvested areas in the event of wildfires for the project area and the watersheds.
U.S. Highway 95, Hazard Creek road, Hard Creek road and ATV trail, and main access road from the south are the primary roads/trails that increase human-wolf encounters. Human activities near active dens or rendezvous areas could have the greatest effect on reproducing wolves. No known dens or rendezvous areas occur within the project area. Current wolf population growth and pack formations in north-central Idaho indicate wolves can thrive even where human-wolf interactions occur regularly. Based on this, current actions do not appear to be preventing wolf recovery.

Reducing the exposure of gray wolves and ungulate prey to humans is a factor in maintaining high quality big game habitat and reducing the risk of incidental wolf mortality. The project area contains established human activities and development including roads, timber harvest, home sites, grazing, and recreational opportunities. In addition, the Little Salmon River – Round Valley Creek, Hazard Creek watershed, and Hard Creek watersheds receives hunting pressure for elk and deer, which not only affect the wolf prey base, but increases the number of wolf-human interactions. The most important cumulative effect to gray wolf recovery in Idaho is incidental mortalities from shooting, trapping, and vehicle-caused mortality. This probability increases with increased road access. Road decommissioning would take place under the proposed project, and existing road access closures would remain in effect. Human access, available cover, and public attitudes largely determine mortality risk to wolves.

Other projects such as private land logging, road construction, and rural development in the area could affect ungulates, small mammals and their habitats. If the end result of these activities is the restoration of more stable vegetative patterns and natural or prescribed fires processes, these actions could help restore declining forage availability, productivity, and nutritional quality of important to big game species. Alternatively, if these actions result in a more fragmented landscape with poor interspersions of foraging and hiding cover, big game populations could decline, reducing the suitability of the area for gray wolves. Administrative uses of closed roads for reforestation or road-related work may affect wolf use of the area. These and other activities such as routine road maintenance, watershed improvements, trail reconstruction, and measures to control weeds are foreseeable and scheduled to occur. Across the analysis area, recreation uses, including hunting, will continue. A BLM and Forest Service livestock allotment occurs within the project/analysis area, and grazing occurs on private and BLM lands in the Little Salmon River subbasin. There have been confirmed reports of wolves within the project/analysis area. No geographic or manufactured barriers exist within the analysis area that would preclude wolf movements to adjacent populations.

The determination for the gray wolf would be "*may impact individuals or habitat, but will not likely result in a trend toward federal listing or reduced viability for the population or species*" is concluded for action alternatives.

No Action alternative would have relatively little immediate cumulative effect on wolves or their habitats since no habitat-altering impacts would be directly added to the road density, timber harvesting, human disturbances, and other vegetative impacts imposed by past management. However, indirect effects of continued trend of fuel buildups, when added to existing cumulative effects would negatively affect wolf prey habitats particularly during post-wildfire recovery. Fire beneficial effects would occur from improvements of forage conditions for big game ungulate species.

Fisher

The action alternatives would add moderately to forest fragmentation at the project level; however, this would result in negligible cumulative effects compared to other past, present, and other foreseeable harvest activities in the project area and adjacent watersheds. It would reduce fuels at relatively moderate levels, potentially contributing to less fire risks to old growth and late seral habitats. The action alternatives would also slightly reduce potential levels of human access, thereby helping to reduce mortality risks from trapping.

Past insect outbreaks, fires, fire suppression, and timber harvest have left a mosaic of habitats on the landscape, but they are not characteristic of the patterns that occurred historically under a more natural disturbance regime. Most harvest units are simple, uniformly-shaped, small- to medium-sized patches (greater than 40 acres), without snags or large fire-resistant trees. Gone in these areas are the important snag, down wood, and residual large tree components that provide the structural diversity preferred by fishers once a stand regenerates. Past activities in developed portions of the watershed may have altered the availability of denning habitat, forested connectivity, and prey habitat for fisher. The loss of medium and large trees from timber harvest has reduced the older forest component that is important to fisher year-round. Across the analysis area, open roads facilitate access for trappers and firewood cutters, potentially decreasing fisher populations and the downed logs important for fisher and their prey species. However, at the watershed analysis level, current suitable fisher habitat is more abundant than historic levels.

Within the analysis area, private land logging target of dead, dying, and merchantable green mixed conifer species has taken place. Cumulatively, the loss of suitable habitat for fishers could affect fisher populations in the project area and adjacent watersheds. At the project and watershed levels, fisher populations could be affected, however, the effects of past, present, and reasonably foreseeable future actions appear to be negligible.

The sensitive species determination for fisher would be "*may impact individuals or habitat, but will not likely result in a trend toward federal listing or reduced viability for the population or species*" for all action alternatives.

The No Action alternative would have no certain cumulative effects on the fisher or its habitat other than fire and security risks, which would eventually become additive to the past effects of logging, incidental trapping risks, fire exclusion and other human disturbances of normal ecosystem processes and forest pattern. Risks of fire-spread losses in old growth or other late seral stands would become cumulative to past and present effects of fire exclusion in the analysis area. Whether these effects would extend outside the project or analysis area is uncertain.

Bald Eagle

Action alternatives would have localized direct and indirect cumulative effects on riparian, aquatic, and upland habitats which may be utilized by the bald eagle, in addition to those produced from past, current, and foreseeable future timber harvest, residential development, livestock grazing, recreation, public access, wildfires, fire exclusion, flood damage, and other habitat impacts. Disturbance or displacement of individuals during project implementation may occur but would not cause injury or substantially interfere with normal winter feeding behavior. If a nest site is located within the project area, the appropriate protective buffers would be established to reduce potential for disturbance to the nest site while it is occupied.

Timber harvest and salvage logging, grazing, insect epidemics, fires, fire suppression, mining, and road construction and maintenance can cumulatively affect bald eagles through changes in vegetative cover, altering stream channels, or by changing the quantity and quality of water flowing into wet meadows. Past timber harvest practices, and residential development that involved removing forest vegetation along streams and wetlands left these sites vulnerable to hydrologic and vegetative changes. Although fires are not as common in riparian habitats, water quality and quantity varies after large fires upstream and could affect local toad populations. Fire suppression has created denser forests, which tend to burn hotter, and hotter fires tend to be more destructive. Whether these potential fire effects would extend outside the project or analysis area is uncertain.

Past, present, and future actions can affect bald eagle habitat in the project area as well as across the Lower Hazard Creek watershed, Lower Hard Creek watershed, and Little Salmon River watershed. Although individuals could be affected, none of the proposed alternatives should affect the low number of bald eagles currently using the area at the project or watershed level.

Based on the effects analysis, duration of this project, scale of the project, and the type of planned activities, implementing all action alternatives; the sensitive species determination for bald eagle is "*May impact individuals or habitat, but not likely to cause a trend toward federal listing or reduce viability for the population or species*."

