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Environmental Assessment

Charlie Preston

St. Joe Ranger District, Idaho Panhandle National Forests
Benewah County and Latah County, Idaho

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Introduction

This Document - The Environmental Assessment

The Forest Service has prepared this Environmental Assessment (EA) in compliance with the National Environmental Policy Act (NEPA) and other relevant federal and state laws and regulations. This Environmental Assessment discloses the direct, indirect, and cumulative environmental impacts that would result from the proposed action and alternatives.

Information presented here, along with comments from the public, will be used to determine whether an environmental impact statement will be prepared. The Responsible Official (Forest Supervisor of the Idaho Panhandle National Forests) will determine whether the project would have significant environmental effects and whether an environmental impact statement is required after consideration of all the comments. If an environmental impact statement is not required the Forest Supervisor would select an alternative to be implemented, and that decision would be documented in a decision notice.

This EA is based on resource reports and other documents in the project file. The resource reports are available online at www.fs.usda.gov/goto/ipnf/projects. Sort by project name then click on "Charlie Preston". Other project file documents are available upon request. Please contact the St. Joe Ranger District at (208)245-2531 for a project file index or specific documents.

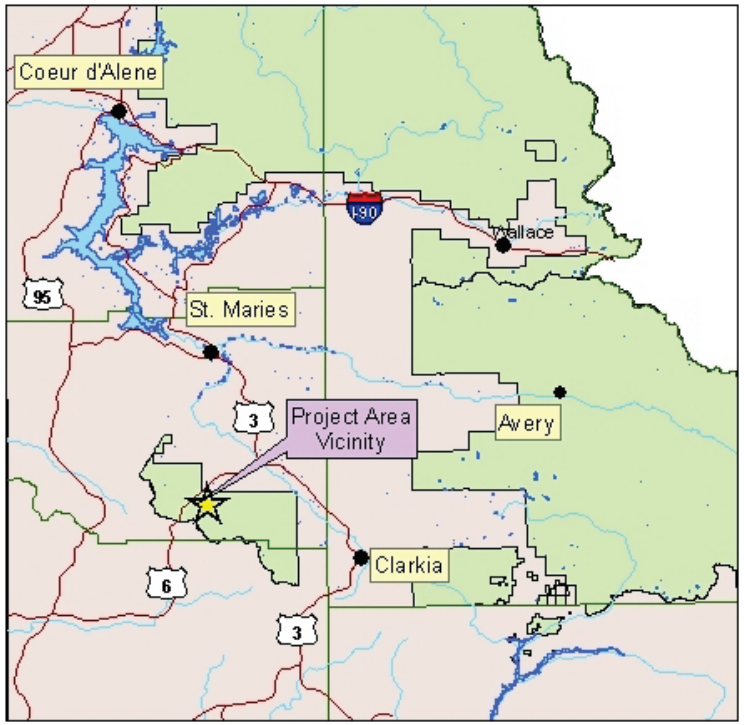
Location

The Charlie Preston Project is located in northern Idaho approximately 18 miles southeast of St. Maries. Actions are proposed on National Forest System lands in Sections 4, 9-10, 14-17, 20-23, 26-28, 34-35; T. 43 N., R. 2 W., Boise Meridian (see Figure 1). The project area is directly south of Emida, Idaho; and part of the project area is within the Wildland Urban Interface designated by Benewah County and Latah County (see Figure 2). The entire project area falls within the Santa Creek drainage, which flows into the St. Maries River.

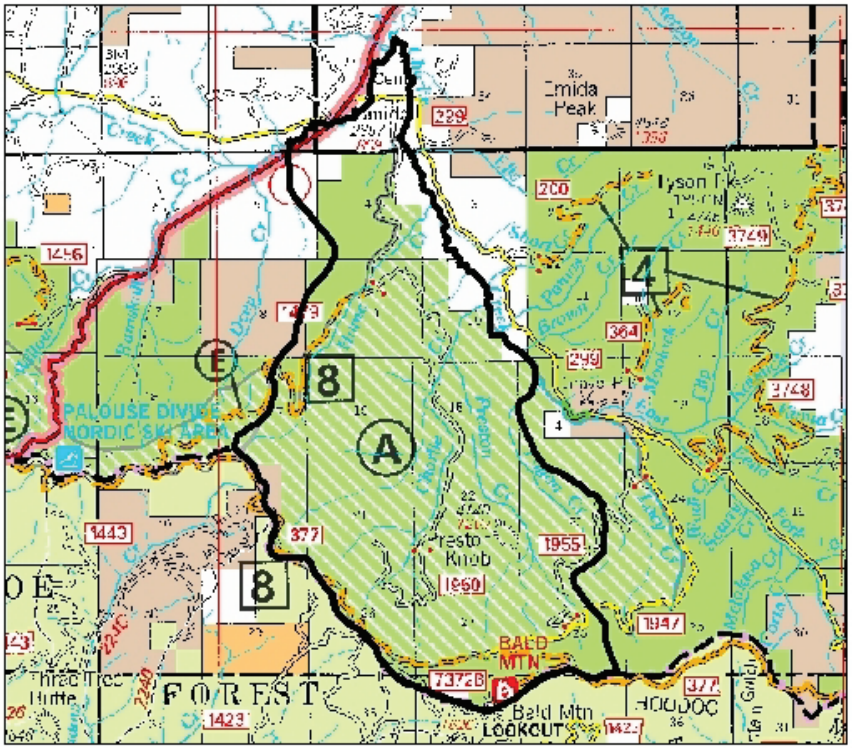
Proposed Action Development

The Charlie Preston Project Area has approximately 6,560 acres of National Forest System land and approximately 824 acres of privately owned land. Although private land is included in the project area, we are not proposing any activity on private land. It was only included in the project area because of the way we map compartment boundaries used to keep track of National Forest System lands.

The project area was initially identified as a place conducive for increasing forest resiliency by promoting long-lived, early-seral tree species (western larch, western white pine, and ponderosa pine) (PD-2, PD-9). The team considered stands with long-lived, early-seral species where commercial thinning could potentially improve stand growth and vigor. Treatment priorities were determined by the proportion of long-lived, early seral species without considering logging systems, transportation, the proximity to other treatment stands, or other resource concerns. Areas that do not have many long-lived, early-seral tree species were considered for treatment if growth rates were declining and the areas could be converted to long-lived, early-seral species with regeneration harvests. Most of these potential regeneration harvest areas lie within the



Charlie Preston Vicinity and Project Area Maps



The following products are reproduced from geospatial information prepared by the U.S. Department of agriculture, Forest Service. GIS data and product accuracy may vary. They may be: developed from sources of differing accuracy, accurate only at certain scales, based on modeling or interpretation, incomplete while being create or revised, etc. Using GIS products for purposes other than those for which they are created may yield inaccurate or misleading results. This information was released on 05/08/2007. The Forest Service Reserves the right to correct, update, modify or replace GIS products without notification. For more information, contact the St. Joe Ranger District at (208) 245-2531.

Figure 1 – Charlie Preston Vicinity Map

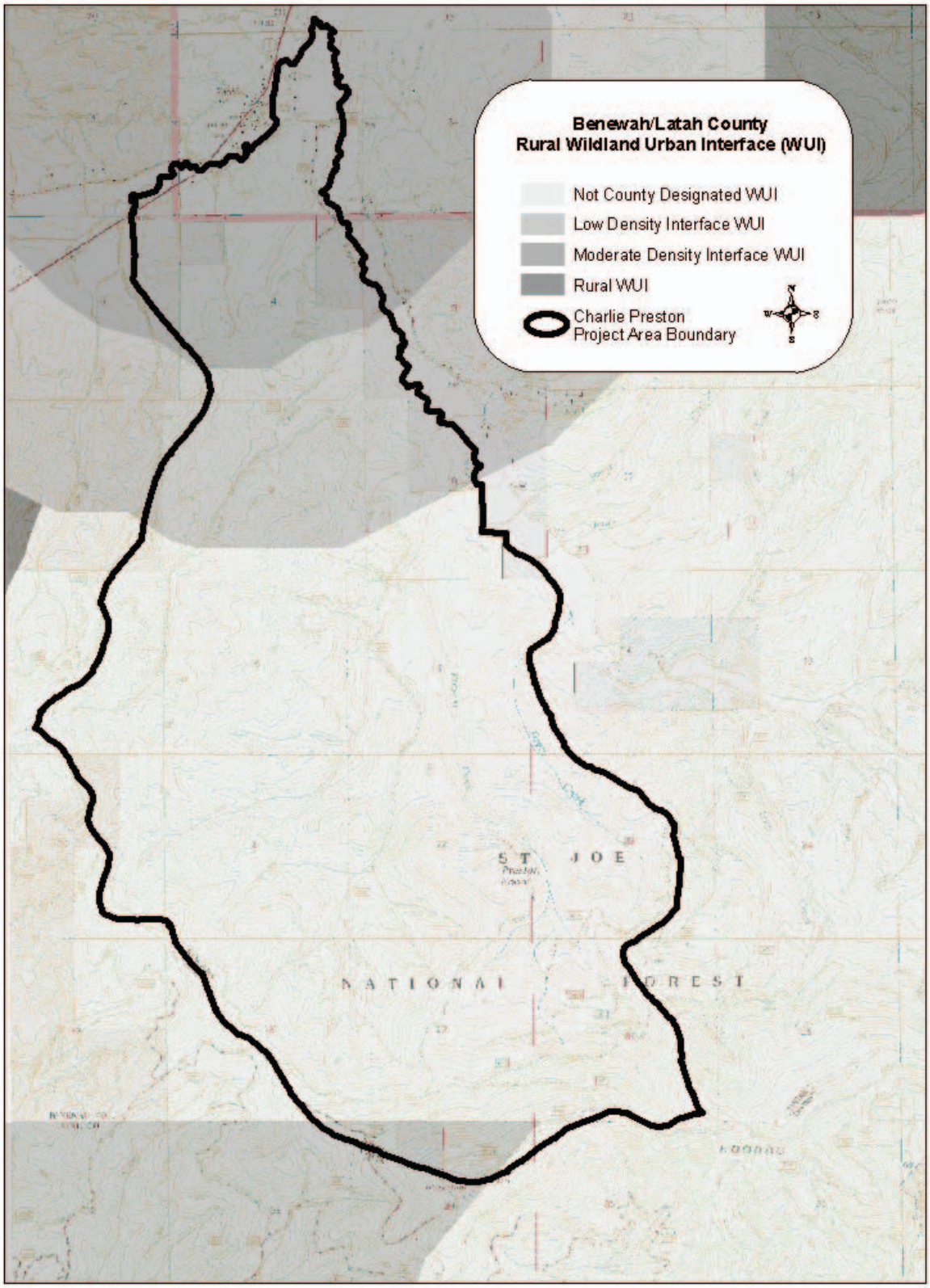


Figure 2 – Wildland Urban Interface for Benewah County and Latah County

mapped wildland-urban interface around Emida, Idaho (Figure 2). Overstory removals from previously harvested areas with established regeneration were included to complete the original silvicultural prescriptions and provide commercially viable wood products.

Stands that meet minimum criteria for old growth were not proposed for treatment. Charlie Preston falls within Old Growth Management Unit (OGMU) 6. An old growth validation process was completed for this project (Old Growth Report). New stand exams were accomplished in 2006, 2007, 2008, and 2010. The data from these new stand exams was used in the old growth validation.

As the interdisciplinary team began to consider the environmental effects of the proposed timber harvest and related activities, the following areas were removed from consideration for treatment: riparian areas, at least 40 acres around known goshawk nest locations, potential alternate goshawk nesting stands, areas that are obviously not feasible to log with conventional logging systems (not helicopter), and known rare plant locations. Additional field review revealed stands that would not benefit from silvicultural treatment at this time, so those were removed from the proposed action. These changes left small slivers of land that would not be feasible to manage, so these were also removed from the proposed action.

In order to log the remaining treatment areas with conventional logging systems approximately 11 miles of road would need to be constructed. The responsible official decided 11 miles would be too much road construction even if all standards and thresholds could be met, so the proposed action was narrowed down to timber harvest on areas that could be reached with about half the new road construction.

Part of the original 11 miles of proposed new road would have replaced the lower part of the Hume Creek Road 1479. We would have a road higher on the slope for timber harvest, and it would reduce sediment sources from the road adjacent to Hume Creek; but it would eliminate the existing road along the creek that is used by many people. Because of the public's long-time, established use of the existing Hume Creek Road the responsible official decided to keep the lower Hume Creek Road open and not replace it with a new road higher on the slope. That proposed new road construction was not included in the proposed action. Other roads that would have accessed lower priority stands were also removed from the proposed action. We eliminated about half of the original proposed road construction and the associated timber harvest from the proposed action.

The team considered the existing conditions for all resources and compared those with the desired conditions for those resources to identify needs for change (see *Purpose and Need for Action* below). These needs for change helped the team identify activities that would move the area closer to desired conditions. The activities were added to the proposed action. They include creating snags by girdling live trees and increasing potential cavity nesting habitat by inoculating live trees with fungus spores; slashing and burning off-site ponderosa pine to prepare sites to plant early-seral, long-lived tree species; reducing fuels along open roads; removing biomass; storing and decommissioning roads; replacing fish migration barriers; planting conifer seedlings in riparian areas; and placing large woody debris in streams.

The team conducted a travel analysis for the project area to determine the minimum road system (PD-21) and which roads would be stored or decommissioned to reduce risks to wildlife, water, and fisheries, and reduce road maintenance costs.

The project was adjusted when it was determined soil conditions could not be improved enough to meet soil quality standards for some of the units that currently do not meet standards for maintaining soil productivity. Those units were eliminated from the proposed action.

In response to public comment the proposed action also includes leaving gates open after timber harvest to allow public firewood gathering, leaving areas in conditions conducive for dispersed camping along open roads, and leaving more trees at the edge of Unit 105 along the private property boundary.

When the proposed activities were refined, the team continued environmental analysis to identify design features or mitigation needed to ensure the project would be consistent with the forest plan and other laws. Those are included as part of the proposed action.

Purpose and Need for Action

The Forest Plan designates approximately 75 percent of the project area as Management Area (MA) 1 and approximately 25 percent as MA 4. The goal for MA 1 is to provide for long-term growth and production of commercially valuable wood products, and the goal for MA 4 is to provide winter forage to support big game populations through scheduled timber harvest and permanent forage areas. See Figure 3.

The interdisciplinary team reviewed the existing conditions of resources in the project area and compared them with desired conditions to identify potential management needs based on Forest Plan direction. The following purpose and need is the results of that process.

Forest Vegetation: We need forests that are more resilient to natural disturbances such as insects, disease, drought, and fire.

Native western white pine, western larch, and ponderosa pine are better adapted to withstand disturbances than other native tree species because they require less water and fewer nutrients. They can live for hundreds of years and can grow very large when they have enough sunlight, water, and nutrients. When trees have enough space to grow, they are healthier because they are not competing with other trees and they have a better chance of surviving insect attacks, disease, fires, and drought conditions.

Some off-site ponderosa pine trees (seedlings from trees outside the seed zone recommended for this area) were planted in the Charlie Preston area as early as the 1940s and 1950s. Those trees have genetic make-up that was adapted to different environmental conditions than those in the Charlie Preston area. The trees have grown, but they are not thriving as well as native ponderosa; and they are showing signs of stress, which include poor form, high susceptibility to insect and disease, thinning crowns, and low cone and seed production.

Large trees are important for the environment whether they are standing, live, dead, or on the ground. They add organic matter to the soil; give birds and animals places to eat, nest, and den; provide shade to keep stream temperatures cool, and help create deep pools for fish.

Currently the Charlie Preston Area has fewer large trees, more small trees, and less white pine, larch, and ponderosa pine than it used to have because of large fires in the 1920s and 1930s (see Figure 4 and Figure 5), previous logging practices, white pine blister rust, and fire suppression.

White pine, larch, and ponderosa pine were the most valuable trees to use for lumber and building. The tree disease, white pine blister rust, killed most of the white pine. The big dead and dying white pine trees were harvested so the wood could be used while it retained its value. Early timber harvest activities took the largest trees, so

smaller trees were left and are now merchantable size.

Before aggressive fire suppression efforts, forest fires used to burn more often than they do today. Sometimes fires would burn slowly through the forest, knocking back the brush and small trees. The trees with low fire-resistance (small trees, fir, and spruce) would be killed, but the thick bark on the big larch and ponderosa pine would protect them so they could survive the fires. Other times the fires would get very large and hot and kill most of the trees, creating favorable growing conditions for trees that require bare ground to germinate and a lot of sun to grow (white pine, larch, and ponderosa pine).

In the early 1900s, we started suppressing fires as quickly as we could. Now the forests are not naturally thinned by fires and are getting crowded, but we still suppress most fires in the area to protect property, homes, timber values, and other values at risk. The trees that need bare ground and a lot of sunlight do not have good growing conditions. Fire suppression is one reason the forest composition has shifted to species that are not as resilient to insects, disease, fire, and drought.

Water & Fisheries: We need to improve fish habitat and water quality. The trout that live in these streams need cool water to survive, and shade helps keep streams cool. Streams with less sediment would have better habitat conditions because pools would not fill up with excessive sediment, the space between rocks would not fill with fine sediment, and eggs would not be covered and smothered by sediment. Streams with more in-stream structure diversity would provide fish with more living space and varied habitats to choose from depending on what is needed at different life stages.

Both Charlie Creek and Santa Creek are listed in the Idaho Department of Environmental Quality's 2008 Integrated Report as "Waters impaired by non-pollutants – habitat alteration". Total maximum daily loads (TMDLs) are not developed for these types of pollutants.

Santa Creek, including the smaller streams that flow into it, is on the State of Idaho's list of streams that have water quality concerns (303d list of water quality limited segments) because sediment levels and stream temperatures are too high. Santa Creek currently does not meet the TMDLs assigned by the Idaho Department of Environmental Quality (DEQ) for sediment levels and water temperatures. Shady streams have cooler water temperatures, and shade is 17% below what is desired in this area. Sediment is estimated to be 120% above background levels, and Idaho DEQ requires the Forest Service to reduce sediment.

Currently, some culverts in the project area do not allow fish passage when the water level is low, so the fish have limited areas to live. When fish can access more streams they have more opportunities for spawning and rearing and there are more fish and they are healthier.

Wildlife: We need to have a greater proportion of large live and dead trees than we currently have in the project area because many animal species prefer to use larger trees for feeding, nesting, and denning. Large snags are somewhat scarce in the project area due to past wildfires and past timber harvest. Most of the existing snags are not the higher-quality snag species that last the longest and work the best for cavities: ponderosa, western larch, western redcedar, or Douglas-fir. See *Forest Vegetation* discussion above.

Wildland Fire/Fuels: We need to promote forest conditions that minimize potential fire behavior in order to better manage hazardous fire risk on National Forest System lands, reduce the potential impacts of wildfire to private lands within and adjacent to the project area, and aid fire suppression efforts. Tree species composition and stand structure have changed due to past management activities, fire exclusion, and insect and disease factors. These changes have resulted in high amounts of surface and ladder fuels.

We also need to reduce potential fire behavior along travel corridors. Safe travel routes are important for the public and fire management.

Areas with lower fuel accumulation and fewer ladder fuels would have less intense fires that would be easier to control and would result in less damage to values-at-risk. Values-at-risk from wildland fire include adjacent private land and industrial timber land; numerous homes, businesses, and other structures; local infrastructure such as water system facilities, bridges, power lines, Bald Mountain Lookout and communication site, and signs; recreation access; natural resources on National Forest lands; and the timber and recreation economy of Emida and surrounding communities.

The community of Emida, Idaho is designated as a "Wildland Urban Interface community within the vicinity of Federal lands that are at high risk from wildfires". Current vegetative conditions prompted Benewah County (ID) to identify an intermix WUI (wildland-urban interface) buffer surrounding Emida (Schlosser, 2004). The southern-most tip of the project area around Bald Mountain Lookout rental cabin and communication site falls within Latah County and is classified by Latah County as rural WUI lands (Schlosser and others, 2004). Approximately 31% of the National Forest System lands within the project area are designated by the counties as WUIs.

Dispersed Sites for Camping: The public asked for additional dispersed sites for camping in the project area. Currently there are few wide spots along open roads that can be used for camping. There is a need to develop additional dispersed sites along open roads in the project area.

Social & Economic: The northern Idaho counties exhibit the highest unemployment and dependency on timber supply in Region One of the Forest Service. Timber harvest would provide employment opportunities for local communities while achieving other project objectives.

We need to enhance community stability and resiliency. We need to contribute to local employment, income, and lifestyles (Forest Plan II-11) by providing commercially viable wood products (Forest Plan III-2, III-16) now and for the long-term. When our Forest Plan was developed, people living and working near the national forest were told the Forest Service would provide a steady flow of timber, and most of the Charlie Preston Area is on lands designated for timber production (MA 1 and MA 4).

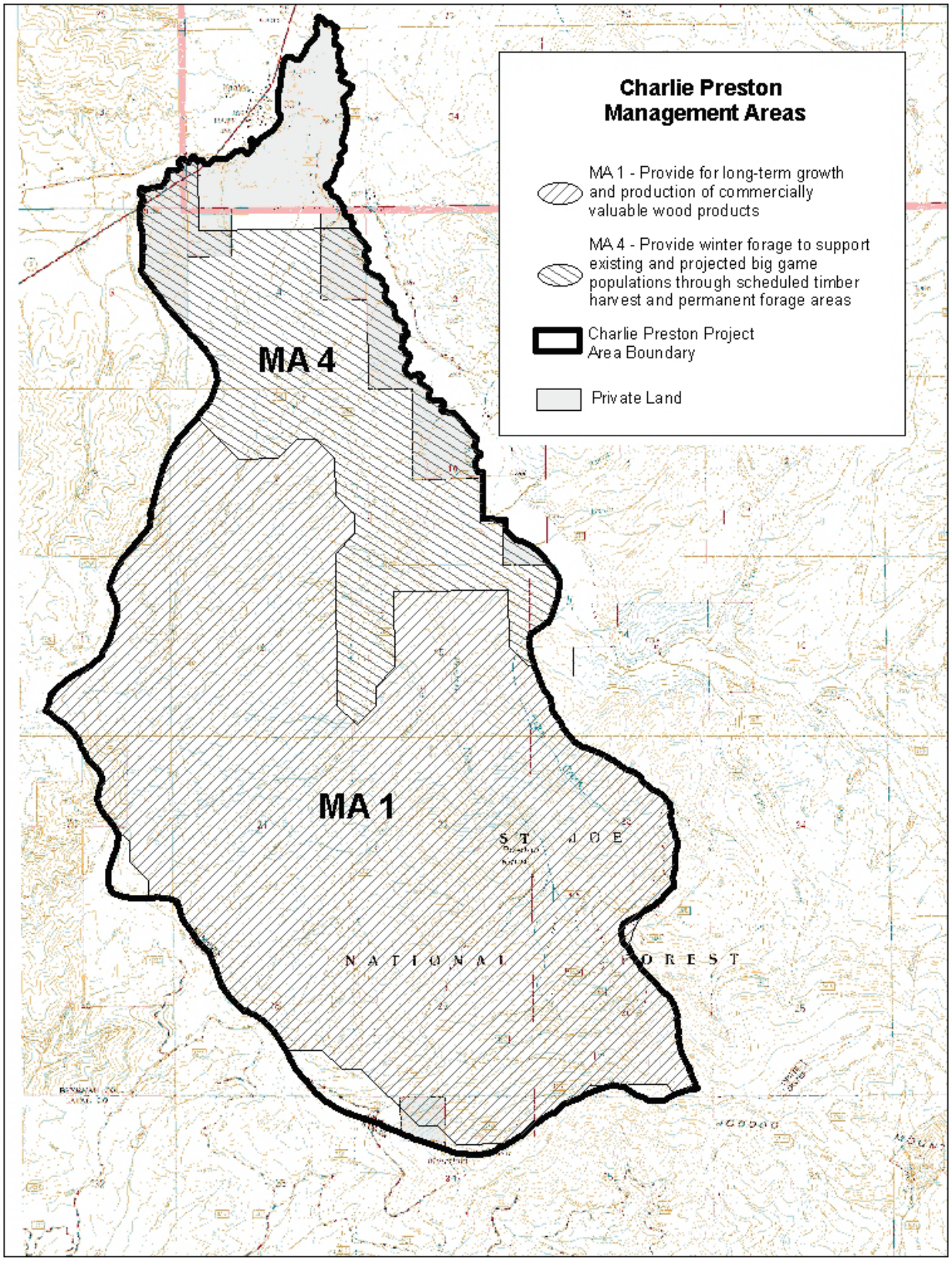


Figure 3 – Management Areas

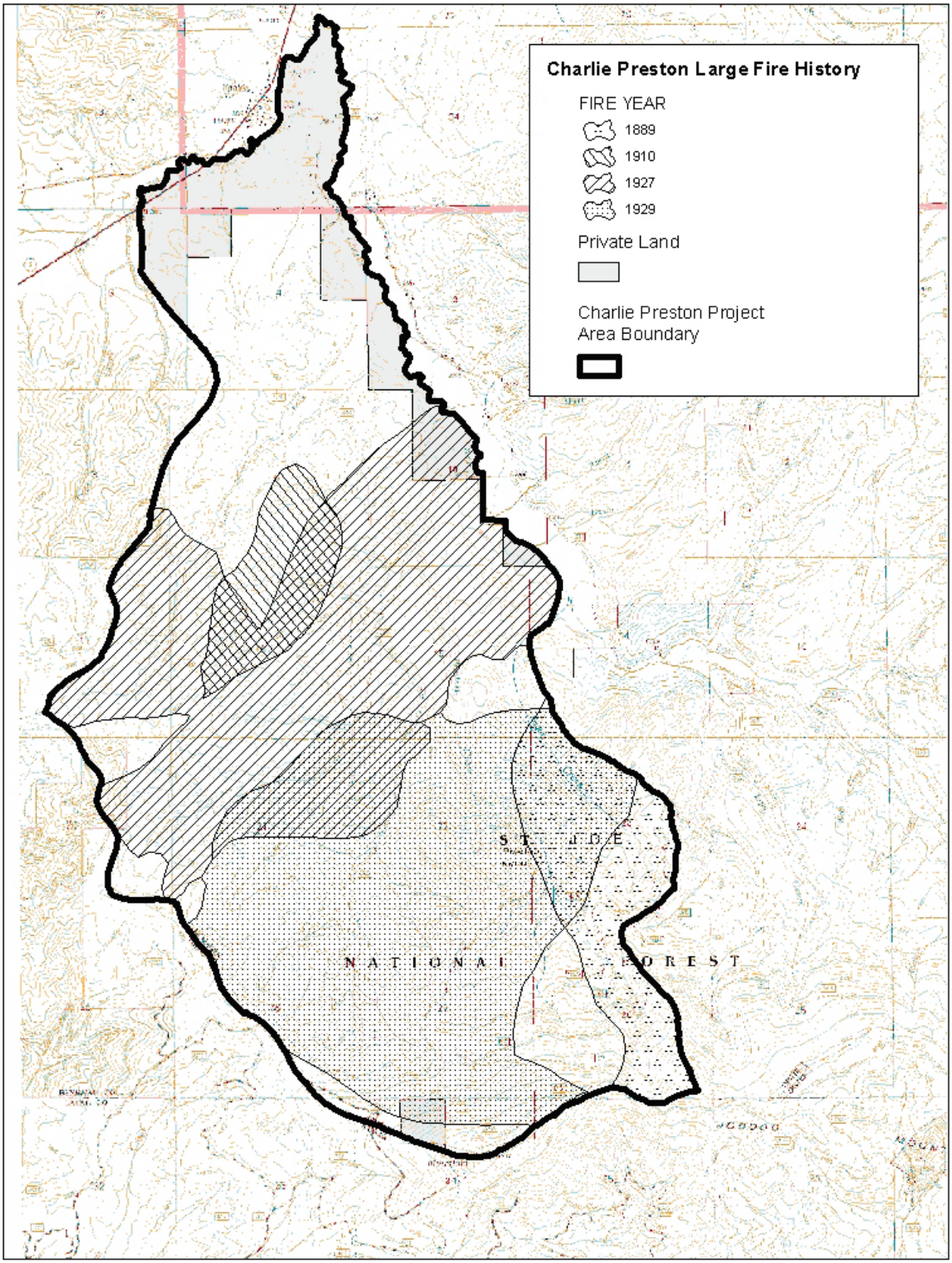


Figure 4 – History of large fires in the Charlie Preston Project Area

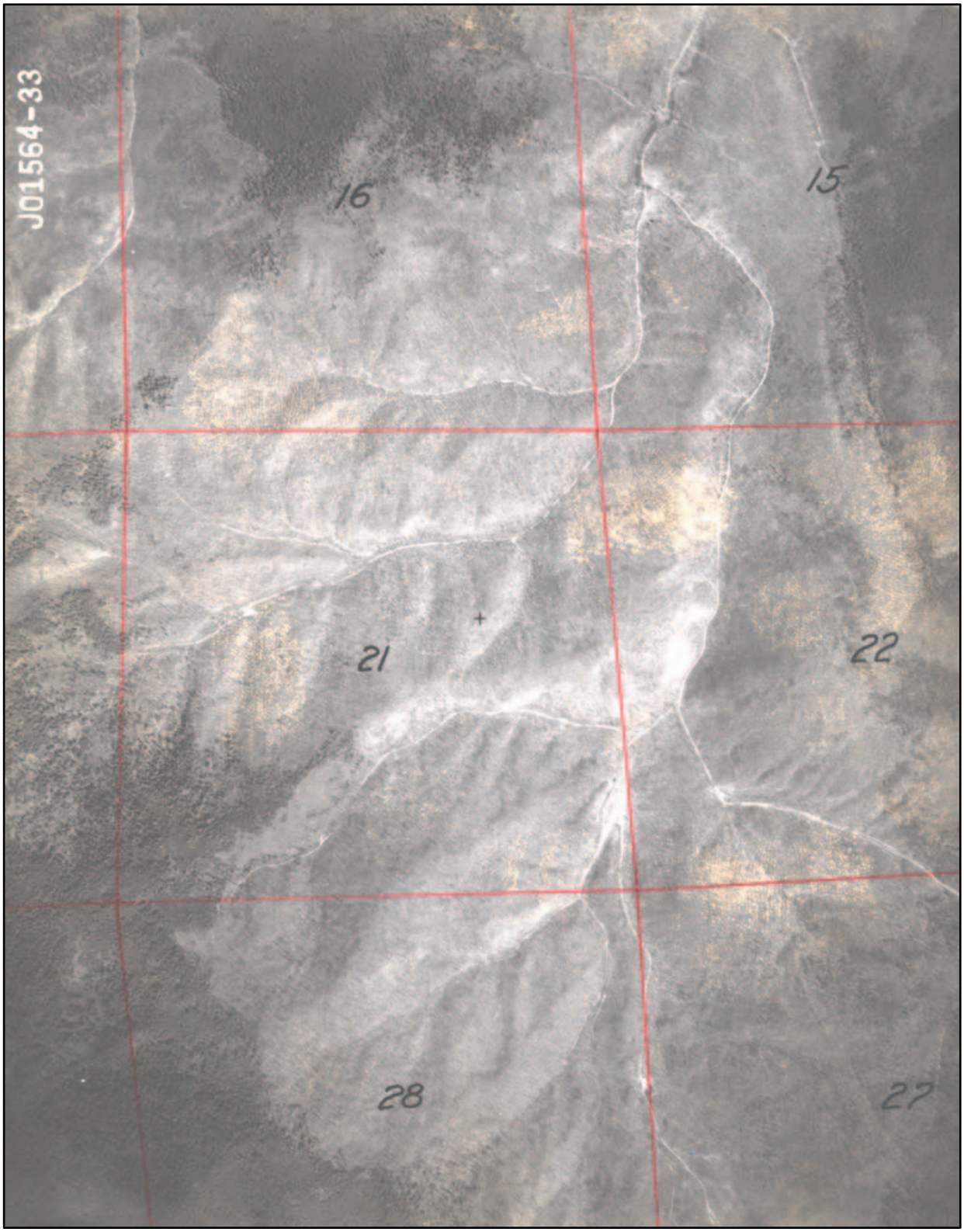


Figure 5 – 1933 aerial photograph showing Charlie Creek with Hume Creek in the upper left

Brief Description of the Proposed Action

The St. Joe Ranger District proposes to harvest timber, treat activity fuels, plant trees, control pocket gophers to protect regeneration, create snags, use prescribed fire with no timber harvest to reduce off-site ponderosa pine and prepare sites to plant trees, reduce fuels along open roads, reduce fuels near Bald Mountain Lookout, remove biomass, open gates for public firewood gathering, construct and reconstruct roads to facilitate timber harvest, put roads into long-term storage, decommission roads and remove them from the National Forest Road system, replace or remove culverts that are fish migration barriers, plant trees in riparian areas, place large woody debris in streams, and leave areas in conditions suitable for dispersed camping.

