RCA widths should be sufficient to provide riparian functions, including delivery of organic matter and woody debris, stream shading, and bank stability (Gregory et al. 1987; Beschta et al. 1987, McDade et al. 1990; Belt et al. 1992). The Fisheries Specialist Report (Project Record) provides rational for RCA delineation distances. Effects to the RCA indicator are measured by trends in function provided in Appendix B of the Forest Plan.

Forest Plan Direction

The 2003 Forest Plan (USDA Forest Service 2003) standards and guidelines applicable to this project are included in Chapter 2 - Mitigation Measures.

The Forest Plan also contains Appendix B that specifically addresses soil, water, riparian, and aquatic resources. Appendix B includes tables to document the desired condition, existing condition, effects of the project, and a key for making Endangered Species Act determinations. These tables have been completed for the project and are located in the Project Record (Fisheries Specialist Report). Upper Indian Creek is a high priority for watershed restoration in the Payette National Forest Watershed and Aquatic Restoration Strategy.

Bull trout is the only aquatic Management Indicator Species (MIS) for the Payette National Forest and occur within the analysis area. Burns et al. (2005) provides an assessment of bull trout viability and trend on the Payette National Forest. A Biological Evaluation on Chinook salmon (Oncorhynchus tshawytscha), steelhead (O. mykiss), and westslope cutthroat trout (O. clarki lewisi), which do not occur in the Analysis Area, is on file in the Project Record. A Biological Assessment on bull trout will be completed.

The project fisheries biologist determined that the entire Indian Creek 6th field Hydrologic Unit (HU) was the appropriate scale to assess baseline, direct and indirect effects, and cumulative effects (Figure 3.3-1).

Scope of the Analysis

Direct, indirect, and cumulative effects to fish habitat and fish populations were analyzed for the Indian Creek subwatershed (24,289 acres). The scope of analysis for this section is referred to as the analysis area (Figure 3.3-1).
Environmental Effects

Relevant habitat indicators for this analysis are sediment and embeddedness, and RCA's. Time scales for effects are temporary (0-3 yrs), short term (3-15 yrs), and long term (>15 yrs). The Fisheries Specialist's Report located in the Project Record should be referenced for a detailed effects analysis for all WCI's.
3– Environment & Effects

Direct and Indirect Effects

Alternative A – No Action - Effects of Failing to Implement the Proposed Action

Sediment and Embeddedness
If the project were not implemented the effects to sediment and embeddedness WCI’s (see change in sediment and embeddedness in Alternative B below) from road graving, road construction, increased road use, road decommissioning and other actions would not occur. Sediment and embeddedness would remain functioning at unacceptable risk in the Indian Creek subwatershed.

Wildfire effects
Long term monitoring (1998-2004) on Big Creek and the SF Salmon River on the Payette National Forest has not shown an association between wildfire and increased substrate embeddedness (Nelson et al. 1999; Minshall et al. 2005). Other studies in Central Idaho have shown temporary and short term increases in sediment related to wildfire (Minshall et al. 1989). Depending on fire severity, temporary to short term increases in sediment delivery may occur as hillslope erosion is increased due to reductions in ground cover following a fire (Wondzell and King 2003). Long-term increases are unlikely given natural re-vegetation and establishment of ground cover that would limit the potential for accelerated erosion and associated sedimentation.

BOISED modeling of high severity fire across proposed treatment areas predicts a temporary and short-term spike in percent over natural sediment slightly greater than the spike estimated with proposed activities (Alternative B), but the duration of the increase with a wildfire is predicted to be shorter than the duration of effects associated with the proposed action.

Riparian Conservation Area Function
The 2.6 acres of RCA rehabilitation from road decommissioning and 1.0 acre of RCA road construction would not occur. The negligible effects of other project actions, such as manual understory thinning and pile burning in RCAs (see change in RCAs in Alternative B below), would not occur. RCAs would remain functioning at risk in the Indian Creek subwatershed.

Wildfire effects
Wildfire in RCAs can have significant effects on vegetation and stream channel characteristics (Minshall et al. 1997; Minshall et al. 1989; Gresswell 1999; Rieman et al. 2003).
However, due to higher humidity, higher soil and fuel moisture, and other environmental characteristics wildfire generally burns with less intensity and frequency in riparian areas (Dwire and Kauffmann 2003). Many riparian species respond quickly to fire through seed production and post-fire growth (Dwire and Kauffman 2003). The WCI would be maintained.

**Direct effects to bull trout and other native fish species**

The proposed action is designed to reduce the threat of wildfire to the town of Cuprum, not the Indian Creek analysis area. Bull trout have not been documented within the project area; therefore, a wildfire within the project area is not likely to affect bull trout. Redband trout are common throughout Indian Creek and the population would likely rebound rapidly if mortalities were to occur from a wildfire (Rieman et al. 1995).

**Alternative B – Proposed Action**

The proposed action would involve commercial harvest, fuels reduction activities (prescribed burning and mechanical and non-mechanical treatment), road construction and road decommissioning.

**Change in Sediment and Embeddedness**

**Road Construction Across Stream Channels.** Before new road construction occurs across Hathaway Gulch and an intermittent stream channel, gravel will be applied to portions of the Lynes Point Road (50111) and the road along Indian Creek (50081) upstream of new road construction (Appendix E, Figure E-1). Therefore, temporary, short, and long term increases in sediment delivery to stream channels from road construction across Hathaway Gulch and an intermittent stream channel will be offset by an overall reduction in sediment delivery due to graveling existing roads (Table 3.3-1). Erosion control measures will be required during road construction and decommissioning, and culvert placement and removal, which will minimize sediment delivery (Chapter 2, Table 2-4). Examples of mitigations include hydro-mulching, silt fencing, slash filter windrows, straw bales, sedimats, and reseeding with native grasses. The temporary culvert on the intermittent stream channel and permanent culvert on Hathaway Gulch will be installed when the channel is dry or at base flow and erosion control will be used (Chapter 2, Table 2-4). In addition the road will be ripped, seeded, and closed to travel after activities are complete, thereby reducing erosion.
3– Environment & Effects

Table 3.3-1: *Sediment yield generated by WEPP (Water Erosion Prediction Project) Model

<table>
<thead>
<tr>
<th>Years after action</th>
<th>3</th>
<th>15</th>
<th>30</th>
<th>60</th>
<th>90</th>
</tr>
</thead>
<tbody>
<tr>
<td>A) Increase in sediment yield (lbs) due to new road construction across Hathaway Gulch and an intermittent stream</td>
<td>2</td>
<td>96</td>
<td>212</td>
<td>322</td>
<td>374</td>
</tr>
<tr>
<td>B) Decrease in sediment yield (lbs) from graveling existing roads</td>
<td>-1917</td>
<td>-2651</td>
<td>-2390</td>
<td>-2554</td>
<td>-2560</td>
</tr>
<tr>
<td>C) Net decrease in sediment yield (B minus A)(lbs.)</td>
<td>-1915</td>
<td>-2555</td>
<td>-2178</td>
<td>-2232</td>
<td>-2186</td>
</tr>
</tbody>
</table>

*Model assumptions, input and output in Fisheries Specialist Report, Project Record). The accuracy of WEPP predicted runoff or erosion rate is, at best, plus or minus 50%. Row C provides the estimated net reduction in sediment yield due to graveling existing roads after accounting for the increase in sediment due to new road construction across stream channels (A).

Application of Best Management Practices (BMPs) would be a requirement for the project. BMPs, as described for Soil and Water Conservation Practices (USDA Forest Service 1988), would be applied to all ground-disturbing activities to reduce or minimize effects on soil and water resources (See Water Resources Section for further detail).

Other Road Construction. Road construction that occurs on ridge tops, outside of RCAs (Appendix E, Figure E-1) will not result in measurable sediment delivery to stream channels due to the long distance from stream channels, proper drainage, application of BMPs and closure to public use after project activities are complete. Required graveling at stream crossings and other drainage improvements prior to log haul will further mitigate temporary sediment delivery from logging traffic.

Road Decommissioning. Nelson et al. (2004) evaluated relationships between road density and fish habitat attributes on the Payette National Forest, and found that sediment deposition (e.g., percent surface fines) increased with road density. Decommissioning 8.94 miles of road, 0.67 miles of which are within RCAs, and associated rehabilitation of at least four stream crossings, will reduce road density from 3.9 to 3.7 miles per square mile in the analysis area and further reduce short and long term rates of sediment delivery to stream channels. Zurstadt (2006) documented little or no visible turbidity associated with streamside road decommissioning and stream crossing rehabilitation when erosion control measures were used. Erosion control measures, such as hydro-mulching, silt fencing, slash filter windrows, straw bales, sedimats, and reseeding with native grasses will be used when decommissioning roads at stream crossings and through RCAs. Therefore, sediment delivery to stream channels will be temporary and negligible.

The model BOISED predicted an overall decrease in sediment delivery from project activities in the long term, with temporary and short term increases; however, the changes were slight and not likely to be measurable on the ground (see water resources specialist report on file in the Project Record).
Due to the offsetting nature and timing of actions (Table 3.3-1, and 3.3-2), small scale of the project, design features and mitigations that capture sediment, and overall reduction in road densities and stream crossings, the rate of sediment delivery to the channel is expected to be reduced over baseline rates at all time scales.

**Treatment of Post Activity Fuels in RCAs.** No fire line would be constructed around hand-piles because slash piles are generally ignited during wetter weather when fire spread is not a concern. Because relative humidity is inherently higher in riparian areas, burning that occurs there is typically of low intensity and much of the ground cover will remain intact. Burning piles will not impair the sediment buffer function of riparian ground cover because the fire will not be allowed to spread beyond the piles.

**Prescribed Fire.** Observations indicate burns implemented under prescription yield little sediment delivery. Field observation of the Rapid River prescribed burn (adjacent drainage to Indian Creek with similar characteristics) found no evidence of sediment delivery to stream channels where riparian vegetation was intact and that ground cover such as logs and large branches effectively inhibited sediment travel (personal communication, Dale Olson, District Fisheries Biologist, 2007). Fuel treatment would not be expected to degrade the current sediment condition nor retard attainment of an appropriately functioning sediment WCI in or downstream of the project area due to (1) mitigation measures to protect RCAs (no ignition of broadcast burns in RCAs, no handline in RCAs, limit size of hand piles in RCAs, fisheries biologist or hydrologist approval of RCA hand piles before burning; (2) expected low intensity burning in riparian areas due to higher relative humidity within RCAs; and (3) the high likelihood burns would be confined to pile areas.

**Cuprum Ditch.** All work will be completed with as little disturbance to surrounding soil and vegetation as possible. Care will be taken to reduce sediment delivery to Indian Creek to negligible levels. Erosion will be minimized using straw bales, sediment fences, excelsior blankets, jute matting, or similar protective measures when ground-disturbing activities occur. Any excavated material will be disposed of in such a way that it will not reach Indian Creek. This may necessitate transporting material away from the site to deposit in an approved location. Disturbed areas, will be reseeded with native grasses. Because sediment delivery will be negligible the sediment WCI will be maintained at all time scales.
Table 3.3-2. Summary of actions, associated erosion control mitigations, and relevant time scale for mitigations.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Temporary (0-3 yrs)</th>
<th>Short-Long Term (&gt;3 yrs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>New road construction across RCAs</td>
<td>Prior to new road construction gravel portions of existing roads upstream of new construction. Use erosion control measures and BMPs</td>
<td>Gravel existing roads prior to new road construction. Within 3 years of new road construction in RCAs decommission equivalent or greater miles of road within RCAs. Close new road across intermittent stream, remove culvert, and rip and seed road.</td>
</tr>
<tr>
<td>New road construction outside of RCAs</td>
<td>Use erosion control measures and BMPs</td>
<td>Within 3 years of new road construction decommission equivalent or greater miles of road in the project area. Close new roads after project activities are complete, except rerout across Hathaway Gulch.</td>
</tr>
<tr>
<td>Increased travel from logging activities</td>
<td>Gravel crossings and complete road drainage improvement before logging traffic begins</td>
<td>Effects are temporary</td>
</tr>
<tr>
<td>Road decommissioning including stream crossing rehabilitation</td>
<td>Use erosion control measures and BMPs</td>
<td>Effects are temporary</td>
</tr>
<tr>
<td>Commercial harvest, fuels reduction activities, prescribed fire.</td>
<td>RCA buffers, BMPs, mitigation measures for RCA treatments</td>
<td>RCA buffers, BMPs, mitigation measures for RCA treatments</td>
</tr>
<tr>
<td>Cuprum ditch and fish screen</td>
<td>Erosion control mitigation measures and design features</td>
<td>Effects are temporary</td>
</tr>
</tbody>
</table>

**Riparian Conservation Area Function**

**Timber Harvest.** Timber harvest would not occur within RCA buffers of 240 feet (two sight potential tree heights) on perennial channels and 120 feet on intermittent channels. Therefore, at all time scales, no, or negligible effects to RCAs would be expected from harvest, RCA function would not be degraded, and actions would not retard attainment of proper function.