The No Action alternative would have no immediate, direct negative or positive impacts on the bald eagle or its habitat. A s local stands mature and decline with their attendant fuel-buildups, lethal, more severe fire risks would become more prevalent. Such risks would increase the chances of late seral habitat losses to wildfires. The No Action alternative would have no effects on the bald eagle or its habitat cumulative to past, current, or foreseeable future timber harvest, residential development, human disturbance, livestock grazing, recreation, wildfires, fires exclusion, flood damage, recreation, mining, or other activities.

Northern Goshawk and Flammulated Owl

The action alternatives would result in habitat losses that add to cumulative losses of existing and potential future goshawk and flammulated owl habitat related to wild fire, previous harvests, and post-disturbance harvest projects as well as reasonably foreseeable harvests on private, state, and nearby Payette National Forest lands in the analysis area.

Alternative 2 would have the least cumulative effect to nesting habitat (potential reduction of 122 acres), followed by Proposed Action and Alternative 3 (potential reduction of 218 acres). All action alternatives would result in varying levels of increases of foraging areas with actions that result in a reduction in canopy cover in medium and large tree stands.

Timber harvest and road construction have reduced the amount and continuity of mature and old growth habitat across the analysis area. In addition, past actions frequently targeted medium and large trees and valuable ponderosa pine and western larch. These actions have left fewer appropriate stands and trees within stands that could be used by goshawks or flammulated owls. At the same time, active fire suppression since the early 1900s has allowed succession to continue in those stands that have not been harvested. Relatively simple one- and two-story stands have transitioned to more complex multi-story stands with increased canopy closure and individual trees have grown larger. Some of these stands may now qualify as suitable goshawk and flammulated owl nesting habitat. Increased fuel loads from fire suppression increase the chance of stand-replacing fires, which could remove some stands of older forest habitats from the landscape. Other private lands projects in or near the project area may also alter the amount, distribution, and connectivity of older, dense-canopied stands.

Project activities would likely improve growing conditions for grasses, forbs, and shrubs, and seedling trees in harvest units, which may in turn improve habitat conditions for some prey species. Similarly, other projects that open or remove canopy may create edges and clearings that provide foraging habitat for goshawks and flammulated owls.

Although individual birds or pairs could be disturbed by project activities, none of the proposed alternatives should affect populations at the local or watershed level. Management practices proposed in the project area would result in negligible effects to goshawk or flammulated owl habitat at the project and watershed level.

Based on the effects analysis, duration of this project, scale of the project, and the type of planned activities, implementing all action alternatives; the sensitive species determination for northern goshawk and flammulated owl is "*May impact individuals or habitat, but not likely to cause a trend toward federal listing or reduce viability for the population or species*."

The No Action alternative would not contribute to past, present, or foreseeable future harvest-related fragmentation and/or losses of existing or replacement old-growth habitat stands. As a result of widespread, cumulative fuels buildup, lethal, stand-replacing fires could become more prevalent with associated risks to old growth habitats (refer to fire effects analysis for additional details). Due to a measure of uncertainty in estimating intensity of future fire risks to habitat conditions considered important for goshawk and owl nesting, there may be impacts to habitat with this alternative.

Lewis Woodpecker and White-headed Woodpecker

Action alternatives would result in harvest of some large legacy ponderosa pine in mature and old growth stands and loss of some preferred snags, and habitat losses that add to cumulative losses of existing and potential woodpecker habitat related to previous harvests, and post-disturbance harvest projects as well as reasonably foreseeable harvests on private, state, and nearby Payette National Forest lands in the analysis area.

Alternative 2 would have the least cumulative effect to woodpecker nesting habitat (potential reduction of 122 acres), followed by the Proposed Action and Alternative 3 (potential reduction of 170.3 acres). All action alternatives would result in varying levels of increases of foraging areas with actions that result in a reduction in canopy cover in medium and large tree stands.

Timber harvest and road construction have reduced the amount and continuity of mature and old growth habitat across the analysis area. In addition, past actions frequently targeted medium and large trees and valuable ponderosa pine and western larch. These actions have left fewer appropriate stands and trees within stands that could be used by woodpeckers. At the same time, active fire suppression since the early 1900s has allowed succession to continue in those stands that have not been harvested. Relatively simple one- and two-story stands have transitioned to more complex multi-story stands with increased canopy closure and individual trees have grown larger. Some of these stands may now qualify as suitable woodpecker nesting habitat. Increased fuel loads from fire suppression increase the chance of stand-replacing fires, which could remove some stands of older forest habitats from the landscape. Other private lands projects in or near the project area may also alter the amount, distribution, and connectivity of older, dense-canopied stands.

Although individual birds or pairs could be disturbed by project activities, none of the proposed alternatives should affect populations at the local or watershed level. Management practices proposed in the project area would result in negligible effects to woodpeckers at the project level.

Based on the effects analysis, duration of this project, scale of the project, and the type of planned activities, implementing all action alternatives; the sensitive species determination for Lewis woodpecker and white-headed woodpecker is "*May impact individuals or habitat, but not likely to cause a trend toward federal listing or reduce viability for the population or species*."

The No Action alternative would not contribute to past, present, or foreseeable future harvest-related fragmentation and/or losses of existing or replacement old-growth habitat stands. As a result of widespread, cumulative fuels buildup, lethal, stand-replacing fires could become more prevalent with associated risks to old growth habitats (refer to fire effects analysis for additional details). Due to a measure of uncertainty in estimating intensity of future fire risks to habitat conditions considered important for woodpecker nesting. Because woodpeckers' are considered burn specialist for their use of snags in post-burn areas, wildfire occurrences would be beneficial to the species.

Williamson's Sapsucker
Timber harvest and road construction have reduced the amount and continuity of mature and old growth habitat across the analysis area. In addition, past actions frequently targeted medium and large trees and valuable ponderosa pine and western larch snags. These actions have left fewer suitable stands, and trees within stands, that could be used by Williamson's sapsuckers. Past harvest left few snags or legacy trees, and little down wood. As these older harvest units have begun to mature, they are devoid of the structures that could be utilized by Williamson's sapsuckers. At the same time, active fire suppression since the early 1900s has allowed succession to continue in those stands that have not been harvested. Relatively simple one- and two-story stands have transitioned to more complex multi-story stands with increased canopy closure and individual trees have grown larger. Some of these stands now qualify as suitable Williamson's sapsucker habitat. Increased fuel loads from fire suppression, insects, and disease increases the chance of stand-replacing fires that could potentially remove stands or acres of older forest habitats from the landscape. Fires would create additional snags, but it would take many years before a new forest would mature to levels where burnt stands could be used by Williamson's sapsuckers. Other private, Forest Service, and State projects within the analysis area may also alter the amount, distribution, and connectivity of older, dense-canopied stands.

The proposed project and other projects proposed in the area could open or remove additional forest canopy cover. When new units abut old harvest units and stands undergoing disease or insect kill, the number and/or size of the openings could be too large to be used by Williamson's sapsuckers.

Although individual birds or pairs could be disturbed by project activities, none of the proposed alternatives should affect populations at the project or watershed level.
The sensitive species determination for Williamson's sapsucker would be "*may impact individuals or habitat, but will not likely result in a trend toward federal listing or reduced viability for the population or species*" for all action alternatives.