Details of the proposed action are described beginning on page 15.

Public Involvement

Acting District Ranger Kimberly Johnson met with the Coeur d'Alene Tribe to discuss projects on the St. Joe Ranger District, including the Charlie Preston Project, on June 4, 2010 (project file PI-1). The representatives of the tribe expressed no concerns about the project.

On September 2, 2010, Acting District Ranger Cornelia Hudson sent a letter, scoping notice, maps of the proposed action, and a comment form to the public concerning the Charlie Preston Project (project file PI-5). The scoping notice described the purpose and need for action, the proposed action, the environmental analysis process for this project, and how people could provide comments on the project.

This information was sent to about 290 individuals, organizations, and agencies (See page 242 and PI-18). Two mailing lists were combined for this project. One mailing list includes people who have told us they would like to receive information about projects on the St. Joe Ranger District. The other mailing list was developed by obtaining addresses from the Benewah County Assessor's office for people who own land within about four miles of the town of Emida (PI-2, PI-3).

The scoping information was also posted on the IPNF website on September 3, 2010 (PI-19). Charlie Preston was first listed on the IPNF's Quarterly Schedule of Proposed Actions (PI-59) in October 2010.

In response to comments from the public, the St. Joe Ranger District hosted a public field trip in the project area followed by a public meeting. We sent flyers announcing the field trip and meeting to the original mailing list (PI-65, PI-66). Flyers about the meeting were posted on October 14 and 19 in Emida, Idaho; Santa, Idaho; Fernwood, Idaho; St. Maries, Idaho; and at Forest Service offices in Clarkia, Potlatch and St. Maries, Idaho (PI-70, PI-71). We sent a news release about the public meeting to area media contacts on October 22, 2010 (PI-72). The public meeting was announced in the *UpRiver News* section of the St. Maries *Gazette Record* on October 27, 2010 (PI-74). Twenty-five people attended the field trip and/or the public meeting (PI-77).

From these scoping efforts, we received written or telephone questions and comments from 44 people, organizations, and agencies. Comments were addressed first by having the public meeting (PI-78), then by adjusting the proposed action to include public firewood gathering, to provide more areas for dispersed camping, leaving more trees along the edges of Unit 105 adjacent to the private property boundary, and to provide more explanation in documents. Alternative C was developed to address public concerns about the amount of timber harvest, the types of timber harvest, and the amount of road construction (see page 21).

Issues

Road Construction: Road construction may negatively affect resources in the project area. It can increase the amount of sediment delivered to streams, increase water yields, reduce shade for streams at stream crossings, affect aquatic organisms and their habitat, spread weeds, eliminate habitat for plants, damage cultural resources, affect old growth, change cattle movements, take land out of production, and affect wildlife habitat.

Amount of Timber Harvest: Timber harvest can increase the amount of sediment delivered to streams, increase water yields, damage cultural resources, affect cattle movements and amount of forage available for grazing, spread weeds, reduce soil productivity, increase fuel loads, affect the visual quality of the forest, and affect wildlife habitat.

Regeneration Timber Harvest: Regeneration harvest (clearcut, seedtree, and shelterwood) removes most of the trees in an area to establish new regeneration. Openings in the tree canopy can increase water yield, create conditions conducive for noxious weeds, reduce habitat for some plants, affect the visual quality of the forest, and affect wildlife habitat.

Alternatives

This section describes the alternatives considered for the Charlie Preston Project. Three alternatives are studied in detail: No action (Alternative A), the proposed action (Alternative B), and an alternative that only includes commercial thinning for timber harvest that would require less road construction (Alternative C). Other alternatives were considered but were not considered in detail for various reasons. The alternatives that were eliminated from detailed study are discussed first, followed by the alternatives considered in detail.

Alternatives Considered but Eliminated from Detailed Study

The following alternatives were considered but were eliminated from detailed study for the reasons given.

More timber harvest and road construction: An alternative that would harvest timber on approximately 4,260 acres was considered but was eliminated from detailed study because it would have had unacceptable impacts on goshawk habitat, rare plants, riparian areas, and old growth; and it would have required approximately 11 miles of new road construction. We know from public comments on this project and public comments on previous projects that amount of road construction would be socially unacceptable at this time.

Decommission the upper part of Hume Creek Road 1479: As part of the alternative discussed above with more timber harvest and more road construction a new road higher on the slope in the Hume Creek drainage would have replaced part of the existing Hume Creek Road 1479. Approximately two and a half miles of Road 1479 would have been decommissioned and would not be available for public use. Many people use and enjoy this road next to Hume Creek, so decommissioning the Hume Creek Road was no longer considered when the amount of new road construction was reduced for the proposed action.

No road construction: An alternative with no road construction was also considered (PD-27). It was eliminated from detailed study because the management area designations for timber production indicate that access to these areas may be required. Part of the purpose and need is to provide commercially viable wood products. Leaving the inaccessible area without roads would mean the timber stands could not be treated with commercial timber harvest because that would

require expensive helicopter logging systems that are not feasible with the current timber market conditions. Road construction to access lands designated for timber production allows the Forest Service to address multiple parts of the purpose and need. It is important to treat the areas proposed for timber harvest at this time because the stands are overstocked and tree growth is beginning to decrease. Late seral species are increasing in dominance, making the area more prone to disturbance such as insects, disease, and fire. Treatment at this time would allow us to release western larch and western white pine trees and increase their representation, making the area more resilient to disturbances. No road construction is considered as part of the no-action alternative.

Allowing natural fires to burn: An alternative that would allow natural fires to burn in the area to thin or replace stands was not considered in detail because of the potential risk of damage to Emida, nearby residences, infrastructure in the area (signs, power poles, fences, Bald Mountain Lookout, etc.), adjacent private timber land, and actively managed stands on National Forest System lands. In addition, the use of fire as the primary management tool would not meet the purpose and need for vegetation management or for contributing to the economy and timber supply. No one can predict when a natural fire would occur in the project area. It could happen before prescriptions and protection measures could be put in place or it could be decades from now, long after we would want to treat the stands. Allowing natural fires to burn is appropriate under the right conditions other places on the St. Joe District, but this is not the place because of the previously mentioned reasons. The forest plan allows prescribed fire from unplanned ignitions in Management Area 1 and Management Area 4, but it also says that confine, contain, and control are appropriate wildfire responses (Forest Plan p. F-3).

Prescribed burning with no timber harvest: The proposed action includes prescribed burning without timber harvest in Unit 18. Another alternative to use prescribed burning with no commercial timber harvest or burning outside of proposed timber harvest units was not considered in detail because the use of fire as the primary management tool would not address the need for vegetation management or for contributing to the economy and timber supply. Approximately 75 percent of the project area is Management Area (MA) 1 and approximately 25 percent is MA 4. The goal for MA 1 is to provide for long-term growth and production of commercially valuable wood products, and the goal for MA 4 is to provide winter forage to support big game populations through scheduled timber harvest and permanent forage areas. Prescribed burning without timber harvest would not meet the goals for MA 1 and could only partially meet the goals for MA 4. However, prescribed burning without timber harvest would not address the need to reduce fuels because it would kill trees without removing the fuels from the site. With prescribed burning only, we would not be increasing the amount or representation of western larch and western white pine because an adequate seed source for those species does not exist in the proposed regeneration harvest units.

No road decommissioning: An alternative with no road decommissioning was not considered in detail. When we determine a road is no longer needed for management purposes we want to restore site productivity, eliminate the potential of road failures, and reestablish natural water infiltration and drainage patterns. Our road maintenance funds are limited, so we only want to keep roads on the National Forest Road System if we know we will need them in the future. The 1.5 miles of roads identified for decommissioning include 0.2 miles of Road 377JA that would be relocated with the proposed action. The other 1.3 miles of road are not needed and present risks to the environment. Decommissioning these roads is important because it would help reduce sediment sources. We are required to reduce sediment in Santa Creek and the smaller streams that flow into it because they are on the State of Idaho's list of streams that have water quality concerns (303d list of water quality limited segments) due to high sediment levels. Our options

for continuing to reduce sediment sources in the area are limited, and in order to manage the vegetation resources in the area we have to show a reduction in sediment.

Maximizing restoration of wildlife habitat, aquatic habitat, soils, natural processes, and areas adversely affected by unauthorized or excessive motorized recreation use: Improving natural conditions is an important component of this project, but it is not the only reason for it. Part of the purpose of the project is to improve conditions so that we have forests that are more resilient, better fish habitat, improved water quality, and larger trees; but the purpose is also to improve conditions for people using the National Forest. It would reduce fuels in the area, make access routes safer; provide additional spots for camping; provide employment opportunities; and provide commercially viable wood products now and in the future. People live and work in and around the project area and the National Forests are important because of the access and employment they provide and for the natural environment people experience when they visit the forest.

Motorized recreation use is addressed with the St. Joe Travel Management EA; and a decision for that project is expected in the near future. It is not the purpose for this project. Motorized access is addressed with the Charlie Preston action alternatives where the proposed actions may affect existing or expected motorized use. For example, the management of gates during project activities and the prevention of motorized access where roads would be stored or decommissioned are incorporated as part of the action alternatives.

No burning of standing trees: An alternative not including Unit 18 where off-site ponderosa pine would be killed with prescribed fire was eliminated from detailed study because there is a need to remove the ponderosa pine. The seedlings were not from appropriate seed sources for this site (ACT-8). Prescribed fire is a good tool in this location because the timber value of the standing trees is very low and we decommissioned the road that provided access to this area, so we don't have road access to the site. Prescribed fire would also rejuvenate the shrubfield portions of the unit which would improve forage conditions for big game.

Improve elk habitat potential by increasing security areas: An alternative that would increase elk habitat potential by increasing security areas was not considered in detail because it would require closing roads that have been open for public motorized use for decades or roads that would be designated for ATV use in the upcoming St. Joe Travel Management decision (ACT-19). The St. Joe Ranger District meets its overall elk habitat potential targets for the district, and is therefore consistent with the Forest Plan, even though Elk Habitat Unit 6 is below its target level (see *Cumulative Effects for Elk*). Storing some the the gated roads would result in an increase in the elk habitat potential, but these roads are not currently available for public use.

Leave all roads open: An alternative that would leave all roads open to the public was eliminated from detailed study for two main reasons: wildlife security and sediment production.

This area falls within Elk Habitat Unit 6 which is currently below its target for elk habitat potential, although district-wide the St. Joe Ranger District meets forest plan goals for elk habitat potential. An alternative that would leave all roads open for motorized travel would reduce security areas and elk habitat potential. This would move Elk Habitat Unit 6 further from forest plan elk habitat potential goals. The most important factor in use of habitat by elk is disturbance by people. Most disturbance (and hunting mortality) is related to roads (Leege 1984). The elk habitat potential is largely determined by the open road density and amount of secure habitat available in the elk habitat unit. In order to qualify as secure habitat for elk habitat potential, there must be at least 250 contiguous acres that are more than ½ mile from open roads (Leege

1984). Limiting public motorized access on National Forest System roads allows the Forest Service to meet forest plan goals for wildlife security and elk habitat potential.

Opening all roads for motorized traffic would increase sediment levels. We are required to reduce sediment in Santa Creek and the smaller streams that flow into it because they are on the State of Idaho's list of streams that have water quality concerns (303d list of water quality limited segments) due to high sediment levels. Gates and barriers reduce the amount of motorized traffic on roads. Less traffic may mean less rutting and channeling of water and sediment to streams. Storing and decommissioning roads leaves them in a hydrologically neutral state and increases infiltration, so less sediment is produced.

Store Fewer Roads: An alternative that did not include storing Road 1950 was considered but was eliminated from detailed study because it did not eliminate enough sediment sources to result in a direct reduction in sediment from the project.

Correct a Water Diversion: We considered correcting an existing water diversion in Hume Creek, but eliminated that from detailed study at this time. The diversion was created decades ago and was related to the railroad. We will consider this for a future project but did not include it with this project because it would require extensive work with adjacent landowners involving water flows and water rights. Changing water flows that have been in place for decades would reduce water flows to some landowners and increase it to others. Adjacent landowners have told the Forest Service that they have already applied for water rights (PI-52). Removing the diversion and changing water flows would be a very involved process that does not fit with the purpose and need for this project.

Alternatives Considered in Detail

Alternative A - No Action

Under the No Action alternative, current management plans would continue to guide management of the project area. Ongoing management activities like road maintenance and fire management would continue. No timber harvest, fuels treatment, snag creation, prescribed burning, biomass removal, additional firewood removal, road construction, road reconstruction, road storage, road decommissioning, fish migration barrier replacement or removal, riparian planting, placement of large woody debris, or improvements for dispersed camping would be implemented. Some people said they would like the Forest Service to leave the forest alone, so this alternative is considered in detail to show effects of no action.

Alternative B - The Proposed Action

The proposed action was designed to meet the purpose and need, address environmental concerns in the project area, and address public concerns and questions. An initial proposal to treat approximately 4,260 acres was screened and adjusted to address goshawk habitat requirements, protect rare plants, protect old growth, reduce the amount of road construction, remove areas with logging systems difficulties, remove small mapping slivers, protect riparian areas, and address soil quality standards by foregoing treatment in some areas and by beginning restoration of soil conditions to aid in recovery in Unit 136A. Based on public comment the proposed action would leave some gates open under specific conditions to allow public firewood gathering and develop areas for dispersed camping.

Alternative B includes the following activities. Descriptions of activities common to both action alternatives are given beginning on page 26.

- Harvest approximately 21 million board feet (42,730 hundred cubic feet (CCF))of timber on 1,546 acres. See details below and Map 1 in Appendix A.
- Treat activity fuels after timber harvest in all units using the methods described beginning on page 35.
- Plant conifer trees on approximately 181 acres after fuel treatments in regeneration harvest units. See Map 2 in Appendix A.
- Control pocket gophers, as needed, to protect regeneration in the proposed regeneration harvest units.
- Prescribe burn 82 acres with no timber harvest to reduce off-site ponderosa pine and prepare sites to plant early-seral, long-lived tree species. See Map 1 in Appendix A.
- Reduce fuels along approximately 7.5 miles (up to 120 acres) of road using methods described beginning on page 37. See details below and Map 1 in Appendix A.
- Reduce fuels in a 30-acre area near Bald Mountain Lookout by lopping, hand piling, and burning piles. See Map 1 in Appendix A.
- Remove and sell biomass, where economically feasible, as a by-product of the other proposed vegetation treatments.
- Open gates on Road 1950 (up to the second gate), Road 1954, and the existing portion of Road 1950C from Memorial Day weekend through Labor Day weekend for public firewood gathering for up to three years after the last timber sale contract closes on each road.
- Create snags by girdling live trees and increasing potential cavity nesting habitat by inoculating live trees with fungus spores on approximately 20-30 trees per year for three to five years on approximately 150 acres.
- Construct 4.5 miles of system road and 0.5 miles of temporary road to facilitate timber harvest. See Map 1 in Appendix A.
- Reconstruct 2.3 miles of roads to facilitate timber harvest. See Map 1 in Appendix A.
- Put 4.4 miles of existing road into long-term storage to leave them in a hydrologically neutral state.
- Decommission 0.6 miles of existing roads and remove them from the National Forest Road system.
- Remove or replace six fish migration barrier culverts. Culverts that are replaced would allow fish passage. Migration barrier culverts on roads to be stored would be removed. See Map 2 in Appendix A.
- Plant conifer seedlings in riparian areas and place large woody debris in streams along approximately five miles of streams in Hume Creek, Charlie Creek, and Preston Creek.
- Where feasible, leave the following areas in conditions conducive for dispersed camping:
    - The beginning of newly constructed or reconstructed roads (system or temporary) off open, existing roads when the road is stored or decommissioned.
    - Log landing areas on open roads.

Alternative B Timber Harvest (Map 1)

Timber harvest and associated activities would occur in the following units. Fuel treatment and site preparation method abbreviations are:

BB = broadcast burn
GP = grapple pile & remove/burn piles
L = leave tops
LS = lop and scatter
RTL = remove tops and limbs at landings
S = slash vegetation less than 6in. at d.b.h.
UB = under/jackpot burn

Table 1 – Alternative B Timber Harvest Silvicultural Prescriptions, Logging Systems, and Fuel Treatment & Site Preparation

Unit	Acres	Silvicultural Prescription	Logging System	Fuel Treatment/ Site Preparation
1	25	Commercial Thin	Ground-based	RTL,S,GP,UB
2A	15	Commercial Thin	Ground-based	RTL,S,GP,UB
3	11	Shelterwood (Regeneration Harvest)	Skyline	L,S,GP,BB
4	39	Commercial Thin	Skyline	RTL,S,UB
5	84	Commercial Thin	Skyline	RTL,S,GP,UB
6A	16	Shelterwood (Regeneration Harvest)	Ground-based	L,S,GP,UB
6B	4	Shelterwood (Regeneration Harvest)	Skyline	L,S,BB
7A	1	Commercial Thin	Ground-based	RTL
7B	2	Commercial Thin	Skyline	RTL
8	102	Commercial Thin	Ground-based	L, LS, S, GP, UB
9	10	Overstory Removal	Skyline	RTL
10	8	Seed Tree (Regeneration Harvest)	Skyline	L,S,GP,BB
11A	6	Overstory Removal	Ground-based	RTL,GP
11B	6	Overstory Removal	Skyline	RTL
12	19	Commercial Thin	Skyline	RTL,S,GP,UB
13A	12	Seed Tree (Regeneration Harvest)	Ground-based	L,S,GP,UB
13B	40	Seed Tree (Regeneration Harvest)	Skyline	L,S,GP,UB
14A	14	Clearcut w/ Reserves (Regeneration Harvest)	Ground-based	L,S,GP,UB
14B	8	Clearcut w/ Reserves (Regeneration Harvest)	Skyline	L,S,GP,UB
15	15	Clearcut w/ Reserves (Regeneration Harvest)	Ground-based	L,S,GP,UB
16A	11	Commercial Thin	Ground-based	RTL,S,GP,UB
16B	75	Commercial Thin	Skyline	RTL,S,GP,UB
17	16	Commercial Thin	Ground-based	RTL,S,GP,UB
19	8	Commercial Thin	Ground-based	RTL,S,GP,UB
23A	20	Commercial Thin	Ground-based	RTL,S,GP,UB
23B	103	Commercial Thin	Skyline	RTL,S,GP,UB
25A	21	Commercial Thin	Ground-based	RTL,S,GP,UB
25B	22	Commercial Thin	Skyline	RTL,S,GP,UB
26	13	Commercial Thin	Skyline	RTL,S,GP,UB
27A	12	Commercial Thin	Ground-based	RTL,S,GP,UB
27B	62	Commercial Thin	Skyline	RTL,S,GP,UB
28	11	Commercial Thin	Ground-based	RTL,S,UB
29A	10	Commercial Thin	Ground-based	RTL,S,GP,UB
29B	10	Commercial Thin	Skyline	RTL,S,GP,UB
30	10	Commercial Thin	Skyline	RTL,S,GP,UB
31	9	Commercial Thin	Track Line Machine	RTL,S,GP,UB
32	3	Commercial Thin	Skyline	RTL,S,UB
33A	17	Commercial Thin	Ground-based	RTL,S,GP,UB
33B	26	Commercial Thin	Skyline	RTL,S,UB

Unit	Acres	Silvicultural Prescription	Logging System	Fuel Treatment/ Site Preparation
34	12	Commercial Thin	Skyline	RTL,S,GP,UB
38	16	Commercial Thin	Track Line Machine	RTL,S,GP,UB
68A	2	Commercial Thin	Ground-based	RTL,S,GP,UB
68B	27	Commercial Thin	Skyline	RTL,S,UB
71A	14	Commercial Thin	Ground-based	L, LS, S, GP, UB
71B	19	Commercial Thin	Skyline	L, LS, S, UB
78A	4	Commercial Thin	Ground-based	L, LS, S, GP, UB
78B	28	Commercial Thin	Skyline	L, LS, S, UB
83A	2	Commercial Thin	Ground-based	L, LS, S, GP, UB
83B	12	Commercial Thin	Skyline	RTL,S,GP,UB
84	28	Commercial Thin	Ground-based	RTL,S,GP,UB
87A	19	Commercial Thin	Ground-based	L, LS, S, GP, UB
87B	8	Commercial Thin	Skyline	L, LS, S, GP, UB
88	44	Commercial Thin	Ground-based	RTL,S,GP,UB
89	26	Commercial Thin	Ground-based	RTL,S,GP,UB
90A	2	Commercial Thin	Ground-based	RTL,S,GP,UB
90B	29	Commercial Thin	Skyline	RTL,S,GP,UB
96	22	Clearcut w/ Reserves (Regeneration Harvest)	Track Line Machine	L,S,GP,UB
100A	8	Commercial Thin	Ground-based	RTL,S,GP,UB
100B	23	Commercial Thin	Skyline	RTL,S,GP,UB
102A	6	Commercial Thin	Ground-based	RTL,S,GP,UB
102B	48	Commercial Thin	Skyline	RTL,S,GP,UB
105	8	Clearcut w/ Reserves (Regeneration Harvest)	Skyline	L,S,GP,BB
118A	3	Commercial Thin	Ground-based	RTL,S,GP,UB
118B	8	Commercial Thin	Skyline	RTL,S,GP,UB
136	13	Shelterwood Final Removal	Skyline	RTL
136A	6	Shelterwood Final Removal	Ground-based	RTL
136B	23	Clearcut w/ Reserves (Regeneration Harvest)	Skyline	L,S,BB
138	52	Overstory Removal	Ground-based	L,LS,GP
139	54	Shelterwood Final Removal	Ground-based	L,LS,GP
140	29	Shelterwood Final Removal	Track Line Machine	L,LS,GP
141	55	Overstory Removal	Track Line Machine	L,LS,GP

Timber would be harvested to achieve project objectives identified in the purpose and need using the following silvicultural prescriptions (Table 2) and logging systems (Table 3). Silvicultural prescriptions are described beginning on page 30.

Table 2 – Alternative B Silvicultural Prescriptions (Rx)

Silvicultural Rx	Clearcut w/ Reserves	Commercial Thin	Final Entry	Seedtree	Shelterwood	Total
Approximate Acres	90	1,134	231	60	31	1,546

Table 3 – Alternative B Logging Systems

Logging System	Ground-based	Skyline	Track Line Machine	Total
Approximate Acres	602	813	131	1,546

Alternative B Fuel Reduction and Site Preparation

Alternative B Fuel Treatment and Site Preparation in Proposed Timber Harvest Units

The following fuels treatment activities would be used to reduce fuel accumulations that would result from the timber harvesting activities.

Table 4 – Alternative B Proposed Fuel Reduction and Site Preparation in Timber Harvest Units

Fuel Treatment in Harvest Units	Leave Tops in Woods, Lop, and/or Grapple Pile	Leave Tops in Woods, Lop, Slash, Grapple Pile and/or Prescribe Burn	Leave Tops in Woods, Slash, and/or Prescribe Burn	Leave Tops in Woods, Slash, Grapple Pile and/or Prescribe Burn	Leave Tops in Woods, Lop, Slash, and/or Prescribe Burn	Total Acres
Approx. Acres	190	168	27	154	28	
Fuel Treatment in Harvest Units	Remove Tops & Limbs	Remove Tops & Limbs and/or Grapple Pile	Remove Tops & Limbs, Slash, Grapple Pile and/or Underburn	Remove Tops & Limbs, Slash and/or Underburn		
Approx. Acres	38	6	829	106		1,546

See Map 1 in Appendix A for unit locations.

Alternative B Other Fuel Treatment

Roadside Fuel Reduction Treatments

Roadside fuel reduction treatments would occur along Roads 377, 1479, 1947, 1950, and 1954 for a total of approximately 120 acres. Table 5 shows lengths and areas of roadside fuel treatment along each road.

Table 5 – Alternative B Roadside Fuel Treatment

Road 377 Palouse Divide	Road 1479 Hume Creek	Road 1947 Lacey Creek	Road 1950 Hume Ridge	Road 1954 Fagan Preston Ridge	Total
1.4 miles	3.1 miles	0.8 miles	0.9 miles	1.3 miles	7.5 miles
20 acres	48 acres	15 acres	17 acres	20 acres	120 acres

Bald Mountain Fuel Reduction

This area was pre-commercially thinned approximately 10 years ago. Slash from that activity is persisting. Existing downed material would be lopped, hand piled, and the piles would be burned to reduce fuel loads on 30 acres.

Biomass Removal

Biomass removal includes harvesting the wood product obtained from all or portions of trees including limbs, tops, and unmerchantable stems usually for energy production. This would be a by-product of the proposed fuel reduction treatments.

Alternative B Other Vegetation Treatments

Planting Conifer Trees in Regeneration Harvest Units:

Trees would be planted in regeneration harvest units which total approximately 181 acres. See Table 2. Seedlings would be a mix of early-seral western white pine and western larch.