**Fuel Reduction in RCA.** Fuel reduction in RCAs would consist of manually thinning only understory trees that provide a ladder of fuel into the overstory, and hand piling and burning slash and excess surface fuel within the 240 foot buffer on perennial channels and 120 foot buffer on intermittent stream channels.

No thinning of overstory trees will occur, and because overstory trees provide the majority of stream shade, thinning understory trees will have minimal influence on shade and negligible effects on stream temperature.
LWD recruitment in the temporary and short term will be maintained because trees that are tall enough to reach the channel will not be cut. Long term recruitment will be maintained because the density of live overstory trees and understory trees that do not provide a ladder of fuel to the overstory will remain high (Figure 3.3-2).

Figure 3.3-2. Example of understory ladder fuel trees that would be thinned and surface fuel that would be piled and burned within the RCA buffer. Understory trees that are not ladder fuel would not be cut. Trees with yellow circle would be cut.

In addition, prior to thinning trees a fisheries biologist or hydrologist will review the layout to insure no trees large enough to reach the stream channel will be cut. Because overall effects to shade or LWD will be negligible, RCA function will be maintained and actions will not retard attainment of proper function.

**Treatment of Post Activity Fuels in RCAs.** Slash and excess surface fuel piles will be ignited during wetter weather when fire spread is not a concern. Piles will be located a sufficient distance from overstory trees to help prevent mortality to trees that provide shade or future LWD recruitment. Burning piles will not impair the sediment buffer function of riparian ground cover because the fire will not be allowed to spread beyond the piles. A fisheries biologist or hydrologist will approve the pile locations before burning occurs.
Prescribed Fire. Due to inherently higher relative humidity prescribed fire that is allowed to back into RCAs, would likely burn at low intensity, limiting consumption of vegetation and tree mortality. Therefore, RCA function will be maintained and actions will not retard attainment of proper function.

Road Construction and Decommissioning. When feasible, trees that are cut during clearing for road construction through 1.0 acre of RCA within one site potential tree height (120 ft) of the Hathaway Gulch and an unnamed intermittent stream channel (Appendix E, Figure E-1), will be felled into the stream channel to provide LWD. Trees or other vegetation within RCAs, that are cut when clearing for road construction, will not be removed from the buffer. Felling trees into the stream channel will maintain or increase LWD recruitment in the temporary and short term. In the long-term LWD recruitment will increase as 2.5 acres of RCA vegetation reestablishes on decommissioned roads within 120 feet of stream channels (1.5 acre improvement). Stream shade will be reduced in the temporary and short term from road construction through 1 acre of RCA within one site potential tree height (120 ft) of the Hathaway Gulch channel and an intermittent stream channel. In the long-term stream shade will increase as 2.5 acres of RCA vegetation reestablishes on decommissioned roads within 120 feet of stream channels. Due to the small scale of shade alteration and lack of water in many of the intermittent stream channel during the warmest part of summer any influence on stream temperature will be negligible at all time scales.

In summary, temporary and short-term effects from road construction altering 1.0 acre of RCA on Hathaway Gulch and an intermittent tributary will be offset by road decommissioning in 2.6 acres of RCA and result in a long-term improvement of 1.6 RCA acres.

Cuprum Ditch. Brushing the existing ditch for maintenance purposes will continue to restrict the development of RCA vegetation within a small area along Indian Creek (< 0.1 acre). Due to the small area involved the opening is expected to have a negligible influence on RCA function at all time scales.

Cumulative Effects

The cumulative effects area encompasses the Indian Creek subwatershed from its headwaters to its mouth (6th field HU Indian Creek).

Past and present activities that affect sediment, substrate embeddedness, and RCAs are timber harvest, roads, grazing, mining, recreation, private land development within the Cuprum townsite, and fires (Appendix D). Generally, habitat fragmentation due to culverts, redistribution of large wood in stream channels from the 2003 flood, and increased sediment delivery due to past actions has influenced WCI is in the cumulative effects area [see Appendix 1 of the Fisheries Specialist Report (Project Record) for baseline condition of all WCI].
Reasonably foreseeable future actions (RFFAs) that may cumulatively influence sediment, substrate embeddedness, and RCAs in conjunction with past and present activities include: forest management and mining activities on private lands (50 acres of small tree thinning is proposed around Cuprum), livestock grazing on public and private lands, fire suppression, fire wood cutting, dispersed recreation and continued OHV/ATV use. One reasonably foreseeable forest management action proposed for public lands within the subwatershed is the School Section salvage sale being proposed in the School Section Gulch drainage. While the project is still in the developmental phases, it is assumed to be very similar in scope and scale to the 2005 Landore Salvage concentrating on the removal of dead and dying trees from the existing road network.

**Cumulative Effects of this Project**

When added to other past, present, and reasonably foreseeable future actions the proposed activities are expected to range from none to an incremental short to long term improvement for sediment, substrate embeddedness and RCAs [see Fisheries Specialist Report (Project Record) for project effects to WCIs within the analysis area].

**Cumulative Effects from Failure to Implement the Project**

When added to other past, present, and reasonably foreseeable future actions, failing to reduce fuels in the project area will have negligible effects on sediment, substrate embeddedness and RCAs [see the Fisheries Specialist Report (Project Record) for project effects to WCIs within the analysis area]. The short and long term improvements in sediment, substrate embeddedness, and RCAs associated with road decommissioning would not occur, and therefore would not contribute to cumulative effects.

**Threatened, Endangered, Sensitive and MIS Species Determination**

Bull trout will not be adversely affected because the project area is downstream of documented bull trout spawning and rearing habitat, and sediment, substrate embeddedness, and RCAs will be maintained or improved within and downstream of the project area. Diversion of up to 1.5 cfs of Indian Creek into the Cuprum Ditch will not have adverse affects on adult bull trout (see Fisheries Specialist Report in the Project Record for more detail). Project effects on bull trout viability will be negligible.
Monitoring
Prior to implementation, a fisheries biologist or hydrologist will review timber sale riparian buffers, riparian thinning layout and fuel treatments to insure mitigations and design features were followed. A fisheries biologist will review culvert installation on Hathaway Gulch to verify that the culvert will provide fish passage and the appropriate erosion control mitigation measures were completed. A fisheries biologist or hydrologist will insure all mitigations associated with new road construction and road decommissioning within RCAs are implemented. Summer stream temperatures and sediment and substrate embeddedness will be monitored upstream and downstream of the project area before, during, and for two years after completion of riparian thinning and road decommissioning and construction within RCAs.

Project Record
This Environmental Analysis hereby incorporates by reference the Fish Specialist’s Report in the Project Record (40 CFR 1502.21). This report includes the Fisheries Biological Evaluation for the Cuprum Fuels Reduction Project and contains the detailed data, methodologies, analysis, references, and other technical documentation used in the assessment.
3.4 Water Resource

Issue - Water Quality

The proposal may increase erosion and sedimentation within the analysis area and potentially, impair beneficial uses and affect aquatic habitat.

Indicators

- Predicted percent over natural sediment from fuel reduction treatments, harvest systems, road actions, and road use as modeled by BOISED
- Road actions within 200 feet of stream channels.

Background for Indicators

A survey of forest practice compliance by the Idaho Water Quality Bureau found that roads near stream channels are the most important factor currently contributing to water quality degradation. According to local research, roads within 200 feet of channels have the highest risk of contributing non-channelized sediment to stream channels (Belt et al., 1992; Burroughs and King, 1989; Megahan and Ketcheson, 1996). The area between roads and streams can provide effective sediment buffering for non-channelized flow. The closer the road is to the stream, the smaller the buffering capability becomes. The current width of vegetation “strips” between roads and streams across the project area is variable. Another road sediment study concluded that non-channelized sediment generally doesn’t reach the stream at distances of over 200 feet (Megahan and Ketcheson 1996). On relatively stable basalts, Belt et al. (1992) found that protective strips of 35 to 127 feet contained 83.5% of the flow and associated sediment (depending upon levels of down wood, ground cover etc.) and estimated that the 97.5% containment could be achieved with an additional 60 feet of protective buffer.

As road density increases, the potential for watershed impacts is increased. Roads intercept subsurface water or stream channels and increase the drainage network. Changes in drainage network and/or changes in vegetation conditions can lead to changes in the timing and/or magnitude of flows and temperature of water being delivered to streams within a drainage. Conversely, where roads occupy portions of the floodplain, the ability of a stream channel to meander is reduced resulting in a reduction in the drainage network due to the straightening of the channel.
As roads intercept subsurface water, this water is forced to the surface where it is heated more rapidly by air/surface temperature and or sunlight. Once water is on the surface it flows off more quickly than it would have as subsurface water. This quickening of flow gives the water more energy to pick up and transport sediment and cut down into the ground surface. This also brings the water to the streams and tributaries faster, creating higher peak flows, lower base flows, and higher temperatures.

The BOISED sediment yield model calculates predicted sediment delivered to streams from each watershed based on landtype, past harvests, roads, and fire events. The measure, percent over natural (%ON), is the predicted amount of sediment from management activities that is above the natural level that would be expected for each watershed without management activities. Natural erosion rates are based on the inherent erodibility of landtypes described in the “Soil-Hydrologic Reconnaissance Survey, Council Ranger District, Payette National Forest” (Knight et al. 1973)(Potyondy et al. 1991). Although the BOISED model evaluates surface and mass erosion to provide estimates of natural sediment yields, model outputs are expressed as average annual yields of total sediment contributed to a watershed. Actual sediment yields for individual years may vary from modeled values by an order of magnitude or more. Results are not reliable predictions of absolute sediment quantities and are best used for developing a quantitative index of cumulative sediment yield and providing a basis for the relative comparison of sediment inputs from different management proposals within a watershed. Assumptions used for the BOISED modeling are included in Appendix C of the Water Resources Specialist Report.

Forest Plan Direction
The Land and Resource Management Plan (Forest Plan) identify forest-wide and management area specific goals, objectives, standards and guidelines aimed at protection and enhancement of the water resources and associated aquatic habitat. Forest-wide goals, objectives, standards and guidelines applicable to this project for the water resource are listed in the Water Resources Specialist Report, the Forest Plan activity table in the project record, and the Payette National Forest Land and Resource management Plan.

Scope of the Analysis
The project area is located in the Indian Creek subwatershed (6th field hydrologic unit) within the larger Snake River-Indian Creek watershed (5th field hydrologic unit). All drainages within the project area flow into Indian Creek that flows directly into the Snake River above the Hells Canyon Dam.

The project activity area (approximately 9,000 total acres with ~7,831
acres of National Forest Lands) encompasses the proposed treatment activity areas (harvest and fuel treatment units) and associated road system necessary to implement proposed activities (Figure 3.4-1).

The sediment analysis area is approximately 16,119 acres and encompasses the entire project area and all of Indian Creek upstream. No activities are proposed downstream of the project area.

The Cumulative effects analysis area includes the entire Indian Creek subwatershed (24,289 acres).