The No Action alternative would allow stands to transition to higher fire hazard conditions, which would be cumulative to effects from past fire exclusion, loss of large diameter trees, and other human-caused impacts on habitat quality. Harvests planned for nearby private, State, or Forest Service lands would add cumulatively to habitat losses and prior impacts. This alternative would indirectly result in slightly greater cumulative risks of fire damage or losses to some individual stands of existing old growth and/or mature mixed conifer stands.

Mountain Quail
The action alternatives would have localized direct and indirect cumulative effects on riparian and upland habitats, which may be utilized by mountain quail, in addition to those produced from past mining, timber harvest, residential development, livestock grazing, recreation, public access, fire exclusion and other habitat impacts.

The sensitive species determination for mountain quail would be "*may impact individuals or habitat, but will not likely result in a trend toward federal listing or reduced viability for the population or species*" for all action alternatives.

The No Action alternative would allow stands to transition to higher fire hazard conditions, which would be cumulative to effects from past fire exclusion, loss of large diameter trees, and other human-caused impacts on habitat quality. Stand-replacing fires could potentially reduce preferred shrub-riparian and shrub-forested habitats (refer to fire effects analysis for additional details). Due to a measure of uncertainty in estimating intensity of future fire risks to habitat conditions considered important for mountain quail; fire may be adverse from reducing shrub cover in the short term, while promoting shrub growth in the long-term and opening up timber canopy cover. Cumulative effects on mountain quail or its habitat from past timber harvest, human disturbance, residential development, livestock grazing, recreation, mining, fire exclusion, or other activities would occur. The No Action alternative would have no measurable direct or indirect effects on mountain quail or its preferred habitats, current vegetation conditions and trends would continue. The sensitive species determination for mountain quail would be "*no impact"* for the No Action alternative.

Olive-sided Flycatcher
The action alternatives would result in habitat increases. Such increases add moderately to cumulative increases of existing and potential future olive-sided flycatcher habitat related to previous harvests and post-disturbance harvest projects as well as reasonably foreseeable harvests on private, Forest Service, and State lands in the analysis area.

Increases of existing and future foraging and nesting habitat opportunities would result from this project, the increase would be relatively moderate in the project and analysis area. These acres may burn by wildfires and become high quality post-fire habitat in the future; therefore, the relative amount of anticipated olive-sided flycatcher habitat predicted to be increased from management treatments is relatively minor within the analysis area and relatively inconsequential.

Activities that reduce the potential for wildfire and insect outbreaks reduce habitat for olive-sided flycatchers; however, some treatments would create suitable habitat. Past timber harvest activities have created a patchy landscape across the watershed, which has likely resulted in more suitable habitat than would occur in unlogged habitats. However, advancement of forest succession will result in these logged areas becoming unsuitable as trees mature and canopy cover increases.

Across the range of the species, especially the Interior Columbia River Basin, moderate or strong declines in unburned habitats potentially used by olive-sided flycatchers have occurred. However, timber harvest activities have created additional suitable habitats. With continued management emphasis on returning fire (both natural and prescribed) to the landscape and silvicultural treatments favoring more open canopy cover, openings, and early seral conditions, habitat conditions for the olive-sided flycatcher will improve.

The sensitive species determination for olive-side flycatcher would be "*may impact individuals or habitat, but will not likely result in a trend toward federal listing or reduced viability for the population or species*" for all action alternatives.

The No Action alternative could in effect, have positive cumulative effects from fire effects on olive-sided flycatcher habitat availability. Absence of fuel reduction would add cumulatively to overall risks of eventual fire spread, which could create post-fire and early seral habitats preferred by olive-sided flycatchers. Successional advancement for some stands would result in mid-aged and mature stands with high canopy cover, resulting in loss of suitable nesting and foraging habitats.

Hammond's Flycatcher

The action alternatives would result in some habitat losses that add to cumulative losses of existing and potential Hammond's catchfly habitat related to wild fire, previous harvests, and post-disturbance harvest projects as well as reasonably foreseeable harvests on private, state, and nearby Payette National Forest lands in the analysis area.

Alternative 2 would have the least cumulative effect to Hammond's flycatcher nesting habitat (potential reduction of 122 acres), followed by Proposed Action and alternative 3 (potential reduction of 170.3 acres. All action alternatives would result in varying levels of impacts from the decreasing of canopy cover of mid-aged and mature tree stands.

Timber harvest and road construction have reduced the amount and continuity of mature and old growth habitat across the analysis area. In addition, past actions frequently targeted medium and large trees and valuable ponderosa pine and western larch. These actions have left fewer appropriate stands and trees within stands that could be used by Hammond's flycatcher. At the same time, active fire suppression since the early 1900s has allowed succession to continue in those stands that have not been harvested. Relatively simple one- and two-story stands have transitioned to more complex multi-story stands with increased canopy closure and individual trees have grown larger. Some of these stands may now qualify as suitable Hammond's flycatcher nesting habitat. Increased fuel loads from fire suppression increase the chance of stand-replacing fires, which could remove some stands of older forest habitats from the landscape. Other private lands projects in or near the project area may also alter the amount, distribution, and connectivity of older, dense-canopied stands.

Although individual birds or pairs could be disturbed by project activities, none of the proposed alternatives should affect populations at the local or watershed level. Management practices proposed in the project area would result in negligible effects to Hammond's flycatcher at the watershed level.

Based on the effects analysis, duration of this project, scale of the project, and the type of planned activities, implementing for all action alternatives; the sensitive species determination for Hammond's flycatcher is "*May impact individuals or habitat, but not likely to cause a trend toward federal listing or reduce viability for the population or species*."

The No Action alternative would not contribute to past, present, or foreseeable future harvest-related fragmentation and/or losses of existing or replacement old-growth habitat stands. As a result of widespread, cumulative fuels buildup, lethal, stand-replacing fires could become more prevalent with associated risks to old growth habitats (refer to fire effects analysis for additional details). Due to a measure of uncertainty in estimating intensity of future fire risks to habitat conditions considered important for Hammond's flycatcher nesting habitat, there may be impacts to the species habitat with this alternative.

Willow Flycatcher
The action alternatives would have localized direct and indirect cumulative effects on riparian and adjacent suitable upland habitats, which may be utilized by willow flycatchers, in addition to those produced from past mining, livestock grazing, timber harvest, residential development, livestock grazing, recreation, public access, fire exclusion and other habitat impacts. All action alternatives identify various restoration actions, which will support upward trends for riparian and aquatic habitats.

The sensitive species determination for willow flycatcher would be "*may impact individuals or habitat, but will not likely result in a trend toward federal listing or reduced viability for the population or species*" for all action alternatives.

The No Action alternative would have no measurable direct or indirect effects on willow flycatchers or their preferred habitats. However, cumulative effects on individuals or their preferred habitat from past timber harvest, human disturbance, recreation, livestock grazing, mining or other activities would occur. The sensitive species determination for willow flycatcher would be "*no impact*" for the No Action alternative.