Off-Site Ponderosa Treatment (Unit 18):

Approximately 82 acres would be prescribed burned with no timber harvest to reduce off-site ponderosa pine and prepare sites to plant early-seral, long-lived tree species. Some smaller trees would be slashed to increase ground fuels enough to carry flame. Trees would be planted where appropriate following the prescribed burn. Multiple entries may be required to achieve desired silvicultural objectives. See Unit 18 on Map 1 in Appendix A.

Pocket Gopher Control after Tree Planting:

Pocket gophers would be controlled, if needed, where trees would be planted in regeneration harvest units (Units 3, 6A, 6B, 10, 13A, 13B, 14A, 14B, 15, 96, 105, and 136B) and in the off-site ponderosa pine treatment unit (Unit 18). See details beginning on page 40.

Personal-Use Firewood Removal

After logging and biomass removal operations, gates on Road 1950 (up to the second gate), Road 1954, and the existing portion of Road 1950C may be opened from Memorial Day weekend through Labor Day weekend for public firewood gathering for up to three years after the last timber sale contract closes on each road. Valid personal-use firewood permits would be required. The public would be allowed to gather firewood except where prohibited as shown on maps and/or as posted. See project file document PD-29 for personal firewood considerations.

Snag and Potential Cavity Nesting Habitat Creation:

Snags would be created by girdling live trees. Potential cavity nesting habitat would be increased by inoculating live trees with fungal spores. See details on page 40.

Alternative B Road Work

Road Construction

Approximately 4.5 miles of new system road construction would be necessary to implement the envisioned timber harvesting systems (See Map 1 in Appendix A). When timber harvest and associated activities are complete newly constructed Road NC3 would be barriered (Road Management Rx B) and the others would be put into long-term storage (see discussion below).

Temporary Roads

Approximately 0.5 miles of temporary road would be necessary to implement the envisioned timber harvesting systems (See Map 1 in Appendix A). A temporary road is a road constructed just for this project that would be obliterated when harvest operations are complete.

Road Reconstruction

Approximately 2.3 miles of road would be reconstructed to their approved traffic service level or would be improved to increase safety, operational efficiency or resource protection (improve drainage and improve water quality).

Barriered Road

Proposed Road NC3 would be barriered when timber harvest and related contract obligations are complete. See details on page 42.

Road Storage

Approximately 4.4 miles of existing road would be put into long-term storage. All newly constructed roads would be put into long-term storage (Road Management Prescription C) or be barriered (Road Management Prescription B) when timber harvest and related contract obligations are complete. See details on page 42.

Road Decommissioning

Approximately 0.6 miles of existing road would be decommissioned and be removed from the National Forest Road system. See details on page 42.

Alternative B Aquatic Improvements

Fish Migration Barrier Removal or Replacement

Fish migration barriers would be removed or be replaced. See details on page 44 and Map 2 in Appendix A.

Riparian Planting and Large Woody Debris Placement

Large woody debris would be placed in streams, and trees and shrubs would be planted in association with the woody debris structures and in other areas of the riparian zones where shade lacking. See details on page 44 and Map 2 in Appendix A.

Alternative B Creation of Dispersed Camping Sites

The following areas would be left in conditions conducive for dispersed camping where feasible:

- The beginning of newly constructed or reconstructed roads (system or temporary) at the junction of open, existing roads when the new road is stored or decommissioned.
- Log landing areas on open roads.

Alternative C - Commercial Thinning with Reduced Road Construction (Maps 3 and 4)

Alternative C was designed to address public concerns regarding the proposed action while still addressing many aspects of the purpose and need. Some people said they did not want any clearcuts. This alternative does not include clearcuts or any other type of regeneration harvest that would cause large openings in the tree cover. It only includes commercial thinning. Some people indicated that too much road construction was included in the proposed action because it would increase sediment. This alternative includes 1.6 miles of new system road construction,

compared with 4.5 proposed in Alternative B. It would also require 0.1 miles less temporary road than Alternative B. It includes many of the same activities as Alternative B, but it does not include any regeneration harvests or final entry harvests.

Alternative C includes the following activities. Details of activities common to both action alternatives begin on page 26.

- Harvest approximately 12 million board feet (24,120 CCF) of timber on 850 acres. See details discussed in Activities Common to Both Action Alternatives beginning on page 26 and Map 3 in Appendix A.
- Treat activity fuels after timber harvest in all units using the methods described beginning on page 35.
- Prescribe burn 82 acres with no timber harvest to reduce off-site ponderosa pine and prepare sites to plant early-seral, long-lived tree species. See Map 3 in Appendix A.
- Control pocket gophers, as needed, to protect regeneration in the off-site ponderosa treatment unit (RxBurn on Map 3 in Appendix A).
- Reduce fuels along approximately 7.5 miles (up to 127 acres) of road using methods described beginning on page 37. See details below and Map 3.
- Reduce fuels in a 30-acre area near Bald Mountain Lookout by lopping, hand piling, and burning piles.
- Remove and sell biomass, where economically feasible, as a by-product of the other proposed vegetation treatments. See Map 3.
- Open gates on Road 1950 (up to the second gate), Road 1954, and the existing portion of Road 1950C from Memorial Day weekend through Labor Day weekend for public firewood gathering for up to three years after the last timber sale contract closes on each road.
- Create snags by girdling live trees and increasing potential cavity nesting habitat by inoculating live trees with fungus spores on approximately 20-30 trees per year for three to five years on approximately 150 acres.
- Construct 1.6 miles of system road and 0.4 miles of temporary road to facilitate timber harvest. See Map 3 for locations.
- Reconstruct 0.7 miles of roads to facilitate timber harvest. See Map 3 for locations.
- Put 4.4 miles of existing road into long-term storage to leave them in a hydrologically neutral state. See Map 4.
- Decommission 0.6 miles of existing roads and remove them from the National Forest Road system. See Map 4.
- Remove or replace six fish migration barrier culverts. Culverts that are replaced would allow fish passage. Migration barrier culverts on roads to be stored would be removed. See Map 4.
- Plant conifer seedlings in riparian areas and place large woody debris in streams along approximately five miles of streams in Hume Creek, Charlie Creek, and Preston Creek. See Map 4.
- Where feasible, log landing areas would be left in conditions conducive for dispersed camping.

Alternative C Timber Harvest (Map 3)

Timber harvest and associated activities would occur in the following units. Fuel treatment method abbreviations are:

BB = broadcast burn
GP = grapple pile & remove/burn piles
L = leave tops
LS = lop and scatter
RTL = remove tops and limbs at landings
S = slash vegetation less than 6in. at d.b.h.
UB = under/jackpot burn

Table 6 – Alternative C Timber Harvest Silvicultural Rx, Logging Systems, & Fuel Treatment

Unit	Acres	Silvicultural Prescription	Logging System	Fuel Treatment
1	25	Commercial Thin	Ground-based	RTL,S,GP,UB
2A	15	Commercial Thin	Ground-based	RTL,S,GP,UB
5	50	Commercial Thin	Track Line Machine	RTL,S,GP,UB
8	80	Commercial Thin	Ground-based	L, LS, S, GP, UB
16A	11	Commercial Thin	Ground-based	RTL,S,GP,UB
16B	75	Commercial Thin	Skyline	RTL,S,GP,UB
17	16	Commercial Thin	Ground-based	RTL,S,GP,UB
19	8	Commercial Thin	Ground-based	RTL,S,GP,UB
23A	20	Commercial Thin	Ground-based	RTL,S,GP,UB
23B	103	Commercial Thin	Skyline	RTL,S,GP,UB
26	13	Commercial Thin	Skyline	RTL,S,GP,UB
27A	12	Commercial Thin	Ground-based	RTL,S,GP,UB
27B	62	Commercial Thin	Skyline	RTL,S,GP,UB
28	11	Commercial Thin	Ground-based	RTL,S,UB
31	9	Commercial Thin	Track Line Machine	RTL,S,GP,UB
32	3	Commercial Thin	Skyline	RTL,S,UB
33A	17	Commercial Thin	Ground-based	RTL,S,GP,UB
33B	26	Commercial Thin	Skyline	RTL,S,UB
34	12	Commercial Thin	Skyline	RTL,S,GP,UB
38	16	Commercial Thin	Track Line Machine	RTL,S,GP,UB
83A	2	Commercial Thin	Ground-based	L, LS, S, GP, UB
83B	12	Commercial Thin	Skyline	RTL,S,GP,UB
84	28	Commercial Thin	Ground-based	RTL,S,GP,UB
87A	19	Commercial Thin	Ground-based	L, LS, S, GP, UB
87B	8	Commercial Thin	Skyline	L, LS, S, GP, UB
88	44	Commercial Thin	Ground-based	RTL,S,GP,UB
89	26	Commercial Thin	Ground-based	RTL,S,GP,UB
90A	2	Commercial Thin	Ground-based	RTL,S,GP,UB
90B	29	Commercial Thin	Skyline	RTL,S,GP,UB
100A	8	Commercial Thin	Ground-based	RTL,S,GP,UB
100B	23	Commercial Thin	Skyline	RTL,S,GP,UB
102A	6	Commercial Thin	Ground-based	RTL,S,GP,UB
102B	48	Commercial Thin	Skyline	RTL,S,GP,UB
118A	3	Commercial Thin	Ground-based	RTL,S,GP,UB
118B	8	Commercial Thin	Skyline	RTL,S,GP,UB

Timber would be harvested to achieve project objectives identified in the purpose and need using commercial thins and the following logging systems (Table 7).

Table 7 – Alternative C Logging Systems

Logging System	Ground-based	Skyline	Track Line Machine	Total
Approximate Acres	353	422	75	850

Alternative C Fuel Reduction

Alternative C Fuel Treatment in Proposed Timber Harvest Units

The following fuels treatment activities would be used to reduce fuel accumulations that would result from the timber harvesting activities.

Table 8 – Alternative C Proposed Fuel Reduction in Timber Harvest Units

Fuel Treatment in Harvest Units	Leave Tops in Woods, Lop, Slash, Grapple Pile and/or Prescribe Burn	Remove Tops & Limbs, Slash, Grapple Pile and/or Underburn	Remove Tops & Limbs, Slash and/or Underburn	Total
Approx. Acres	109	701	40	850

Alternative C Other Fuel Treatment

Roadside Fuel Reduction Treatments (Map 3)

Roadside fuel reduction treatments would occur along Roads 377, 1479, 1947, 1950, and 1954 for a total of approximately 127 acres. Table 9 shows lengths and areas of roadside fuel treatment along each road.

Table 9 – Alternative C Roadside Fuel Treatment

Road 377 Palouse Divide	Road 1479 Hume Creek	Road 1947 Lacey Creek	Road 1950 Hume Ridge	Road 1954 Fagan Preston Ridge	Total
1.4 miles	3.1 miles	0.8 miles	0.9 miles	1.3 miles	7.5 miles
20 acres	55 acres	15 acres	17 acres	20 acres	127 acres

Bald Mountain Fuel Reduction (Map 3)

This area was pre-commercially thinned approximately 10 years ago. Slash from that activity is persisting. Existing downed material would be lopped, hand piled, and the piles would be burned to reduce fuel loads on 30-acres.

Biomass Removal

Biomass removal includes harvesting the wood product obtained from all or portions of trees including limbs, tops, and unmerchantable stems usually for energy production. This would be a by-product of the proposed fuel reduction treatments.

Alternative C Other Vegetation Treatments

Off-Site Ponderosa Treatment (RxBurn on Map 3):

Approximately 82 acres would be prescribed burned with no timber harvest to reduce off-site ponderosa pine and prepare sites to plant early-seral, long-lived tree species. Some smaller trees would be slashed to increase ground fuels enough to carry flame. Trees would be planted where appropriate following the prescribed burn. Multiple entries may be required to achieve desired silvicultural objectives. See RxBurn on Map 3.

Pocket Gopher Control After Tree Planting:

Pocket gophers would be controlled, if needed, in the off-site ponderosa pine treatment unit (Unit 18 / RxBurn). See details beginning on page 40.

Personal-Use Firewood Removal

After logging and biomass removal operations, gates on Road 1950 (up to the second gate), Road 1954, and the existing portion of Road 1950C may be opened from Memorial Day weekend through Labor Day weekend for public firewood gathering for up to three years after the last timber sale contract closes on each road. Valid personal-use firewood permits would be required. The public would be allowed to gather firewood except where prohibited as shown on maps and/or as posted. See project file document PD-29 for personal firewood considerations.

Snag and Potential Cavity Nesting Habitat Creation:

Snags would be created by girdling live trees. Potential cavity nesting habitat would be increased by inoculating live trees with fungal spores. See details on page 40.

Alternative C Road Work

Road Construction

Approximately 1.6 miles of new system road construction would be necessary to implement the envisioned timber harvesting systems. See details on page 41. Also see Map 3.

Temporary Roads

Approximately 0.4 miles of temporary road would be necessary to implement the envisioned timber harvesting systems (See Map 3). A temporary road is a road constructed just for this project that would be obliterated when harvest operations are complete.

Road Reconstruction

Approximately 0.7 miles of road would be reconstructed to their approved traffic service level or would be improved to increase safety, operational efficiency or resource protection (improve drainage and improve water quality). See Map 3.

Road Storage

Approximately 4.4 miles of existing road would be put into long-term storage. All newly constructed roads would be put into long-term storage (Road Management Prescription C) or be barriered (Road Management Prescription B) when timber harvest and related contract obligations are complete. See details on page 42 and Map 4.

Road Decommissioning

Approximately 0.6 miles of existing road would be decommissioned and be removed from the National Forest Road system. See details on page 42 and Map 4.

Alternative C Aquatic Improvements

Fish Migration Barrier Removal or Replacement

Fish migration barriers would be removed or be replaced. See details on page 44 and Map 4.

Riparian Planting and Large Woody Debris Placement

Large woody debris would be placed in streams, and trees and shrubs would be planted in association with the woody debris structures and in other areas of the riparian zones where shade lacking. See details on page 44 and Map 4.

Alternative C Creation of Dispersed Camping Sites

Log landings would be left in conditions conducive for dispersed camping where feasible.

Design Features for Action Alternatives

I. Design Features for All Proposed Activities

A. Aquatic Resources

1. The project would implement standard riparian habitat conservation area (RHCA) widths specified by Inland Native Fish Strategy (INFS) (Table 10). These buffer zones are no-entry for harvest and equipment. Exceptions are described in the Standards and Guidelines, General Riparian Area Management (INFS RA-2) that states: "Trees may be felled in Riparian Habitat Conservation Areas when they pose a safety risk."

Table 10 – Standard Riparian Habitat Conservation Area (RHCA) Widths

INFS Category	Description	RHCA Width
1	Fish bearing streams	300 feet from either side of channel
2	Permanent, flowing, non-fish bearing stream	150 feet from either side of channel
3	Wetlands > 1 acre	150 feet from wetland
4	Seasonally flowing or intermittent streams Wetlands <1 acre Landslide prone areas	50 feet from either side of channel or wetland (non-priority watersheds)

2. Best Management Practices (BMPs) would be used to achieve water quality standards (Charlie Preston EA Appendix B). The Forest Service Handbook 2509.22 (Soil and Water Conservation Handbook) outlines BMPs that meet the intent of the water quality protection elements of the Idaho Forest Practices Act, Forest Plan Standards and replaces the Forest Plan Appendix S – Best Management Practices. To ensure water quality protection additional site-specific BMPs may be identified and developed during layout, design, or implementation of proposed activities.

3. All treatments would meet or exceed requirements and erosion control guidelines of the Rules and Regulations pertaining to the Idaho Forest Practices Act, Title 38, Chapter 13, Idaho Code.

B. Cultural Resources

1. All known cultural resource sites that are eligible or potentially eligible for the National Register of Historic Places would be protected or mitigated as directed by the National Historic Preservation Act.
2. Any future discovery of cultural resources, archaeological sites, or caves would be inventoried and protected if found to be of cultural significance. A provision would be included in all contracts to ensure protection of the sites. A discovery plan for the protection of cultural resources would be included in contracts in case of cultural resource discovery during project implementation.

C. Fuels

Any slash created from proposed activities left after slash treatment would not exceed a depth of 18 inches.

D. Noxious Weeds

1. If new populations of noxious weeds are found treatment would be implemented in accordance with priorities set by the noxious weed program. New invader species would be slated for eradication immediately upon discovery. Other weed infestations would be treated according to the direction in the St. Joe Noxious Weed Project FEIS and ROD and district priorities.
2. All equipment taken off roads (including machinery used in restoration projects and logging and construction equipment) would be cleaned prior to entering the project area to remove dirt, plant parts, and material that may carry weed seeds. A provision would be included in contracts.
3. Seed and mulching agents, such as hay or straw, would be certified weed-free prior to use. On-site slash could be used. A provision would be included in contracts.
4. After implementation, project areas would be reviewed for new populations of noxious weeds. If new populations are found more intensive surveys would be conducted, sites would be mapped, and treatment would be scheduled.
5. All weed treatments would be monitored for effectiveness

E. Plants (Threatened, Endangered, and Sensitive)

If Threatened, Endangered, and Sensitive (TES) species are discovered during project implementation, the district botanist would be notified so that measures could be taken to maintain population viability. Measures to protect population viability and habitat for all known and newly discovered occurrences would include altering or dropping proposed units from activity, modifying the proposed activity, or implementing buffers/breaks around plant occurrences. Provisions for protection of Endangered Species, and settlement for environmental cancellation would be included in all contracts.

F. Public Health and Safety

1. Warning signs would be posted and/or temporary road closures may be used to provide safety when project operations occur on or adjacent to roads that are open to motorized vehicles.

2. Dust abatement would be used as needed near homes.

G. Recreation

1. Existing dispersed recreation sites used for project activities would be restored or rehabilitated if motorized access to the sites would remain available after project implementation.
2. Contractors would follow permit provisions required for camping.
3. No project activities would be allowed from December 1 to March 31 on Palouse Divide Road 377 from the junction with Highway 6 to Bald Mountain Lookout and along Hume Creek Road 1479 from the junction with Palouse Divide Road 377 to the junction with Road 1950. These sections of roads are closed to all motorized traffic as part of the Palouse Divide Park n' Ski Cross-Country Ski system.

H. Seeding

Seed mixes would be certified weed-free and of a mix appropriate to the habitat as described in the most current version of the Idaho Panhandle National Forest Native Seed Mix document (project file B-14). The approved seed mix may change by the time seeding is implemented, so the most recent seed mix would be used.

I. Soils

1. To reduce the impacts to soils and soil productivity, the proposed activities would utilize soil and conservation practices as described in the Soil and Water Conservation Practices (SWCP) Handbook (FSH 2509.22) and the Charlie Preston EA Appendix B. This handbook and appendix outline best management practices (BMPs) that protect the soil resources at a higher level than existing Idaho Forest Practices rules and regulations do, thereby incorporating all Idaho state standards.
2. Design features given below were developed to minimize the detrimental impacts of soil compaction, displacement, severe burning, and nutrient and organic matter depletion on long-term soil productivity.
   a. Existing fine organic matter and large woody debris would be retained on the ground for sustained nutrient recycling in harvest units, consistent with Graham and others (1994).
   b. Downed woody retention levels would be maintained wherever practical for both high elevation and moist forest habitat types. Graham and others (1994) recommend retaining 17-33 tons per acre for moist and 10-19 tons per acre for high elevation habitat types of downed woody material greater than three inches in diameter. The high elevation areas are Units 27A, 27B and 28, with the remaining units falling into the moist habitat groups.
   c. The latest soil nutrient management recommendations from the Intermountain Forest Tree Nutrient Cooperative (IFTNC) and Rocky Mountain Research Station (RMRS) would be applied as appropriate to each activity area where organic material is removed. Slash should be left to over-winter nutrients back into the soil in most cases until fuel reduction treatments occur. In those units in which tops and limbs are to be removed, only the tops, limbs, and branches that break during harvesting operations would be left to overwinter before fuel treatments. Tops and limbs would come out when the logs are yarded.

d. Those units in which the parent geology is rated relatively poor for nutrient-holding capacity, slash would be left on the ground untreated from 9 to 15 months before prescribed fire activities are to occur (Johnston 2009). The length of time slash needs to remain on the ground before the fuel treatments is based on the season in which the harvest occurs. For winter harvest (December-February), logging slash should remain untreated for up to 15 months to enable all the nutrients to leach out and become usable to other vegetation. Likewise for spring harvest (March- May), untreated slash should remain on the ground for up to 12 months; and for summer and fall harvest (June-November), slash should remain on the ground for up to 9 months. The following units fall on parent geology with low nutrient hold capacity: (south end of Unit 1, west half of Unit 3, south end of Units 8, 12, 13A, 13B, 14A, 14B, north end of Units 25B, 27A, 27B, 28 and 29A).

e. Prescribed burning and pile burning would occur only when the upper surface inch of mineral soil has a moisture content of 25% by weight, or when duff moisture exceeds 60%, or when other monitoring or modeling indicates that soil productivity will be protected. It is strongly recommended when fuel loads are high and fuel moistures are low that the mineral soil be above 25% moisture content.

f. When prescribed fire is utilized, post-burn conditions would result in no more than 25 to 30 percent bare soils (excluding natural conditions) within an activity area (burn unit). On sensitive soils or slopes at or greater than 40%, no more than 20% of bare soils (excluding natural conditions) would be exposed within the activity area.

g. The desired prescribed fire outcome includes retention of organic matter (generally not much less than ¼ of an inch) that protects the soil from rain splash impacts, erosion, a decrease in soil moisture holding capacity, and increased solar surface heating, especially on south-facing slopes.

J. <u>Wildlife</u>

1. Threatened, Endangered, and Sensitive Wildlife Species Management:

   Contract provisions for protection of Threatened, Endangered, and Sensitive (TES) species, and settlement for environmental cancellation would be included. If TES species and/or significant habitat are discovered before or during project implementation the Sale Administrator and the district wildlife biologist would be notified so that if needed, measures could be taken to avoid impacts and meet Forest Plan Standards. Measures could include altering or dropping proposed units, modifying the proposed activity, or implementing buffers.

2. Goshawk:

   a. Nests: Existing nests and those found before and during project implementation would be protected with a 40-acre no-activity buffer (Brewer and others 2007).

   b. Post-Fledging Areas (PFA): Proposed project activities would be suspended in the PFA of active goshawk nests between April 15 and August 15. After August 15th, treatment-related activities may commence within the PFA but outside the nest area (Brewer and others 2007). Restrictions may be removed after June 30 if the nest is determined by the district biologist to be inactive or unsuccessful.

II. Design Features for Timber Harvest

A. Silvicultural Prescriptions

Timber would be harvested to achieve project objectives identified in the purpose and need. All harvest would be on lands identified as suitable for timber production (Forest Vegetation Report). Various harvest methods described below would be prescribed depending on individual stand conditions.

Regeneration harvest: This only applies to Alternative B. A timber harvest that creates a new age class of trees. For Charlie Preston it includes clearcutting, seed tree, and shelterwood (see below).

Clearcut with reserves (CC w/R): This only applies to Alternative B. A regeneration harvest that removes essentially all trees in a stand with reserve trees left to attain goals other than regeneration. Reserve trees would be any tree or group of trees left uncut and kept for the entire next rotation. Reserves would be safe snags; live culls; healthy, early-seral trees; and other individuals /groups of trees with specific resource value scattered throughout stand. This treatment would develop an even-aged stand structure and would include site preparation and reforestation.

Seed tree harvest (ST): This only applies to Alternative B. A regeneration harvest in a mature, or near mature, stand to open its canopy to provide conditions suitable for regeneration. Trees are retained to provide seed for regeneration to create a desirable species mix. The majority of the standing crop trees would be removed. Natural regeneration is often supplemented with artificial regeneration to assure rapid stocking of the site and to provide for a desirable species composition.

Shelterwood harvest (SW): This only applies to Alternative B. A regeneration harvest in which most of the trees are cut, leaving those needed to provide enough seed and shade to produce a new age class. Additional harvest should be possible sometime in the future. The last or final removal cut would remove the remaining old age class after the new age class has established. This results in continuous coverage of large or small trees.

Commercial thin (CT): Any type of thinning producing merchantable material. For Charlie Preston this would be used in immature stands to increase tree vigor and growth rates and retain the trees with better form, without permanently breaking or opening the canopy. No site preparation or planting would be required. The purpose of the treatment is to regulate stand density to promote tree growth and vigor. Generally, smaller trees would be harvested and larger trees would be retained.

Shelterwood final removal (SWFR): This only applies to Alternative B. A removal cut to release established regeneration from competition with the overstory. This is the final cut in a shelterwood system.

Overstory removal (OSR): This only applies to Alternative B. The cutting of trees from the upper canopy layer to release trees in an understory. For Charlie Preston this is used to describe the final cut in previously harvested seed tree units.

B. Gates

Existing gates would remain in place. Temporary gates would be installed on any road that is not behind a gate but is currently not open. During timber hauling the gate would be closed and locked at the end of each day. For other operations gates would be closed and locked after passage of each vehicle.

C. Sensitive Plants

In Unit 89 two Sensitive plants sites would have 50-foot buffers around the plant sites. Timber harvest would not occur at the plant sites or in the buffers.

D. Old Growth

No timber harvest would occur in stands that meet minimum criteria for old growth or in stands allocated for old growth management.

E. Recreation

1. Where skid trails approach or intersect open roads or designated ATV routes, restrictive devices or debris such as logs, brush, and rocks would be placed to effectively stop vehicle use.
2. The tread on Trail 228 would be replaced where it intersects Road 377B when the road is no longer needed for harvest activities

F. Silviculture

1. Tops and limbs of trees would be left in all regeneration harvest units to ensure adequate fuels for prescribed burns and to leave protected sites for tree seedlings. This does not apply to Alternative C because it does not include regeneration harvest.
2. White pine leave tree guidelines (Schwandt and Zack 1996) would be utilized in all silvicultural prescriptions for timber harvest. The objective of these guidelines is to retain and protect genetic resources which may contribute to long-term white pine restoration.

G. Soils

1. Ground-Based Yarding

   a. Ground-based yarding would operate on slopes generally under 35% using existing skid trails whenever possible, and the leading end of the log would be suspended. When incidental steeper slopes of up to 40% are encountered, skid trails should not be longer than 200 feet in length along those increased slopes with no excavated trails or turning. Where terrain is conducive, go-back trails (trails used to get back to an area where logs would be skidded) should be used to minimize impacts wherever possible.

   b. All new skid trails would be designated and laid out to take advantage of topography and minimize disruption of natural drainage patterns. Where terrain is conducive, trails would be spaced at least 100 feet or more apart. Mechanized felling and skidding would allow skid patterns to be closer, provided slash mats are being utilized. After timber harvest ground disturbance associated with skid trails would be covered with slash and randomly placed logs (on the contour) and be seeded with the latest seed mix recommended at time of implementation (project file document B-14) to help reduce runoff.

   c. Timber harvest activities including both skidding and mechanized felling in ground-based units and mechanical felling in skyline units would occur when the soil profile is dry to reduce the effects from compaction (Poff 1996 p. 482) unless harvest activities would be conducted during winter conditions as specified below.

2. Skyline Yarding: The leading end of logs would be suspended during skyline yarding. No yarding across designated RHCAs would occur with this project.
3. Mechanized Felling Operations:
    a. Mechanized felling operations would be permitted in all tractor units and in skyline/cable units provided the slopes are under 45 percent except for the following units: 10, 12, 33b, 14b, 25b, 33b, 68b, 71b, 78b, 96, 102b, 105, 136a and 139 where mechanical felling would be prohibited to limit detrimental soil disturbance and protect soil productivity.
    b. Pivoting of mechanized felling equipment would be limited to slopes of generally 25 percent or less to reduce soil displacement. Pivoting on slopes greater than 25% but less than 35% would be allowed providing the turns are short and any areas of displaced soils are returned to natural conditions.
    c. Timber harvest activities including both skidding and mechanized felling in ground-based units and mechanical felling in skyline units would occur when the soil profile is dry (unless operations are conducted during winter as specified below) to reduce the effects from compaction (Poff 1996 p. 482).
4. Log Landings: Existing roads would be utilized as landings where appropriate in order to avoid additional soil compaction. All landings that are free of slash piles, other than existing or newly-constructed system roads, would be decompacted and covered with residual slash within guidelines provided by Graham and others (1994) for coarse-woody debris by habitat type, and seeded upon completion of the sale with the latest seed mix recommended at time of implementation. Those landings that are conducive to dispersed camping as determined by the district recreation specialist are exempt from these restoration activities.
5. Winter Logging Operations: If any units are to be harvested in the winter the following requirements are to be used depending on current site conditions:
    a. Operate on a 24-inch snow layer or 18 inches of settled snow or when the ground is frozen to a minimum depth of 3 inches for small equipment and 6 inches for larger equipment.
    b. Restrict equipment operation to main skid trails or where adequate slash matting exists.
    c. Suspend operations under wet or thawing conditions.
    d. Snow could be plowed from or packed onto skid trails and/or operations could be delayed until skid trails have sufficiently frozen.
6. Temporary Road Decommissioning
    a. Decompaction of the running surface to a depth not less than 18 inches shall occur before any of the side cast upper horizon soil profiles are placed across the road surface.
    b. After running surface is decompacted, side cast material can be laid over the running surface matching top of cut slope and bottom of fill slope for proper slope.
    c. Slash and coarse-woody debris on site from the temporary road construction and adjacent harvest activities would be placed on the newly recontoured sections (within guidelines provided by Graham and others (1994) to promote nutrient cycling and reduce recovery time.

d. Weed mitigation measures and prevention practices would occur in accordance with the St. Joe Noxious Weed Management Project (USDA FS IPNF 1999) for all landings and road disturbances.