The temporal scopes (timeframes) for the analysis are the same as utilized by the Forest Plan and defined as temporary being from 0 to 3 years, short term as 3 to 15 years and long term as greater than 15 years.

Figure 3.4-1. Location of Cuprum Project Activity Area and Water Analysis Areas
Environmental Effects

Introduction

Research identifies roads as the major source of management induced sediment in forested watersheds (King 1993, Megahan 1977, Belt et. al. 1992. Li et. al. 1978, Duncan et. al. 1987, Rothwell 1993). Based on this and the fact that all proposed silvicultural (harvest) and mechanical fuel reduction activities are buffered from streams by defined Riparian Conservation Areas (RCA) buffers, the majority of the discussion of sediment and effects on water quality will be focused on roads. Two indicators will be used to evaluate road impacts on water quality – BOISED predicted percent over natural sediment, road actions within 200 feet of stream channels.

There are no 303 (d) listed waterbodies within the Indian Creek subwatershed or entire Snake River-Indian Creek watershed. Beneficial uses for Indian Creek and other tributaries in the drainage have not been designated by the state. As undesignated waters, the state presumes uses to include cold water aquatic life and primary or secondary contact recreation. Undesignated waters shall be protected the same as designated waters.

Temperature monitoring of Indian Creek in the project area during 2005 indicates state standards for cold water aquatic life were fully met (no daily averages above 19 degree C, or daily maximums above 22 degree C). Discussion in the specialist report of mining activities disclosed past impacts (sediment) from breaching of tailing impoundments below the Copper Cliff Mine and earlier water chemistry monitoring found Indian Creek to be in a near natural condition with physical, chemical and biological environments in good condition (Payette NF, Steens Creek Salvage EIS).

Sedimentation of Indian Creek is the primary water quality concern and current levels of sediment as modeled by BOISED (Reinig et. al. 1991) are estimated at 12.1% over natural conditions mostly due to past road building and a smaller amount from past harvests. Fisheries data found surface fines ranged from 12 to 21 percent in the five reaches surveyed with only one reach (Huntley Gulch Reach 3) exceeding 21%. This reach is located in the upper portions of Huntley Gulch and is likely reflecting the degraded channel conditions found in the headwater areas. The upper portions of Indian Creek also showed increased levels of fines presumably due to the 2003 summer thunderstorm event that “reorganized” much of the channel in this area.
Alternative A - No Action - Effects of not Implementing the Proposed Action

*Predicted percent over natural sediment from fuel reduction treatments, harvest systems, road actions, and road use as modeled by BOISED*

Under the “no action” alternative, there would be no changes in road use or management in the subwatershed. Impacts to water quality associated with proposed road and fuels reduction activities would not occur. Similarly, improvements to channel conditions and associated reductions in hydrologic risk associated with proposed actions (namely road decommissioning) would not occur. Their would be no decrease in the total road network and no associated short to long term decrease in predicted percent over natural sediment to 10.8%. Predicted levels of percent over natural (%ON) sediment would stabilize at 11.9% by year 2010 when effects (0.5% increase on %ON) of the 2005 Landore Salvage harvest recover and only the effects of the road actions are left. Changes in sediment from hill slope erosion would not be affected by harvest or fuels reduction activities. In the event of a high severity fire, levels of sediment from hill slope erosion would increase temporarily while ground vegetation and soil properties recover from the impacts of wildfire. BOISED modeling of a fire with high severity across the entire sediment analysis area (16,119 acre fire), which would be very unlikely even in the highest of fire dangers, predicts a short-term spike in %ON to 149.7%ON in the first year decreasing rapidly to no impact after four years. Wildfires on the Payette have averaged about 10% of their area in high severity. The duration of the increase with a sever wildfire is predicted to be shorter than the duration of effects associated with the proposed action. The BOISED model assumes re-vegetation and stabilization of the soil following the harvest occurs within six years, and following fire within four years (model documentation of file in Project Record).

*Road actions within 200 feet streams.*

Under no action there would be no changes in road use or management in the subwatershed. The amount, condition of road within 200 feet of stream channels, and road density would remain unchanged and continue to be the most likely source of management induced sediment in the subwatershed (Table 3-4-1). Increases in road related sediment would be associated with increased road use or extreme climatic events.
Table 3.4-1. Miles of Roads within 200 feet of stream channels, total road miles, and road density.

<table>
<thead>
<tr>
<th>Area</th>
<th>Total Road Miles</th>
<th>Road Density (miles/square mile)</th>
<th>Miles of Roads within 200 feet of channels</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Area</td>
<td>67.4</td>
<td>4.8</td>
<td>16.9</td>
</tr>
<tr>
<td>Indian Creek Subwatershed</td>
<td>145</td>
<td>3.8</td>
<td>28.8</td>
</tr>
</tbody>
</table>

**Alternative B - Proposed Action**

*Predicted percent over natural sediment from fuel reduction treatments, harvest systems, road actions, and road use as modeled by BOISED*

With the proposed actions predicted levels of %ON sediment would increase in the temporary to short term in conjunction with road, harvest and fuel reduction activities (Figure 3.4-2). The greatest predicted sediment increases are associated with increased road use and construction of new roads. Predicted %ON sediment would spike at 18.9% in the year of road construction (year 2008) and fall below pre-treatment levels by year 2013 (Figure 3.4-2). Application of the project design features described in the specialist report under channel condition section and in the mitigations section would aid in reducing sediment impacts associated with proposed road activities.

Predicted %ON sediment outputs fall below no action levels by 2013 and drop to 10.8% by 2016 based on stabilization and re-vegetation of road cuts and fills, re-vegetation within harvest disturbed areas and recovery of ground vegetation on decommissioned roads. Long-term sediment levels are predicted to fall below the 11.9 %ON baseline levels associated with the no action alternative stabilizing at 10.8% by the year 2016. This lower baseline is due primarily to the reduction in total amount of roads threw decommissioning activities and improvements to road surface conditions on existing road system.
Road actions within 200 feet of streams

The actual reductions in sediment over the long term may be greater than BOISED predictions. The BOISED model does not take into account the distance between roads and streams. Roads most likely to contribute sediment to streams are the roads within 200 feet of stream channels. Proposed road actions (construction, decommissioning) would result in a net reduction of 1.0 mile of road and improved surface conditions of roads within 200 feet of stream channels.

Given the relatively small changes in BOISED predictions of %ON sediment, application of project design features to reduce potential sediment impacts from harvest, fuels reduction and road activities, the reduction of roads, and improvement of roads most likely to contribute sediment (i.e. roads within 200 feet of streams), negative impacts to water quality from sediment associated with proposed management actions are unlikely in the temporary, short and long term.

Cumulative Effects

Cumulative effects on the water resource will be considered at the Indian Creek subwatershed scale (Figure 3.4-1). Effects from the temporary increases in sediment from this proposal are expected to be immeasurable and the effects from the decrease in %ON and 1 mile decrease in roads within 200 ft of streams will be small when measured at the watershed scale.
Given the relatively small amount of acreage treated (1,644 acres or <1 % of the Snake River-Indian Creek watershed) and because all proposed actions include specific design features aimed at protecting and minimizing negative effects to the water resource. This project will have an incrementally positive effect when added to the past present and foreseeable action in this watershed, albeit a very small effect.

The sediment analysis encompasses the middle and upper portions of Indian Creek as no activities (present or future) are anticipated in the lower portions downstream of the project area (Figure 3.4-1) and expansion of the sediment analysis area would “dilute” predicted changes in %ON sediment.

Discussion of past activities (road building, harvest, fire, grazing, mining) on the water resource are disclosed in the specialist report and the combination of past and present (proposed) actions in the previous environmental effects section.

Reasonably foreseeable future actions that may cumulatively influence the water resource in conjunction with past and present activities include: forest management and/or mining activities on private lands, livestock grazing on public and private lands, fire suppression, fire wood cutting, dispersed recreation and continued OHV/ATV use. One reasonably foreseeable forest management action proposed for public lands within the subwatershed is the School Section salvage sale being proposed in the Huntley Gulch drainage. This project is still in the developmental phases, it is assumed to be very similar in scope and scale to the 2005 Landore Salvage concentrating on the removal of dead and dying trees from the existing road network.

**Effects of not Implementing the Proposed Action**

Impacts to water quality associated with proposed road and fuels reduction activities would not occur in the foreseeable future. Similarly, improvements to channel conditions and associated reductions in hydrologic risk associated with proposed actions (namely road decommissioning) would not occur in the foreseeable future.

There would be no expected changes to channel conditions outside of the influence of extreme climatic events (such as 2003 thunderstorm event) or on-going effects from livestock grazing or illegal firewood harvest.

Levels of %ON sediment are estimated to remain at 11.9% ON over the short to long term in the absence of wildfire. Presence of a wildfire would result in short term (3-5 years) increases in %ON sediment, but the magnitude of increase cannot be predicted with any accuracy due to the uncertainty of fire and variable nature of fire effects across the landscape. At current %ON levels observable changes at the critical reach due to sediment impacts are unlikely (Potyondy 1992).
Forest management actions on private lands could impact water quality, however, given these lands are under the jurisdiction of state forest practices act and associated best management practices (BMP’s) impacts to channels, hydrologic risk or water quality would likely be minimized. Additionally, the majority of the private lands have been recently harvested (within past 10 years) limiting the opportunity and associated probability that they would be re-entered for harvest in the next 10-20 years.

Approximately 50 acres around the town of Cuprum will have the small trees (non-merchantable) thinned and slash piled within the year 2007 or 2008. This may include the use of heavy equipment and if operated near stream channels could negatively impact channel conditions. Given the small scale of this action, cumulative impacts to water quality at the subwatershed scale are unlikely.

There is no information available on potential mining activities proposed for private lands. In the event mining activities were initiated, local impacts to channel conditions could occur as there are 959 acres of private land within 200 feet of stream channels. Depending upon the type of mining activities, water quality could be impacted, but without specific information on the type or extent of potential mining operations impacts cannot be evaluated.

Livestock grazing impacts to water quality would continue on both public and private lands in the subwatershed. Where livestock use is concentrated near streams disturbance to stream channels and potential increased levels of sediment is probable. Impacts to riparian areas accessed by roads proposed for decommissioning would continue and likely retard recovery of stream banks and riparian vegetation especially in the upper headwater reaches of Huntley Gulch.

Firewood cutting would continue across the subwatershed and where firewood is harvested (illegally) from riparian conservation areas (RCA’s), there would be a reduction in LWD available for recruitment into stream channels negatively affecting channel conditions. Effects on hydrologic risk or water quality are unlikely at the subwatershed scale given the isolated and scattered nature of firewood cutting activities.

Fire suppression activities would continue across the subwatershed. Disturbance from heavy equipment employed to “fight” fire near streams could result in disturbance to stream channels and result in added sediment. Chemical inputs from retardant, foaming agents, or other sources is also a possibility with firefighting, reducing water quality in the temporary timeframe. However, in most instances fire suppression tactics are considerate of other resources and measures are taken to minimize negative impacts.

Continued successful fire suppression brings continued perpetuation of un-natural fuel levels and altered forest structure and composition.
As these conditions are maintained (or even enhanced) by fire suppression, the opportunity for severe wildfire would be maintained or increased. In the event of such a fire, disturbance to the vegetation and soils near streams and across the subwatershed could lead to altered channel conditions and increased sediment production. This, in combination with the existing road network and management history, could lead to elevated levels of erosion and sedimentation, and negatively impact water.

The proposed School Section Salvage would include similar requirements (RCA buffers, BMP’s and SWCP’s) to protect the water resource as included in the earlier Landore Salvage and proposed Cuprum Project. As such, the School Section salvage is not likely to result in negative impacts (directly, indirectly or cumulatively) to water quality.

**Proposed Action**

Effects to water quality associated with proposed road and fuels reduction activities would add incrementally to existing and reasonably foreseeable future actions. When these incremental effects are viewed in context of past, present, and future effects, and evaluated against appropriate literature, it is apparent that they are relatively minor and unlikely to lead to negative impacts to the water resource.