Calliope Hummingbird
The action alternatives would have localized direct and indirect cumulative effects on riparian and upland open montane and shrub habitats, which may be utilized by the calliope hummingbird, in addition to those produced from past mining, roading, livestock grazing, timber harvest, residential development, livestock grazing, recreation, public access, fire exclusion and other habitat impacts. All action alternatives identify various restoration actions, which will support upward trends for riparian/aquatic habitats and upland open montane and shrub habitats.

The sensitive species determination for calliope hummingbird would be "*may impact individuals or habitat, but will not likely result in a trend toward federal listing or reduced viability for the population or species*" for all action alternatives.

The No Action alternative would have no measurable direct or indirect effects on calliope hummingbirds or its preferred habitats. However, cumulative effects on calliope hummingbird habitat from past timber harvest, roading, human disturbance, recreation, livestock grazing, mining or other activities would occur. The sensitive species determination for calliope hummingbird would be "*no impact*" for the No Action Alternative.

Common Garter Snake, Idaho Giant Salamander, and Western Toad
The action alternatives would have localized direct and indirect effects on riparian, aquatic, and upland habitats, which may be utilized by the common garter snake, Idaho giant salamander, and western toad, in addition to those produced from past mining, timber harvest, residential development, livestock grazing, recreation, public access, fire exclusion and other habitat impacts. These species are less mobile and are more prone to injury or morality from various land uses. Discountable or negligible effects are expected to occur to the common garter snake, Idaho giant salamander, and western toad and their preferred habitats from proposed actions. It is unlikely that the proposed activities would contribute to cumulative effects of past, present, and future management actions on the common garter snake, Idaho giant salamander, or western toad populations or their preferred habitats within the analysis area.

The sensitive species determination for common garter snake, Idaho giant salamander, and western toad would be "*may impact individuals or habitat, but will not likely result in a trend toward federal listing or reduced viability for the population or species*" for all action alternatives.

The No Action alternative would have no measurable direct or indirect effects on these species or their preferred habitats. However, cumulative effects on the individuals or their habitat from past timber harvest, human disturbance, recreation, livestock grazing, mining or other activities would occur. The sensitive species determination for the common garter snake, Idaho giant salamander, and western toad would be "*no impact*" for the No Action alternative.

3.2.12 Threatened, Endangered, and Sensitive Plants

Affected Environment

There are plant species, listed under the Endangered Species Act (ESA), two plants listed as Threatened may occur on lands managed by the Cottonwood Field Office: MacFarlane's four-o'clock (*Mirabilis macfarlanei*) and Spalding's catchfly (*Silene spaldingii*), and one plant listed as candidate, Whitebark pine (*Pinus albicaulis*). The project area has been extensively surveyed for listed plants during the spring and summers of 2005 – 2008, and no listed plants were found. In addition, BLM has identified sensitive plant species – designated by the State Director under 16 USC 1536 (a)(2) – as occurring within the project area. BLM Manual 6840, *Special Status Species Management*, requires that sensitive plant species be managed with the same level of protection as candidate species, to avoid being listed as threatened or endangered in the future. Sensitive plants that have been found in the project area include broad-fruit mariposa lily (*Calochortus nitidus*) and Palouse thistle (*Cirsium brevifolium*).

Broad-fruit mariposa lily
Broad-fruit mariposa lily is a perennial herb, which grows from a deep-seated bulb. It is endemic to the Palouse Prairie and canyon grasslands and associated with canyon rims, ridges and upper slopes. It also occurs within natural forest openings and open ponderosa pine and/or Douglas-fir communities in forested uplands. The plant is shade-intolerant and occurs on flat to gentle or occasionally steep slopes, on all aspects. In the project area, a population was found growing in a grassland community near the main ridgeline where a prescribed burn treatment is proposed.

Palouse thistle
Palouse thistle is a white-flowered perennial herb endemic to the Columbia Basin. In Idaho, it is known from both the Palouse Prairie and canyon grasslands (Lichthardt and Moseley 1997). In the project area, a population was found growing in a grass-and shrub-dominated opening in a ponderosa pine/Douglas-fir community where a prescribed burn treatment is proposed.

Puzzling halimolobos
One BLM Watch species, puzzling halimolobos (*Halimolobos perplexa* var. *perplexa*), was found in the project area. This biennial herb only occurs in the main Salmon River and Little Salmon River drainages and their tributaries. This species can colonize road cuts and other areas with disturbed soils but also grows in natural forest openings.

Effects of Alternatives

Common to All Action Alternatives

There would be no effect on any federally-listed threatened, endangered, or candidate plant species through implementation of any action alternative because after extensive plant surveys, no federally-listed plants were found in the project area.

The broad-fruit mariposa lily population grows where a prescribed burning treatment is proposed. However, Caicco (1992) has suggested that wildfires were a frequent, natural disturbance during the late summer drought after the mariposa fruit would have dried. The deep-seated bulb would permit the plant to survive even the hottest surface fires. Based upon Caicco's discussion of fire effects, it is likely that broad-fruit mariposa lily population would not be negatively impacted by prescribed burning, if it is done after the plant has gone dormant for the year. Spring burning, however, could affect the plants' annual cycle of growth and reproduction if it occurs during emergence, flowering, or fruit-development stages.

The Palouse thistle population also grows in an area proposed for prescribed burning. Although no specific fire effects information is available for this species, it is likely that the Palouse thistle populations would not be negatively impacted by prescribed burning, if it is done after the plants have gone dormant for the year. Wind-dispersed seeds from plants not consumed by fire could also establish following the burn. Spring burning effects would probably be similar to those mentioned for broad-fruit mariposa lily.

Bull thistle and cheatgrass have been reported from the stands where the broad-fruit mariposa lily and Palouse thistle populations occur and also from the adjacent stand where helicopter logging is proposed. Both of these species can establish in a post-fire plant community (USDA Forest Service 2008) and could compete with the two Sensitive plant populations for pollinators (bull thistle only), light, water, or nutrients. Canopy removal in the adjacent helicopter logging unit could also create warmer, drier conditions, which might favor expansion of these two weedy species.

Puzzling halimolobos plants grow where several project-related activities would occur including prescribed burning; helicopter thinning; tractor logging; road decommissioning; and along travel routes. This species would likely expand into areas that are disturbed or at least its habitat would be maintained by disturbance. Although individual plants might be impacted by logging equipment, road improvements/removal, or burning, the overall population would likely survive due its adaptation to early successional conditions and presence of a soil seed bank.

Bull thistle, cheatgrass, common St. John's-wort, hounds-tongue, ox-eye daisy, spotted knapweed, and sulfur cinquefoil have been reported from the stands where puzzling halimolobos occurs. These weedy species could compete with puzzling halimolobos for pollinators, light, water, or nutrients. Expansion of these weedy species beyond their present distributions could affect the amount of puzzling halimolobos plants occurring in the project area. See Weeds section in this EA for more detailed discussion on noxious and other invasive weed species.