7. Mitigation: Post harvest activities would include mitigation to improve soil conditions to aid in recovery in Unit 136A. Decompaction of all the skid trails in Unit 136A would reduce compaction levels and aid in recovery.

   a. Decompaction of skid trails would be conducted with as little mixing of the soil profiles as possible, keeping the most productive soils near the top.

   b. All treated skid trails would be covered with slash and randomly placed logs (within guidelines provided by Graham et al. (1994) for coarse-woody debris by habitat type) and would be seeded with native vegetation to reduce soil erosion.

H. <u>Visual Quality</u>

1. Pre-sale and Sale Administration personal would work closely with the District or Forest visual staff to determine that design criteria are adequate for each application.

2. Activities would remain visually subordinate to the characteristic landscape but "appear slightly altered" repeating the form, line, color, and texture common to the surrounding area with differences in qualities of size, amount, intensity, direction, and pattern.

   a. Form, line, color, and textures not frequently found in the characteristic landscape might be introduced in these units. Changes would remain subordinate to the visual strength of the characteristic landscape.

   b. Openings in these areas would repeat natural openings frequently found in the characteristic landscape so completely they would not be evident, or borrow from other proposed harvest activities.

   c. Basal area density would transition from unit boundary into harvest unit.

3. Units 27A, 27B, 105, 136, and 136A would have irregular boundaries. The Unit 105 boundary adjacent to privately owned land would be feathered.

4. Units 26, 27A, 27B, and 28 would have skid trails and skyline corridors angled away from the view from State Highway 6 approximately three to five degrees from perpendicular.

5. Commercial thin units along Road 377 and Road 377A (Units 16B, 17, 23A, 23B, 26, 27A, 27B, 28, 33A, and 33B) would be cut-tree marked so tree marking paint is not visible after timber harvest and does not detract from the forest visitor's drive along these roads.

6. Unit 136B, in Alternative B, would have an irregular boundary in addition to the stream buffers to break up any straight lines. Groups of fire resilient trees would be left, where possible, approximately 100 feet (tree length) below the road so that the crowns would help screen the road prism. This unit would also borrow form and texture from the commercial thin above and the overstory removal to the west to soften the effect of the opening.

I. <u>Wildlife</u>

1. Table 12 Wildlife Travel and Movement Corridors: Maintenance of landscape-level connectivity and minimization of fragmentation was incorporated into the design of all alternatives with timber harvest. Travel cover along ridges and saddles was identified

and considered in terms of connectivity (WL33). Site-specific mitigation measures for units with proposed vegetation removal in designated travel corridors are found in Table 12.

2. Openings on ridge tops within designated corridors: Travel cover would be maintained and vegetation management would avoid making openings (i.e. areas with <30% canopy cover) within 200 feet of the ridgetop or 400 feet if the other side of the ridge does not provide cover. Where openings would be created on ridges designated as potential travel corridors they would meet the following criteria:
    a. Less than 300 feet wide (Heinemeyer and Jones 1994)
    b. Limited to one side of the ridge top (IDFG 1995)
    c. Minimum of 800 feet between openings (IPNF Forest Plan, Appendix Y [Leege 1984])
    d. None to be situated in a saddle (Heinemeyer and Jones 1994)
3. Big Game Security: To provide big game security, timber harvest in adjacent drainages would have a ridgeline between the disturbance and security areas. In larger contracts, subdivisions or scheduling of harvest units would be utilized to maintain adequate security (IPNF Forest Plan, Appendix Y [Leege 1984]).

Cavity Nesting Species: Recommendations for snag numbers, size and species from the Northern Region Snag Management Protocol (NRSP) (January 2000) would be met where these or higher levels exist. The retention of snags and snag replacements would be applied at the stand scale of every 5 to 25 acres (Bull and others 1997). Live trees would be retained at five times the number of snags recommended in the NRSP for snag recruitment. To meet the objectives listed in Table 11.

4. Snag Guidelines:
    a. Silvicultural and burning prescriptions would protect large diameter snags (unless deemed unsafe) and large green tree replacement snags. This would be accomplished by pulling back slash, constructing firelines, or directed ignition. Prescriptions would also retain recommended levels and distribution of coarse woody debris during site preparation and fuels treatment.
    b. Snags that show signs of decay, loose bark, or broken tops would not be designated for harvest (Bull and others 1997). Exceptions would be made for safety, road construction, and log landings.
    c. Specific details on snag and leave tree selection from the Reserve Tree Guide (USDA Forest Service IPNF 1995) and the Snag and Woody Debris Guidelines (IPNF Forest Plan Appendix X) would be followed to reach objectives of the Northern Region Snag Management Protocol; and worker safety.
    d. The species priority for selection as snags or live leave trees is as follows: western larch, ponderosa pine, western redcedar, Douglas-fir, grand fir, hemlock, lodgepole pine, spruce, alpine fir, and white pine. After size and species, preferred wildlife leave trees would be selected based on showing signs of: wildlife use, decay, broken tops, hollows, rot, brooms, loose bark, and other defects. All hardwood trees would be retained. (IPNF Forest Plan, Appendix X)
    e. Snags cut for safety reasons would be left in the unit, preferably where they fall.

Table 11 – Snag Guidelines from Northern Region Snag Management Protocol (2000)

Forest Type	Snags/Acre
Low elevation western redcedar, hemlock: Units 6, 11, 12, 13, 15, 18, 23, 25, 33, 68, 71,	12 total snags with 4>20" d.b.h.
Cool, wet, & dry spruce, grand fir, hemlock, & subalpine fir: All other units	6-12 total snags with 2>20" d.b.h.

Table 12 – Site-Specific Mitigation Measures and Design Features for Wildlife

Objective	Site-Specific Mitigation Measure and Design Feature
Protect goshawk pair and young	Allow no ground disturbing activities inside known occupied PFAs from April 15 through no sooner than August 15 (Brewer and others 2009). **This applies to proposed harvest units in the Post Fledging Area: 100, 102, and 136, and construction of roads NC2 and NC7.**
Maintain Connectivity and Minimize Fragmentation	Avoid placing skyline corridors on ridge tops designated as travel corridors. Maintain canopy cover of stands at > 30% for all designated corridors (Heinemeyer and Jones, 1994). The minimum wildlife corridor width would be 400 feet (IDFG 1995). **This applies to proposed harvest units in designated travel corridors: 6A, 7, 8, 9, 10, 11A, 12, 13, 14, 17, 23, 26, 27, 28, 29A, 33A, 71A, 83, 87A, 89, 90A, 100A, 102A, 118A, and Bald Mountain Fuel Reduction.**
Maximize Habitat Use by Big Game (Elk)	**In Units: 9, 10, 11, 13, 14, 15, 96, 105, 136, 138, 139, 140, and 141:** The units would be no greater than 1,000 feet wide and should be bordered on all sides by cover habitat that is a minimum of 800 feet wide.
Facilitate Big Game Movement	Slash depths on ridge tops within designated corridors would be less than 1½ feet depth within 400 feet of ridge top (IPNF Forest Plan, Appendix Y [Leege 1984]). **This applies to proposed harvest units in designated travel corridors: 6A, 7, 8, 9, 10, 11A, 12, 13, 14, 17, 23, 26, 27, 28, 29A, 33A, 71A, 83, 87A, 89, 90A, 100A, 102A, 118A, and Bald Mountain Fuel Reduction.** **Slash depths along new and reconstructed roads** should not exceed 1.5 feet. If this level of slash disposal is not practical, 16-foot wide openings through the slash every 200 feet should be created, especially on ridges and game trail crossings (IPNF Forest Plan, Appendix Y [Leege 1984]).

III. Design Features for Fuel Treatment & Site Preparation

A. Description of Fuel Treatments in Timber Harvest Units

1. Fuels would be treated to achieve objectives identified in the purpose and need for this project. The mix of treatment methods and design criteria described in this section attempt to provide fire managers with options to ensure objectives can be achieved safely, legally, efficiently, and effectively.

   Fuels in harvest units may be treated in their entirety across the unit or on strategic portions of the units, with either the harvest activity or following the harvest activity. Assessment of fuel conditions by fire management personnel would be made to determine if additional modification of fuels is necessary following harvest. Depending on the objective for the unit, treatment methods will vary.

   One suite of fuel treatment activities is proposed in regeneration harvest units (CCw/R, ST, and SW), and another suite of fuel treatments activities is proposed for the other timber harvest units (OSR, SWFR, and CT). See details below. Some or all of the fuel treatments would be implemented depending on the conditions after timber harvest.

   Fireline or fuelbreaks would be constructed where necessary to contain prescribed burns as determined by fire management personnel. Topographic and vegetative features of the landscape may also be used for containment of prescribed fires when possible.

   Landing piles generated from harvest units and would either be burned or removed for biomass.

Biomass could be removed from any of the proposed landing piles and commercial thins. Biomass includes wood products obtained from all or portions of trees including limbs, tops, and unmerchantable stems, usually for energy production. Biomass would be a by-product of proposed vegetative treatments.

Directional felling would be used:

a. During harvest activities to minimize the amount of activity fuels in areas where fuelbreaks are required;
b. In final removal units (Units 9, 11A, 11B, 136, 136A, 138, 139, 140, 141) to reduce the amount of activity fuels along unit boundaries and therefore reduce the amount of grapple piling required. This does not apply to Alternative C because it does not include final removal units.
c. To protect reserve trees in regeneration harvest units retained for visual, wildlife, or silvicultural reasons. This does not apply to Alternative C because it does not include regeneration harvest units.

Prescribed burns may occur at any time of year, as prescription parameters, burn windows, and smoke emission restrictions permit.

2. Fuel Reduction and Site Preparation after Regeneration Harvest (Clearcut w/Reserves, Seedtree, and Shelterwood):

   This does not apply to Alternative C because it does not include regeneration harvest units.

   Activity fuels generated by harvest activities would be treated to reduce hazardous fuel loadings generated by the harvest and prepare the sites for hand planting of conifers.

   The main methods used to treat fuels in these units would include broadcast, jackpot, or underburning, and/or piling (mechanical or hand) followed by pile burning or removal. Units with a mix of slopes may have a mix of piling and burning in order to maximize the effective burn window and ensure slash is treated and units can be reforested in a timely manner.

   Firelines or fuelbreaks would be constructed, where needed, prior to prescribed burning activities.

   Slashing of residual non-merchantable trees may occur as part of site preparation or to ensure a continuous fuel bed for prescribed burning activities.

   Leave tree protection may be done at the base of some reserve trees to better protect them from fire impacts during burning operations.

3. Fuel Reduction after Intermediate Harvest (Overstory Removal, Shelterwood Final Removal, & Commercial Thin):

   Activity fuels generated by harvest would be treated to reduce hazardous fuel loadings generated by the harvest.

   Limbing and topping of harvested trees would be done at landings for units with sufficient coarse woody debris (CWD) levels.

   In units where existing CWD levels are deficient, tops and limbs of harvested trees would be left in the unit and that material would be lopped and scattered to minimize slash height. This applies to units 8, 71A, 71B, 78A, 78B, 83A, 87A, and 87B.

In addition to the above treatment, assessment of vegetative conditions would be done by fire managers and a silviculturist to determine if additional modification of fuels is necessary to achieve other fuel or silvicultural objectives (surface and ladder fuel reduction, disrupt fuel continuity, enhance early seral component).

Where further treatment is determined necessary the following methods may be applied, either across the unit or in strategically located portions of the unit: under burning or jackpot burning, excavator piling and pile burning along prominent ridges, slashing of sub-merchantable material (less than 6 inches d.b.h.), mulching, chipping, mastication, or biomass removal and utilization.

Multiple entries may be needed to meet desired objectives while maintaining desired stand composition.

B. <u>Other Fuel Treatments Outside Timber Harvest Units</u>

1. Biomass Removal

Biomass removal includes harvesting the wood product obtained from all or portions of trees including limbs, tops, and unmerchantable stems usually for energy production. This would be a by-product of the proposed fuel reduction treatments.

2. Roadside Fuel Reduction Treatments

Roadside fuel reduction treatment in areas shown on the Treatment Units Map would include two different treatments: one within five feet of roads and one extending up to 100 feet from the roads. The area closest to the roads (within 5 feet of the edge of the cuts and fills) would be cleared of brush, trees, and down wood. The area beyond the five-foot road maintenance clearing (up to 100 feet) would be thinned from below removing trees and snags less than 6 inches d.b.h. and brush to reduce surface and ladder fuels, increase canopy base height and select for fire-resilient, early-seral species.

Brush would be slashed. Low branches on residual overstory would be pruned to reduce ladder fuels. Surface fuel would be treated and reduced. Treatment would vary with cover type, canopy characteristics, fuel loading, aspect, slope, level of access. Treatment would be applied in multiple entries in order to achieve desired results and/or to maintain desired conditions. Fuels generated would be removed for biomass utilization purposes, mulched/chipped/masticated on site, or piled and burned on site.

Methods to accomplish roadside fuel reduction include hand cutting with chainsaws or other hand tools, or machine cutting with small grapple, mulching, or masticating head. Heavy equipment would only be used on roads and would not be taken off the road surface.

3. Fuel Reduction Near Bald Mountain Lookout

This area was pre-commercially thinned approximately 10 years ago. Slash from that activity is persisting. Existing downed material would be lopped, hand piled, and the piles would be burned to reduce fuel loads on 30-acres.

C. <u>Air Quality</u>

To comply with the Clean Air Act (1977), prescribed burns during any time of the year are regulated by the Idaho State Department of Environmental Quality which issues burning closures when necessary to protect air quality. The Forest Service cooperates with the State by requesting approval to burn through the Montana/Idaho Airshed Management System in compliance with the Idaho State Implementation Plan. Proposed burning activities would follow procedures outlined by the North Idaho Smoke Management Memorandum of

Agreement. Measures used to reduce effects of prescribed burning on air quality would include:

1. Prescribed burning would be accomplished as much as practical when on-site fuel and weather conditions are less conducive to total consumption of duff and larger fuels, with a resultant reduction in total emissions.
2. Scheduling ignitions when air quality is least likely to be threatened.
3. Slash piles would be constructed as clean as practical and be burned as dry as practical to enhance efficient combustion.

D. Aquatics

1. To avoid adverse effects to fish and redds when using streams for prescribed burning control, water removal may not exceed 90 gallons per minute and pumping sites would be located away from spawning gravels. The intake hose would be screened to prevent accidental intake of small fish. An emergency spill clean-up kit would be on site in the unlikely event of a fuel spill outside the containment system.
2. At road crossings on perennial fish-bearing and non-fish-bearing streams, riparian buffers would be applied (see page 26).
3. At road crossings on intermittent streams, crossings would be reviewed by a fisheries biologist or hydrologist and archaeologist to determine if roadside fuel treatment could be applied within the 50-foot buffer.
4. All firelines, whether constructed by machine or hand tools, would be waterbarred at time of construction to the standard IPNF fire rehabilitation specifications. Firelines would not be constructed through any moist zones or riparian areas in which the micro-site conditions can be relied upon to check the spread of fire during normal prescribed fire conditions. Surface fuels may be removed from these areas as necessary, but fireline construction would not occur.

E. Forest Vegetation

Only surface fuels would be treated in roadside fuel reduction treatment areas through areas that have already been pre-commercially thinned. Trees would not be cut in these areas because we don't want to reduce crop trees.

F. Recreation

Leave trees to act as a screen between dispersed sites and roadside fuel reduction areas.

G. Soils

1. Downed woody retention levels would be maintained wherever practical for both high elevation and moist forest habitat types. Graham and others (1994) recommend retaining 17-33 tons per acre for moist and 10-19 tons per acre for high elevation habitat types of downed woody material greater than three inches in diameter. The high elevation areas are Units 27A, 27B and 28, with the remaining units falling into the moist habitat groups.
2. The latest soil nutrient management recommendations from the Intermountain Forest Tree Nutrient Cooperative (IFTNC) and Rocky Mountain Research Station (RMRS) would be applied as appropriate to each activity area where organic material is removed. Slash should be left to over-winter nutrients back into the soil in most cases until fuel reduction treatments occur. In those units in which tops and limbs are

to be removed, only the broken tops and limbs would be left to overwinter before fuel treatments. Tops and limbs would be removed when the logs are yarded.

3. Those units in which the parent geology is rated relatively poor for nutrient-holding capacity, slash would be left on the ground untreated from 9 to 15 months before prescribed fire activities are to occur (Johnston 2009). The length of time slash needs to remain on the ground before the fuel treatments is based on the season in which the harvest occurs. For winter harvest (December-February), logging slash should remain untreated for up to 15 months to enable all the nutrients to leach out and become usable to other vegetation. Likewise for spring harvest (March- May), untreated slash should remain on the ground for up to 12 months; and for summer and fall harvest (June-November), slash should remain on the ground for up to 9 months. The following units fall on parent geology with low nutrient hold capacity: (south end of Unit 1, west half of Unit 3, south end of Units 8, 12, 13A, 13B, 14A, 14B, north end of Units 25B, 27A, 27B, 28 and 29A).
4. Prescribed burning and pile burning would occur only when the upper surface inch of mineral soil has a moisture content of 25% by weight, or when duff moisture exceeds 60%, or when other monitoring or modeling indicates that soil productivity will be protected. It is strongly recommended when fuel loads are high and fuel moistures are low that the mineral soil be above 25% moisture content.
5. When prescribed fire is utilized, post-burn conditions would result in no more than 25 to 30 percent bare soils (excluding natural conditions) within an activity area (burn unit). On sensitive soils or slopes at or greater than 40%, no more than 20% of bare soils (excluding natural conditions) would be exposed within the activity area.
6. The desired prescribed fire outcome includes retention of organic matter (generally not much less than ¼ of an inch) that protects the soil from rain splash impacts, erosion, a decrease in soil moisture holding capacity, and increased solar surface heating, especially on south-facing slopes.
7. Grapple Piling: Any equipment used for ground-based piling of slash (grapple-piling) would operate on slopes under 35%, would utilize existing skid trails where possible, and would operate on slash mats wherever possible. Burn piles would be small and numerous rather than large and few. Several ground-based units were identified in which grapple piling would be conducted from skid trails only. They include units: 11a, 13a, 14a, 15, 83a, 90a, 96 and 105.

H. <u>Sensitive Plants</u>

In Unit 89 two Sensitive plants sites would have 50-foot buffers around the plant sites. Grapple piling would not occur in the buffers. If Unit 89 is prescribed burned 10-foot fuel breaks would be constructed on the outside of the 50-foot buffers around the plant sites.

I. <u>Range</u>

If prescribed fire/burning were to occur in the project area between June 15th and October 15th the Forest Service range lead would be notified at least 30 days prior to the burning.

J. <u>Wildlife</u>

1. Snags: Burning prescriptions would protect large diameter snags and live trees for snag recruitment. This would be accomplished by pulling back slash, building fireline, or directed ignition. Prescriptions would also retain recommended levels and distribution of coarse woody debris during site preparation and fuels treatment.

2. Small Mammal Habitat: In harvest units where slash piles are created, one pile unburned per five acres would be left to supply potential fisher rest sites, provide cover for small animals (prey habitat) and serve as potential den sites (IDFG 1995). Piles left should be those closest to standing timber, such as the unit edge or a large cluster of leave trees.

IV. Design Features for Other Vegetation Treatments

A. Snag and Potential Cavity Nesting Habitat Creation

Snags would be created by girdling live trees. Potential cavity nesting habitat would be increased by inoculating live trees with fungal spores. Approximately 20-30 trees would be treated each year for three to five years on a total of approximately 150 acres in and adjacent to the following units proposed for treatment in Alternative B: 3, 6, 9, 10, 11, 13, 14, 15, 96, 105, 136, 138, 139, 140, and 141. Snags would be created in the same areas for Alternative C although there would be no timber harvest in these areas. Depending on the results of the prescribed burn, some of the larger off-site ponderosa pine may also be potential candidates for this treatment. The maximum inoculation/snag creation density would average one tree per acre.

B. Off-Site Ponderosa Pine Treatment

Approximately 82 acres would be prescribed burned with no timber harvest to reduce off-site ponderosa pine and prepare sites to plant early-seral, long-lived tree species. Some smaller trees would be slashed to increase ground fuels enough to carry flame. Trees would be planted where appropriate following the prescribed burn. Multiple entries may be required to achieve desired silvicultural objectives. See RxBurn on Maps 1 and 3 in Appendix A.

C. Pocket Gopher Control after Tree Planting

The need for pocket gopher control would be evaluated with regeneration surveys for the first, third and fifth year after planting. Only planted areas that have high mortality due to pocket gophers would be treated. Plantations would be treated by hand application of grain treated with (2.0%) zinc phosphide or (0.5%) strychnine. This grain would be deposited into the gophers' underground burrows at a rate of 1/4 to 1/2 pound per acre. The project would comply with all registered label instructions for zinc phosphide and strychnine bait including application in accordance with Idaho State law. Follow-up treatments may be necessary in some areas to ensure adequate seedling stocking levels.

The following design features would be followed during gopher baiting project implementation:

1. Product labels and manufacturer's recommendations for use would be followed.
2. Treated bait would be applied by a licensed applicator in accordance with Idaho State law.
3. No gopher baiting treatment:
   a. within riparian habitat conservation area buffers;
   b. in areas with saturated soil;
   c. during periods of, or forecasted periods of, heavy precipitation.
4. Treated bait would not be stored or transferred within 300 feet of any stream or live water.
5. Treated bait would not be directly applied to or discarded in open water bodies such as lakes, streams, ponds, and wetlands.
6. Initial setting of bait would usually occur after July 1.

7. A mandatory provision for bait spill cleanup and disposal would be included in the contract.
8. The application of bait would be monitored by a Forest Service employee, who has been trained in animal damage control.
9. Follow-up gopher control effectiveness surveys would be completed. Any evidence of non-target wildlife or fish mortality would be would be collected and be reported to the District Fisheries Biologist or Wildlife Biologist.

D. Personal-Use Firewood Removal

After logging and biomass removal operations, gates on Road 1950 (up to the second gate), Road 1954, and the existing portion of Road 1950C may be opened from Memorial Day weekend through Labor Day weekend for public firewood gathering for up to three years after the last timber sale contract closes on each road. Valid personal-use firewood permits would be required. The public would be allowed to gather firewood except where prohibited as shown on maps and/or as posted. See project file document PD-29 for personal firewood considerations.

V. Design Features for Road Work

A. Road Construction

New system road construction would be necessary to implement the envisioned timber harvesting systems (See Map 1 and Map 3 in Appendix A). When timber harvest and associated activities are complete newly constructed roads would either be barriered (Road Management Rx B) or would be put into long-term storage (Road Management Rx C). Road construction plans, standards and specifications for new system roads would provide for minimum needed road width, drainage and safe operation while incorporating measures for mitigating for resource disturbances. New roads would be single-lane facilities, suitable for log truck or lowboy use.

B. Road Reconstruction

Some roads would be reconstructed to their approved traffic service level or would be improved to increase safety, operational efficiency or resource protection (improve drainage and improve water quality). For this project, reconstruction includes rebuilding roads to their original standards. Road drainage may be improved where needed. Reconstruction may include the installation of drain dips and culverts, grading, clearing, dust abatement, and resurfacing. All road reconstruction plans, standards, and specifications would provide for minimum needed road width, drainage, and safe operation while incorporating measures to protect resources.

The overall existing condition of roads to be reconstructed is generally inadequate for resource protection or anticipated use or the road is impassable for the design vehicle. Spot reconstruction on some roads would also occur, where the primary disturbance is confined to a limited area, such as culvert installations, rebuilding a shoulder or addition of turnouts. Areas between the spots generally would need reconditioning (reshaping and processing the road surface and ditches and brushing the shoulders). Most of the work described as reconstruction and reconditioning would actually be maintenance (FSM 7705) to restore the road to its original condition.

Undersized culverts would be replaced on roads that would be reconstructed unless those roads would be stored or decommissioned after this entry. In that case, the culverts would not be upgraded because they would be removed when the road is stored or decommissioned.

Table 13 – Proposed Road Reconstruction by Road and Alternative

Road Number	Miles of Reconstruction Alt. B	Miles of Reconstruction Alt. C
377B	0.2	0.2
377JA	0.4	0.4
1955B	0.9	-
1955UE	0.6	-
road converted to trail	0.2	0.2
Total	**2.3**	**0.8**

C. Barriered Road (Road Management Prescription B)

This only applies to system Road NC3 that would be constructed with Alternative B. The use and need for the road is anticipated to occur at a lower frequency. The road may remain "closed" for a period of 5 to 15 years between uses but remains on the transportation system for future use. Culverts assessed to have a higher risk of failure would be removed or replaced, and the road surface may be water barred and seeded. Traffic would be controlled with a guardrail barrier. This does not apply to Alternative C because no roads are proposed to be put into Road Management Prescription B in Alternative C.

D. Long-Term Storage (Road Management Prescription C)

Approximate 4.4 miles of existing road would be put into long-term storage because after this project there would be no foreseeable use for the road in the next 15 to 25 years, but the roads may be needed at some future date. All newly constructed system roads, except for Road NC3, would also be put into long-term storage. The road would be out-sloped and have the drainage structures removed. The intent of this prescription is to put the road into "long-term storage" where the road is not a sediment source and does not channel water. The road prism is basically left intact but in a condition that would not require any maintenance. All water courses and problem areas would be stabilized. The roadbed may require light scarification, water bars, and/or decompaction. Aggregate surfaced roads would not be decompacted, but road surfaces would be shaped to drain. Roads without an aggregate (gravel) surface may be decompacted to a minimum of 18 inches where possible to facilitate and augment infiltration.

The road may be seeded and/or planted to establish a vegetative cover in the road prism. Roads would remain on the transportation system. The beginning of roads would be left in a condition to effectively block motorized use beyond dispersed camping sites.

Table 14 – Existing Roads to be Stored (Road Management Prescription C)

Road #	Name	Miles to be Stored
377B	-	0.2
377JA	-	0.5
1950	Hume Ridge	1.9
1955A	Mid	0.3
1955B	Mid	0.9
1955UE	-	0.6
	Total	**4.4**

E. Decommission with Full or Partial Recontouring (Road Management Prescription D)

Approximately 0.6 miles of existing road would be decommissioned because they are not needed for management purposes. The road would be decompacted and major fills, embankments, and higher failure risk areas would be pulled up onto the roadbed and be stabilized. Drainage structures would be removed, and the adjacent slopes would be restored

to resemble natural conditions. The goal of this prescription is to restore site productivity, eliminate the potential of road failures, and reestablish natural water infiltration and drainage patterns. Recontouring or partial pullback is based on site-specific conditions and could range from about 20 to 100 percent of the roads length. Decommissioning may require only partial recontouring; only pulling up the amount of fill necessary to stabilize the slope condition. Some cut and fill slopes or parts of cut and fill slopes may be evident in areas of recontouring. Following prescription implementation, roads would be removed from the National Forest Road System.

Table 15 – Existing Roads to be Decommissioned (Road Management Prescription D)

Road #	Name	Miles to be Decommissioned	Notes
377JA	-	0.2	Part of road realignment
1955A	Mid	0.4	
	Total	0.6	

F. General

1. Existing gates would remain in place. Temporary gates would be installed on any road to be used that is not behind a gate and is currently not drivable. During timber hauling the gate would be closed and locked at the end of each day. For other operations gates would be closed and locked after passage of each vehicle.
2. Road Management Prescription B (barriered roads) would effectively restrict motorized access with a guardrail barrier. Road Management Prescription C (long-term storage) and Road Management Prescription D (decommissioning) would effectively restrict motorized access with either a guardrail barrier or by recontouring the beginning of the road for at least a site distance.
3. The St. Joe Ranger District Administrative Access Policy will be used when administrative access is needed on roads not open to the public (ACT-23).

G. Aquatics

1. Road maintenance/reconstruction: Within the RHCA trees greater than 12” diameter at breast height (d. b. h.) would only be limbed unless tree removal is necessary for safety reasons. If trees are felled within the RHCA, they shall be left onsite unless their presence limits sight distance and poses a further safety hazard. Trees felled within the RHCA will require a review by a fisheries biologist.
2. Activities in streams: Activities such as culvert replacement, culvert removal associated with road removal, etc. would occur after July 15th and prior to October 15.
3. Road Management Prescription C (long-term storage) and Road Management Prescription D (decommissioning) at a minimum would have: all culverts removed, all fill within the stream crossing sites removed, stream gradient and valley side-slopes returned to near natural conditions for 200 feet on both sides of stream. Aggregate surfaced roads would not be decompacted, but road surfaces would be shaped to drain. Roads without an aggregate (gravel) surface would be decompacted to a minimum of 18 inches where possible to facilitate and augment infiltration.