The project will result in temporary to short term increases in sediment, but the duration of increase is limited (~ 5 years), and is followed by long term reductions in %ON sediment (Figure 3.4-2).

BOISED predicts that implementation of proposed activities would result in a maximum increase of 6.8%ON at its peak (year 2008) and stay above the no action level until 2012 (Figure 3.4-3). After 2012, BOISED predicts that the base %ON level will be approximately 1.3% lower than the existing condition (Figure 3.4-2). The cumulative effect of the proposed action on % ON sediment is a temporary to short term increase, followed by a long term reduction due to the decommissioning of roads, natural recovery of disturbed areas and improvements (surfacing) to roads used for harvest. As none of the BOISED analyses estimate relative differences of predicted %ON greater than 20%, cumulative impacts of proposed activities on sediment or conditions at the critical reach (Indian Creek at mouth of project area) are unlikely to be observable on the ground (Potyondy 1992).

The cumulative effect of proposed activities on the amount of roads within 200 feet of streams is a reduction of 1.0 mile of road. This represents a 3.5% reduction in the amount of road within 200 feet of streams and will likely have immeasurable effects on water quality at the subwatershed scale.
Livestock grazing impacts to water quality would continue on both public and private lands in small isolated areas across the subwatershed. Where livestock use is concentrated near streams disturbance to stream channels and potential increased levels of sediment is probable. Livestock accessibility to portions of Huntley Gulch and tributaries would be somewhat reduced as a result of proposed road decommissioning in this headwater area. Current road surfaces allow easy riparian access for livestock and other ungulates. Re-contouring and scattering of slash would result in more difficult terrain for livestock or other animals to move through.

With reduced accessibility, there would be some reduction in the potential for stream bank trampling and browsing on riparian vegetation.

Firewood cutting would continue across the subwatershed and where firewood is harvested (illegally) from riparian conservation areas (RCA’s), there would be a reduction in LWD available for recruitment into stream channels. The impacts of illegal firewood harvest on levels of LWD would be somewhat reduced with the proposed action due to a reduced amount of road within close proximity to stream channels.

OHV/ATV use would continue across the subwatershed. Some of the roads proposed for decommissioning are currently accessible and being used by OHV’s/ATV’s even though they are closed. As these roads are reclaimed and illegal use effectively stopped, the impacts of OHV/ATV’s on erosion and sedimentation and associated stream channels would be lessened. There is the possibility that additional, unauthorized ATV trails could be developed in response to reduced access.
These unauthorized trails could lead to additional disturbance to riparian areas and stream channels.

Fire suppression activities would continue across the subwatershed. Treatment of the contiguous block of forest around Cuprum should reduce the likelihood of uncharacteristically severe wildfires, improve fire suppression efforts and allow lower impact suppression strategies. The combined risk to the subwatershed and stream channels associated with a severe fire would be somewhat reduced with the proposed action due to the reduction in forest density and fuels on 1624 acres.

When considered in conjunction with existing conditions and other reasonably foreseeable future actions, the cumulative effect of proposed activities on WCI’s are considered neutral to positive over the short to long term given the reduction in roads (especially roads near streams), long term reduction in %ON sediment, maintenance and improvement of channel conditions, and increased resiliency of the treated area to severe wildfire.

**Project Record**

This Environmental Analysis hereby incorporates by reference the Water Resources Specialist Report in the Project Record (40 CFR 1502.21). The Water Resources Specialist Report contains the detailed data, methodologies, analysis, references, and other technical documentation used in the assessment.
3.5 Soil Resource

Issue
Proposed harvesting, fuel reduction and road activities may affect soil productivity through physical impacts to the soil and reductions in levels of woody debris.

Indicators
- Is the Forest Plan standard, SWST02, for Detrimental soil Disturbance (DD) met?
- Is the Forest Plan standard, SWST03, for Total Soil Resource Commitment (TSRC) met?
- Is Forest Plan direction for Coarse Woody Debris (CWD) met?

Background
Potential soil effects are primarily a function of the type and amount of disturbance, the timing and location of activities, and properties of the landscape (topography) and soils within affected areas. The soil resource and associated site productivity may be directly, indirectly, and cumulatively affected within the proposed project and treatment areas on National Forest System lands. Activities affecting the soil resource include road actions (construction and decommissioning); use of heavy equipment for harvest and fuels treatments, and application of prescribed fire to reduce fuels (pile burning and broadcast burning). Three indicators will be used to evaluate the effects on the soils and their long-term productivity: Detrimental Soil Disturbance (DD), Total Soil Resource Commitment (TSRC), and Levels of Coarse Woody Debris (CWD). The Forest Plan specifies standards and guidelines addressing these indicators and defines them as follows:

**Detrimental Soil Disturbance** (DD) is the alteration of natural soil characteristics that results in immediate or prolonged loss of soil productivity and soil-hydrologic conditions. Detrimental soil Disturbance can occur from soil that has been displaced, compacted, puddled or severely burned. Determination of Detrimental soil Disturbance excludes existing or planned classified transportation facilities, unclassified roads, dedicated trails, and landings, mining dumps or excavations, parking areas, developed campgrounds, and other dedicated facilities; these disturbances tend to fall into the TSRC category of disturbance. The Forest Plan sets a limit for levels of Detrimental soil Disturbance at no more than 15% of a treatment activity area or units when the existing levels are below 15%.
If the existing levels of Detrimental soil Disturbance exceed 15% the Forest Plan requires post activity levels to move towards 15% or less.

**Total Soil Resource Commitment (TSRC)** is the conversion of a productive site to an essentially non-productive site for a period of more than 50 years. The effects from these land uses may reduce the soils productive potential to 40% or less of the natural capability and alter the infiltration and movement of water within the watershed. These impacts can lead to potential changes in surface erosion rates, sedimentation and/or timing and magnitude of runoff. Examples include classified or unclassified roads, designated skid roads, landing areas, parking lots, mining dumps or excavations, dedicated trails (primary skid trails included), developed campgrounds, other dedicated facilities, and some stock driveways. The plan sets a limit of no more than 5% of a project activity area to be in a TSRC condition when existing conditions are less than or equal to 5% and requires reductions in TSRC when existing levels exceed 5%.

**Coarse Woody Debris (CWD)** is defined as pieces of woody material having a diameter of at least 3 inches and a length greater than 6 feet. The Forest Plan defines desired minimum levels of CWD tons per acre based on potential vegetation groups (PVG). Desired minimum levels for PVGs present in the project area are from 4-14 tons per acre with greater than 65% or 75% (depending on PVG) of CWD in the larger size class (15+ inches).

**Forest Plan Direction**

The 2003 Payette National Forest Land and Resource Management Plan (Forest Plan) sets goals, objectives and management direction/standards for the soil resource. The primary goal stated in the Forest Plan is to:

“Maintain soil productivity and ecological processes where functioning properly, and restore where currently degraded. Maintain the physical, chemical, and biological properties of soils to support desired vegetation conditions and soil-hydrologic functions and processes within watersheds (SWG001, Forest Plan page III-19).”

**Scope of the Analysis**

This analysis will use treatment activity area boundaries (harvest and/or fuel reduction units) to define the activity areas for evaluation of DD and CWD. The activity area for assessment of TSRC is defined as the 7,831- acres of National Forest land within the larger ~9000 acre project area displayed in Chapter 2, Figures 2-2 and 2-3. The temporal scopes for the soils analysis calculations are existing conditions and after all actions have been implemented.
Environmental Effects

Alternative A - No Action - Effects of not Implementing the Proposed Action

Detrimental Soil Disturbance

Levels of detrimental soil disturbance would not increase from harvest or fuels reduction activities and continue to meet Forest Plan standard SWST02. Areas of existing detrimental soil disturbance in past activity areas would continue to recover naturally. Natural processes (root penetration, gopher/rodent activity, freeze/thaw, wetting/drying) would slowly restore soil porosity in compacted areas, while continued development/establishment of ground cover and accumulation of organic matter would aid in restoring areas of detrimental displacement. Soil disturbance associated with livestock grazing, big game use, recreational uses and use of administrative sites would continue.

The existing fuels and forest vegetation conditions that contribute to increased risk of uncharacteristically intense fires would remain. As such, the risk of detrimental soil disturbance associated with a highly intense fire (severe burning, displacement) would remain and potentially increase through time as stand conditions continue to change (increased fuel loads).

Total Soil Resource Commitment (TSRC)

There would be no additional creation of TSRC conditions as a result of harvest or road related activities. Existing areas of TSRC would remain, reducing physical, chemical and biological properties of the soil. This limits plant growth, reduces percolation/infiltration rates, impedes subsurface flow, and elevated rates of soil erosion would continue. There would be no restoration of existing TSRC conditions associated with decommissioning and rehabilitation of unneeded roads and logging facilities, reducing TSRC to 3.2%. Accelerated erosion occurring in these areas would continue. Existing amounts of TSRC within the project area would remain at 3.4%, meeting the Forest Plan standard of being below 5% (Figure 3.5-1).

Coarse Woody Debris

Levels of coarse woody debris and surface organic matter would gradually increase across the project area as inputs to CWD exceed reduction (firewood cutting and decomposition). Within forested areas falling down of existing snags, wind/snow related limb and top breakage, and additional natural tree mortality would provide inputs of coarse woody debris through time.
Continued firewood cutting activities would reduce levels of snags available for future CWD, as well as reducing material on the ground along open roads and easily accessible areas. However, given the large amount of inaccessible areas levels of CWD would likely still increase (as a whole across the project area) even with continued firewood cutting. Annual leaf and needle fall, and turnover of grasses, forbs and shrubs would add to existing litter/duff layers providing inputs of short-term nutrient sources. Levels of CWD would continue to provide micro sites for moisture and microbial activity and accompanied with litter and duff would provide for both short and long term nutrient inputs to the soil.

With this continued accumulation of CWD and litter/duff comes an associated increased risk of uncharacteristic wildfires. Occurrence of wild fires would indiscriminately reduce levels of coarse woody debris and levels of duff/litter across the project area. Existing heavy concentrations of fuels would likely burn at higher intensities potentially creating areas of severely burned soils. These areas could act as sources of increased surface erosion if hydrophobic soil conditions are created. Probability of land slides could also increase due to more water in the soils due to less transpiration because of less vegetation. Wildfires would also result in an immediate release of nutrients available for surviving and re-establishing vegetation. Over time, burned areas would maintain, or could see an increase, in CWD as fire killed vegetation is recruited to the forest floor, depending if salvage logging occurs.

**Alternative B - Proposed Action**

**Detrimental Soil Disturbance (DD)**

Activities proposed with this project, that would potentially create detrimental soil disturbance, include use of heavy equipment for harvest and fuels reduction activities, and use of prescribed fire (broadcast and pile burning) for reducing surface and activity fuels.

Harvest and fuel reduction activities would create areas of detrimental soil disturbance within treatment activity areas as a result of felling, skidding, and yarding of logs, piling slash with excavators, pile burning, and broadcast burning. Best Management Practices (BMP’s) (FSH 2509.22), and project design features would be implemented to minimize accelerated surface erosion and limit the extent of detrimental soil disturbance resulting from harvest and fuel reduction activities to less than 15% of the treatment activity areas meeting the Forest Plan standard.

Heavy equipment operations during harvest (felling, skidding/yarding) fuels reduction (slash piling, fire line construction) and road decommissioning activities have the potential to detrimentally disturb the soil resource through compaction, displacement and/or puddling.
Ground based equipment for harvest and fuel reduction (tractor, jammer, and excavator) have the greatest potential to cause soil disturbance given the operation of heavy equipment within treatment activity areas during felling, skidding and piling operations. Aerial harvest systems (skyline, cable, and helicopter) result in less ground disturbance since heavy equipment is limited to existing or temporary roads, and logs are generally suspended (at least on one end) during skidding. In the case of full suspension skyline or helicopter harvest systems, levels of disturbance are generally very low since no equipment enters treatment activity areas, and logs are fully suspended during yarding. The project proposes to utilize a variety of harvest systems (Table 3.5-1).