Therefore, all action alternatives may impact Sensitive plant individuals and/or their habitats but is not likely to cause a trend toward Federal listing or reduce viability for the population or species for broad-fruit mariposa lily, Palouse thistle, and puzzling halimolobos.

No Action

Under this alternative, there would be no impacts to any federally-listed threatened or endangered species or to Sensitive plant individuals, subpopulations, populations, or habitat for broad-fruit mariposa lily, Palouse thistle, and puzzling halimolobos.

Cumulative Impacts

The analysis area for cumulative impacts will be the same area included in the project area.

Common to All Action Alternatives

There will be no cumulative effects to Threatened or Endangered plants, because, after extensive plant surveys, none have been found in the analysis area.

Cumulative effects for the Sensitive plants occurring in the analysis area are addressed through consideration of past, present, and reasonably foreseeable actions. It is not possible to directly quantify effects of specific past activities that are several years or decades old on species of concern today, because the status and occurrence of Sensitive plants was not known for much of the management history of the analysis area.

Historically the changes in condition and abundance of specific habitats important to these species in the analysis area are also unknown. Therefore, the effects of past projects can only be qualified through general discussions. However, the results of past projects contribute to the current existing condition, which can be used to discuss and quantify effects of proposed activities on this group of plant species.

In general, the following cumulative effects have or could be expected to occur in the analysis area:

- Encroachment of shrubs and trees into the more open canopy habitats occupied by broad-fruit mariposa lily and Palouse thistle due to wildfire suppression and ecological succession.

- Creation/maintenance of early seral habitat for puzzling halimolobos due to road and trail building and use; timber harvest; land-clearing in the vicinity of homesites; wildfire occurrence and suppression techniques (such as dozer lines). Puzzling halimolobos does occur along previously constructed roads and trails along Hard and Hazard Creeks outside of the analysis area.

- Introduction of competitive weedy species into disturbed areas from airborne seeds and seeds brought in from future vehicle use of roads in the analysis area.
- Impacts to puzzling halimolobos may occur from future herbicide spraying of noxious and other weeds, especially along road corridors.

3.2.13 Invasive, Non-Native Species

The geographic scope of the invasive, non-native species analysis is focused on the project area.

Affected Environment

The project area is relatively weed free and is located within the Salmon River Weed Management Area. Inventories have shown weed populations of any significant density are generally limited to main travel corridors. Weed control which has occurred is ground based and mostly spot treatment of an estimated twenty acres per year. The weeds found in the project area include, spotted knapweed (*Centaurea stoebe* ssp. *micranthos*), Canada thistle (*Cirsium arvense*), hounds-tongue (*Cynoglossum officinale*), oxeye daisy (*Chrysanthemum leucanthemum*), common crupina (*Crupina vulgaris*), orange hawkweed (*Hieracium aurantiacum*), rush skeletonweed (*Chondrilla juncea*), yellow toadflax *(Linaria vulgaris*), bull thistle (*Cirsium vulgare*), cheatgrass (*Bromus tectorum*), and St. John's-wort (*Hypericum perforatum*).

Spotted knapweed makes up the largest acreage and is found along US Highway 95 and along the Hard Creek Road. Weed treatment along the roadways has significantly reduced the acreage and density of this weed although it still exists along these travel corridors.

Canada thistle is mainly a transitory weed in forested environments. Seed of this plant is wind spread and the plant is fairly common in the project area but, densities are not causing long term replacement of native plant communities.

Hounds-tongue and oxeye daisy were also found within the project area. These species were recently put on the Idaho Noxious Weed list so control strategies for these species are under development. Hounds-tongue seed sticks to animals and vehicles so spread is mainly along travel corridors. Oxeye daisy reproduces by seed and vegetatively from rhizomes. It is adapted to open meadows, forest openings and higher precipitation grasslands.

Common crupina, mainly a weed of dryer aspects, was noted in a couple of survey areas and is currently a minor weed in the project area.

Orange hawkweed, rush skeletonweed, and yellow toadflax are found adjacent to the project area. Active control of these species is taking place with the goal of eradication.

Dalmation toadflax grows in proximity to the project area. Other weeds of concern observed growing in the project area include bull thistle and cheatgrass. St. John's-wort is found periodically in the project area and is considered controlled at acceptable levels through the use of biological control insects.

Effects of Alternatives

Common to All Action Alternatives

Invasion and expansion of invasive species on public land is an ever-increasing concern for the BLM. These plants have a competitive advantage over native species because, for the most part, they escaped their native environment without their natural enemies. These plants are generally very aggressive in nature, more efficiently uptaking limited moisture and nutrients from the soil. Because of the limited availability of these resources, there is a reduction in the vigor of the native plants caused by this competition. In some instances, competition from invasive plants impacts recruitment of native species by restricting the successful establishment of new native plants to replace those expiring from the system. Because of the high seedling vigor normally exhibited by invasive seedlings, if a seed source is present, they quickly colonize disturbed areas. Native plant communities and soils disturbed in the project area, particularly in logging areas and along roads, would be vulnerable to noxious weed invasion and/or expansion. Without proper project design to mitigate factors of disturbance, there is the possibility that weeds may out compete and displace desirable, native vegetation, altering plant community composition, structure, and function both in the present and future on some portions of the project area.
The invasive species of most concern in the project area, mainly due to their current distribution and densities in the project areas are cheatgrass, spotted knapweed, and Canada thistle. Cheatgrass is a fire promoted species and fairly common in the project area.

Under the proposed action, fire intensities would be expected to be fairly low as burning prescriptions would be consistent with removing understory fuels while still protecting overstory conifer species. The native understory grasslands in the project area are adapted to occasional fire and should be able to withstand low intensity prescribed burning without long-term impacts to plant health. Native plant communities are in fairly good condition in the project area and would be expected to provide competition for resources enough to reduce cheatgrass to pre–project levels within a couple years of implementation. Providing controlled fire would be preferable to conditions, which would exist if late summer fire occurred in the plant community with higher levels of fire intensity then what would occur in the proposed action

Native plants seem able to out-compete this species where more precipitation occurs (over 20 inches) such as forest areas or in Idaho fescue range sites. Favorable conditions for early seral weed species such as spotted knapweed would be created in the short-term by opening the vegetation canopy. As the forest canopy closes, this competitive advantage would dissipate long-term. Canada thistle will commonly increase in density due to disturbance such as forest management, road building, fireline construction or fire. Once herbaceous vegetation recovers post disturbance, Canada thistle often reduces in density and becomes a background weed. Long-term increase in this weed post disturbance is not generally an issue unless the site is devoid of competing native or desired vegetation to recolonize the disturbed area.

Implementation of project design features to reduce the opportunity for weed introduction, establishment, and spread will significantly reduce the risk to native plant communities from invasive species. Design features include pre-treatment of existing weed infestations along entry points to the project area, reduction of the opportunity for off-site weed seed to be carried into the project area on vehicles and equipment through contract stipulations for cleaning, revegetating sites to reduce areas for colonization by weeds, and post project weed inventory and treatment to remove accidental weed introduction.