H. Noxious Weeds

To the degree practicable gravel used for road maintenance would be certified from weed free-sources. Gravel sources would be inspected for the presence of noxious weeds prior to utilization of gravel in the project area as appropriate.

I. Recreation

The beginning of newly constructed or reconstructed roads (system or temporary) off open, existing roads would be left in a condition conducive for dispersed camping when the road is barriered, stored or decommissioned, where feasible. Log landing areas on open roads would also be left in a condition conducive for dispersed camping, where feasible.

J. Wildlife

1. Big Game Security:
   a. Road Management Prescription C may require obliteration for a distance of 300 feet, a sight-distance, or whatever distance is effective to eliminate motorized access. The amount and type of obliteration required would be the minimum needed to effectively prevent motorized vehicle use. This would vary depending on the slope and vegetation present. A guardrail barrier may be used if it can be placed to effectively prevent motorized access.
   b. The second gate on Road 1950 just past the junction with Road 1954 would remain closed to public motorized use year-round to provide elk habitat security.

Snags: To meet the objectives listed above in Table 11 – Snag Guidelines, snags that show signs of decay, loose bark, or broken tops would not be designated for harvest (Bull and others 1997). Exceptions would be made for safety, road construction, and log landings.

VI. Design Features for Aquatic Improvements

A. Fish Migration Barrier Removal or Replacement

Six culverts which are fish migration barriers are located on Road 1950 and Road 1955A. These culverts would be replaced or be removed to ensure aquatic organism passage. Channels would be diverted while culverts are being replaced. See Maps 2 and 4 in Appendix A.

B. Riparian Planting and Large Woody Debris Placement

Large woody debris structures would be constructed in Preston Creek and Charlie Creek. Riparian conifers and shrubs would be planted in association with the woody debris structures and throughout the riparian zones where trees were removed to facilitate past logging and railroad activity. A spider hoe would be used to place the logs. Most of the work would be accomplished from the stream bank, but equipment may operate in the stream. The wood may come from the riparian areas where adequate amounts of down or standing trees exist for this project and for future recruitment. See Maps 2 and 4 in Appendix A.

C. Timing

Culvert removal or replacement and placement of large woody debris will be done during low-flow periods between July 15 and October 15.

D. Seeding

Exposed soil would be seeded and mulched.

E. Snags

No snags would be cut to be used for large woody debris in streams.

F. Permits

Required permits would be obtained before implementation.

VII. Design Features for Creation of Dispersed Camping Sites

A. The following areas would be left in conditions conducive for dispersed camping where feasible:

1. The beginning of newly constructed or reconstructed roads (system or temporary) at the junction of open, existing roads when the new road is stored or decommissioned.
2. Log landing areas on open roads.

B. Log landings that are conducive to dispersed camping as determined by the district recreation specialist would be exempt from soil restoration activities in order to leave the site in a condition that would be conducive for camping (for example, a relatively even surface without coarse woody debris).

Implementation of Activities

During implementation harvest units and road locations shown on EA maps may vary slightly when implemented on the ground due to topography, vegetation conditions, insect and disease patterns, etc. Activities are anticipated to be implemented according to the following schedule. This schedule may change depending on market conditions, funding levels, etc., but it is used to estimate timing of effects for some resources.

Table 16 – Anticipated Activity Implementation Schedule

Activity	Year(s) of Implementation
Road construction and reconstruction	1
Timber harvest	1-5
Fuel reduction and site preparation associated with timber harvest	2-6
Tree planting after site preparation and timber harvest	3-7
Pocket gopher control	4-8
Fuel reduction not associated with timber harvest	1-8
Road storage and decommissioning	3-7
Other vegetation treatments	Any time after project is approved
Aquatic improvement projects	Any time after project is approved

Monitoring

The following monitoring would be included as part of the proposed action:

- Following fuel treatment in intermediate timber harvest units, assessment of vegetative conditions would be done by fire managers, a silviculturist, and a soils specialist to determine what, if any, additional fuel modification is necessary to achieve objectives (surface and ladder fuel reduction, disrupt fuel continuity, enhance early seral component) and still meet coarse woody debris requirements. Where further treatment is determined necessary and coarse woody debris requirements can be met, the following methods may be applied, either across the unit or in strategically located portions of the unit: under burning /jackpot burning, excavator piling and pile burning along prominent ridges, slashing of sub-merchantable material (less than 6 inches d.b.h.), mulching, chipping, mastication, or biomass removal and utilization.
- Soils would be monitored on a sample of units after the harvest and burning activities to determine if design features were implemented and if they were effective and to determine whether coarse woody debris retention complies with Graham and others (1994). A sample of skid trails and temporary roads to be restored would be monitored prior to and the year after restoration. Monitoring would be done according to Soils Report Appendix A.
- At road crossings on intermittent streams, crossings would be reviewed by a fisheries biologist or hydrologist and an archaeologist to determine if roadside fuel treatment could be applied within the 50-foot riparian buffer.
- Road closures would be monitored to determine how effective they are at preventing motorized access. It the closure methods are not preventing motorized access another method would be used to increase effectiveness. For example, a gate may be moved to a better location or a guardrail barrier may be replaced with road recontouring for the first sight-distance.
- A crest gauge and staff gauge installed in Hume Creek will be used to measure and compare water levels. Successive staff and crest gauge readings give a general picture of a stream's behavior in response to water yields and may indicate responses to management activities. See project file document W-62.
- The St. Joe Ranger District would coordinate with the Coeur d'Alene Tribe for pre-treatment surveys and monitoring of on-site gopher baiting applications.
- A Forest Service employee trained in animal damage control would monitor the application of gopher bait.
- Follow-up gopher control effectiveness surveys would be completed. Any evidence of non-target wildlife or fish mortality would be would be collected and be reported to the District Fisheries Biologist or Wildlife Biologist.
- After implementation, project areas would be reviewed for new populations of noxious weeds. If new populations are found more intensive surveys would be conducted, sites would be mapped, and treatment would be scheduled.
- All weed treatments would be monitored for effectiveness.

Environmental Consequences

This section summarizes the affected environments and the potential changes to those environments from the alternatives considered in detail. Additional information about the affected environments and environmental consequences is available in reports for each resource and other supporting documentation cited in those reports. The resource reports are available online at www.fs.usda.gov/goto/ipnf/projects. Sort by project name.

Analysis Methods and Modeling

Analysis methods are discussed in the resource reports. The data and level of analysis in this EA are commensurate with the importance of the potential effects (40 CFR 1502.15). The numbers for things such as miles of roads, acres of proposed treatments, and acres of habitat in the modeling and analysis are the best estimates based on the latest available information. New or more detailed information may add precision but is not essential to provide adequate information for the decision maker to make a reasoned choice among the alternatives.

The purpose of modeling is to provide comparative insight into complex questions, not to provide absolute numbers. Decision makers and managers use modeling results along with an understanding of the assumptions used in building the model as a factor in their decisions, but there are many other factors that are considered, many of which are not included in models. The modeling and other analysis conducted for the EA were intended and designed to indicate relative differences between no action and the proposed action, rather than to predict absolute amounts.

Past, Present, and Reasonably Foreseeable Activities

The Charlie Preston Activities Report provides information of relevant past, present, and reasonably foreseeable projects/activities. Where applicable these activities are considered in the cumulative effects analysis for each resource.

Forest Service regulations (36 CFR 220.4 [f]) state:

> Cumulative effects analysis shall be carried out in accordance with 40 CFR 1508.7 and in accordance with "The Council on Environmental Quality Guidance Memorandum on Consideration of Past Actions in Cumulative Effects Analysis" dated June 24, 2005. The analysis of cumulative effects begins with consideration of the direct and indirect effects on the environment that are expected or likely to result from the alternative proposals for agency action. Agencies then look for present effects of past actions that are, in the judgment of the agency, relevant and useful because they have a significant cause-and-effect relationship with the direct and indirect effects of the proposal for agency action and its alternatives. CEQ regulations do not require the consideration of the individual effects of all past actions to determine the present effects of past actions. Once the agency has identified those present effects of past actions that warrant consideration, the agency assesses the extent that the effects of the proposal for agency action or its alternatives will add to, modify, or mitigate those effects. The final analysis documents an agency assessment of the cumulative effects of the actions considered (including past, present, and reasonable foreseeable future actions) on the affected environment. With respect to past actions, during the scoping process and subsequent preparation of the analysis, the agency must determine what information regarding past actions is useful and relevant to the required analysis of cumulative effects. Cataloging past actions and specific information about the

> direct and indirect effects of their design and implementation could in some contexts be useful to predict the cumulative effects of the proposal. The CEQ regulations, however, do not require agencies to catalogue or exhaustively list and analyze all individual past actions. Simply because information about past actions may be available or obtained with reasonable effort does not mean that it is relevant and necessary to inform decisionmaking. (40 CFR 1508.7)

There are marked differences between past and current land management practices and policies for National Forest System lands. The evolution that has occurred in land management practices is the result of science, changing social and environmental concerns, and our ongoing monitoring actions. The Activities Report discusses the history and management of the Idaho Panhandle National Forests, in general, and specifics for the Charlie Preston area, some of which are also presented below.

History and Management of the Charlie Preston Project Area

The forests in the Charlie Preston area are not static. They constantly change. Some of the changes result from natural forces like fire, flood, and forest succession. Other changes result from people using and managing the forests.

Historic fires are known to have impacted the project area in 1889, 1910, 1927, and 1929 (Figure 4, Figure 5, Table 17). Evidence of these fires can still be seen as burned stumps, the many larch trees in the area, the number of relatively young trees, and open ridge tops on Preston Knob.

Table 17 – Known Burned Area History in the Charlie Preston Project Area

Year of Fire	1889	1910	1927	1929	Total*
Acres Burned	691	348	2,429	2,526	5,994

*The total includes overlap. See Figure 4 and Figure 5.

Major flood events in the 1890s, 1933, and 1936 followed large fires in 1887 and 1928. Other floods occurred in 1948, 1961, 1974, 1996, and 2002 (Charlie Tyson FEIS p. III-3: CT-5, W-8).

Records of people using the land in the Charlie Preston Project Area cover many decades, and people were probably using parts of the area before records were kept. We do not have evidence of Native Americans using the area, but it is likely they did long before European settlers came to the region.

Most of the private land in the Charlie Creek drainage was patented between 1901 and 1914 (Charlie Tyson FEIS III-1; CT-5). In 1907 approximately 30 percent of the Charlie Creek drainage became part of the new National Forest System (NFS) by a Presidential Proclamation. Forty-five percent of the current National Forest System was acquired through land exchanges in 1925, 1932, and 1934 (Charlie Tyson FEIS III-1; CT-5). Other, smaller exchanges continued into the 1970s for an additional five percent, bringing the total of NFS land in the Charlie Creek drainage to approximately 80 percent.

Currently approximately 89% or 6,560 acres of the Charlie Preston Project Area is National Forest System land. Approximately 824 acres are privately owned. The project area boundary follows the Forest Service compartment boundary line, so even though it includes some private land, no activities are proposed on private land, and the Forest Service has no jurisdiction on private land except for maintaining Charlie Creek Road 299 which crosses the northern part of the project area. The Forest Service shares in the maintenance of this road with Potlatch Corporation. Hume Creek Road 1479 is a Benewah County road that the county maintains from Highway 6 to the National Forest boundary.

The Charlie Preston project area is part of the Charlie Creek Grazing Allotment. Grazing has been permitted in the area since 1951. According to the Charlie Tyson FEIS (p. III-29; CT-5), in the 1920s over 4,000 annual unit months (AUM) of sheep and goats were grazed in the drainage; in the 1940s there were 400 AUMs of cattle and 2,000-11,000 AUMs of sheep and goats; and in the 1950s no sheep or goats were grazed. Other Forest Service records show the area around Preston Knob in Section 22 was heavily grazed by sheep (ACT-7). Natural meadows and logged areas became established hay fields and grazing areas. Some of these areas were revegetated with domestic pasture grasses for cattle forage (Charlie Tyson FEIS p. IV-25; CT-6).

Exploration for gold during the 1940s and 1950s channelized the lower ¼ mile of Preston Creek. Abandoned diversion ditches can still be seen in the riparian area along this section. (Charlie Tyson FEIS p. III-3: CT-5).

Since the early 1900s approximately 44 miles of road were built in the Charlie Preston Project Area (ACT-2; ACT-11). Approximately ten miles of that road are decommissioned; either by actively removing culverts and recontouring the road surface or by letting the road grow in until it is hydrologically neutral. About 34 miles of road remain. Road development in the Charlie Creek Drainage can be categorized into three eras. Each era indicates a transition in logging methods, road construction practices, and other forest management practices.

The primary modes of travel during the first era were walking, horses, wagons, and railroads were. Approximately 70 percent of the area was privately owned, and most of the railroad construction, road construction, and timber harvest took place on private land during this time. Riparian areas were heavily impacted by railroad grades and skid trails (ACT-2; ACT-3). Railroads were constructed along Hume Creek and along Charlie Creek to haul logs to the mills. Logging camps were common, and a splash dam in the East Fork of Charlie Creek was used to transport logs downstream. Timber was salvage logged after the big fires and the areas that did not burn were "high-graded" (See Figure 5). "High-grading" refers to the practice of removing the largest, best trees and leaving the smaller trees of less-desirable species. Horse and walking trails generally followed the ridges. As motor vehicles became more common early trails and railroad grades were converted to roads. Primary access routes in the stream bottoms in Charlie Creek, Hume Creek, and the East Fork of Charlie Creek were built during this period.

Transition into the second era occurred with several land exchanges. National Forest lands increased from 30 percent to 75 percent of the Charlie Creek drainage. National Forest lands became important sources of timber. Trucks replaced the railroads to get harvested timber to the mills, and chainsaws replaced cross-cut saws. Bulldozers made road construction easier, and logging methods changed. Tractors could skid logs faster than horses and on terrain where horses were not practical. Jammers facilitated harvesting steeper terrain, but they required 300-foot to 500-foot road spacing. Excavated skid trails and roads were constructed in side-drainages to get logs to the existing road system. Roads were constructed to low standards with little or no engineering design. Some of these roads continued to be used, and others became overgrown. The Forest Service was not only building roads and harvesting timber, but it was also actively managing the forests in other ways. Activity fuels were treated after timber harvest (ACT-9; ACT-10). Fire, herbicides, and mechanical methods were used to kill *Ribes* brush in the hopes of getting rid of the alternate host for white pine blister rust (ACT-7). Records show the Forest Service planted trees as early as 1940, then checked the planting success and re-planted when necessary (ACT-4, ACT-5, ACT-6, ACT-8, ACT-12). The Forest Service began thinning timber stands as early as 1965 (ACT-13).

In the third era multiple use, sustained yield, roadless areas, water quality, visual quality, and species extinction became national issues. As environmental laws were passed and implemented, interdisciplinary teams worked to address environmental concerns with public participation.

Improved cable logging systems extended external yarding distances, requiring fewer roads for access. Tractor logging on steeper slopes was reduced to avoid associated erosion, soil disturbance, and compaction. Instead of piling slash with bull dozer we began treating fuels in other ways including prescribed burning and grapple piling. Mitigation measures and higher construction standards were included in road designs to reduce environmental impacts. Gates and barriers became standard features to manage access and use to protect resources. During this time the Forest Service began actively decommissioning roads that were no longer needed.

Approximately 11 miles of road have been decommissioned and an additional 1.25 miles of road have been stored and culverts have been removed in the Charlie Preston project area.

Decommissioned Roads				Stored Roads	
Road #	**Miles Decommissioned**	**Road #**	**Miles Decommissioned**	**Road #**	**Miles Stored**
1947BUC	0.12	1955UH	0.3	1952	0.75
1947BUA	0.17	1955UG	0.3	1952A	0.5
1947BUB	0.1	1955UF	0.3	Total	1.25
1947UB	0.2	299UC	0.45		
1947UA	0.3	3322	2.25		
1947UC	0.5	1953	0.4		
1955UK	1	377JB	0.35		
1955UJ	1.25	377JA	0.14		
1955UI	1.2	1950A	1.5		
1955	0.3				
	Total		10.84		

The most recent Forest Service management activities in the Charlie Preston project area occurred in 2010 and included precommercial thinning and pruning authorized with the 2009 Timber Stand Improvement Project DM (ACT-18) and pocket gopher control authorized with the 2008 Pocket Gopher Control Project DM (ACT-17) in previously harvested stands. Herbicide was applied in the project area in 2010 to control noxious weeds. This was a continuation of treatments from previous years (ACT-16) authorized with the St. Joe Noxious Weed Project FEIS and ROD (1999). The most recently accomplished activities authorized by the Charlie Tyson Record of Decision (CT-1) were completed in 2009 when slash piles from the Charlie Brown and Charlie Horse II Timber Sales were burned on 42 stand acres. These areas had been piled in 2007. The last of the tree planting for the Charlie Tyson FEIS harvest units was completed in 2007. The most recent timber harvest was completed in 2005. That was a 12-acre commercial thin done with the Charlie Horse II Timber Sale.

The table below provides a record of timber harvest in the Charlie Preston Area in the ten years between 1995 and 2005 which was authorized with the Charlie Tyson ROD (1995). Timber harvest by decade going back to the 1950s is given the Activities Report. Also see Map 5 in Appendix A.

Table 18 – Timber Harvest Authorized by the Charlie Tyson ROD in the Charlie Preston Project Area

Year	Timber Sale	Silvicultural Prescription	Acres
1996	Iron Horse	Shelterwood w/ reserves	24
1997	Cow Pony	Sanitation Cut	18
1998	Horses Aspen	Commercial Thin	30
1999	----- No timber harvest -----		
2000	Charlie Brown	Commercial Thin	65
2001	Charlie Horse II	Clearcut w/ reserves	4
	Charlie Brown	Shelterwood w/ reserves	13
		Seedtree w/ reserves	50

Year	Timber Sale	Silvicultural Prescription	Acres
2002	Charlie Brown	Shelterwood w/ reserves	146
		Commercial Thin	90
		Seedtree Cut w/ reserves	90
		Shelterwood Final Removal	59
	Charlie Flight	Shelterwood w/ reserves	50
		Commercial Thin	95
2003	Charlie Brown	Shelterwood w/ reserves	10
	Charlie Horse II	Commercial Thin	6
2004	Charlie Brown	Shelterwood w/ reserves	12
		Commercial Thin	64
2005	Charlie Horse II	Commercial Thin	12
Total Timber Harvest in the Charlie Preston Project Area from the Charlie Tyson FEIS			838

Present (Ongoing) and Future Activities on National Forest System Lands

Fire Suppression: Wildfires may continue to be suppressed within the Charlie Preston Project Area to protect values at risk: property, homes, infrastructure, the investments in regeneration, and timber values. The forest plan says that confine, contain, and control are appropriate wildfire responses in Management Areas 1 and 4 (Forest Plan p. F-3). The Idaho Department of Lands has wildfire suppression responsibility within the Charlie Preston project area, and any suppression actions would be consistent with objectives for the area (Idaho Cooperative Fire Protection Agreement 2007-2012). The Forest Service may provide a resource advisor to guide suppression actions.

Mining: Recreational placer mining is permitted in a tributary to the East Fork of Charlie Creek near Melakwa Creek. Some mining activity occurs most years, and the level of activity fluctuates with the price of gold.

Cattle Grazing: The Charlie Preston project area is part of the Charlie Creek Grazing Allotment. There are currently 25 cow/calf pairs permitted on the Charlie Creek Allotment under a single permittee. These cattle are permitted from June 6 to October 15, annually. The Charlie Creek Allotment is managed as a single pasture grazing system. In June cattle are released in the project area. They tend to congregate at lower elevations for the first one to two weeks, often congregating at two flat open areas along Forest Service Road 1479. See the Range Report.

Noxious Weed Biocontrol Insects Expansion: The district weed program continues to treat St. Johnswort with biocontrols (insects that eat the plants). Knapweed also has well established biocontrol in the project area. See the Noxious Weeds Report.

Herbicide Spraying to Control Noxious Weeds: Herbicides are used according to the St. Joe Noxious Weed Control FEIS and ROD (1999). Weed treatments in the Charlie Preston are primarily herbicide treatments with a small amount of mechanical removal.

Research Plot Monitoring: These are white pine pruning and thinning plots established in the 1980s that are remeasured periodically.

Outfitter & Guide Permit for Idaho Whitetail Guides: Idaho Whitetail Guides operates an outfitter and guide business in the area between Potlatch, Idaho on the west, Clarkia on the east, Emida on the north, and Deary on the south. 30 use-days are allowed on the St. Joe Ranger District under the permit. The permit covers deer and elk hunting in the fall, bear hunting in the

spring and fall, mountain lion hunting in the fall and winter, and wolf hunts pending final approval. See project file document ACT-22.

Road Maintenance: Routine road maintenance is likely to occur as needed on existing roads in the project area. This includes the ongoing upkeep of roads necessary to retain the approved road management objective. Maintenance of existing roads and newly constructed roads is designed to minimize resource disturbance. Maintenance includes blading, brushing, drainage improvements, culvert maintenance, and surfacing. Road maintenance occurs regularly during active timber harvest (M-7) and as needed at other times.

Public Use of the Area: People use the project area for firewood gathering, berry picking, hunting, recreational driving, etc. The effects of these activities are generally considered with effects associated with open roads. Some unauthorized use of ATVs has occurred behind closed gates.

ATV use on lower part of Road 1950 and on Road 1954: The St. Joe Travel Management EA proposes to designate part of Road 1950 and all of Road 1954 for seasonal use by vehicles less than 50" wide (ATVs) (ACT-19). A decision for that project is expected in the near future. When the Motor Vehicle Use Map (MVUM) is published ATV use on those roads would be allowed as designated, but until the MVUM is published ATV use on those roads is prohibited.

Timber Stand Improvement: The following activities are planned on National Forest System lands within the Charlie Preston project area and have not been accomplished. Activities to control gophers in order to protect regeneration, authorized in the 2008 Pocket Gopher Control Project Decision Memo (ACT-17), would continue on nine acres in the project area. Precommercial thinning and pruning would be conducted according to the 2009 Timber Stand Improvement Project Decision Memo (ACT-18). Additional stands outside the project area in the Charlie Creek drainage are proposed to be thinned under the 2011 Precommercial Thinning and Pruning Project that is currently being considered (2011 PCT & Pruning Scoping [ACT-26]).

Past, present, and reasonably foreseeable future activities were identified from the FACTS database (ACT-24, ACT-25), aerial photographs from different years, the District Burned Area Map (ACT-1), physical evidence in the project area, information contained in the Charlie Tyson Final EIS (CT-5, CT-6), and the interdisciplinary team's knowledge of the area. The following lists of activities were considered for analysis of cumulative effects for the Charlie Preston cumulative effects analysis areas. If effects from these activities are still evident, they are considered in the cumulative effects analysis for the applicable resource. Details of past, present, and reasonably foreseeable activities are given in the Activities Report.

Table 19 – Past, Present, & Foreseeable Actions Considered for Cumulative Effects

Action	Past	Present	Future
Activities on National Forest System Lands			
Wildfires	X		unknown
Fire suppression	X	X	X
Homesteads	X		
Mining	X	X	X
Railroad grade construction and abandonment	X		
Splash dam in East Fork Charlie	X		
White pine blister rust control (fire, herbicides, pulling *Ribes spp.*)	X		
Off-site ponderosa pine planting in the 1940s and/or 1950s	X		
White pine planting in 1940s	X		
Slash piling and burning in 1953 & 1954	X		
Grazing – sheep and goats	X		
Grazing - cattle	X	X	X
Roads built for Preston Timber Sale and left to decommission on their own	X		
Other road construction	X		

Action	Past	Present	Future
Road decommissioning	X		
Noxious weed biocontrol (insect) expansion into the project area		X	
Herbicide spraying for noxious weeds	X	X	X
Research plot establishment and monitoring	X	X	X
Timber harvest	X		
Fuel treatments and site preparation	X		
Slashing	X		
Fireline construction	X		
Tree planting and fill-in replanting	X		
Fencing to protect regeneration	X		
Gopher control to protect regeneration	X		X
Precommercial thinning	X	X	X
White pine pruning	X	X	X
Fertilizing	X		
Seed production area establishment	X		
Watershed and fisheries improvement projects	X		
Soil productivity improvements	X		
Wildlife habitat improvement	X		
Outfitter & guide permit for Idaho Whitetail Guides	X	X	X
Road maintenance	X	X	X
Public firewood gathering	X	X	X
Public use of motorized vehicles	X	X	X
Other public recreational activities such as berry picking, hunting, hiking, etc.	X	X	X
Use of ATVs on Road 1954 and the lower part of Road 1950			X
Activities on Other Lands			
Wildfires	X		**unknown**
Timber harvest and associated silvicultural practices	X	X	X
Road construction	X		
Home sites	X	X	**likely**
Grazing	X	X	X
Hay production	X	X	X
Weed control	X	X	X
Mining	X		
Stream channelization	X		

Aquatic Resources - Watershed (see Watershed Report)

Analysis Area (Spatial and Temporal scale)

The project area is used for the analysis area for direct and indirect effects, and the cumulative effects area is the Charlie Creek watershed (6th level).

The Charlie Creek watershed is bounded by Bald Mountain to the south, Nakarna Mountain to the east, Tyson and Emida Peaks to the north, and the ridge dividing Hume Creek and Deep Creek on the west. All the project area streams flow into Charlie Creek directly or indirectly. The project area boundary encompasses a small portion of the Upper Santa Creek 6th code watershed; however, no activities are proposed in this watershed and therefore Upper Santa Creek is not discussed further.

Elevations within the project area range from a low of 3000 feet to 5000 feet in the headwaters of Preston Creek. Approximately 86 percent of the area is within the 3,000-4,500 foot contour interval “rain-on-snow” zone (PF, W-39). Some elevations within the Charlie Creek Watershed reach 7000 feet. Aspects are variable, but the area drains generally to the north. Slopes range from about five to over 60 percent in the project area.

The average annual precipitation in the watershed and project area is approximately 37.6 inches and over 50 inches in some of the higher elevations and less than 30 inches in lower elevations. The wettest month, on average, is January with 4.5 inches, and the driest month is July with 1 inch of precipitation. Average annual snowfall for nearby St Maries is 61.4 inches with the most falling in December and January (PF, W-40).

Within the watershed, valley types are typically broad in the lower reaches of the main tributaries and the lower main stem of Charlie Creek. Upper reaches of the East Fork of Charlie Creek and the West Fork of Charlie Creek and their tributary streams have narrow valleys and moderately-steep to steep side slopes. Ridge tops are generally broad and rounded. The watershed contains highly productive soils on slopes that are highly dissected and for the most part heavily vegetated with conifers, shrubs, forbs, and grasses. Valley bottoms in lower reaches of Charlie Creek are meadows utilized for grazing and hay production.

Table 20 – 7th Level Hydrologic Units and Stream Segments Within the Charlie Creek Project Area

7th Level Watershed Name	Acres (%)
Hume Creek	1344 (20%)
West Fork Charlie Creek & No Name Ck	2899 (44%)
Preston Creek	1267 (19%)
Fagan Creek	561 (9%)
East Fork Charlie Creek 1mile stream section	300 (6%)
Other stream segments along Lower Charlie Creek	190 aces (2%)

Temporal scales used in cumulative effects area discussions begin with the period starting in the late 1800s when Europeans began homesteading and wildfires burned large parts of the drainage and continue through reasonably foreseeable activities. Short-term effects are considered effects occurring in 1-5 years and long-term effects would be realized after 5 to 15 years and potentially beyond.

Methodology

The following changes resulting from the action alternatives were selected as the principal issues were used to evaluate potential effects:

1. water yield and peak flow
2. sediment delivery
3. stream stability
4. stream temperatures

The affected environment and existing condition section of the Watershed Specialist Report (PF, W-47) establishes a reference condition, provides insight into historical patterns and processes, and provides a basis for predicting the effects of natural and human disturbances.

The environmental consequences section below examines the potential direct and indirect effects of the proposed activities. The cumulative effects analysis below combines direct and indirect effects with effects of past, present, and reasonably foreseeable activities throughout the Charlie Creek watershed.

Models of ecological systems, used to understand the effects of natural events and human activities, attempt to evaluate extremely complex interactions of environmental variables. A model's output is meaningful only when it is used to evaluate conditions in combination with local knowledge, field data, and professional judgment. Although the models used in this

generate specific quantitative values for water yield and sediment, the results are only estimates, used to interpret how the natural system may respond under different scenarios (i.e. alternatives). The results of models used are not intended to predict exact quantities of water or sediment that could be produced or routed to the stream network (PF, W-47 pages 5-10).