<table>
<thead>
<tr>
<th>Alternative</th>
<th>Tractor Harvest</th>
<th>Skyline or Cable</th>
<th>Helicopter</th>
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<tr>
<td>A</td>
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<td>0</td>
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<tr>
<td>B</td>
<td>348</td>
<td>306</td>
<td>79</td>
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Project design requirements would be incorporated to minimize and reduce the magnitude and extent of ground based detrimental soil disturbance within treatment activity areas. These include:

- Requiring harvest equipment to stay on designated skidtrails.
- Maintaining an average secondary (lateral) skidtrail spacing of 100 feet, unless frozen or snow covered.
- Allowing closer spacing of skidtrails on complex terrain only with advanced approval by the timber sale administrator.
- Re-using existing skidtrails (as feasible) to limit creation of additional areas of DD.
- Limiting equipment operations to dry (<20% soil moisture) or frozen/snow covered conditions.
- Limiting harvest equipment operations on slopes between 35-45% to designated skidtrails located at an average 300-foot spacing. All logs would be winched to designated trails.
- Buldozers or similar equipment will not be used for piling slash in units.
- Reclamation of skidtrails following harvest. Reclamation would include sub-soiling to ameliorate compaction, scattering of organic matter to provide a minimum of 50% effective ground cover, and seeding with native seed to facilitate vegetation recovery.
3– Environment & Effects

- Disturbed skyline corridors would have soil berms pulled back and be water barred as needed, and organic matter (limbs, needles, logs, etc.) scattered to provide for 35-50% ground cover and facilitate recovery of displaced soils.


Fuel reduction activities can cause soil disturbance similar to ground based harvest when mechanical piling is employed, and can also cause severe burning where pile burning and broadcast burning is utilized. Mechanical fuel treatments will be used with this project. Piling and burning on landings would not add to levels of DD since landing areas are already considered as TSRC. Disturbance from the use of mechanical equipment (an excavator is assumed) to make piles in the units would be controlled by:

- Not allowing buldozers or similar equipment to make piles.
- Limiting operations to periods of dry or frozen soil conditions.
- Operating on existing skid trails as possible.

Proposed fuel reduction treatments may also affect the soil resource through temporary or short-term reductions in ground cover, consumption of CWD, and creation of severely burned soils. These impacts would be reduced through application of fire during periods of adequate soil and fuel moistures that allow retention of an effective duff layer, minimize soil heating, and retain adequate levels of CWD. Application of prescribed fire would also have beneficial effects on the soil through nutrient release and promotion of native fire adapted ground vegetation. Monitoring of prescribed fires, not including pile burning, across the west zone of the Payette have indicated rapid ground vegetation recovery, limited areas of severely burned soils and adequate retention of CWD following prescribed fires implemented under controlled ignitions and appropriate weather and fuel conditions (Soil and Water Monitoring Results 1996-1999, 2004).

The project area is approximately 9,000 acres; 7,831 acres being Forest Service managed land. Of the 7,831 acres, 2,404 acres have previously been entered before for the purpose of timber harvest. Some of those areas have been entered multiple times. The proposed action will have impacts on 1,644 acres of land in the project area. Of those 1,644 acres, 321 acres have been entered in the past for timber harvest.
The remaining 1,321 acres have not been entered in the past for timber harvest. These areas are expected to have very low levels, if any, detrimentally disturbed soil because logging is the main source of soil disturbance on these lands. Livestock grazing, mining activity, and wildfire are other causes of detrimental soil disturbance.

However, there is no sign of impact from livestock grazing in the activity area, and the mining activities that occurred on these lands appears to be over 100 years ago and only occur in a few isolated places.

The Forest Plan standard for Detrimental Soil Disturbance will be met for the proposed action through mitigation measures, BMP’s/SWCP’s, project design, and lack of previous entry into most of the activity areas.

**Total soil resource commitment (TSRC)**

Proposed activities potentially affecting TSRC within the project activity area include harvest (primary skidtrails and landings) and road activities (construction and decommissioning).

Existing levels of TSRC in the project activity area would temporarily increase by 0.3% (27 acres) in conjunction with construction of temporary roads (2.3 miles), primary skidtrails, and landings. This increase would occur during implementation of harvest activities. Following completion of harvest, these areas would be reclaimed to a non-TSRC condition by alleviating compaction, re-contouring cut and fills to the natural slope profile, and scattering of organic matter (limbs, logs, slash, etc) to provide a minimum of 50% ground cover. These areas would be considered disturbed, but not detrimentally disturbed, until ground vegetation and an organic litter layer is re-established.

New road construction of 2.7 miles would result in an increase of 0.1% (7.8 acres) TSRC across the project activity area. Decommissioning of an estimated 8.8 miles of road in the project activity area would reduce TSRC by 0.3% (24.6 acres). Recent local monitoring has indicated that roads decommissioned with these design features generally show rapid ground vegetation recovery and little to no signs of erosion or sedimentation (West zone Soil and Monitoring Results 2002-2004).

Post implementation levels of TSRC in the project activity area would be reduced to 3.2%, lower than the no action alternative, and meeting the Forest Plan standard. As areas of TSRC are restored, soil processes (infiltration, improved growing conditions, reduced erosion potential, etc.) and hydrologic processes (infiltration, erosion/sedimentation, drainage network, etc.) would be improved over the existing condition.

**Coarse Woody Debris (CWD)**

Silvicultural practices, and fuels reduction treatments can affect soil productivity by reducing the amount of organic matter and coarse woody debris (CWD) available for the soil.
Litter, duff, and small (< 3 inch) woody material are the primary source of soil nutrient replenishment. Soil organic matter from root and forest-floor decomposition is a key factor in buffering soil against compaction and imparting resilience against permanent change (Powers 1989).

Coarse woody debris (greater than 3 inches in diameter) is also an important component for long-term nutrient cycling and providing microsites and nutrients for beneficial soil organisms (Powers 1989, Amaranthus et al. 1989). Mycorrhizae are beneficial soil fungi important for conifer establishment and survival. Activities that reduce soil porosity or soil organic matter may reduce mycorrhizal activity (Powers 1989).

Research indicates that for habitat types, such as those found in the treatment area, retention of 5 to 15 tons per acre of distributed coarse woody debris is adequate to maintain soil productivity, and for maintenance of healthy populations of mycorrhizal fungi and other beneficial soil organisms (Graham et al. 1991 and 1994).

The probable amounts of coarse woody debris within treatment activity areas are expected to increase in the short term as a result of breakage of tops/limbs during felling and yarding. Fuel reduction treatments (low intensity underburns and piling) following harvest would reduce CWD, resulting in four to seven tons per acre. This puts the levels at the lower end of forest plan standards of 4 to 14 tons per acre. Levels of CWD are expected to increase from these tons per acre in forested areas over the short and long term as trees killed directly by the fire, or secondarily by insects, are recruited to the forest floor (Harmon 1992).

Burn plans would include soil and fuel moisture guidelines to minimize the risk of severely burned soils and facilitate retention of adequate levels of CWD. Low-intensity fire does not easily consume woody material much larger than 3 inches in diameter, and charring does not substantially interfere with the decomposition or function of coarse woody debris (Graham et al., 1994). Given the existing CWD across most treatment activity areas, larger size (15+ inches) CWD is expected to be well represented, meeting the Forest Plan direction of more than 65 – 75 percent of the CWD being 15 inches in diameter or larger, except in pre-commercial thin units 19 and 24, which are plantations. Research indicates that retention of CWD at these levels in these habitat types is sufficient to maintain long-term soil and forest productivity (Graham et al. 1994). Local monitoring results (Soil, Water and Fisheries Monitoring Results, Implementation of Coarse Woody Debris Guidelines for Soil Productivity, Council and Weiser Ranger Districts, Payette National Forest, 1997 to 1999, 2002, 2004) have documented compliance with CWD retention requirements. Therefore, the same level of success in project implementation is anticipated for similar management activities proposed in Cuprum.
The 17 acres of pre-commercial thinning areas would realize an increase in levels of CWD through the lopping and scattering of trees felled during thinning operations. No fire would be applied in these thinning areas allowing retention of all existing and felled CWD.

Levels of larger (15+ inch) CWD would likely be less than desired in these areas given these sites were previously clear cut harvested, machine piled, and mechanically site prepped, resulting in the piling and burning of the majority of the CWD left on the site.

Forest Plan direction for Course Wood Debris (CWD) would be met with the proposed action through project design, contract administration/monitoring, and burn plan design.

**Cumulative Effects**

Cumulative effects on the soil resource include all past, present, and reasonably foreseeable actions that cause soil disturbance within the same activity areas on National Forest System lands. Effects of past actions, natural disturbances, and their relationship with proposed actions are included and described in the Environmental Effects section and the specialist report.

Reasonably foreseeable future actions in the project area considered in this section include firewood cutting, livestock grazing, off highway vehicle (OHV) use, and wildland fire suppression. In addition, one reasonably foreseeable forest management action proposed for public lands within the subwatershed is the School Section salvage sale being proposed in the Huntley Gulch drainage. While the project is still in the developmental phases, it is assumed to be very similar in scope and scale to the 2005 Landore Salvage, concentrating on the removal of dead and dying trees from the existing road. The effects are estimated to be similar to those disclosed with the Landore Salvage project.

**Detrimental Soil Disturbance**

**Effects of not Implementing the Proposed Action**

There would be no increase in detrimental soil disturbance within activity areas resulting from harvest or fuels reduction activities. The extent of detrimentally disturbed soil would remain at the current levels, but continued recovery through natural processes would result in reduced levels of DD over the long-term. Disturbance associated with livestock grazing would likely be confined to existing disturbed high use areas (watering sites, bedding areas, fence lines etc.) and travel routes, which are outside of the activity areas. Unregulated OHV use and woodcutter “roads” may lead to additional areas of detrimental soil conditions or inhibit recovery of existing areas of disturbance across the project area.
The possibility of an uncharacteristic fire burning through the area would remain higher and the associated impact to detrimental soil disturbance through burned or displaced soil would remain.

**Proposed Action**

As discussed in the environmental effects section, harvest and fuels reduction operations would cause additional increases in detrimental soil disturbance in previously entered areas, and result in new areas of DD in previously un-entered treatment activity areas. Areas of soil disturbance occurring outside of proposed treatment activity areas would continue to recover naturally.

Past management activities have reduced fuel loadings in previously harvested areas. This alternative would also reduce hazardous fuels through thinning, and fuel reduction treatments. The increased amount of area with reduced fuel level and creation of more resilient stand conditions will incrementally reduce the risk for future high severity fires and associated potential for severe burning of the soils across the area.

Known, foreseeable future activities that may contribute to detrimental soil disturbance within treatment activity areas include livestock grazing and unregulated OHV use. Areas of past concentrated livestock use (bedding sites, watering areas) would continue to be disturbed. Trails created by unregulated OHV use and woodcutters may result in added areas of detrimental soil conditions within and outside of existing activity areas. Given the relatively steep topography of treatment activity areas additional impacts from ATV/OHV or livestock use are unlikely.

The proposed actions and some reasonably foreseeable actions would cause physical disturbances that cannot be avoided, but amounts estimated to qualify as detrimental soil disturbance within treatment activity areas are expected to be less than the 15% forest plan standard given adherence to BMP’s/SWCP’s and additional project requirements designed to reduce creation of additional and restore existing areas of detrimental disturbance.

**Total soil resource commitment (TSRC)**

**Effects of not Implementing the Proposed Action**

Past soil disturbances from natural events and management activities were described in the Environmental Effects section. Impacts associated with the Cuprum Project would not contribute cumulatively to TSRC levels. Conversely, no restoration of existing facilities (skid trails, landings, and roads) would occur, leaving existing TSRC areas that are proposed for restoration in an essentially non-productive and hydrologically impaired condition.
Firewood harvest, fire suppression, grazing and OHV use is not expected to contribute to additional TSRC across the project area.