No Action

Under this alternative there would be no change in the existing conditions or rate of weed spread as a result of activities to implement the project such as vehicle travel and short-term opening of the overstory canopy. This alternative does increase the potential for more acres of spotted knapweed and cheatgrass that would result from high intensity fire and resultant loss of overstory cover. High intensity fire conditions, like those which would occur with current fuel loading in the project area, have a higher potential for long-term vegetation change toward weedy species. It is likely that in the case of wildfire much of the conifer overstory would be removed, therefore providing better conditions for establishment and persistence of spotted knapweed in currently forested areas. Dryer areas which currently have a sparse overstory of conifers and native bunchgrass would be more likely to see an increase in the density and persistence of exotic annual bromes under the no action alternative. High intensity fire conditions would have a higher potential to kill individual native bunchgrass plants than the lower intensity conditions of the proposed action. Removal of individual bunchgrass plants reduces the level of perennial grass competition with annual bromes and would likely result in an increase in the density of annual bromes in the plant community.

Cumulative Impacts

Foreseeable actions which may occur in the project area include the BLMs Boulder project which is an action similar to Bally Mountain and would likely have the same preventative actions and project design features. There may also be some small forest product sales proposed on BLM. These would also incorporate preventive measures. It is unknown what management actions would occur on private lands in the area but some forest management and grazing would be expected to occur.

With properly implemented project design features that avoid weed introduction and that respond to the potential for weed establishment and spread, it is not expected that the action alternatives would contribute to negative cumulative impacts for weeds. Implementation of the action alternatives that reduce fuel loading may actually decrease the potential for negative cumulative effects resulting from currently existing fuel loads as described in the effects analysis. Through planning for the project, weed inventories have been conducted that facilitate effective management of the current weed situation and allow prescriptive measures to be implemented in project development to avoid a change in weed populations thereby reducing the opportunity for negative cumulative impacts.

3.2.14 Cultural Resources

Affected Environment

A historic property inventory was conducted in areas that could be potentially affected based upon the nature of the actions proposed in the various alternatives. No cultural resources were located in these areas. One historic property was located outside any areas of potential effect.

Consultation was completed with the Idaho State Historic Preservation Office in October 2008.

Effects of Alternatives

Proposed Action

A cabin is located outside of any proposed actions on-the-ground and therefore will be avoided and not affected.

Alternatives 2 and 3

There are no known cultural resources under these alternatives. Therefore, Alternative 2 and 3 would have no effects to cultural resources.

No Action

Under this alternative, no vegetation treatments would occur, thus no effects would occur to cultural resources in the project area.

Cumulative Impacts

All cultural resource values have been evaluated for cumulative impacts. It has been determined that no adverse cumulative effects would result from implementation of the Proposed Action or alternative actions.

3.2.15 Visual Resources

Affected Environment

BLM is required to manage public lands to protect their scenic values. To consistently evaluate its lands within their regional context, BLM developed the Visual Resource Management (VRM) program (Handbook H-8410-1; BLM 1986). Visual values are identified through VRM inventory and are considered with other resource values in the Resource Management Planning process. Visual management objectives are established in conformance with the land use allocations. These area specific objectives provide the standards for planning, designing, and evaluating future management projects. BLM uses the VRM process to manage the scenic quality of the landscape and to reduce the impact of development on the scenery.

A VRM Inventory study was conducted of the project area, along Highway 95. Based on the study the project area encompasses two Visual Resource Management (VRM) classes, Class II and Class III. Class II encompasses the majority of the project area. Portions of the project area are visible in the background.

The class II objective is to retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen, but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape. The class III objective is to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.

Effects of Alternatives

Common to All Action Alternatives

The project area can be briefly viewed from U.S. Highway 95 along the five miles that border it. However, most people using U.S. Highway 95 at 55 miles per hour would not notice a change in scenery from the proposed activities. The Little Salmon River dominates the observation of people driving through this area along the highway as the river is very scenic with waterfalls that can be viewed from the highway. The road is curvy following the Little Salmon River, which seems to be the main focus of people riding in the car at 55 miles per hour while driving through the project area. There are also a number of concrete barriers, telephone lines, and power poles along the highway also included was several private residences and buildings. There are few places to pull over on the highway along the project area. Consequently, the visual experience of the vast majority of travelers will not change during or after the project is implemented. Local residents may experience minor visual changes; however, the end result will remain within the Class II and III objectives.

The use of prescribed fire would result in line, color, and texture contrasts to the scenery. In general, these contrasts would be of small scale associated with the landscape and regrowth of vegetation should blend back the impacts the following year. As regrowth of grasses and shrubs occurs, the prescribed fire’s visual effects could change, adding greater visual diversity to the landscape. In the long-term, the action alternatives would improve scenic quality by increasing vegetative diversity and age class and allowing for natural ecological change.

No Action

Under the No Action alternative, there would be no direct effect on the visual resources of the project area. In the long-term, the No Action alternative could decrease the variability in vegetative type and age class, decreasing scenic diversity. If in the absence of fuels reduction, a wildland fire occurs within the project area, the landscape character could be greatly altered with an extensive loss of existing vegetative cover. Appropriate management response would be taken for wildland fires. Successful suppression would reduce the size of the area affected; however, if the fire out-paces suppression efforts a large area could potentially be affected. Ground disturbing fire suppression activities would result in line and color contrasts and changes in the character of the landscape.

Cumulative Impacts

There would be no cumulative effects to VRM. Class II and III management objectives would be met.

3.2.16 Socio Economic

The economic analysis for the Bally Mountain Project will focus on those costs and revenues associated with implementation of each of the proposed alternatives. The project specific area is located within Idaho County; however, Adams County borders the project. Two primary processing facilities for timber products likely to be interested in the project are, one in Tamarack (approximately 21 miles) and the other in Grangeville (approximately 66 miles), Idaho. There are several regional service contractors within 200 miles that could be impacted. The purpose of the economic analysis is to display potential costs and revenues associated with implementation of the alternatives for comparison purposes.

Affected Environment

The project lies at the extreme southern end of Idaho County and borders the northeast portion of Adams County. The following Idaho County labor market information comes from the Idaho Department of Labor (April, 18, 2011). "Geographically, Idaho County is one of the largest counties in the continental United States. Wilderness and national forests cover much of the county. The Forest Service is a major employer. Known for spectacular scenery, whitewater rafting, fishing, hunting, hiking and camping, the county's small tourism industry has expanded considerably in recent years. Abundant forests traditionally have provided hundreds of logging and wood produces jobs. Technology and changes in Forest Service timber management have reduced those jobs over the years while the national housing crisis caused further erosion. Jobs in logging and wood products fell from 472 in 2000 to 381 in 2007 and then to just 185 in 2009. Some jobs have been regained in the last year as lumber prices moved up from historic lows in 2009. Idaho Forest Group with nearly 150 employees at its mill in Grangeville is the county's largest private-sector employer. The Three Rivers Mill in Kamiah closed at the end of 2008, putting more than 100 people out of work. This summer, Blue North Forest Products opened at the mill site, restoring more than half those jobs."