Background and supporting information for this report was gathered from field data and reviews, District files, geographic information system (GIS) data, historical records, aerial photographs, and published and unpublished scientific literature. Additional research included discussions with Idaho Department of Environmental Quality personnel.

Principal Aquatics Issues and Indicators

The issues and indicators listed below in Table 21 were used to track watershed concerns.

Table 21 – Principal Watershed Issues and Indicators

Principal Aquatics Issue	Principal Issue Indicators
Water yield/peak flows/rain-on-snow	Potential change in water yield and peak flows
Water quality (sediment, roads)	Potential change in the magnitude of sediment yields
Stream channel stability	Predicted channel responses or changes that may result from natural events and human disturbance
Water quality (stream temperature)	Potential changes in vegetation within riparian areas and associated shade component

Water Yield/Peak Flows (W-47, pages 5-8)

The relationship between removal of vegetation by timber harvest and increases in water yield are well established. Snow accumulation and subsequent water yield are higher in open forest conditions, as would be created by timber harvest or fire (McCaughey and Farnes 2001; Skidmore et al. 1994; Molnau and Dodd 1995), and snowmelt may be advanced in time as well, moving peak flows to earlier in the spring (Farnes 2000).

The hydrologic processes affecting peak flows are: evapotranspiration, interception, cloud water interception, snow accumulation and melt rates, and soil compaction. Watershed sensitivity is considered in the evaluation of potential effects of water yield increases.

There are no streamflow records for any of the streams within the project area boundary or immediately downstream in Santa Creek; therefore, water yield modeling is used to assess relative changes. There is a USGS gauging site near the town of Santa, ID (PF, W-4) near where Santa Creek flows into the St. Maries River, and its data is also used to assess relative changes or trends in water yields and peak flows that have occurred in the St Maries River basin over time (PF, W-4).

An Excel worksheet titled “Water Yield Analysis” (WYA) was developed in 2002 by Tony Nelson, a hydrologist for the Montana Department of Natural Resources and Conservation (DNRC) (PF, W-28). WYA worksheets were used to estimate increased water yields from proposed activities in individual watersheds that have experienced past timber management, road building, or wildfires. The WYA worksheet uses the procedure discussed in “Forest Hydrology,

Hydrologic Effects of Vegetation Manipulation, Part II" (USDA Forest Service 1976) and follows the general principles (Equivalent Clear Cut Area, (ECA) concept) which is a similar concept as the one used in the WATSED model (USDA Forest Service 1990b) (Note: the WATSED Model was not used in this analysis). A detailed discussion of the WYA using the ECA concept, its assumptions, limitations, and value for use in this analysis in combination with other factors are found in the watershed report (W-47, pages 5-8).

Baseline peak flows for individual watersheds were estimated using USGS StreamStats. StreamStats does not account for management activities or specific storm events, therefore these estimates are used only as a baseline (PF, W-4). Peak flows in the cumulative effects area drainage are also estimated using USGS StreamStats (PF, W- 5, 7). However, StreamStats does not account for all past management activities that could adjust peak flows therefore measurements are assigned prediction errors of + or - 50%.

Peak flow assessment discussions, including rain on snow (ROS) events, are based on relevant and best available science literature findings (PF, W-47 pages 6, 7, 8). Uncertainty, controversy, and consideration for this watershed assessment regarding peak flow and water yield changes are taken into account and discussed in the watershed report (PF, W-47 pages 6, 7, 8).

Water Quality (Sediment and Roads) (PF, W-47, pages 8, 9, 10)

Water quality refers to the physical, chemical, and biological composition of a given water body and how these components affect beneficial uses.

Potential changes in peak flows from the proposed activities and the effects of peak flow changes on water quality (i.e. channel stability, sedimentation, erosion) within the project area is assessed through a combination of information from current literature, site-specific field information, GIS watershed information, extrapolation of offsite USGS stream gauging data, and professional judgment.

Several FS WEPP online interface tools were used as a means to compare sediment delivery from physical disturbances such as road construction and decommissioning, timber harvesting, and prescribed burning. These models and supporting documentation can be found at http://forest.moscowfsl.wsu.edu/fswepp/ (PF, W-48). The WEPP model is a physically based soil erosion model that provides estimates of soil erosion and sediment yield considering site-specific information about soil texture, climate, ground cover, and topographic settings (Elliot and others 2000). The surface erosion potential for the proposed treatments was estimated using the Water Erosion Prediction Project (WEPP) computer model.

The ROAD-WEPP interface of the model was used to estimate sediment delivery from roads and stream crossings within the project area. Road condition surveys and engineering road logs including examination of stream crossings and drainage structures (PF, W- 11, 11A) along with GIS information and knowledge of the area were used for data and parameters for the WEPP model. Road designs using current BMPs and design features (Appendix B and PF W-21A) were used with the WEPP model to estimate sediment outputs from new road construction, road reconstruction, and temporary road construction (PF, W-20, 21). A discussion regarding the assumptions, limitations, use, and value of the WEPP tools used in assessing sediment delivery is found in the watershed report (PF, W-47, pages 8-9).

Watershed road densities can further provide a relative measure of road/stream interaction and the relative risk for increased flows and sediment input into the hydrologic system. This is especially true for road density within the Riparian Conservation Areas (RHCAs) (See PF, W-47, page 10, 18 and 19) for further discussion of road densities and rating system used). This watershed

analysis uses road densities ratings to further qualitatively assess cumulative watershed impacts within the analysis area.

Stream Channel Stability Assessments

Conditions of stream channels from peak flow or water yield changes may reflect how watersheds with similar conditions and landtypes have responded over time to a similar history of disturbance. Stream channel data helps to provide an indicator of watershed condition and trend. Stream channels change because of both human-caused and natural events.

Stream channel responses to past flood or high flow events, including ROS events that may have occurred or may occur in the area, coupled with watershed activities such as logging and road building in the project area can provide qualitative insight to the sensitivity, resiliency, or stability of the stream channels and the relative ability of the streams to accommodate flow fluctuations. See the watershed report (PF, W-47, pages 10-14) for discussions regarding stream channel data collection methods, uncertainty, controversy, use, and value in assessing trends.

Stream channels were surveyed and/or monitored in the project area during the 2008, 2009, 2010, and 2011 field seasons by the project hydrologist, fisheries biologist, and hydrological technicians. (PF, W-12, 13, 14, 51, 51A, 51B, and 51C).

Aerial photography analysis of stream channels using photos taken between 1933 and 2009 (to investigate channel migration over time), current literature, Forest Service records, watershed information, GIS, and professional judgment were also used to investigate and assess exiting conditions and qualitative effects associated with past management. Older 1993 stream surveys were used as cross-reference information (PF, W-12A).

Stream classification, stability, dimensions, and substrate data were collected using concepts from Rosgen (1996) and monitoring and survey components from the Region 1 Aquatic Ecosystem Unit Inventory (AEUI) technical guide (PF W-13A), which incorporates the Rosgen methodology.

Stream systems normally function within natural ranges of temperature, sediment, flow, and other characteristics in dynamic equilibrium. When the system is pushed beyond these normal ranges, it may require intervention or protection to help restore or move toward “dynamic equilibrium”. When a stream is functioning at or near dynamic equilibrium, it has a greater ability to facilitate natural climactic or environmental fluctuations without unnatural channel degradation. Based on stream channel information gathered as well other watershed information available, stream channels are qualitatively assessed in terms of their current trend (toward or away from dynamic equilibrium). In 1996, Rosgen developed stream stability classes for each stream type, which also aids in this assessment. Refer to the table on page 6-30 and 8-1 in Applied River Morphology (Rosgen, 1996).

Stream type characterization using the Rosgen stream classification system provides a method for stratifying streams based on morphological characteristics such as channel gradient, sinuosity, width/depth ratio, dominant particle size of bed and bank materials, the entrenchment of channel, and the confinement of channel in the valley. Rosgen stream types are fully described in Rosgen 1996, and summarized in the watershed report (W-47 pages 11-12)

Rain-on-snow and resulting peak flows are natural processes in the area and are responsible for the overall morphology and stability of stream channels in the area. Grant et al. (2008) found that in ROS-dominated landscapes peak flow effects on channels is confined to reaches where the channel gradient is less than two percent and streambed and banks are composed of gravels and finer materials. An analysis of stream gradients within the project area was done to help assess

potential risk on low-gradient stream sections from peak flows in ROS landscapes (Table 23 and PF, W-47, pages 19-20).

Stream Temperature

Direct incoming solar radiation is the dominant energy input for increasing stream temperatures with shade being the single most important variable to reduce this heat input (Cobb 1988, Gravelle and Link 2007).

Gravelle and Link (2007) also found that riparian buffers effectively negated the effects of timber harvest impacts on stream temperatures in the reaches directly below harvested areas.

Stream temperature analysis is based on qualitative discussion regarding the existing TMDL and assessment (DEQ 2003) and recent direction from Idaho Department of Environmental Quality (IDEQ) (PF, W- 3- IDEQ letter 4/29/2011) that focuses on the Charlie Creek temperature TMDL. The TMDL review focused on intact riparian communities and their role in shading streams to provide natural stream temperatures. Targets in the TMDL were set using shade curves developed within the Idaho Panhandle National Forest to achieve full potential natural shade. Following the completion of the draft TMDL Charlie Creek was found to have an average lack of shade of 17 percent.

Qualitative assessment of stream temperature trends are based on field reviews, aerial photography interpretation of existing cover and shade, the condition and maintenance of RHCA buffers that maintain and increase shade, and information provided in the St. Maries River Subbasin Assessment and Total Maximum Daily Load (TMDL) (IDEQ 2003) and the IDEQ letter (4/21/2011).

Environmental Consequences

Alternative A (No Action) Direct and Indirect Effects

Since no additional management activities would be implemented with this alternative, there would be no direct effects from land management activities proposed in this analysis. Water and sediment yield values and trends would not change from existing conditions and predicted trends barring any future natural disturbances. The ECA model was used to generate an estimate of the existing water yield increase above natural for all of the Charlie Creek watershed and the project area combined drainages. The existing water yield increase over natural within the project area is currently estimated at 2.4 percent above natural annual water yield (PF, W-28, 29). It is important to note that not all land within the project area would have had canopy vegetation. Some areas of shallow rocky soils, meadows, and bogs would have been naturally open areas.

Road densities within the project area would likely remain unchanged. Existing roads could perpetuate sediment delivery from surface erosion and there may be increasing risk of culvert failures. Multiple stream crossings, ruts, rills, and head-cutting coupled with being in close proximity to the stream on segments of Roads 1950, 377JA, 1955UE, 1955A, and 1955B may not be properly addressed. Four stream crossings in West Fork Charlie Creek with undersized culverts, one undersized culvert on Hume Creek, and one undersized culvert on Preston Creek would not be addressed with this project. The road segments described above total about five miles in length and are contributing an estimated 3.6 tons of sediment per year into the project area stream and this sediment input would not be addressed or reduced with this project. Erosion and sediment delivery values for these existing roads were obtained using FS WEPP:Road (PF, W-19). Given no new management activities, existing sediment yield values in the project area may remain above natural background levels for many years until all existing roads are recovered

vegetatively. However, it is more likely that most existing roads and drainage structures would be maintained to minimize sedimentation and reduce risk of failure for the foreseeable future.

Alternative A would not treat fuels. Delaying harvest in overstocked timber stands could result in an increase in tree mortality and fuel build-up. Continued fuel loading may increase the risk of high-intensity wildfires that would kill vegetation in both upland and riparian areas. For example, Spigel and Robichaud (2007) report that in forested ecosystems in west central Montana, post-fire erosion can range from 0.1 – 38 tons/hectare/year depending on fire intensity, terrain, and climate. The main point of the above citation being that high intensity wildfires can reduce infiltration and increase run off and erosion in forest ecosystems.

High-intensity fires could burn through riparian and upland areas killing vegetation critical for stream stabilization and shade and buffer from overland flow and erosion (sedimentation). For example combined effects from past wildfires within the project area were estimated immediately (1 year) after fires to have contributed over 36,000 tons of sediment from 1887 to 2011 (WEPP analysis) (PF W-26). Increased runoff combined with a lack of vegetative cover to protect soils caused by wildfire effects could lead to increased peak stream flows, excessive sediment delivery, and consequent adverse impacts to stream channels and water quality.

Project area stream peak flows were estimated using USGS StreamStats (PF W- 4, 5, 6, 7). However, StreamStats does not account for all past management activities that could adjust peak flows; therefore measurements are assigned prediction errors of 50% + or -. Table 22 lists peak flow for the two- and fifty-year recurrence intervals in cubic feet per second (cfs) for drainages with proposed activities in the Charlie Preston area.

Table 22 – Peak Flow for 2- and 50-year Return Intervals

Watershed	Annual Precipitation	2-Year Peakflow	50-Year Peakflow
Hume Creek	37 inches	42 cfs	159 cfs
West Fork Charlie Creek, No Name Creek and Preston Creek	39 inches	123 cfs	400 cfs
Preston Creek	39 inches	42 cfs	132 cfs
Fagan Creek	38 inches	20 cfs	73 cfs

Analysis of yearly peak flow values from US Geological Survey (USGS) gauging station on the St. Maries River near Santa, Idaho, (short distance down-stream of the project area) indicates that there is no significant trend in peak flow values (PF, W-8) for the period of record, 1966-2010.

Within the project area, streamflow on average begins to increase in April as the snow pack melts, and peak flow is usually reached in May. Within the project area, not all snowmelt or rainfall immediately becomes surface runoff. The majority of the precipitation infiltrates the soil surface to become groundwater that percolates downward into the subsoil and bedrock, resurfacing in wet areas, small ponds, and perennial streams at various elevations below the point of infiltration. Slow release of groundwater provides stream base-flow beginning in mid-July and continues until the fall rains, which typically begin in mid-September.

According to recorded data from the USGS gauging site on the St. Maries River near Santa, Idaho annual peak streamflow usually occurs between January and May due to rain-on-snow events and spring snowmelt. These trends likely are similar to the flow in the project area. However, streams in the project area rarely overtop the channel banks and erode adjacent land areas. High

flows that erode the upper banks of the channel may occur every three to five years. The last major high flow events were in the April 2002 and February 1996 from rain-on-snow events (PF-W-8).

Rain-on-snow events, which can lead to rapid snowmelt in the area, could potentially affect peak flows. Changes in forest vegetation resulting from management or natural events can affect the frequency and magnitude of rain-on-snow events (Harr 1986). These events do not occur on an annual basis and they are dependent on certain climatic conditions such as air temperature, intensity and duration of precipitation, rain-on-snow elevations, and snowpack characteristics (Berris and Harr 1987). GIS analysis shows that about 86 percent of the project area falls within the rain-on-snow zone (PF W-39).

Rain-on-snow and resulting peak flows are natural processes in the area and are responsible for the overall morphology and stability of stream channels in the area. Grant et al. (2008) found that peak flow effects on channels is confined to reaches where the channel gradient is less than 0.02 and streambed and banks are composed of gravels and finer materials (see Table 23 below).

In a paper by Grant and others 2008 that focused on peak flow responses to forest practices in Washington and Oregon watersheds, it was concluded that generally when 15 percent of an area was harvested (15% ESA), detectible changes in peak flows (i.e. greater than 10 %) were made in rain-on-snow dominated landscapes. It was also concluded that harvest areas under 15 percent would have undetectable changes for peak flows.

Within the project area, the existing ECA is estimated at 10 percent, which means that 10 percent of project area exists in clear-cut conditions hydrologically (PF W-28, 29). Based on findings in Grant and others (2008) for rain-on-snow-dominated landscapes existing peak flow changes over natural levels would currently not be detectible within the project area. Peak flow changes would remain undetectable for Alternative A providing no large wildfires occur in the area in the future.

In addition, assuming no natural canopy openings from events such as wildfire within the project area, ECA values would continue to decrease from the existing 10 percent as past timber harvest stands continue to grow vegetation and canopy cover increases further. Existing water yield percent over baseline would decrease over time as ECA values decrease and canopy cover is maximized. Due to the existing roads ECA values would remain greater than zero and water yields would likely stay above baseline levels. As vegetation and cover continue to increase in the project area existing peak flow fluctuations theoretically would decrease given increased evapotranspiration and interception especially in rain-on-snow (ROS) zones.

Field surveys and monitoring conducted in 2008, 2009, and 2011 along with GIS analysis (elevations) and aerial photography analysis indicate that a majority of the channels in the project area are of the type that have low probability of damage from potentially moderate peak flows changes, given the channel type and gradient (see Table 23) and resiliency (Watershed Report Pages 19 through 26, PF W-51, 51A, 51B, 51C).

Table 23 – Stream Miles/7th Level Watershed or Stream Segment and Miles of Stream Gradient Class

7th Level Watershed Name	Stream miles Perennial* Intermittent**	Miles of Low Gradient Channel types <2%	Miles of Higher gradient Stream Channels >2%
Hume Creek	4.3* 2.5**	1.3	5.5
West Fork Charlie Creek & No Name Ck	12.9* 14**	1.3	25.6
Preston Creek	9.3* 4.7**	.8	13.2
Fagan Creek	4.6* 1.3**	.3	5.6
East Fork Charlie Creek 1 mile stream section	.3*	.1	.2
Other stream segments along Lower Charlie Creek (private)	3.0*	2.5	.5
Totals	34.4* 22.5**	6.2	50.3

The lower reaches of Preston Creek were noted in the Charlie Tyson EIS 1995 as having some aggradations of bedload that had caused some braiding to occur in the channel and possibly the formation of a 'D' channel type. Recent field reviews indicate that this section of stream has stabilized and has become well vegetated (PF, W-13, 14, 17). Given the elevations (conducive to rain-on-snow events), past management, existing roads, and large wildfires in the Charlie Preston Project area, moderate to large peak flow changes have likely occurred although it appears that stream channels were not appreciably affected (especially in the head waters), have recovered or are recovering from any past effects.

On 5/17/2011 the St. Joe Ranger District hydrologist and the Idaho Panhandle National Forest aquatics program manager visited the project area to observe stream channel function and stability during a spring runoff event (likely a bank full/ ROS event) (PF, W-51, 51A, 51B, 51C). All project area streams were functioning properly and no sign of appreciable bank erosion was noted. Stream banks appeared stable and well vegetated. LWD was present in most reaches and was effectively protecting stream banks and dissipating stream flow energy. All main stream channels were at or near bank full (2+ year flows). Streams within the project appeared to have low to very low turbidity. This indicates that stream channels within the project area are currently functioning appropriately and accommodating high-flow spring runoff events without appreciable stream bank disturbance and/or increase in turbidity.

Even though the stream channel downstream of the project area subwatersheds (lower main stem of Charlie Creek is a low gradient (less than two percent) stream which is composed of gravels and finer material) may theoretically be affected more by higher peak flows as literature suggested and even though short reaches of low gradient (less than two percent) stream channels do exist in transition zones near the mouths of Preston Creek, Fagan Creek, Charlie Creek, and Hume Creek, these channel sections are relatively stable and have shown resiliency to hydrological changes as discussed on pages 19 through 24 of the watershed report (PF W-47).

In the event of a large peak flow event today, the potential for negative impacts to stream channels is predominately caused by existing road/stream crossing failures (USDA Forest Service 1996).

Sediment yield values within the project area would slowly decrease from the existing condition of approximately 120 percent over background (DEQ 2003) as RHCA buffers continue to protect stream banks from erosion and promote vigorous riparian vegetation. Although, "high" road

densities within the project area would remain a sediment source especially densities within riparian zones.

Given no new management activities, existing sediment yield values in the project area may remain above natural background levels for many years or at least until all existing roads are recovered vegetatively. However, it is more likely that some existing roads (especially public access roads) in the project area would be maintained to minimize sedimentation and reduce risk of failure for the foreseeable future. Other less used, previously mentioned roads, would remain at risk of failure and/or a sedimentation source.

Overall, stream channels within the project area would continue to improve slowly and trend toward dynamic equilibrium as RHCA buffers protect riparian areas, continue to grow canopy cover and riparian vegetation, and as large woody debris (LWD) is recruited to the stream channels. Field surveys and monitoring conducted in 2008, 2009, and 2011 along with GIS analysis (elevations) and aerial photography analysis indicate that streams within the project area are generally stable, well vegetated, and have shown resiliency over time. Stream channel segments within the West Fork of Charlie Creek and Hume Creek, although currently stable, would have difficulty naturally trending toward dynamic equilibrium due to road segments within the riparian zone. Because of this riparian road, stream channels are unable to function naturally within their flood plains and hydrologic networks.

Direct incoming solar radiation is the dominant energy input for increasing stream temperatures with shade being the single most important variable to reduce this heat input (Cobb 1988, Gravelle and Link 2007).

Stream temperatures within the project area would continue to improve (decrease) as RHCAs continue to grow vegetative canopy cover and as LWD is recruited to the stream channels.

Alternative A Cumulative Effects

Peak flows in the cumulative effects area drainage are also estimated using USGS StreamStats (PF, W- 5, 7). However, StreamStats does not account for all past management activities that could adjust peak flows therefore measurements are assigned prediction errors of + or - 50%. Table 24 lists peak flow for the two- and fifty-year recurrence intervals in cubic feet per second (cfs) for the Charlie Creek watershed.

Table 24 – Peak Flow for 2- and 50-year Return Intervals

Watershed	Annual Precipitation	2 Year Peakflow	50 Year Peakflow
Charlie Creek Watershed all	38 inches	428 cfs	1370 cfs

Data from USGS StreamStats (http://water.usgs.gov/osw/streamstats)

Mean annual flow for Charlie Creek watershed measured at its mouth on the Charlie Creek mainstem is estimated at 43.9 cubic feet per second using USGS StreamStats (PF, W-5).

Within the cumulative effects area, on average streamflow begins to increase in April as the snow pack melts, and peak flow is usually reached in May. Not all snowmelt or rainfall immediately becomes surface runoff. The majority of the precipitation infiltrates the soil surface to become groundwater that percolates downward into the subsoil and bedrock, resurfacing in wet areas, small ponds, and perennial streams at various elevations below the point of infiltration. Slow release of groundwater provides stream base-flow beginning in mid-July and continues until the fall rains, which typically begin in mid-September.

Analysis of yearly peak flow values from US Geological Survey (USGS) gauging station on the St. Maries River near Santa, Idaho, (short distance down-stream of the project area) indicates that there is no notable trend in water yield values (PF, W-8) for the period of record, 1966-2010 within the St. Maries River Basin which includes Charlie Creek.

According to recorded data from the USGS gauging site, annual peak streamflow usually occurs between January and May due to rain-on-snow events and spring snowmelt. These trends likely are similar to the flows in the cumulative effects area. However, most streams in the Charlie Creek watershed appear to rarely overtop the channel banks and erode adjacent land areas. More typically, higher flows that can erode the upper banks of stream channels would more likely occur in three to five or more year event. However the last major high flow events in the basin that had more potential to erode or change stream channels were in the April 2002 and February 1996 from rain-on-snow events (PF, W-8). No detrimental effects from past floods to stream channels were documented or noted in recent stream surveys and/or investigations in the cumulative effects area.

Homesteading, past vegetative treatments, road building, wildfire, and past fire suppression may have cumulatively affected the Charlie Creek watershed hydrology through changes of the hydrologic cycle. However, 45 years of trend data of yearly peak flow values from the USGS gauging station on the St. Maries River indicate practically no change in peak flow at the basin scale.

Changes in canopy cover or density affect transpiration, interception, snow accumulation, evaporation from the ground surface (wind velocity and radiation balance changes), sublimation, and organic material accumulation. Changes or fluctuations in water yield and peak flows may have resulted within the Charlie Creek Watershed from change in the vegetative structure over time. Basin hydrology responds to these changes by adjusting components of the hydrologic cycle. Considering geologic timeframes, the Charlie Creek Watershed has likely experienced all vegetative conditions: from extreme fire behavior that created hydrophobic soil conditions and large runoff events to overstocked, dense stands of timber that utilized most soil moisture and intercepted much precipitation (especially snow) and reduced water yields to minimal levels in which some streams may have dried up early or had no flow.

Given the habitat types that exist within the Charlie Creek watershed and associated recovery potential (W-38, 38A), past large openings (ECAs) can take up to 60 years to fully recover hydrologically. Most previously harvested areas within the Charlie Creek Watershed are now well vegetated with large and medium sized trees, poles, shrubs, and/or grasses (ground cover) due to highly productive site conditions for vegetation growth (habitat types) that exist in the Charlie Creek watershed (Fuels Specialist Report, II E 1, Forest Vegetation Specialist Report Page 4-5, Forest Plan Appendix A, A3-Habitat Type, W-38). These past harvested areas are likely not contributing measurable or appreciable sediment to streams at the watershed scale given protective stream buffers, natural vegetative recovery, reforestation, increased ground cover and a reduction in roads (W-10A). In general the watershed is likely well on the way to hydrologically recovering from the past vegetation treatments and/or wildfires.

The ECA model was used to generate an estimate of the existing water yield increase above natural for all of the Charlie Creek watershed and the project area combined drainages. The existing water yield increase over natural annual water yield conditions was estimated at 2.8% (cumulative effects area) (PF, W-28, 29).

Water yield increase above natural water yield conditions (i.e. 100% cover) for the Charlie Creek watershed after the 7000-acre 1889 wildfire was estimated to have increased by 8.2% (table 7). This suggests that the existing conditions for water yield are well within the natural range of

variability and are currently below water yield peaks that likely occurred in the watershed naturally in the past. Pre-1950 road and railroad building and timber harvest would have likely elevated water yields as well.

Although vegetative recovery is occurring on some existing roads, existing management and canopy removal on private land and post-1950 timber harvest (mostly recovered) are the primary components driving the water yields over baseline today. Not all land within the Charlie Creek watershed has canopy vegetation naturally. Some area of shallow rocky soils, meadows, and bogs are naturally open areas.

Within the Charlie Creek drainage, the existing cumulative ECA is 12 percent, which means that 12 percent of cumulative effects area exists in clear-cut conditions hydrologically (PF W-28, 29). Based on findings in Grant and others (2008) for rain-on-snow-dominated landscapes, existing peak flow changes over natural levels would be slightly detectible at the Charlie Creek Watershed level indicating a slight cumulative effect in water yields from past canopy openings including roads.

Field surveys and monitoring conducted in 2008 and 2009, along with GIS analysis (elevations) and aerial photography analysis, indicate that many of the channels in the watershed are of the type that have low probability of damage due to higher peak flows from ROS events given the bulk of channel types and stream gradients less than two percent (Table 23). However, the stream channel in the lower main stem of Charlie Creek is a sustained low-gradient stream segment that is composed of gravels and finer material which may be affected more by higher peak flows from ROS events.

Given the elevations (conducive to rain-on-snow events), past management, existing roads, and large wildfires in the watershed, moderate to large peak flow changes have likely occurred although it appears that stream channels were not appreciably affected (especially in the head waters), have recovered, or are recovering from any past effects (see watershed report pages 10-14).

As previously stated, on 5/17/2011 the St. Joe Ranger District hydrologist and the Idaho Panhandle National Forest aquatics program manager (Forest Hydrologist) visited the Charlie Creek watershed to observe stream channel function and stability during a spring peak-runoff event (likely bank full/ROS event). According to the data provided by the USGS gauging site at Santa which is downstream of the project area (W-60), May 2011 had the highest flows (cfs) of any month in 2011. Flows in May of 2011 were the highest of any monthly flows since April 1997. One of the highest daily peaks for the basin in May 2011 was during the 5/17/2011 field visit time frame (W-60).

Project area and watershed main-stem streams were functioning properly and no sign of appreciable bank erosion was noted. Streams within the watershed appeared to have low to very low turbidity (PF W-51, 51A, 51B, 51C). Stream banks appeared stable and well vegetated. LWD was present in most reaches and was effectively protecting stream banks and dissipating stream flow energy. However, further LWD enhancement/habitat restoration work in sections of Preston Creek, West Fork Charlie Creek and Hume Creek would continue to improve aquatic habitat (beneficial uses) and fortify stream banks long term (see EA Map 4, W-47 page 36). All main, stream channels were at or near bank full (2+ year flows). This indicates that stream channels within the project area are currently functioning appropriately and accommodating high-flow spring runoff events without appreciable stream bank disturbance and/or increase in turbidity. Stream channel segments in the lower Charlie Creek, which flows through private land used for grazing and homesteading, appeared to have some elevated turbidity which indicated a possible sign of recent or active localized bank erosion. It appeared that most of the localized

bank erosion was occurring in areas were vegetation was disturbed along the channel from cattle grazing. These segments of stream channel in the lower Charlie Creek, through private land, would remain susceptible to localized bank erosion due to stream side vegetation disturbances, as it likely has since homesteading and grazing began over 80 years ago. Some of these areas have been re-vegetated with domestic pasture grasses for cattle forage (Charlie Tyson FEIS p. IV-25; CT-6) which may be less suitable for bank protection and stability due to shallow roots than native grasses with deep roots. Regardless of upstream watershed disturbances, ongoing concentrated grazing in this reach will likely continue to affect localized riparian vegetation and stream banks. Even though this reach has been subject to a long history of grazing, the overall stream channel segment appears to have maintained relative horizontal and vertical stability over time (W-37, 51).