Most firewood gathering and suppression, along with OHV use, occurs from existing roads; and areas of concentrated livestock use or travel are also often associated with existing areas of TSRC (roads, trails).

Implementation of the School Section Salvage project would likely result in temporary increases in TSRC as the result of skid trail and landing construction, but given it would include requirements to reclaim these as well as other existing areas of TSRC (skid trails, landings, unclassified roads used as temporary roads) short to long term levels of TSRC would likely be slightly reduced from the existing condition. Levels of TSRC across the project activity area would probably remain at or slightly below the current level of 3.4%, meeting the Forest Plan standard.

**Proposed Action**

Implementation of skid trail and landing restoration requirements combined with road decommissioning would reduce both newly created and existing areas of TSRC in the project activity area leading to an incremental reduction of 0.2% TSRC over the current condition. The implementation of this project would result in temporary to short term increases in TSRC followed by short to long term reductions, leaving the project area with a 3.2% TSRC; lower than the existing 3.4% TSRC, meeting the Forest Plan standard.

**Coarse Woody Debris (CWD)**

**Effects of not Implementing the Proposed Action**

Existing levels of CWD would remain continuing to meet the Forest Plan direction for CWD as input (snags and with wind throw) accumulate faster than output (firewood cutting and decomposition). CWD would increase in response to natural tree mortality, wind throw and associated breakage of limbs and tops. Loss of existing or potential future (snags) CWD associated with firewood cutting would continue along open roads and easily accessible areas. Areas with high fuel levels would remain and increase through natural mortality and fuel accumulation leading to an increased potential for high severity fires. In the event of a high severity fire, levels of CWD would be reduced temporarily through consumption and then increased over the short to long term with recruitment of fire-killed vegetation to the forest floor (Harmon 1992).

**Proposed Action**

Natural mortality, wind throw and breakage of tops and limbs during felling and yarding would result in temporary cumulative increases in CWD within treatment activity areas.
Application of fuels treatments would result in a reduction of CWD to four to seven tons per acre meeting the Forest Plan standard for CWD. Research indicates that for habitat types like those found in the treatment area, retention of 5 to 15 tons per acre of distributed coarse woody debris is adequate to maintain soil productivity, and for maintenance of healthy populations of mycorrhizal fungi and other beneficial soil organisms (Graham et al. 1991 and 1994).

Firewood cutting along open roads and easily accessible areas as well as decomposition would continue to reduce sources of future CWD. The decommissioning of existing roads that provide access to treatment activity areas will reduce their accessibility and the associated risk of reduction in CWD levels associated with firewood cutting. Continued fire suppression would allow retention and accumulation of CWD in treatment activity areas and across the project area. In the event of a wildfire, levels of CWD would be temporarily reduced and then increases over the short to long-term as fire killed trees are recruited to the forest floor, unless salvage logging occurs. No other actions are expected to cumulative effect CWD levels in treatment activity areas.

**Project Record**

This Environmental Analysis hereby incorporates by reference the Soil Resources Specialist Report in the Project Record (40 CFR 1502.21). The Soil Resources Specialist Report contains the detailed data, methodologies, analysis, references, and other technical documentation used in the assessment.
3.6 Wildlife Resource

Issue
Proposed management activities may affect the habitats of federally-listed Threatened, Endangered, and Candidate species; Payette National Forest (PNF) Management Indicator Species; Region 4 Sensitive Species; migratory birds; and PNF Species of Special Interest, in and adjacent to the Project Area.

Indicators
- Degree of modification of habitat for federally-listed Threatened, Endangered, and Candidate species; PNF Management Indicator Species; R4 Sensitive Species; migratory birds; PNF Species of Special Interest, found in the Project Area, Indian Creek Watershed, and in the designated Action Area.
- Big Game Habitat (elk) – hunting mortality vulnerability potential (open road densities and changes in cover), and security areas.

Introduction
The proposed activities will alter vegetation structure, composition, and density to achieve the Purpose and Need of this project and move the area toward desired conditions. Implementation of this project will be through a timber sale, post harvest burning and mechanical fuel reduction operations, and prescribed burning operations outside the harvested areas. Approximately 735 acres will be harvested producing about 8.4 million board feet. After harvest, approximately 450 acres will be underburned. On about 271 of the harvested acres fuels will be excavator piled or removed through the timber sale contract. Where the timber sale contract is used to remove fuels, the contract will require removal of the understory trees as well as the tops and limbs of harvested trees. These areas may not require any further fuel reduction treatments. In units with steep slopes, about 20 harvested acres will be hand piled or the slash will be lopped and scattered. In addition to the harvested areas, another 771 acres of grass, brush, and scattered timber will be underburned to reduce fuels. In areas adjacent to private land, another 23 acres will be hand piled or piled with an excavator. About 28 acres in riparian areas will be hand piled or underburned. In 2 stands identified for northern goshawk management, about 65 acres of understory trees will be thinned or the ground fuels will be hand piled.
Forest Plan Direction

The desired condition for wildlife resources on the PNF is supported by vegetation with the amount, distribution, and characteristics necessary to maintain viable populations of native and desired non-native wildlife species and habitats. For Forest Service Region 4 Sensitive Species (R4SS) and PNF Management Indicator Species (MIS), management actions maintain properly functioning habitats. Appropriate habitat conditions in the Project Area generally contribute to the survival, recovery, and de-listing of species under the Endangered Species Act, and should prevent a trend toward federal listing of R4SS. Project activities should not prevent wildlife species from maintaining desired population distribution and abundance during critical life stages. Project Area habitat conditions should support populations of wildlife species of ecological, socio-economic, tribal, cultural, and recreational significance (Forest Plan, III-25).

To ensure that the PNF is moving toward this desired condition, the 2003 PNF Land and Resource Management Plan (Forest Plan) (USDA Forest Service 2003) identified wildlife species that may be affected by project activities. These species are analyzed in detail and include Threatened, Endangered, and Candidate species; R4SS; MIS; PNF Species of Special Interest (SOSI); and selected migratory bird species and their habitats.

This report conforms to legal requirements of the Endangered Species Act of 1973 (ESA) (19 U.S.C. 1536 ©, 50 CFR 402.12 (f) and 402.14 ©, Section 7; the Migratory Bird Treaty Act of 1918 (MBTA) (16 U.S.C. 703-712); and Executive Order 13186 (EO), titled “Responsibilities of Federal Agencies to Protect Migratory Birds” (see Chapter 3, Section 3.9 – Disclosures). The report also conforms to the goals, objectives, standards, and guidelines (pertinent to the proposed action) established by the Forest Plan. Forest Plan direction for wildlife resources standards & guidelines applicable to this project include TEST01-05, 11-15; TEGU01, 02, 04, 06; WIST 01-06; WIGU01, 05-09, 11-14. These standards and guidelines are presented in detail in the Activity Table (Project Record).

Scope of the Analysis

Wildlife resources were analyzed at the Project Area and Action Area levels. Some discussion refers to an Activity Area, which is simply the area where proposed activities are planned to occur within the Project Area. The Activity Area encompasses all of the Timber Thinning and Prescribed Fire units, covering approximately 1,644 acres within the 9,026-acre Project Area, which includes 7,823 acres of Forest Service land, and 1,203 acres of private land. The Project Area is located within the 24,289-acre Lower Indian Creek sub-watershed.
Potential effects for elk were analyzed at the Snake River - Indian Creek 5th Field Hydrologic Unit level.

Federally-listed wildlife species, MIS, R4SS, SOSI, and migratory bird species and their habitats also were analyzed using a 69,938-acre Action Area (Figure 3.6-1), which was delineated for making effects determinations in a Biological Assessment/Biological Evaluation, following Counterpart Regulations consultation procedures, as agreed to with the U.S. Fish and Wildlife Service (FWS), under the National Fire Plan.

Information and data collected to complete these analyses were obtained from a variety of sources. Wildlife surveys were conducted throughout the project area (Council Ranger District files) from 2005 through early 2007. Scientific literature, agency reports, resource maps, aerial photos, orthographic photos, data from the Idaho Conservation Data Center (ICDC), species information from NatureServe (NatureServe 2006), and personal communications with specialists from other agencies were used to complete the analyses. Geographic Information System (GIS) modeling of the forest vegetation layer was used to identify potential wildlife habitats and to calculate acreages of wildlife species habitats.

This Environmental Assessment provides a summary of the analysis results for selected wildlife species analyzed in detail for this project (Table 3.6-1) (see the Wildlife Specialist Report for the detailed analyses). Pileated and white-headed woodpeckers are MIS (white-headed woodpecker also is a R4SS). The boreal owl, flammulated owl, great gray owl, northern goshawk, and mountain quail are R4SS; the Rocky Mountain elk is the only SOSI. Other PNF species were analyzed, but not selected for the detailed analysis, because the proposed project would have either no effect on the species, the species was not an issue, or the species was not likely to occur within the project or analysis areas, due to the absence of potential habitat. As identified in the Forest Plan, the rationales for not selecting the remaining species are addressed in Table 3.6-1. Additional wildlife analysis was conducted for selected migratory bird habitats. Approximate acreages of potential habitat for each wildlife species analyzed were associated to PNF Potential Vegetation Groups (PVG) (Table 3.6-2).
Figure 3.6-1: Action Area and Project Area identified for Cuprum Fuels Reduction Project. The Action Area encompasses 69,938 acres; the Project Area is approximately 9,026 acres.
Table 3.6-1: Classified wildlife species selected for analysis for the Cuprum Fuels Reduction Project.

<table>
<thead>
<tr>
<th>Category</th>
<th>Species</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Endangered Species</strong></td>
<td>None known in the Project Area</td>
</tr>
<tr>
<td><strong>Threatened Species</strong></td>
<td>Bald Eagle (<em>Haliaeetus leucocephalus</em>)</td>
</tr>
<tr>
<td></td>
<td>Canada Lynx (<em>Lynx Canadensis</em>)</td>
</tr>
<tr>
<td></td>
<td>Northern Idaho Ground Squirrel (<em>Spermophilus brunneus brunneus</em>)</td>
</tr>
<tr>
<td><strong>Proposed Species</strong></td>
<td>None known in the Project Area</td>
</tr>
<tr>
<td><strong>Candidate Species</strong></td>
<td>*Yellow-Billed Cuckoo (<em>Coccyzus americanus</em>)</td>
</tr>
<tr>
<td><strong>Experimental / Non-essential Species</strong></td>
<td>Gray Wolf (<em>Canis lupus</em>)</td>
</tr>
<tr>
<td><strong>Management Indicator Species</strong></td>
<td>Pileated woodpecker (<em>Drycopus pileatus</em>)</td>
</tr>
<tr>
<td></td>
<td>White-headed woodpecker (<em>Picoides albolarvatus</em>)</td>
</tr>
<tr>
<td><strong>Intermountain Regional Forester Sensitive Species</strong></td>
<td>*Fisher (<em>Martes pennanti</em>)</td>
</tr>
<tr>
<td></td>
<td>*Spotted bat (<em>Euderma maculatum</em>)</td>
</tr>
<tr>
<td></td>
<td>*Townsend’s big-eared bat (<em>Corynorhinus townsendii</em>)</td>
</tr>
<tr>
<td></td>
<td>*Wolverine (<em>Gulo gulo luscus</em>)</td>
</tr>
<tr>
<td></td>
<td>*American three-toed woodpecker (<em>Picoides tridactylus</em>)</td>
</tr>
<tr>
<td></td>
<td>*Boreal owl (<em>Aegolius funereus</em>)</td>
</tr>
<tr>
<td></td>
<td>*Columbian sharp-tailed grouse (<em>Tympanuchus phasianellus columbianus</em>)</td>
</tr>
<tr>
<td></td>
<td>Flammulated owl (<em>Otus flammeolus</em>)</td>
</tr>
<tr>
<td></td>
<td>Great gray owl (<em>Strix nebulosa</em>)</td>
</tr>
<tr>
<td></td>
<td>*Harlequin duck (<em>Histrionicus histrionicus</em>)</td>
</tr>
<tr>
<td></td>
<td>Mountain quail (<em>Oreortyx pictus</em>)</td>
</tr>
<tr>
<td></td>
<td>Northern goshawk (<em>Accipiter gentilis</em>)</td>
</tr>
<tr>
<td></td>
<td>*Peregrine falcon (<em>Falco peregrinus</em>)</td>
</tr>
<tr>
<td></td>
<td>Columbia spotted frog (<em>Rana luteventris</em>)</td>
</tr>
<tr>
<td><strong>Species of Special Interest</strong></td>
<td>Rocky Mountain elk (<em>Cervus elaphus</em>)</td>
</tr>
<tr>
<td><em>Not included in the Environmental Assessment. Analysis located in the Wildlife Specialist Report in the Project Record.</em></td>
<td></td>
</tr>
</tbody>
</table>
Table 3.6.2: Description of forested Potential Vegetation Groups (PVG) (USDA Forest Service 2003).