"Adams County ranks 41st among Idaho's 44 counties in population and is sixth smallest in area. Adams County has a core group of residents to keep it stable. Fluctuations result from the comings and goings of people looking for a rural life and hoping to avoid the escalating cost of living in other areas. However, many have trouble finding work in an economy hit hard by the decline in natural resource-related industries" (Idaho Department of Labor January 2011). The report notes that the sixth largest major employer in the county is Tom Mahon Logging Inc.

Effects of Alternatives

Only direct costs and revenues are considered in the analysis for the Bally Mountain Project. Non-market values such as hunting and dispersed recreation were not considered. There may be some temporary displacement of these activities during project implementation; for example, users could hunt and recreate in other areas of BLM and adjacent Payette National Forest during fuel reduction activities. Upon completion of project activities, hunting and recreation is expected to return to present levels.

Local Employment

Common to All Action Alternatives

Local employment would be directly impacted by all action alternatives. It is difficult to determine the extent of new jobs created, but with current unemployment at 14.1 percent in Adams County and 12.3 percent in Idaho County (Idaho Department of Labor, April 2011), employment opportunities that may result from project implementation include:

- fuels reduction (thinning, pruning, piling, and burning)
- forest products (including harvest, transportation and milling)
- reforestation (seedlings, planting)
- road construction/maintenance.

Secondary economic activity would also be supported indirectly through implementation of any action alternative. This would be related to suppliers of equipment and fuel, repairs, lodging, etc.

No Action

Local employment could be directly or indirectly impacted by the No Action Alternative. This alternative harvests no timber, generates no revenues, and incurs no expenses from fuels reduction treatments. No jobs or individual income are generated. The only expense incurred with Alternative 1 is the cost of preparing the environmental analysis.

No action results indirectly in a lost opportunity for commercial timber harvest for a period of 3-5 years on much of the project area. This would be the time required for initiating and completing new NEPA and renewing easements across adjacent property owners. The indirect effect would be the lost employment potential of managing the current forest stands and the risk of a stand replacing fire that should it occur extends the timeframe to the maturity of the next generation approximately 100 years.

Revenues and Costs

Common to All Action Alternatives

The implementation of any action alternative has the potential to directly affect associated revenue and costs. The top portion of Tables 41–43 display the revenue and costs associated with the harvest activities and the bottom portion displays the restoration activity and its associated cost. This information provides an estimate only and can be used as a relative comparison tool of the economic impact of each alternative.

The information in Tables 39–41 displays that the net value (all implementation costs minus revenues). They illustrate the full project implementation of any of the alternatives would necessitate the expenditure of appropriated monies. The differences between alternatives are primarily the result of variations in timber harvest methods and acres of under burning.

The benefits of reducing fuels and therefore the associated costs of fire suppression and potential saving of property and resources is difficult to quantify. However, recent wildfires within the project (Teepee Spring) or adjacent to the project (Hazard Creek) are indicative of the current situation. The Teepee Spring fire of approximately 5 acres in 2007 cost $127,996 to suppress; or $25,599 per acre. The Hazard Creek fire of approximately 5 acres in 2008 cost $47,000 in suppression; or $9,400 per acre. This is much higher than the total net cost per acre for project implementation: Proposed Action $610, Alternative 2 $569, and Alternative 3 $957.

No Action

The No Action Alternative, by foregoing implementation of timber harvest and the development and restoration package would result in no change to the current revenue production or expenditures. The timber volume proposed in the Bally Mountain Project would be part of the BLM's allowable sale quantity of 46.9 million board feet per 15-year planning period. If the sale is not offered, the BLM's planned volume for the year in which the sale was to occur may decline, affecting local and regional economies. Changes in harvest levels translate into changes in timber industry employment and income levels.

Table 39. Revenue and Costs of Implementation–Proposed Action

Item	Cost/Unit	Units	Costs	Revenue
Timber/Fuels Treatment Activities				
Delivered Log Revenue (tons)	$51.26	29,382		$1,506,049
Tractor Logging (tons)	$30.95	11,624	$359,787	
Cable/Skyline Logging (tons)	$38.10	14,055	$535,446	
Helicopter Logging (tons)	$75.40	3,702	$279,136	
Excavator Pile & Burn (acre)	$370	291	$107,670	
Slashing (acre)	$100	115	$11,500	
Pull Back (acre)	$220	340	$74,800	
Underburn Slash (acre)	$550	340	$187,000	
Reforestation (acre)	$171	165	$28,215	
New Permanent Road (lump sum)	$8,012	1	$8,012	
Temporary Road Construction & Decomm. (miles)	$11,722	1.37	$16,059	
Minor Reconstruction (miles)	$4,065	11.65	$47,357	
Major Reconstruction (lump sum)	$5,875	1	$5,875	
New Truck Creek Crossing (Bridge)	$0	0	$0	
Subtotal–Treatment Activities			**$1,660,857**	**$1,506,049**
Restoration/Vegetation/Fuels Activities				
Road Decommissioning (miles)	$3,802	7.7	$29,275	
Understory Thin/Hand Pile (Acres)	$550	40	$22,000	
Handline (Chains)	$220	280	$61,600	
Under Burn	$650	798	$518,700	
Subtotal–Restoration Activities			**$631,575**	**0**
Subtotal			**$2,292,432**	
Net Revenue				**($786,383)**

Table 40. Revenue and Costs of Implementation–Alternative 2

Item	Cost/Unit	Units	Costs	Revenue
Timber/Fuels Treatment Activities				
Delivered Log Revenue (tons)	$51.57	27,015		$1,393,078
Tractor Logging (tons)	$30.95	12,941	$400,569	
Cable/Skyline Logging (tons)	$38.10	11,510	$438,486	
Helicopter Logging (tons)	$75.40	2,563	$193,247	
Excavator Pile & Burn (acre)	$370	350	$129,500	
Slashing (acre)	$100	150	$15,000	
Pull Back (acre)	$220	313	$68,600	
Underburn Slash (acre)	$550	313	$172,150	
Reforestation (acre)	$171	122	$20,862	
New Permanent Road (lump sum)	$8,012	1	$8,012	
Temporary Road Construction & Decomm. (miles)	$11,722	1.62	$18,989	
Minor Reconstruction (miles)	$4,065	15.43	$62,723	
Major Reconstruction (lump sum)	$9,080	1	$9,080	
New Truck Creek Crossing (Bridge)	$64,792	1	$64,792	
Subtotal–Treatment Activities			**$1,602,010**	**$1,393,078**
Restoration/Vegetation/Fuels Activities				
Road Decommissioning (miles)	$3,802	0.00	$0	
Understory Thin/Hand Pile (Acres)	$550	43	$23,650	
Handline (Chains)	$220	433	$95,260	
Under Burn	$650	618	$401,700	
Subtotal–Restoration Activities			**$585,402**	**0**
Subtotal			**$2,122,620.00**	
Net Revenue				**($729,542)**