Other riparian areas within the project area within Charlie Creek on forested National Forest System lands are part of the Charlie Creek Grazing Allotment. Grazing has been permitted in the area since 1951. Surveys for allotment monitoring completed in 1998 (USDA FS, 1999a, St. Maries Grazing Allotment EA) and continuing mid and end of season monitoring through 2010 (*Range Report*) indicate that the condition of the riparian vegetation in the Charlie Creek Allotment is stable. This is likely due to the limited periods for grazing and the fact cattle in the more forested non-gated areas dissipate and move around thus create limited grazing concentration situations that could affect riparian vegetation. Therefore, cattle grazing on National Forest System lands is likely not causing measurable sedimentation from riparian disturbances as noted above and would likely not cause future measureable sedimentation, given the current level of grazing does not appreciably increase.

Assuming no natural canopy openings from events such as wildfire within the cumulative effects area, estimated ECA values would continue to decrease from the existing 12 percent as past timber harvest stands continue to grow vegetation and canopy cover increases. Existing water yield percent over baseline would decrease over time as ECA values decrease and canopy cover is maximized. Due to the existing roads, ECA values would remain greater than zero and water yields would likely stay above baseline levels. As vegetation and cover continues to increase in the cumulative effects area, peak flow fluctuations theoretically would decrease given increased evapotranspiration and interception, especially in ROS zones.

At least 10 miles of other road segments that were not modeled for sediment reductions but have been decommissioned or reclaimed naturally and have had drainages structures pulled since the early 2000s were identified in other parts of the Charlie Creek watershed (W-11, 11A). It is very likely these reclaimed roads produce less sediment than they did before the drainage structures were removed.

Additionally since 2003, approximately 11.4 miles of road have been mechanically or naturally decommissioned with drainage structures removed, which has reduced risks of failure and cumulative effects and was modeled to have reduced sediment by approximately 11 tons/year within the cumulative effects area (W-10A, 24).

Although several miles of road have been reduced by the Forest Service within the watershed over the past ten years, watershed road densities would not be further reduced with Alternative A. There are approximately 85 miles of road within the cumulative effects area. Some of these roads, especially the riparian roads or where there is high hydrologic connectivity at the multiple stream crossings or on roads exhibiting ruts and rills, would continue to contribute erosion and sedimentation to streams and may have potential for failure in extreme flood events.

This alternative would not address fuel conditions that could reduce wildfire risks as described above. High intensity fires could burn through riparian and upland areas within the cumulative

effects area killing vegetation critical for stream stabilization, shade, and buffer from overland flow and erosion (sedimentation).

The effects of ongoing and reasonably foreseeable activities within the cumulative effects area would result in no substantial changes over the existing condition other than the sustained fuel load and fire risk and the continued existence and sediment inputs from RHCA roads or roads that would not be reconstructed (improved), stored (hydrologically inert).

Given that most riparian areas in the watershed would remain relatively undisturbed (especially in the upper drainages), overall stream shade should increase over time and trend toward meeting the TMDL shade targets set for Charlie Creek.

Table 25 – Alternative A Summary of Trends Regarding Principal Watershed Issues and Indicators

Principal Aquatics Issue	Principal Issue Indicators	Trend
Water yield/peak flows (rain-on-snow)	Change in water yield and peak flows.	Trend toward 100 % cover long term if no new large-scale canopy opening events occur such as wildfire.
Water quality (sediment, roads)	Change in the magnitude of sediment yields.	Slight trend toward long-term reduction with overall vegetative recovery. Along with naturally occurring sediment watershed roads and activities on private land activity would likely continue to cause some sediment sources.
Stream channel stability	Predicted channel responses or changes that may result from natural events and human disturbance.	Stream channel stability throughout watershed would to generally trend toward improvement given stream buffer protection and proper grazing management occurs. Riparian roads would be a limiting factor in trending toward improvement on some streams channels such as Hume Creek (Watershed Report)
Water quality (stream temperature)	Changes in vegetation within riparian areas and associated shade component.	In general, vegetation within riparian areas and associated shade components would continue to be protected with RHCA buffers and stream temperatures would continue to be reduced over time given that large-scale wildfire do not occur.

Alternative B Direct and Indirect Effects

Water Yield / Peak Flows

Alternative B would likely increase water yields over the existing condition (based on ECA modeling) due to the canopy openings created by the timber harvest, prescribed burning, fuel treatments and proposed road construction. Increases in water yield would likely not be detectable in the project area streams (*see below*) and would likely not be differentiated from normal climatic fluctuations within the project area.

According to the ECA analysis, the proposed activities in Alternative B would indirectly increase the annual water yield in the project area streams by approximately 2.9%, which would increase the total annual water yield over baseline to 5.3 % (PF, W-30). Annual water yields would likely

decrease by at least 1% within ten years of harvest due to vegetative recovery (PF, W-30) as well as the proposed road decommissioning.

If annual water yields increase to modeled levels after proposed activities are implemented they would likely have little effect on stream channels due to the streams' morphological characteristics, ability to deal with flow fluctuations, overall stability, wood component, and existing stream side vegetation (*See Affected Environment Section of the Watershed Report*). Water yield would decrease as stands become re-vegetated and canopy increases.

There was an estimated annual water yield increase of 8.2% over natural baseline due to the large canopy openings from a past wildfire event (PF W-32) (table 7). The effects of Alternative B activities are within the historic range of variability when comparing the difference in water yield changes from the proposed activity and the existing condition to water yield changes associated with single large canopy-opening events such as wildfires.

The proposed timber harvest would result in a direct canopy reduction or ECA of 13%. Directly, a 13% ECA increase would not result in a detectable change in peak flows over the existing condition (Grant and others 2008). When the 13% increase is added to the existing ECA of 10%, slight peak flow changes may be noticeable in the project area streams.

Activities would occur on landtypes with moderate or low mass failure potential and surface erosion potential (Table 43). Moderate and low surface erosion indicates moderate to good soil permeability, which limits overland erosion.

Small stream flow fluctuations that may occur would be relatively short term. Percentage change in peak flow generally decreases with time after harvest (Jones 2000, Jones and Grant 1996, Thomas and Megahan 1998). We use this general finding to guide our analysis by reporting peak flow increases for the first postharvest interval, generally 2 to 5 years (Grant 2008). As harvested areas become well re-vegetated after 2 to 5 years, any peak flow fluctuations caused by changes in cover would likely decrease through increased evapotranspiration.

Evidence does not indicate that forest harvest increases peak flow for storms with recurrence intervals longer than 6 years (Grant 2008). This interpretation is consistent with hydrologic theory that predicts diminishing effect of forest harvest with increasing flow magnitude (Leopold 1980). Therefore, effects from the proposed activities on peak flows would also likely not be discernable at larger recurrence intervals or large flood events such as the one that occurred in 1996.

The proposed action would more likely raise peak flows minimally to a small amount in the 1st order small headwater streams within the project area over the existing condition.

This was also predicted for approximately the same area with similar proposed activities in the 1995 Charlie Tyson EIS watershed assessment and is predicted the Charlie Preston project area based on literature reviews discussed. This rise in peak flows would likely occur at storm reoccurrence levels of less than 6 years. However, these peak flow changes would likely be undetectable given the information above, limited canopy openings, implementation of RHCA stream buffers, use of water and soil best management practices (BMPs) (Appendix B), aquatic and soils design features requiring coarse woody debris to be left (reduces surface runoff potential), limited ground base disturbance (compaction), protection against surface erosion (See Soils Report), and the fact that activity would not occur on highly sensitive landtypes.

As previously stated any increase in peak flows would be short term as evapotranspiration rates would increase rapidly with re-vegetation. If peak flows do increase a small amount due to increased canopy openings, they would likely have little direct or indirect effects on stream

channels based on the channels assessed stability, structure (form and function), existing conditions, vigorous vegetative components and demonstrated ability to accommodate peak flow changes and flood events in the past with little evidence of channel degradation.

Table 26 – Alternative B Water Yield and Peak Flow Changes

Project Drainage Area	Existing			Alternative B		
	ECA	Water Yield % over Natural*	Water Yields from Past Fires**	(Change in ECA) and total ECA	(Change in Water yield) and Total Annual Water Yield	Potential Peak Flow Increase based on ECA (Grant2008)
7384 ac	10% includes private land	2.4%	8.2%	(13%) 23%	(2.9%) 5.3%	3% to 9%

**Natural assumes 100% cover*
***Estimated water yield from past fires indicates the natural range*

Sediment Yield

The estimated short-term increases in sediment yield associated with this project (all road work and harvest) would likely not be measurable in the project area streams.

Overall, long-term sediment reductions from the proposed road closures and decommissioning would improve water quality and stream channel conditions and therefore would meet the intent of the total maximum daily load (TMDL) assigned by the Idaho Department of Environmental Quality and move the streams toward improving conditions of beneficial uses (PF, W-3).

Activities would occur on landtypes with moderate or low mass failure potential and surface erosion potential (Table 43). Activities would not occur on landtypes with "high" mass failure potential or "high" surface erosion potential (PF, W-43). Moderate and low surface erosion indicates moderate to good soil permeability, which limits overland erosion.
Best Management Practices (BMPs) are techniques that have been proven to be effective in preventing excessive erosion and protecting water quality. The Idaho Panhandle National Forest primarily uses BMPs as detailed and outlined in Appendix B of the Charlie Preston EA which states that the listed BMPs tier to practices outlined Region 1/4 Forest Service Handbook direction 2509.22 (Soil and Water Conservation Practices Handbook). Based on Forest Plan monitoring efforts, conducted from 2002-2007, the application of BMPs has been shown to be highly effective in protecting water quality on the Forest (PF, W-52, W-53, W-54, W-55 and W-56). Not only have BMPs been proven to be effective on the Forest, there is a high compliance rating when applying these practices on Forest Service lands in Idaho. An interagency water quality audit was conducted in 2008, and federal agencies were observed to have had 98% compliance. Two projects on the Idaho Panhandle National Forests were audited during that time (see PF W- 57 discussion of Bear Paws and Bear South in USDA Forest Service 2009 p. 72).

Changes in sediment yield values within the project area for Alternative B over the time periods affected by this project are summarized in the table below and are based on WEPP analysis (PF, W-21 though 27). Logging and timber harvest prescriptions (including the 82 acre Rx burn), temporary and new road construction, road reconstruction, road maintenance, road storage and road decommissioning and post-harvest activities are modeled (PF, W-20, 21, 22, 23, 27). See Watershed Report for more details (PF, W- 47).

Table 27 – Alternative B Estimated Sediment Yield Changes

Activity	Short-Term Effects (1-5 years)	Long-Term Effects (~ 10-15 years)	Total Change After 15 years
1546 acres harvest/fuel treatments & 82-acre Rx burn	+15 tons over 2 years	reduced potential effects to water quality through stand improvement	+15 tons
4.5 miles of new road construction	minimal	minimal	+.5 ton
2.4 miles of road re-construction and subsequent storage (removes ~ 15 culverts)	improved water quality	reduction in sediment once roads are closed	-14 tons
.6 miles of temp road construction	no additional sediment due to location& short-term status	none	0
Decommission (.6 miles of road)	small sediment pulse during and immediately after decommissioning	reduction in sediment from existing condition once roads are decommissioned	-2 tons
2 miles of existing road storage (includes 1.75 miles of encroaching or high risk road & removes 15 culverts)	small sediment pulse during and immediately after decommission	2.4 tons/yr reduction once all roads are stored	-24 tons
Total project sediment increase			+15.5 tons increase over 15 years
Total project sediment decrease			- 40 tons reduced over 15 yrs
Net Sediment Product			-25 tons over 15 years with a -1.6 tons/yr average

Cumulative totals are for a 15-year time frame. However, overall annual sediment reductions may continue for the foreseeable future; WEPP results are based on the average return (2-year event) interval for 30 years of predicted climate (PF, W-48); All numbers to nearest 10th.

Assumes:

- All work to be done according to the most current BMPs (PF, W-21A)
- New construction would be stored after 5 years after contract is signed although they may be stored sooner.
- Existing road storage and decommissioning would occur in 5 years although they may be stored or decommissioned sooner.
- All harvest would occur in year one (worst-case scenario) although it is likely that harvest would occur over 5 years or more.

Road Densities

Changes in road densities would occur with the implementation of the Alternative B. After harvest and post-harvest treatments, 4.4 miles of existing road would be stored and 0.6 miles would be decommissioned and would be considered hydrologically inert. Approximately 4.5 miles of newly constructed roads would be stored after use and would be considered hydrologically inert.

The newly constructed roads would increase road densities for approximately five years until they are hydrologically stored.

Upon the completion of the harvest treatments, post harvest treatments, and subsequent road decommissioning and closures, there would be an overall decrease in road density in the project

area. Approximately 2.5 miles of the exiting road to be closed would occur in the West Fork Charlie Creek Subwatershed and about 2.0 miles in the Preston Creek Subwatershed. 0.3 miles of the exiting road to be decommissioned would occur in the West Fork Charlie Creek Subwatershed and 0.3 miles in the Preston Creek Subwatershed.

This lower road density, especially within RHCAs, would help decrease the overall effects of roads on flows (ECA) and decrease the overall potential for sedimentation into stream networks.

Stream Channel Stability

Based on stream channel responses from past disturbances within the project area and the existing stream channel and landtype characteristics within the project area, the estimated changes in flows, sediment yields, and the potential increases in flows from rain-on-snow (ROS) events would not appreciably affect stream channel stability from any of the activities proposed in Alternative B.

Project area streams are generally stable channel types. The dominant stream bank material in the project area is primarily composed of boulders and cobbles that are not easily erodible. In addition, most channels are well confined and entrenched, which allow sediment and debris to be easily transported. Most of the project area stream channels are not alluvial or low gradient (< 2%) channels, which are more susceptible to changes in peak flows. Low-gradient (< 2%) channel segments within the project area appear to be relatively stable and have shown resiliency to effects from disturbances (PF, W-47 pages 19-26, PF, W-51, 51A, 51B, 51C).

Within the project area 1st order streams (headwater streams) channels are such that they are composed mostly of boulders, cobbles and bedrock that have a good portion of large woody debris jams, are more confined and are more stable with respect to fluctuations in flow and sediment yields according to Chamberlin et al. 1991 and Grant et al. 2008.

Stream channels were monitored and surveyed to document the current condition and assess potential future or past effects associated with peak flows and water yield changes (in-channel erosion). Recent stream investigations indicated overall intact and stable stream channels and riparian areas with the project area streams. No major stream channel disturbance or erosion was discovered or noted during 2008, 2009, 2010 and 2011 streams surveys, field reviews or monitoring (PF, W-12, 13, 14, 51, 51A, 51B, 51C). Stream survey data from 2008 and 2009 indicate that woody debris recruitment and abundance levels are relatively moderate to high in most stream reaches. Large woody debris (LWD) creates pool features and fish habitat and dissipates stream energy.

Alternative B may minimally modify the magnitude, intensity, and duration of flows and sediment yields at different levels. Changes that may occur with respect to peak flow and water yield with Alternative B would be well within natural rages of variability for the project area. Theoretically, changes in the magnitude, intensity, or duration of peak flows and sediment yields have the potential to change stream channel characteristics. According to Grant and others, to date no field studies explicitly link peak flow increases with changes in channel morphology. Although there is extensive literature on forest harvest effects on stream channels, studies have not demonstrated a direct correlation between peak flow changes attributed to forest harvest alone and changes to the physical structure of streams (Grant and others 2008).

Protection of RHCAs would continue to aid project area streams in trending toward dynamic equilibrium. Restoration and enhancement of selected stream reaches within the project area in conjunction with protection of RHCAs and the proposed road storage and decommission would

likely improve overall stream channel function and stability in the long term within the project area.

Stream Temperatures

Alternative B would decrease stream temperatures throughout the project area over the long-term.

Shade controls direct solar radiation and thus heat influx in small forest streams. Charlie Preston project would include riparian habitat conservation area (RHCA) buffers as described in the Inland Native Fish Strategy (INFS) (USDA 1995) to protect the stream from increased solar radiation by retaining canopy cover therefore the proposed action which includes timber harvesting would not decrease shade.

Alternative B also proposes to plant riparian vegetation along Hume Creek, Preston Creek, and West Fork Charlie Creek that would further promote riparian shade and reduce stream temperatures long term.

Roadside fuels treatments proposed would not reduce canopies or stream shade. Along segments of Hume Creek, the road lies between the stream and the proposed treatment areas therefore potential recruitment or shade would not be reduced beyond the existing condition.

Given that riparian areas would remain undisturbed and/or would be enhanced, overall stream shade should increase over time and would trend toward meeting the TMDL target set for Charlie Creek in the future.

Effects to Water Quality from Other Proposed Activities

Roadside fuel reduction treatments would not change water yields or peak flows or affect stream channels. Watershed conditions would have increased protection by fewer ladder fuels and thus reduced risk of potential wildfire effects. At road crossings on intermittent streams, crossings would be reviewed by a fisheries biologist or hydrologist and archaeologist to determine if roadside fuel treatment could be applied within the 50-foot RHCA buffer (See design features). Pocket gopher treatments would have no negative effects to water quality given the aquatics design features. The 30-acre Bald Mountain fuels reduction unit would have no effect on water quality because there are no streams in the area.

Proposed roadside fuels treatments would not increase sediment to streams because RHCA buffers would be implemented.

This project proposes riparian planting and LWD enhancement/habitat restoration work in Preston Creek, Fagan Creek, and West Fork Charlie Creek based on available funding and materials. There would likely be small sediment pulse during and immediately after restoration construction. Long-term reduction in sediment and temperature within the project area would occur due to increased stream bank stability, stream function and canopy shade. Maintained and protected INFS buffers would move canopies towards TMDL targets and reduced stream temperatures.

Alternative C Direct and Indirect Effects

Water Yield / Peak Flows

For Alternative C, increases in water yield over existing conditions due to canopy reductions created by the timber harvest, prescribed burning, fuel treatments and road construction, would likely not be detectable in the project area streams and would likely not be differentiated from normal climatic fluctuations.

The potential effects of Alternative C activities on peak flows and water yields would be small relative to the modeled changes in flows that occurred from past large canopy openings created by wildfires.

According to the ECA analysis, Alternative C would increase the annual water yield in the project area streams approximately 1.6 % over the existing condition, which is currently 2.4 % over baseline.

Alternative C would increase the ECA by 7% (PF W-31). Given the results of Grant and others (2008) and Stednick (1996), the projected 7% increase or direct changes in harvested area (ECA) for Alternative C would not show a detectible change in peak flows over the existing conditions. Even when added to the existing ECA, according to Grant and others (2008), the change in peak flows resulting from the proposed timber harvest and road construction would be barely detectable.

If annual water yields increase to modeled levels after proposed activities are implemented they would likely have little effect on stream channels due to the streams' morphological characteristics, ability to deal with flow fluctuations, overall stability, wood component, and existing stream side vegetation (*See Affected Environment Section of the Watershed Report*). Water yield would decrease as stands become re-vegetated and canopy increases.

Activities would occur on landtypes with moderate or low mass failure potential and surface erosion potential. Moderate and low surface erosion indicates moderate to good soil permeability, which limits overland erosion.

Overall, Alternative C would indirectly raise peak flows a small amount in the 1st order headwater streams within the project area. However these changes would likely be undetectable given the relative small change in ECA, implementation of RHCA stream buffers, BMPs (Appendix B), and design features that require coarse woody debris to be left (reduces surface runoff potential) and limit ground base disturbance (compaction). Any increase in peak flows would be short term as evapotranspiration rates would increase rapidly with vegetation growth due to highly productive site conditions for vegetation growth (Fuels Specialist Report, II E 1, Forest Vegetation Specialist Report Page 4-5, Forest Plan Appendix A, A3-Habitat Type, W-38). Table 28 summarizes the modeled water yield and ECA changes associated with the proposed activities.

Table 28 – Alternative C Estimated Water Yield Changes

Project Drainage Area	Existing			Alternative C		
	ECA	Water Yield % over Natural*	Water Yields from Past Fires**	(Change in ECA) and total ECA	(Change in Water yield) and Total Annual Water Yield	Potential Peak Flow Increase based on ECA (Grant 2008)
7384 ac	10% includes private land	2.4%	8.2%	(7%) 17%	(1.6%) 4.0%	>3%

**Natural assumes 100% cover*

***Estimated water yield from past fires indicates the natural range*

Sediment Yield

The estimated short-term increases in sediment yield associated with this project (all road work and harvest) would likely not be measurable in the project area streams.

Activities would occur on landtypes with moderate or low mass failure potential and surface erosion potential (Table 43). Activities would not occur on landtypes with “high” mass failure

potential or "high" surface erosion potential (PF, W-43). Moderate and low surface erosion indicates moderate to good soil permeability, which limits overland erosion.
Best Management Practices (BMPs) are techniques that have been proven to be effective in preventing excessive erosion and protecting water quality. The Idaho Panhandle National Forest primarily uses BMPs as detailed and outlined in Appendix B of the Charlie Preston EA which states that the listed BMPs tier to practices outlined Region 1/4 Forest Service Handbook direction 2509.22 (Soil and Water Conservation Practices Handbook). Based on Forest Plan monitoring efforts, conducted from 2002-2007, the application of BMPs has been shown to be highly effective in protecting water quality on the Forest (PF, W-52, W-53, W-54, W-55 and W-56). Not only have BMPs been proven to be effective on the Forest, there is a high compliance rating when applying these practices on Forest Service lands in Idaho. An interagency water quality audit was conducted in 2008, and federal agencies were observed to have had 98% compliance. Two projects on the Idaho Panhandle National Forests were audited during that time (see PF W- 57 discussion of Bear Paws and Bear South in USDA Forest Service 2009 p. 72).

Table 29 – Alternative C Estimated Sediment Yield Changes

Activity	Short term effects 1-5yrs	Long term effects ~ 10- 15yrs	Total change over the existing condition after 15 years
850 acres harvest/fuel treatments and 82-acre Rx burn	5.8 tons over 2 years	Reduced potential effects to water quality with stand improvement	+5.8 tons
1.6 miles of new road construction, primarily near ridges	Minimal	minimal	+ .06 tons
.7 miles of road re-construction and subsequent storage	Minimal	Reduction from existing once roads are closed	-7 tons
.3 miles of temp road	no additional sediment due to location & short-term status	0	0
Decommission (.6 miles of road)	small sediment pulse during and immediately after	reduction from existing condition once roads are decommissioned	-1.8 tons
3.7 mile of existing road storage (2 miles of encroaching or RHCA road and removes 23 culverts)	small sediment pulse during and immediately after decommission	reduction from existing condition once all roads are stored	-26 tons
Total project sediment increase			+ 5.9 tons over 15 years
Total project sediment decrease			- 34.8 tons over 15 years
Net Sediment Product			- 29.0 tons over 15 years with a 1.9 ton/yr reduction
Other Reductions			

Cumulative totals are for a 15-year time frame. However, overall annual sediment reductions may continue for the foreseeable future; WEPP results are based on the average return (2-year event) interval for 30 years of predicted climate (PF, W-48); All numbers to nearest 10th.
Assumes:

- All work to be done according to the most current BMPs. (PF, W-21A)
- New construction would be stored after 5 years after contract is signed although they may be stored sooner.
- Existing road storage and decommissioning would occur in 5 years although they may be stored or decommissioned sooner.
- All harvest would occur in year one (worst-case scenario) although it is likely that harvest would occur over 5 years or more.

Changes in sediment yield values within the project area for the proposed action over the time affected by the project are displayed in Table 29. Logging and timber harvest prescriptions (including the 82 acre Rx burn), temporary and new road construction, road reconstruction and road maintenance, and post-harvest activities are modeled (PF, W-20, 21, 27). Reduction in sediment delivery from proposed road decommissioning and road closures are modeled as well (PF, W- 22, 23).

Overall the direct long-term sediment reductions from the proposed road closures and decommissioning would improve water quality and stream channel conditions, meet the intent of the total maximum daily load (TMDL) and move the streams toward improving conditions of beneficial uses (PF, W-3). See Watershed Report for details.

Road Densities

Changes in road densities would occur with the implementation of the Alternative C. After harvest and post-harvest treatments, 4.4 miles of existing road would be stored and 0.6 miles would be decommissioned and would be considered hydrologically inert. Approximately 1.6 miles of newly constructed roads would be stored after use and would be considered hydrologically inert.

The newly constructed roads would increase road densities for approximately five years until they are hydrologically stored.

Upon the completion of the harvest treatments, post harvest treatments, and subsequent road decommissioning and closures, there would be an overall decrease in road density in the project area. Approximately 2.5 miles of the exiting road to be closed would occur in the West Fork Charlie Creek Subwatershed, about 2.0 miles in the Preston Creek Subwatershed, about 0.3 miles in the West Fork Charlie Creek Subwatershed, and 0.3 miles in the Preston Creek Subwatershed.

This lower road density, especially within RHCAs, would help decrease the overall effects of roads on flows (ECA) and decrease the overall potential for sedimentation into stream networks.

Stream Channel Stability

Based on stream channel responses from past disturbances within the project area and the existing stream channel and landtype characteristics within the project area, the estimated changes in flows, sediment yields, and the potential increases in flows from rain-on-snow (ROS) events would not appreciably affect stream channel stability from any of the activities proposed in Alternative C.

Project area streams are generally stable channel types. The dominant stream bank material in the project area is primarily composed of boulders and cobbles that are not easily erodible. In addition, most channels are well confined and entrenched, which allow sediment and debris to be easily transported. Most of the project area stream channels are not alluvial or low gradient (< 2%) channels, which are more susceptible to changes in peak flows. Low-gradient (< 2%) channel segments within the project area appear to be relatively stable and have shown resiliency to effects from disturbances (PF, W-47 pages 19-26, PF, W-51, 51A, 51B, 51C).

Within the project area 1st order stream (headwater streams) channels are composed mostly of boulders, cobbles and bedrock that have a good portion of large woody debris jams, are more confined and are more stable with respect to fluctuations in flow and sediment yields according to Chamberlin and others (1991) and Grant and others (2008).

Stream channels were monitored and surveyed to document the current condition and assess potential future or past effects associated with peak flows and water yield changes (in-channel

erosion). Recent stream investigations indicated overall intact and stable stream channels and riparian areas with the project area streams. No major stream channel disturbance or erosion was discovered or noted during 2008, 2009, 2010 and 2011 streams surveys, field reviews or monitoring (PF, W-12, 13, 14, 51, 51A, 51B, 51C). Stream survey data from 2008 and 2009 indicate that woody debris recruitment and abundance levels are relatively moderate to high in most stream reaches. Large woody debris (LWD) creates pool features and fish habitat and dissipates stream energy.

Alternative C may minimally modify the magnitude, intensity, and duration of flows and sediment yields at different levels. Changes that may occur with respect to peak flow and water yield with Alternative C would be well within natural rages of variability for the project area. Theoretically, changes in the magnitude, intensity, or duration of peak flows and sediment yields have the potential to change stream channel characteristics. According to Grant and others, to date no field studies explicitly link peak flow increases with changes in channel morphology. Although there is extensive literature on forest harvest effects on stream channels, studies have not demonstrated a direct correlation between peak flow changes attributed to forest harvest alone and changes to the physical structure of streams (Grant and others 2008).

Protection of RHCAs would continue to aid project area streams in trending toward dynamic equilibrium. Restoration and enhancement of selected stream reaches within the project area in conjunction with protection of RHCAs and the proposed road storage and decommission would likely improve overall stream channel function and stability in the long term within the project area.

Stream Temperatures

Alternative C would decrease stream temperatures throughout the project area over the long-term.

Shade controls direct solar radiation and thus heat influx in small forest streams. Charlie Preston project would include riparian habitat conservation area (RHCA) buffers as described in the Inland Native Fish Strategy (INFS) (USDA 1995) to protect the stream from increased solar radiation by retaining canopy cover; therefore, Alternative C, which includes timber harvest, would not decrease shade.

Riparian vegetation would also be planted along Hume Creek, Preston Creek, and West Fork Charlie Creek that would further promote riparian shade and reduce stream temperatures in the long term.

Roadside fuels treatments proposed would not reduce canopies or stream shade. Along segments of Hume Creek, the road lies between the stream and the proposed treatment areas therefore potential recruitment or shade would not be reduced beyond the existing condition.

Given that riparian areas would remain undisturbed and/or would be enhanced, overall stream shade would increase over time and would trend toward meeting the TMDL target set for Charlie Creek in the future.