<table>
<thead>
<tr>
<th>PVG</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Dry ponderosa pine / xeric Douglas-fir</td>
</tr>
<tr>
<td>2</td>
<td>Warm, dry Douglas-fir / moist ponderosa pine</td>
</tr>
<tr>
<td>3</td>
<td>Cool, moist Douglas-fir</td>
</tr>
<tr>
<td>4</td>
<td>Cool, dry Douglas-fir</td>
</tr>
<tr>
<td>5</td>
<td>Dry grand fir</td>
</tr>
<tr>
<td>6</td>
<td>Cool, moist grand fir</td>
</tr>
<tr>
<td>7</td>
<td>Warm, dry subalpine fir</td>
</tr>
<tr>
<td>8</td>
<td>Warm, moist subalpine fir</td>
</tr>
<tr>
<td>9</td>
<td>Hydric subalpine fir</td>
</tr>
<tr>
<td>10</td>
<td>Persistent lodgepole pine</td>
</tr>
<tr>
<td>11</td>
<td>High-elevation subalpine fir</td>
</tr>
</tbody>
</table>

Environmental Effects

Alternative A – No Action/Effects of Failing to Implement

Threatened, Endangered, Proposed, and Candidate Species

There are no Endangered or Proposed wildlife species, or proposed wildlife critical habitat, in the Project or Action areas. See Table 3.6-2 for a summary of all of the species analyzed for this project.

Bald eagle

Bald eagles are associated with large trees near lakes, reservoirs, or large streams. Eagles also are known to feed on large mammal carrion away from the more typical riparian habitats. Nesting and foraging habitat occurs in both the Project and Action areas. Streams in the Project Area are extremely narrow and shallow, with dense vegetative cover along streambanks; therefore, most bald eagle habitat occurs in the Snake River canyon. It is very unlikely that bald eagles would use these small riparian areas for nesting or foraging. Bald eagles would opportunistically feed on big game carcasses in more open sites. Night roosting sites could be located in large conifers on hillsides above Indian Creek; however, no roosting sites have been identified in the drainage (Wildlife Specialist Report).

Bald eagle habitat currently available in the Project Area is at risk of alteration from uncharacteristic wildfire. Failing to implement this project would allow this risk of fire to remain high for the foreseeable future in the Project Area, thereby placing bald eagle habitat at greater risk.

Canada lynx

Lynx presence has not been confirmed on the PNF in recent years, although it is generally accepted that lynx do occur at a low density in the Action Area.
Based on available observation data (Council Ranger District files), there is a moderate probability of lynx presence in the Project and Action areas. Systematic lynx surveys have not been conducted in the Action Area. Lynx habitat is associated with PVGs 3 and 7-11; none of these occur in the Project Area. However, in the Action Area, warm, dry subalpine fir stands (PVG 7) do occur north of the Project Area (Figure 3.6-3). Lacking a GIS current vegetation layer for the PNF, lynx habitat here is best identified using PNF Forest Strata, which are based on silvicultural parameters of stand structure, tree species composition, and timber harvest suitability. Lynx seasonal habitats are usually associated with Strata 22-24, 26, 32, and 35 (Table 3.6-3). Considering these Strata, 442 acres of suitable Lynx habitat within the 54,583 acre Granite Lynx Analysis Unit occur within the Project Area (Wildlife Specialist Report).

Lynx habitat currently available in the Project Area is at risk of alteration from uncharacteristic wildfire. Failing to implement this project would allow this risk of wildfire to remain high for the foreseeable future in the Project Area, thereby placing lynx habitat at greater risk.

<table>
<thead>
<tr>
<th>Stratum</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>Clearcuts</td>
</tr>
<tr>
<td>21</td>
<td>Partial Cuts – low stocking</td>
</tr>
<tr>
<td>22*</td>
<td>Partial Cuts – moderate stocking</td>
</tr>
<tr>
<td>23*</td>
<td>Mature / Overmature – high stocking (old forest)</td>
</tr>
<tr>
<td>24*</td>
<td>Mature / Overmature – moderate stocking (old forest)</td>
</tr>
<tr>
<td>25</td>
<td>Mature / Overmature – low stocking (old forest)</td>
</tr>
<tr>
<td>26*</td>
<td>Partial Cuts – moderate stocking (old)</td>
</tr>
<tr>
<td>29</td>
<td>Burned areas</td>
</tr>
<tr>
<td>30</td>
<td>Sapling / Poles – natural regeneration</td>
</tr>
<tr>
<td>32</td>
<td>Sapling / Poles – artificial regeneration</td>
</tr>
<tr>
<td>33</td>
<td>Immature / Mature – low stocking</td>
</tr>
<tr>
<td>34*</td>
<td>Immature / Mature – moderate stocking</td>
</tr>
<tr>
<td>35*</td>
<td>Immature / Mature – high stocking</td>
</tr>
<tr>
<td>41</td>
<td>Unsuitable – low stocking</td>
</tr>
<tr>
<td>42</td>
<td>Unsuitable – moderate to high stocking</td>
</tr>
<tr>
<td>60</td>
<td>Nonforest lands</td>
</tr>
<tr>
<td>61</td>
<td>Nonforest lands (cultivated)</td>
</tr>
<tr>
<td>70</td>
<td>Hardwoods or High Brush</td>
</tr>
<tr>
<td>98</td>
<td>Water (noncensus)</td>
</tr>
<tr>
<td>99</td>
<td>Water (census)</td>
</tr>
</tbody>
</table>

* Strata associated with Canada lynx habitats in the current Payette National Forest GIS database.
Figure 3.6-2: Potential habitat for the bald eagle and gray wolf, based on Potential Vegetation Groups identified for the Payette National Forest.
Figure 3.6-3: Potential habitat for the Canada lynx, based on Potential Vegetation Groups identified for the Payette National Forest. Note the proximity of lynx habitat (PVGs 7, 9, and 10) in the northern third of the Project Area.
Northern Idaho ground squirrel

Northern Idaho ground squirrels (NIDGS) occur in natural meadows and open areas (grass, forb, scab, and scrub), adjacent to forested stands, dominated at low-to-mid-elevations with open-canopies and understories dominated by forb and grass communities. Suitable habitat originally included a ponderosa pine and/or Douglas-fir tree layer, and shrub-steppe open areas with shallow, dry, rocky meadows usually associated with deeper, well-drained soils and surrounded by forested stands. Most NIDGS sites occur on south-facing aspects with <30% slope. NIDGS originally appeared to be restricted to elevations between 3,800-6,000 feet, but recent locations have expanded the known occupied habitat to elevations of 7,500 feet, including subalpine fir and whitebark pine stands (Evans Mack 2007, Council Ranger District files).

The Project Area is within historic NIDGS range and includes approximately 2,055 acres of potential NIDGS habitat. Using a 2005 habitat model, approximately 47,780 acres of potential NIDGS habitat was identified within the Action Area, with 3,988 acres identified in the Project Area (R. Richards, District Wildlife Biologist, New Meadows Ranger District, 2007; GIS modeling of NIDGS habitat, based on NIDGS habitat model developed by USFS in 2005). Using Richards’ 2007 GIS application, NIDGS habitat is modeled at 25,679 acres in the Action Area and 2,055 acres in the Project Area.

Considering the elevational changes noted from NIDGS sites located in 2005 and 2006, it is possible that NIDGS are present within the Project Area. However, the dense overstory and lack of relatively-flat, south-facing, meadow complexes in the area decrease the probability of NIDGS presence. No NIDGS were located in the Project Area during surveys in 2006. The nearest known occupied NIDGS site is the Huckleberry colony in the Bear Creek drainage, approximately 2 miles east of the Project Area. Surveys have not been conducted along ridges at the headwaters of Indian Creek, north of the Project Area, nor on the ridge overlooking the Snake River, to the west; nor in the drier habitats to the south of the Project Area, farther down the Indian Creek drainage (Wildlife Specialist Report).

Failing to implement this project would allow the risk of uncharacteristic wildfire to remain high for the foreseeable future in the Project Area. However, such a fire in this area would improve habitat for NIDGS, by reducing tree density, opening the tree canopy, reducing shrub cover, and rejuvenating understory grasses and forbs.
Figure 3.6-4: Occupied and Potential habitat for the Northern Idaho ground squirrel, classified by Forest Strata (Table 3.6-3) identified for the Payette National Forest.
Figure 3.6-5. NIDGS potential habitat as represented by old (2005) and new (2007) models for the Cuprum Fuels Reduction Project.
Experimental / Non-essential Species

Gray wolf

Wolves use a wide variety of plant communities, ranging over large territories that provide denning and rendezvous sites, as well as large and small mammal prey species (Figure 3.6-2). Wolves have not yet been observed in the Project Area, or the adjacent private lands. However, C. Mack (Wolf Research Biologist, Nez Perce Tribe, personal communication, February 2007), stated that a portion of the Oxbow Pack home range includes this watershed. There are no known denning sites, rendezvous sites, or other evidence of wolf breeding, within the Snake River-Indian Creek Watershed. Observations from elsewhere in the Indian Creek area have ranged from single to multiple wolves, but animals from that pack have not been radio-marked recently (Council Ranger District files).

Within the Action Area, Mack also identified the Lick Creek Pack, which was first documented at the headwaters of Bear Creek, one drainage to the east of the Project Area. This pack includes several radio-marked wolves (captured in spring 2006) and has been monitored by Nez Perce Tribe biologists for nearly a year. Most of the Lick Creek Pack activity has been farther east (10-20 miles), in the Lost Valley area; however, as the pack matures, wolf use of Indian Creek is likely.

Although big game species are the most common wolf prey, they will opportunistically take livestock and pets. Because of this, the FWS; USDA Animal and Plant Health Inspection Service, Wildlife Services; and IDFG have an aggressive wolf management program in place. Wolf management in Idaho, south of Interstate 90, includes lethal removal of individual animals and, occasionally, entire packs, to attempt to decrease livestock and pet losses (Ed Bangs, Northern Rockies Wolf Recovery Coordinator, FWS, personal communication, November 2006). According to IDFG public announcements, the FWS will soon shift management responsibilities for the gray wolf to the State of Idaho (S. Nadeau, Wolf Manager, IDFG, personal communication, November, 2006). The IDFG wolf management program will include a drastic reduction in the Idaho wolf population, including the west-central Idaho area. The wolf population may be reduced from the current high of 60(+) packs to 10-20 packs state-wide.

If left untreated, the Project Area would remain at high risk for an uncharacteristic wildfire. Although such a fire would reduce cover for wolves, it would remove much of the overstory and create openings in the forest that would improve habitat for elk and deer (Odocoileus spp.), providing better opportunities for wolf predation of big game.
Management Indicator Species

Pileated woodpecker

Pileated woodpeckers are known to occur within the Project Area (Table 3.6-4). Forest Service personnel identified pileated woodpeckers and recent evidence of feeding during wildlife surveys within the Project Area from 2005 to 2007. The PNF is gathering distribution, abundance, and trend data for this species, by conducting Forest-wide point count transects.