Table 41. Revenue and Costs of Implementation–Alternative 3

Item	Cost/Unit	Units	Costs	Revenue
Timber/Fuels Treatment Activities				
Delivered Log Revenue (tons)	$51.53	27,869		$1,436,218
Tractor Logging (tons)	$30.95	12,184	$377115	
Cable/Skyline Logging (tons)	$0.000	0	$0	
Helicopter Logging (tons)	$75.40	15,685	$1,182,628	
Excavator Pile & Burn (acre)	$370	325	$120,250	
Slashing (acre)	$100	150	$15,000	
Pull Back (acre)	$220	337	$71,140	
Underburn Slash (acre)	$550	337	$185,350	
Reforestation (acre)	$171	136	$23,256	
New Permanent Road (lump sum)	$8,012	1	$8,012	
Temporary Road Construction & Decomm. (miles)	$11,722	0	$0	
Minor Reconstruction (miles)	$4,065	13.95	$56,707	
Major Reconstruction (lump sum)	$9,080	1	$9,080	
New Truck Creek Crossing (Bridge)	$64,792	1	$64,792	
Subtotal–Treatment Activities			**$2,113,330**	**$1,436,218**
Restoration/Vegetation/Fuels Activities				
Road Decommissioning (miles)	$3,802	10.7	$40,681	
Understory Thin/Hand Pile (Acres)	$550	43	$23,650	
Handline (Chains)	$220	433	$95,260	
Under Burn	$650	610	$396,500	
Subtotal–Restoration Activities			**$556,091**	**0**
Subtotal			**$2,669,421**	
Net Revenue				**($1,233,203)**

Other Economic Effects

Common to All Alternatives

Grazing and recreation-based services also provide economic inputs to the local economy, but they are very minor relative to the values of the forest products and restoration treatments. Current grazing levels and recreation-based economic activities would not be appreciably affected by implementation of any alternative.

Environmental Justice

Common to All Alternatives

Environmental Justice is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Through scoping, public and collaborative meetings, the public and local residents have had a voice in developing alternatives and have been thoroughly informed of potential environmental consequences**.**

The analysis area is within the ceded territory of the Nez Perce Tribe. Consideration on the impacts to Native Americans can be found in the Tribal Trust and Treaty Rights report. The Tribe was kept fully involved in project development through meetings with the Natural Resources Subcommittee and specialist to specialist dialogue. No environmental health hazards have been identified resulting from project implementation. The project should not disproportionately affect income levels.

Cumulative Impacts

Long-term and cumulative effects of individual projects are difficult to quantify. Private lands will continue to produce forest products, but the rate of harvest is largely dependent on the landowner's circumstances and is unpredictable. The Payette National Forest as well as the Idaho Department of Lands administer some of the adjacent lands. Currently neither agency is planning projects near the Bally Mountain project.

4 CONSULTATION AND COORDINATION

4.1 Persons, Groups or Agencies Consulted

Scoping for preparation of this EA included publishing information on the Idaho BLM NEPA website in October 2007, and sending letters requesting comments from various groups and the public. On November 21, 2007, scoping letters describing the proposed action, location and purpose and need were sent interested individuals, businesses, organizations and agencies. A public meeting was held in New Meadows, Idaho on December 13, 2007 with seven private citizens in attendance, and a scoping update package was posted on the NEPA website and mailed to interested parties on July 25, 2011. Section 1.2.3 of this EA includes the list of substantive issues identified by seven individuals, three organizations, and six agencies that BLM considered in the development and analysis of the project. The Cottonwood Field Office will hold another meeting following issuance of this EA for public comment.

4.1.1 Coordination with Other Agencies

Consultation under section 7 of the Endangered Species Act is ongoing for ESA-listed wildlife and fish. BLM coordinated with NOAA Fisheries and USFWS biologists in preparing a biological assessment specific to the Proposed Action (BLM 2012).

Consultation under section 106 of the National Historic Preservation Act with the Idaho State Historic Preservation Office was completed in October 2008.

4.1.2 Native American Consultation

The BLM sent a letter describing the proposal to the Nez Perce Tribe on November 21, 2007, and the scoping update package on July 25, 2011. Coordination with the Tribe did not identify any concerns for traditional cultural properties or their ability to exercise treaty rights.

4.2 Preparers

BLM Cottonwood Field Office
Kristen Sanders, Fire/fuels, Air Quality
Robbin Boyce, Vegetation; Socio Economic; Transportation
Craig Johnson, Aquatic Resources; Wildlife/Habitat; Special Status Species
Lynn Danly, Weeds
Mark Lowry, Special Status Plants
David Sisson, Cultural Resources
Joe O'Neill, Visual Resource Management, Wild and Scenic Rivers
Lorrie West, Planning and Environmental Coordinator
Mike Stevenson, Soils, Water Resources

Ecosystem Management, Inc.
Stephanie Lee, Project Manager
Mike Tremble, Assistant Project Manager

4.3 Distribution

This EA will be available from the Idaho BLM public internet site at: http://www.blm.gov/id/st/en/info/nepa.html. Copies may be requested by calling or visiting the BLM Cottonwood Field Office, 1 Butte Drive, Cottonwood ID 83522, telephone 208-962-3245. A notice of availability or copy of this EA will be sent to the interested entities who commented during scoping and/or requested a copy.

Individuals
Lester A Etux Bellinger, New Meadows ID
Bitton Family Trust, Culdesac ID
Roy E Dickerson, Weiser ID
Faron Gilbert, McCall ID
Thomas Hubbard, New Meadows ID
Dell E Jemmtt, Parma ID
Gayle C Josephson, Caldwell ID
Norman Keesler, Nampa ID
Barron Loper, Pollock ID

Non-Governmental Organizations
Rocky Mountain Elk Foundation, Boise ID
Alliance for the Wild Rockies, Missoula MT
Friends of the Clearwater, Moscow ID
Lands Council, Spokane WA
Wildwest Institute, Missoula MT
Western Watersheds Project, McCall ID
Idaho Conservation League, Boise ID

Federal, Tribal, State and Local Governmental Agencies
NOAA Fisheries, Boise ID
NOAA Fisheries, Grangeville ID
U.S. Fish and Wildlife Service, Boise ID
U.S. Forest Service, Payette National Forest, Boise, ID
Nez Perce Tribe, Lapwai ID
Idaho Department of Environmental Quality, Lewiston ID
Idaho Department of Fish and Game, Boise ID
Idaho Department of Fish and Game, McCall, ID
Idaho Department of Lands, McCall ID

Elected Officials
Idaho County Commissioners, Grangeville ID
Adams County Commissioners
Rep. Raúl R. Labrador, First Congressional District, Idaho
Rep. Mike Simpson, First Congressional District, Idaho
Senator Mike Crapo, Idaho
Senator James E. Risch, Idaho

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