These woodpeckers use mature forest with moderate to high tree densities and canopy closures and a well-developed understory, with snags and down logs for nesting and foraging (Wisdom et al. 2000). This habitat is generally found in PVGs 1-9, and 11 (Figure 3.6-6). Approximately 13,153 acres of pileated woodpecker habitat occur in the Action Area, including 2,710 acres in the Project Area.

Without implementation of the fire fuels reduction project, the risk is high of uncharacteristic wildfire, which could severely alter the habitat in the Project Area, thereby reducing habitat for pileated woodpeckers. If a mosaic of plant communities were created by a less catastrophic fire, downed tree and snag habitat for pileated woodpecker foraging and nesting would be improved.

Table 3.6-4: Region 4 Sensitive Species Probability Checklist for the Cuprum Fuels Reduction Project Area.

<table>
<thead>
<tr>
<th>Name</th>
<th>Probability of Occurrence</th>
<th>Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>NA</td>
<td>Low</td>
</tr>
<tr>
<td>Wolverine</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Fisher</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Townsend’s big-eared bat</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Spotted bat</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Northern goshawk</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>White-headed woodpecker</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Northern three-toed woodpecker</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Flammulated owl</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Boreal owl</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Great gray owl</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Harlequin duck</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Mountain quail</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Columbian sharp-tailed grouse</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Columbia spotted frog</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Peregrine Falcon</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>
Figure 3.6-6: Potential habitat for the pileated woodpecker and boreal owl, based on Potential Vegetation Groups identified for the Payette National Forest.
White-headed woodpecker

The ICDC (2006) database and PNF show that white-headed woodpeckers have been observed in the area since 1991. The last recorded observation was in 1996. The PNF gathering distribution, abundance, and trend data for this species, by conducting Forest-wide point count transects.

White-headed woodpeckers use mid-to-low-elevation forests with large, low-density ponderosa pine, including snags, (Wisdom et al. 2000). The population may have decreased because of historical selective harvesting of large diameter ponderosa pine, snag removal, and fire suppression. White-headed woodpeckers typically use PVGs 1, 2, 3, 5, and 6 (Figure 3.6-7). Approximately 25,223 acres of white-headed woodpecker habitat occur in the Action Area, including 4,520 acres in the Project Area.

Failure to implement the proposed project would allow the forest density to increase, limiting the amount of potential habitat for white-headed woodpeckers. An uncharacteristic wildfire would actually improve white-headed woodpecker habitat by opening the forest canopy and supporting a replacement stand of large-diameter ponderosa pines and an open understory of grasses.

Region 4 Sensitive Species

Boreal owl

Habitat for boreal owls does occur in the Project Area. This small owl uses dense stands associated with dense, multi-layered, spruce and fir forests at higher elevations. Boreal owls nest in cavities in conifers and aspen and day-roost close to the tree trunk, in dense cover, generally associated with nearby openings in the forest canopy. Modeling PVGs 8-11, there are 156 acres of boreal owl habitat in the Action Area, with no acreage of habitat in the Project Area (Figure 3.6-6). However, modeling Forest Strata 23, 24, 26, 35, and 42 as boreal owl habitat, a large portion of the Action Area is identified for boreal owls and only 1 of the 32 units in the Project Area does not fit these strata. This discrepancy may illustrate that use of potential habitats to identify current condition may be difficult to apply for all species analyzed. Hayward (1989) suggested that boreal owls use forested habitat components similar to those required by pileated woodpeckers. Council Ranger District files indicate that boreal owls have been observed in the Action Area, although many of these sightings are not well-documented. Historic records from the Ranger District indicate that surveys for boreal owls were once conducted in the general area, but these records do not show dates or results of the surveys.
Figure 3.6-7: Potential habitat for the white-headed woodpecker and flammulated owl, based on Potential Vegetation Groups identified for the Payette National Forest.
There is a high risk of uncharacteristic wildfire in the Project Area. Assuming that boreal owl habitat exists within the area, such a fire could severely alter dense stands of trees and the shrub understory, reducing habitat for boreal owls.

**Flammulated owl**

Flammulated owls are present on the PNF during the breeding season (May to mid October) and migrate off the Forest to winter. Flammulated owls are secondary cavity nesters and are dependent on cavity excavators, such as pileated woodpeckers. Although it is common for flammulated owls to use pileated woodpecker nest cavities, their habitat requirements more closely match those of white-headed woodpeckers (Figure 3.6-7). Nearly all documented nest sites on the PNF have occurred in mature and old stands of ponderosa pine and Douglas-fir with canopy closures between 35 to 60 percent.

In 2005, IDFG conducted nocturnal playback surveys for flammulated owls, using 38 transects on the PNF. Previous surveys had been conducted in 1991. IDFG detected 60 owls along these surveys routes and, incidentally, during scouting or at campgrounds. Most owls were detected in ponderosa pine, Douglas-fir, or mixed pine/Douglas-fir forest types in areas with a large tree component. IDFG detected 22 of the 60 owls in old forest stands. During these surveys, six flammulated owls were detected in the Project Area (Idaho Department of Fish and Game 2006).

Failure to implement the proposed project could lead to uncharacteristic wildfires that could severely alter old forest stands in the Project Area. Loss of the large tree component of these stands would be detrimental for flammulated owl reproduction.

**Great gray owl**

The great gray owl is a year-round resident on the PNF. Great gray owls use mixed coniferous and hardwood forest, usually bordering small openings or meadows. They forage along edges of clearings. In the Intermountain Region, great grays occur primarily in the lodgepole pine/Douglas-fir/aspen zone and in ponderosa pine (Spahr et al. 1991). Intensive timber harvest, snag removal, and removing trees with broken tops in forested areas with meadows are important concerns for this species. The Action Area has 20,703 acres of great gray owl habitat, including 4,520 acres in the Project Area (Figure 3.6-8). Great grays were not identified during project wildlife surveys and no systematic surveys were conducted for the species within the Project Area. IDFG conducts systematic great gray owl surveys on the PNF, but not in this portion of the Forest.
The effects of not implementing the proposed action are minimal for the great gray owl. Forested stands would continue to increase in density, leading to a greater risk of uncharacteristic wildfires.

Although the initial loss of habitat from these fires would be detrimental, the burn pattern could likely produce more of a mosaic of plant communities that would benefit great gray owls.

**Northern three-toed woodpecker**

Three-toed woodpeckers may exist in the Project Area. These birds use lodgepole pine, western larch, and Englemann spruce forests, with high densities of snags, at higher elevations. Council Ranger District records from the past decade indicate observations in the general area near the Project Area. Modeling with PVGs indicates 4,708 acres of potential habitat in the Action Area, but only one acre in the Project Area. This one acre of potential habitat does not occur within the 1,644-acre Activity Area. Because there is no northern three-toed woodpecker habitat in the Activity Area and only one acre in the Project Area, this species will not be considered for further analysis.

**Northern goshawk**

The goshawk is a high priority landbird that hunts in mature forests with a high percentage of canopy cover and a relatively open understory and uses low-elevation, mixed-conifer stands as primary breeding habitat (Idaho Partners in Flight 2000). Breeding goshawks typically use a home range of about 6,000 acres, but goshawk home ranges in the Interior Columbia River Basin may be closer to 7,000 acres (Wisdom, 2000). The Action Area includes 12,176 acres of potential goshawk habitat, with 2,901 acres in the Project Area (Figure 3.6-9). One active nest and one alternate nest were identified during surveys of the Project Area in 2005-2007. One active nest stand, two alternate nest stands, and three replacement nest stands were designated within a Post Fledging Area of 658 acres, including parts of 12 units within the Project Area.

Failure to implement the proposed project would allow the forested stands to increase in density, improving suitable nesting habitat, but reducing foraging habitat. However, an uncharacteristic wildfire, especially one occurring in nesting habitat, would be detrimental to goshawks. However, the mosaic of plant communities created by a fire of less severity would increase habitat quality for goshawks by providing nest sites, as well as foraging areas.
Figure 3.6-8: Potential habitat for the great gray owl, based on Potential Vegetation Groups identified for the Payette National Forest.
Figure 3.6-9: Potential habitat for the northern goshawk, based on Potential Vegetation Groups identified for the Payette National Forest.
Mountain quail

In Idaho, mountain quail have a range restricted mostly to areas of west-central Idaho, with remnant population strongholds near the town of Riggins (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 mostly plant material, whereas invertebrates are very important food items for chicks. Seed heads and bulbs are important foods 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). Interspecific competition with California quail and chukars, introduced around 1950, also may be a limiting factor.

Populations in west-central and southwestern Idaho have declined steadily (Spahr et al. 1991), even with a hunting ban in place. Illegal hunting could still be a limiting factor, but habitat availability and degradation may be the likely reasons for the loss of mountain quail. Mountain quail habitat exists in small patches in both the Action Area and Project Area. The 2006 ICDC database includes observations of mountain quail within the Indian Creek watershed in 2000 and 2002. No observations have been recorded more recently and no systematic surveys have been conducted for mountain quail on the West Zone of the PNF.

Failure to implement the proposed project could lead to uncharacteristic wildfires that could severely alter the already patchy distribution of habitat for mountain quail. Such fire could severely limit use of the Project Area by mountain quail.

Columbia spotted frog

Potential spotted frog habitat exists in the Project Area. Based on buffering of 120 feet around intermittent streams, 240 feet around perennial streams, and 150 feet around springs and lakes, there is suitable habitat for spotted frogs along Indian Creek and some of the side streams in the drainage may provide good summer habitat (Figure 3.6-10). None of the riparian zones in the Project Area or Action Area has been surveyed for spotted frogs (M. Henon, PNF West Zone Wildlife Technician, personal communication, 2006; B. Gamble, PNF West Zone Hydrologist, personal communication, 2006). Spotted frogs were not observed during annual fisheries MIS snorkel surveys of the major streams in the watershed (C. Zurstadt, PNF West Zone Fisheries Biologist, personal communication, 2007).
An uncharacteristic wildfire in the Project Area could severely alter spotted frog habitat, by removing most of the vegetation buffering streams and springs and altering riparian habitat characteristics.

Migratory Bird Species Habitats

Idaho Partners In Flight (2000) identified four high-priority habitats in Idaho, including riparian; low-elevation, mixed-conifer; grassland; and ponderosa pine. Three of these habitats occur within the Project Area (riparian; low-elevation, mixed-conifer; and ponderosa pine). For the riparian habitats, 2 of 13 priority species that may occur include the dusky and willow flycatchers.

The willow flycatcher will serve to represent riparian habitat. The white-headed woodpecker and flammulated owl (also R4SS) are two high-priority species in the ponderosa pine habitat and both were chosen to represent this habitat class. Four of nine high-priority species, representing the low-elevation, mixed-conifer habitat, include the northern goshawk (also a R4SS), sharp-shinned hawk, brown creeper, and the Williamson’s sapsucker. The goshawk was chosen to represent this group (see northern goshawk discussion under R4SS, this Chapter).

Table 3.6-5 presents the migratory bird species habitats that occur in the Project Area.

Table 3.6-5: Migratory Landbird Habitat Groups and Associated Species

<table>
<thead>
<tr>
<th>IDBCP Priority</th>
<th>Species Using Habitat</th>
<th>Species Using as Primary Breeding Habitat</th>
<th>High Priority Species Using as Primary Habitat</th>
<th>Representative High Priority Species</th>
<th>Issues</th>
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<tr>
<td>Riparian Habitat</td>
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<tr>
<td>High</td>
<td>114</td>
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<td>13</td>
<td>Willow flycatcher</td>
<td>Habitat loss</td>
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<td>Ponderosa Pine Habitat</td>
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<td></td>
<td>White-headed woodpecker, flammulated owl</td>
<td>Habitat loss</td>
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<td>High</td>
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<td>5</td>
<td>2</td>
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<td></td>
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<td>Low Elevation Mixed Conifer Habitat</td>
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<td></td>
<td></td>
<td>Northern goshawk</td>
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<td>34</td>
<td>9</td>
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Figure 3.6-10: Potential habitat for the Columbia spotted frog, based on Potential Vegetation Groups identified for the Payette National Forest.