Effects to Water Quality from Other Proposed Activities

Roadside fuel reduction treatments would not change water yields or peak flows or affect stream channels. Watershed conditions would have increased protection by fewer ladder fuels and thus reduced risk of potential wildfire effects. At road crossings on intermittent streams, crossings would be reviewed by a fisheries biologist or hydrologist and an archaeologist to determine if roadside fuel treatment could be applied within the 50-foot RHCA buffer (See design features). Pocket gopher treatments would have no negative effects to water quality given the aquatics

design features. The 30-acre Bald Mountain fuels reduction unit would have no effect on water quality because there are no streams in the area.

Proposed roadside fuels treatments would not increase sediment to streams because RHCA buffers would be implemented.

This project proposes riparian planting and LWD enhancement/habitat restoration work in Preston Creek, Fagan Creek, and West Fork Charlie Creek based on available funding and materials. There would likely be small sediment pulse during and immediately after restoration construction. Long-term reduction in sediment and temperature within the project area would occur due to increased stream bank stability, stream function and canopy shade. Maintained and protected INFS buffers would move canopies towards TMDL targets and reduced stream temperatures.

Alternatives B and C Cumulative Effects

Table 30 – Alternatives B and C, Trends Regarding Principal Watershed Issues and Indicators

Principal Aquatics Issue	Principal Issue Indicators	Trend
Water yield/peak flows (rain-on-snow)	Change in water yield and peak flows.	Slight increase short term and long term decrease due to vegetation growth in past openings and if no new large scale canopy opening events occur such as wildfire.
Water quality (sediment, roads)	Change in the magnitude of sediment yields.	Trend toward long-term reduction in sediment by reduction and hydrologic improvement of riparian roads and culverts and overall vegetative protection and enhancement in riparian areas. Along with naturally occurring sediment watershed, roads and activities on private land activity would likely continue to cause some sediment sources.
Stream channel stability	Predicted channel responses or changes that may result from natural events and human disturbance.	Stream channel stability throughout watershed would to generally trend toward improvement and increased stability given stream buffer protection. Remaining riparian roads would be a limiting factor in trending toward improvement on some streams channels such as Hume Creek (Watershed Report).
Water quality (stream temperature)	Changes in vegetation within riparian areas and associated shade component.	In general, vegetation within riparian areas and associated shade components would continue to be protected with RHCA buffers and stream temperatures would continue to be reduced over time given that large-scale wildfire do not occur. Proposed riparian planting would further increase shade and aid to lower stream temperatures long term

<u>Water Yield / Peak Flows</u>

With either of the action alternatives, the direct and indirect effects of increased peak flows combined with the effects from past, present and reasonably foreseeable activities would not result in any detrimental cumulative effects within the Charlie Creek watershed. Estimated annual water yield increases are within the historic range of variability for magnitude, intensity, and duration when compared with estimates from past natural events and likely would be undetectable.

Past openings within the cumulative effects area have likely caused peak flow changes. Changes in peak flow from the proposed activities would likely be undetectable at the Charlie Creek watershed level. Cumulatively when combining past openings that are still not completely

vegetated with the proposed openings there may be slightly detectable peak flow change (PF W-28, 33, 34).

Even with the highest estimated water yield increase (by ECA analysis) from Alternative B, peak flows in the cumulative effects area would likely be barely detectible cumulatively given the large total watershed area, limited canopy openings proposed (compared to natural historic canopy openings), implementation of stream buffers, BMPs and design features, which corresponds with the findings by Grant and others 2008. Table 31 is a summary of water yield and peak flow changes from Alternatives B and C based on drainage area and ECA for the cumulative effects area (W-28, W-32, W-33, W-34).

Table 31 – Estimated Water Yield Changes for the Cumulative Effects Area

Charlie Creek Watershed (HUC 6) 17,426 ac	Existing Water Yield % over Natural*	Water Yields from Past Fires' Natural Range of Variblity	(Change in ECA) and Total ECA**	(Change in Water yield) and Total Annual Water Yield
Alternative A	2.8%	8.2%	(0) 12%	(0) 2.8%
Alternative B	2.8%	8.2%	(6.0%) 18%	(1.3%) 4.1%
Alternative C	2.8%	8.2%	(3%) 15%	(.6%) 3.4

*Natural assumes 100% cover
**Includes private land

Within the Charlie Creek watershed, the existing ECA was estimated to be at 12 percent, which means that 12 percent of the cumulative effects area exists in clearcut conditions hydrologically or there is currently a 12 percent canopy reduction for the entire watershed over natural conditions (PF W-28). Based on the previously mentioned studies, direct changes in peak flows would be undetectable for either action alternative at the Charlie Creek watershed level.

The historic fires likely produced much larger water yield and peak flow fluctuations than the ones that may be produced by the combination of activities proposed within the watershed. Historic photos from 1930s (during time of large wildfire recovery and new large fires) to the recent time show that stream channels within the watershed remained generally stable vertically and horizontally over time which indicates that sedimentation due to in-channel erosion from large yield and peak flow fluctuations may have been limited. This may be due in large part to healthy residual riparian vegetation and productive riparian area vegetation growth that stabilizes stream banks. Estimated changes from Alternatives B and C are small compared to changes to these elements that could be generated from high-severity wildfire.

The proposed activities would not substantially increase water yields or peak flows within the Charlie Creek watershed because the proposed canopy opening (ECA) activities in Alternative B account for only 6% of the total area within the cumulative effects area and Alternative C accounts for only 3% of the total area within the cumulative effects area. The increases in flows from the Charlie Preston project would not only be well within the historic range of variability for Charlie Creek and its tributaries, but they would also not likely be measureable according Grant and others (2008) and Stednick (1996).

Peak flow increases from ROS events would likely increase in the project area in the short term due to openings within ROS zones in the project area. As discussed above, cumulative openings

within the project area and the Charlie Creek watershed, primarily in ROS zones, may show a slightly detectable peak flow increase due in part to ROS events. Future openings may occur on private land within the project area and the cumulative effects area from home building or timber harvest activities; however, it is unknown when and/or how much canopy would be opened. There may be a slight increase in peak flows from ROS if future openings occur on private land.

Grant and others (2008), in a paper that focused on peak flow responses to forest practices in Washington and Oregon watersheds, concluded that in general when 15 percent of an area was harvested (clearcut), detectible changes (i.e. greater than 10 percent) in peak flows were made in ROS-dominated landscapes and that in general under 15 percent area harvest would be undetectable for peak flow changes. Compilation of research on paired catchment studies for water yield increases showed that a canopy reduction of 20 percent or less would not show a measurable increase in annual water yield (Stednick, 1996, p. 90). Given the results of these studies and the ECA results shown in Table 31for the cumulative effects area, the projected increase in harvested area (ECA) with the existing condition may show a relatively slight detectible change over baseline conditions (100% cover).

It is likely that large peak flow events and past management had some impacts to these stream segments over time, but field reviews indicate the stream channels in the project area recover relatively quickly due to the stable and resilient stream channels in the upper watershed and because of the area's ability to grow and maintain vigorous riparian vegetation which stabilizes and protects stream banks.

Reducing fuel load build up and/or managing overstocked timber stands would reduce risk from effects of high-intensity wildfires within the cumulative effects area (see Fuels and Air Quality report). Alternative B would treat more fuels and therefore would do more to reduce wildfire effects risks to watershed resources that could water yields and peak flow.

In summary, water yield increase and peak flow fluctuations may occur due to proposed harvest and road building activities; however, these changes would be relatively small and potentially undetectable. Increase in peak flows with Alternative B may be slightly detectible cumulatively given the canopy openings proposed.

Sediment Yield

Cumulative net effects from Alternatives B and C would be a reduction in sediment over the long term (15 years) within the Charlie Creek drainage due to the proposed road work as described above (see table 7 and 9). The overall long-term benefit through sediment reduction would be consistent with the goals identified in the TMDL (PF, W-3) and would improve beneficial uses. The estimated short-term increases in sediment yield associated with this project (all road work and harvest) would be too small to measure at the Charlie Creek watershed scale. The limited sediment modeled to be generated is expected to be routed through the stream channels and be dissipated and diluted out in manner that would not diminish habitat. Sediment that could be generated would not be of a magnitude that would cause changes to stream channel stability (e.g., migration, braiding, widening of channels and filling of pools) and would likely be too small to measure at the Charlie Creek watershed scale.

The combination of direct and indirect effects of either action alternative with past, present and reasonably foreseeable activities within the cumulative effects area would result in an overall long- term net decrease in sediment yield to the Charlie Creek watershed after project completion. As calculated, Alternative C would have the largest net reduction in sediment of 1.9 tons per year, followed by Alternative B with 1.6 tons per year. These reductions would be realized by

proposed road decommissioning, storage and reconstruction. The differences between the action alternatives would be undetectable.

Within the cumulative effects area road densities would be reduced by about five miles with approximately two miles inside RHCAs with either alternative when the project is complete. This would improve hydrologic networks, reduce risk of road and culvert failures, reduce sediment inputs, and improve water quality in the long term.

There are currently approximately 85 miles of road with the Charlie Creek watershed. A separate WEPP:Road analysis was completed for several road segments that were identified during field reviews as being naturally decommissioned after culverts were removed (revegetated and hydrologically stable and inert) or roads that were decommissioned with machinery since 2003. These segments include about 11 miles of road within varied distances from streams within the project area. WEPP:Road calculates that the chronic sediment input from these road segments likely produced approximately 11 tons per year (PF W-24). Research conducted on the IPNF indicates that thick duff, vegetation, and moss layers found on brushed-in roads protects the surface from erosion (Foltz et al. 2008). Since these roads have insignificant active erosive processes, slight benefit can be shown in regards to sediment production for roads decommissioned naturally.

Although sediment contributions are low, compacted driving surfaces left on the landscape can still increase runoff and disrupt hydrologic continuity. The same study by Foltz and others (2008), also discloses that hydraulic conductivity of brushed-in roads does recover towards values found on undisturbed forest floors, but many decades of recovery may be needed. Field review of the roads in the Charlie Creek drainage indicates they are stable, heavily vegetated, and lack ditches and drainage structures that are the primary cause of mass failures and disrupted watershed function (PF, W-10, 11).

At least 10 miles of other road segments that were not modeled for sediment reductions but have been decommissioned or reclaimed naturally and have had drainages structures pulled since around 2000 were identified in other parts of the Charlie Creek watershed. These roads were not modeled due to insufficient data to accurately assess the change in condition. However, it is likely these reclaimed roads produce much less sediment than they did before the drainage structures were removed.

Additionally since 2003, approximately 11.4 miles of road have been mechanically or naturally decommissioned or reclaimed with drainage structures removed, which has reduced risks of failure and cumulative effects and was modeled to have reduced sediment by approximately 11 tons/year within the cumulative effects area.

Vegetated stream buffers are typically large enough to prevent sediment from harvest units (INFISH 1995 p. A-5) from entering the stream system. However, WEPP modeling estimates showed that Alternative B proposed harvest treatments may have a short-term increase in sediment of 7.5 tons per year for two years and Alternative C may have a 5.8 tons/year increase for two years after harvest. (See table 7 and 9).

Within Charlie Creek watershed the ongoing activities and reasonably foreseeable projects, such as the firewood gathering and use of roads, is not expected to increase sediment contributions to cumulative effects area. As previously discussed, however, segments of stream channel in the lower Charlie Creek, through private land, would remain susceptible to localized bank erosion due to streamside vegetation disturbances, as it likely has since homesteading and grazing began in the area over 80 years ago.

Future disturbance may occur on private land within the cumulative effects area from home building or timber harvest activities; however, it is unknown when or what level of harvest, road building, road decommissioning or road closures would occur. Private land owners are required to meet the intent of the TMDL by reducing sediment long term within the Charlie Creek watershed. Private land owners are also required to follow the Idaho State Forest Practices Act standards for management activities and use BMPs. It is therefore assumed that future activities by private landowners would result in a net decrease in sediment within the cumulative effects area.

Within the cumulative effects area a likely short-term increase in sediment that would be too small to measure may occur while more appreciable long-term sediment reductions would be realized with either action alternative from proposed road work, stream channel restoration/enhancement and riparian planting as previously described, and reductions realized from activities on other lands as required by the TMDLs.

Reducing fuel load build up and/or managing overstocked timber stands would reduce risk from effects of high-intensity wildfires within the cumulative effects area (see Fuels and Air Quality Report). Alternative B would treat more fuels and therefore would do more to reduce wildfire effects risks to watershed resources (increased sedimentation).

Stream Channel Stability

Cumulative effects of past, present, and foreseeable activities including activities from Alternative B and C are not expected to appreciably affect stream channel characteristics or stability within the watershed because the streams are generally stable channel types (morphological characteristics) and because existing stream channels have adjusted to current water and sediment yield as evidenced by the relative stability of stream channels, the current riparian vegetation, and the amount of stable large woody material present in many stream reaches (PF, W-12, 13, 14, 15, 16, 17, 18, 51, 51A, 51B, 51C).

The estimated changes in flows, sediment yields, and potential increases in peak flows from ROS events would not appreciably affect stream channel morphology or stability within the cumulative effects area. This conclusion is based on assessed stream channel responses from recent disturbances, flow fluctuations, and past flood events within the watershed and based on the existing stream channel characteristics, stability, stream side vegetation, and local landtype characteristics along with the implementation of stream buffers (INFISH 1995), design features and BMPs.

Stream channels with less than 2% gradient would be most at risk of erosion from rain-on-snow (ROS) events. There are relatively few miles of this channel type (6.2 miles) compared to the amount of higher gradient stream channels in the project area (50.3 miles) (See Table 23). These areas with lower gradients are currently relatively stable and well vegetated and have shown little effects form past peak flow fluctuations. The dominant stream bank material in the project area is primarily composed of boulders, cobbles that are not easily erodible. In addition, most channels are well confined and entrenched, which allow sediment and debris to be easily transported.

These channel reaches have been subjected to the effects of natural large stand-replacing fires within drainages that contain large percentages of the ROS zones as well as road building and logging over the past 100 years; and today there is little evidence of major aggregation, degradation or erosion within the watershed streams (PF, W-12-18, 51, 51A, 51B, 51C).

It is likely that large, peak flow, ROS events caused by canopy openings from past management and wildfires had some impacts to these stream segments over time; but field reviews indicate the

stream channels recover relatively quickly due to the area's ability to grow and maintain vigorous riparian vegetation which stabilizes and protects stream banks as well as the stable and resilient stream channels in the upper watershed. Continued maintenance of the RHCAs will promote the long-term stability, function, and resiliency of these low-gradient channels.

In general, peak flow increases from ROS events can cause cumulative effects in Charlie Creek or its tributaries even though these events are natural processes that occur episodically in time and space. As previously discussed, impacts from ROS events can occur when there is a lack of road drainage or culverts become plugged from resulting floods and debris flows. By improving road drainage and improving or removing undersized culverts and lowering overall road densities through decommissioning and storage as proposed with both Alternatives B and C, the risk of failure and subsequent sediment delivery and affects to stream channels would be reduced. Since around 2000, at least 21.4 miles of road segments have been decommissioned naturally or mechanically with drainages structures pulled. This has ultimately reduced potential and risks of road and/or stream crossing failures within the cumulative area.

The stream channel in the lower Charlie Creek, through private land, would remain susceptible to localized bank erosion, as it likely has since homesteading and grazing began over 80 years ago, regardless of upstream watershed disturbances, due to ongoing concentrated grazing in this reach that affects riparian vegetation and stream banks. The existing condition of this segment of stream channel has likely been directly affected by localized grazing practices and not by cumulative effects of past and/or present management in the upper watershed. Even though this reach has been subject to a long history of grazing, the overall stream channel segment appears to have maintained relative horizontal and vertical stability over time (PF Photos). Cumulatively, neither Alternative B nor Alternative C would have an appreciable negative effect on this segment of stream channel because it is not within close proximity to the activity areas; there would only be an undetectable, short-term increase in sediment that would likely be diluted and dissipated out; and water yield increases would likely be minimal.

Protection of RHCAs would continue to aid streams within the cumulative effects area in trending toward dynamic equilibrium and increased stability. Restoration and enhancement of selected stream reaches within the project area in conjunction with protection of RHCAs and the proposed road storage and decommission associated with the action alternatives would likely improve overall stream channel function and stability over the long term within the project area and cumulative effects area.

Stream Temperature

No short-term cumulative change in stream temperature would occur because there would be no immediate change in vegetation within the riparian habitat conservation area (RHCA) buffers; however, stream temperature may be reduced over time from increased stream shade as vegetation continues to grow in RHCA areas adjacent to stream channels within the Charlie Creek watershed. Riparian planting as proposed with both action alternatives would also further reduce stream temperatures in the long term. Reducing fuel load build up and/or managing overstocked timber stands would reduce risk from effects of high-intensity wildfires within the cumulative effects area (see Fuels and Air Quality Report). Overall, Alternative B would treat more fuels and therefore would do more to reduce wildfire effects risks to watershed resources such as riparian vegetation.

Forest Plan and Regulatory Consistency

Forest Plan

All alternatives meet the requirements of the IPNF Forest Plan for water resources.

Forest Plan Standard #1: Management activities on Forest lands will not significantly impair the long-term productivity of the water resource and ensure that state water quality standards will be met or exceeded.

> The long-term productivity of the water resource would be protected and improved though reducing sediment to stream channels, reducing risk of road failures by hydrologically storing or decommissioning roads, enhancing shade and stream bank stability in selected riparian reaches, and promoting more resilient forest vegetation. Design features and BMPs would protect water quality. The short-term sediment increase would not substantially change water resource productivity. See discussion below for how State water quality standards would be met or exceeded.

Forest Plan Standard #2: Maintain concentrations of total sediment or chemical constituents within State standards.

> The proposed activities would not affect the chemical constituents of the water, and total sediment would be within State standards. The Idaho Department of Environmental Quality stated that the long-term benefit, sediment reduction, is consistent with the goals identified in the sediment TMDL (W-3).

Forest Plan Standard #3: Implement project level standards and guidelines for water quality contained in the Best Management Practices (Appendix S, available upon request), including those defined by State regulation or agreement between the State and Forest Service as:

> *a. Idaho Forest Practices Rules*
>
> *b. Rules and Regulations and Minimum Standards for Stream Channel Alterations*
>
> *c. Best Management Practices for Road Activities*
>
> Best management practices would be implemented with this project. See design features and EA Appendix B and PF, W-21A.

Forest Plan Standard #4: Cooperate with the states to determine necessary in-stream flows for various uses. In-stream flows should be maintained by acquiring water rights or reservations.

> In-stream flows would not be affected by this project, and there would be no change in in-stream flows.

Forest Plan Standard #5: Manage public water system plans for multiple uses by balancing present and future resources with public water supply needs. Project plans for activities in public water systems will be reviewed by the water users and the State.

> This project is not in a municipal watershed and will not affect public water supplies.

Forest Plan Standard #6: Activities within non-fishery drainages, including first and second order streams, will be planned and executed to maintain existing biota. Maintenance of existing biota will be defined as maintaining the physical integrity of these streams. Best management practices (Appendix S), Appendix O, and riparian guidelines will be used to accomplish this objective.

The physical integrity of all streams would be maintained and would be improved in the long term.

The estimated changes in flows, sediment yields and the potential increases in peak flows from rain-on-snow events would not appreciably affect stream channel stability from any of the proposed activities. This is based on assessed stream channel responses from past disturbances and flow fluctuations within the project area and on the existing stream channel characteristics, stability, streamside vegetation and local landtype characteristics within the project area. Vegetated stream buffers are typically large enough to prevent sediment from harvest units (INFISH 1995 p. A-5) from entering the stream system.

Protection of RHCAs would continue to aid project area streams in trending toward dynamic equilibrium. Restoration and enhancement of selected stream reaches within the project area in conjunction with protection of RHCAs and the proposed road storage and decommission would likely improve overall stream channel function and stability long term within the project area.

Forest Plan Standard #7: It is the intent of this plan that models be used as a tool to approximate the effects of National Forest activities on water quality values. The models will be used in conjunction with field data, monitoring results, continuing research and professional judgment, to further refine estimated effects and to make recommendations.

Models were used in conjunction with field data, monitoring results, recent research, and professional judgment to estimate effects. The WEPP models and the ECA model were used to estimate effects to sediment and water yield. Information from field reviews and stream surveys were used to verify existing stream conditions. Scientific literature was reviewed to evaluate potential effects from proposed activities. See Watershed Report References.

State Water Quality Standards

Overall, water quality standards would be met because:

1. The short-term sediment increase would not be detectable and beneficial uses would be maintained because of temporal and spatial scales (i.e. duration and estimated amount to be treated over multiple years), riparian buffers, large total area vs. relatively small treated area, length and surface area of the channel, and floodplain network.
2. Net sediment inputs to streams would be reduced in the long term. The overall long-term benefit through sediment reduction would be consistent with the goals identified in the TMDL (PF, W-3) and would improve beneficial uses.
3. Riparian plantings and other stream restoration/enhancement activities proposed with the action alternatives would eventually increase stream shading, reduce stream temperature, protect stream banks from erosion and would improve beneficial uses long term.
4. Stream temperatures would continue to improve due to the maintenance and protection of RHCAs.
5. The overall long-term benefit of having more resilient forest vegetation and the protection from extensive high-severity fire would continue to maintain and improve beneficial use support.
6. The estimated changes in flows, sediment yields, and potential increases in peak flows from ROS events would not appreciably affect stream channel morphology or stability.

This conclusion is based on assessed stream channel responses from recent disturbances, flow fluctuations, and past flood events within the watershed and based on the existing stream channel characteristics, stability, stream side vegetation, and local landtype characteristics along with the implementation of stream buffers (INFISH 1995), design features and BMPs.

7. See *Aquatic Organisms* section for documentation of aquatic organism populations, trends, and effects from proposed activities.
8. There are no municipal watersheds in the cumulative effects area.

Clean Water Act

All alternatives would be consistent with the requirements of the Federal Water Pollution Control Act as amended by the Clean Water Act, 33 U.S.C. §1251. Water temperature and sediment, the principal pollutant of concern, would not increase within the Charlie Creek watershed. Through implementation of design features, BMPs, and the net sediment reduction that would take place, risks would be reduced to beneficial uses designation for support of cold-water biota and secondary contact recreation in Charlie Creek and its tributaries. The net reduction of sediment and long-term temperature improvement from either action alternative would likely improve conditions that led to the 303(d) listing and would meet the intent of the TMDL (DEQ letter 4/29/2011 PF, W-3). The Forest Service would obtain any required permits.

Floodplain Management and Wetland Protection

The activities would meet Executive Order 11988 and Executive Order 11990 related to floodplains and wetlands because no activity is proposed in wetlands or on floodplains (other than proposed enhancement or restoration work with riparian planting, large woody debris (LWD) placement or culvert upgrades) and no substantial negative effects are expected. Design features and BMPs would be implemented to protect riparian areas.

Aquatic Organisms (see Aquatic Organisms Report)

Issue Indicator Determination

The aquatic organism issue for this project is: How would the implementation of this project trend the populations of fish and mussel and the miles of habitat, both within the analysis area (the individual streams) and the cumulative effects area (Charlie Creek just downstream of project area). The measures selected for this project area are *miles of fish habitat* and *populations of westslope cutthroat trout and western pearlshell mussel* trending toward the desired condition. Bull trout and critical bull trout habitat do not occur within the analysis area; therefore, they are not used as measurement indicators.

Aquatic habitat is comprised of many components/parameters. Each parameter has a desired condition/criteria. Table 32 displays these parameters and criteria.

Table 32 – Fish Population and Habitat Criteria

Issue Indicator	Measurement Parameter	Criteria/Desired Condition					Reference
Population Characteristics	Presence/ Absence of fish species	Presence of native fish species					
	Fish/m^2/hour	Expected range 0.1 -0.3					IDEQ 2003
Water Quality	Temperature	A stream is temperature-impaired if the temperature standard is exceeded greater than 10% of the specified time period (Pettit, personal communication PF Doc. #F-32).					Idaho State criteria (Idaho DEQ 2005).
		Metric	Spring Salmonid Spawning	Bull Trout			
		Dates	April 15 – July 15	Juvenile	Spawning		
				6/1-8/31	9/1-10/31		
		MDMT	13 °C				
		MWMT		13 °C			
		MDAT	9°C		9°C		
		MDMT= maximum daily maximum temperature , MWMT= maximum weekly maximum temperature, MDAT=maximum daily average temperature					
	Sediment	Sediment production	Good	Moderate	Poor		Biological Assessment: St. Joe River Basin/NF Clearwater 1998
		# stream crossings/stream mile	<0.5	0.5-1.0	>1.5		
		A stream is also considered sediment limited if the State of Idaho identifies sediment as a pollutant of concern and has developed a TMDL for that stream					
	Chemical Contamination / Nutrients	Low levels of chemical contamination, no excess nutrients, no CWA 303d designated reaches					USFWS 1998
Habitat Access	Physical Barriers (human created)	No Physical Barriers					INFS standard RF-5, IPNF FP standard Fish - 4
Habitat Elements	Substrate Embeddedness	Reach embeddedness <20%					USFWS 1998
	Large Woody Debris	> 20 pieces/mile >12” dia >35’ long					INFS RMO 1995 and USFWS 1998
	Pool Frequency and Quality	Wetted Width	0-10’	10-20’	20-25’	25-50’	INFS RMO 1995 and USFWS 1998
		Pools/1000’	7.4-18	9-18.2	4.4-10.6	2-8.9	
	Large Pools (stream width >3m)	Each reach has many larger pools >1meter deep					USFWS 1998
	Off channel habitat	Watershed has many ponds, oxbows, backwaters and other off-channel areas with cover and side-channels are low energy areas					USFWS 1998
	Refugia	Habitats capable of supporting strong and significant populations are protected and are well distributed and connected for all life stages and forms of the species					USFWS 1998

Issue Indicator	Measurement Parameter	Criteria/Desired Condition	Reference
Channel Condition and Dynamics	Average wetted width/maximum depth ratio in scour pools	$\leq$ 10	USFWS 1998
	Streambank condition	>80% of any stream reach has $\geq$ 90% stability	USFWS 1998
	Floodplain connectivity	Off-channel areas are frequently hydrologically linked to main channel; overbank flows occur and maintain wetland functions, riparian vegetation and succession	USFWS 1998
Flow/ Hydrology	Change in Peak/Base Flows	See Charlie Preston Watershed Report	Charlie Preston Watershed Report
	Increase in drainage network	Zero or minimum increases in active channel length correlated with human caused disturbance (pertains to water diversions)	USFWS 1998
Watershed Condition	Road Density and Location	Lee et al 1997 found that the "status of four non-anadromous salmonid species (which include bull trout and westslope cutthroat trout) are less likely to use moderate to highly roaded areas for spawning and rearing and if found are less likely to be at strong population levels"	ICBEMP definitions for road density ratings (Quigley and others 1996 p. 67).
		Rating: Very low / Low / Moderate / High / Extremely High	
		Densities: 0.02-0.1 mi/mi^2 / 0.1-0.7 mi/mi^2 / 0.7-1.7 mi/mi^2 / 1.7-4.7 mi/mi^2 / 4.7+ mi/mi^2	
	Disturbance History	< 15% ECA of entire watershed with no concentration of disturbance in unstable or potentially unstable areas, and/or refugia, and/or riparian areas.	USFWS 1998
	Riparian Conservation Area	RHCA condition: Good / Moderate / Poor	Biological Assessment: St. Joe River Basin/NF Clearwater 1998
		% RHCA harvested in last 15 years: <13% / 13-33% / >33%	

The habitat trend for this analysis is contingent on whether the proposed activities would:

- improve the status of the limiting factor (Table 33) thus trend the stream toward the desired condition
- cause additional impacts, thus trend the condition away from the desired state
- have no effect either way, thus maintain the current condition (adequate or altered)

Table 33 – Parameters That Are Not Meeting Desired Condition (Limiting Factor) For Each Stream

Parameter	Charlie within PA	Fagan	Hume	Preston
Stream temperature	X	X	X	X
Sediment	X		X	X
Physical barriers	X		X	X
Large woody debris				X
Pool frequency	X			X
Streambank condition	X		X	X
Road density	X	X	X	X

The existing condition of each stream (see aquatic organism report) was analyzed based on the above criteria and an overall rating for each stream was established in Table 34.

Table 34 – Summary of Existing Fish Habitat Status (miles)

Stream Name	Total Mainstem Stream Length in Project Area (miles)	Unaltered	Adequate	Moderately Altered/ Moderate Risk	Highly Altered/ High Risk
Charlie Creek (within project area)	5.7	0	0	4.7	1.0
Preston Creek	2.1	0	1.7	0	0.4
Fagan Creek	1.8	0	1.8	0	0
Hume Creek	3.2	0	0	0	3.2

Aquatic organism population trends:

The trend for fish populations is based on the trend for fish habitat; i.e. if the habitat improves, the population would potentially improve. *The trend for western pearlshell mussel* is based on the trend for westslope cutthroat trout, (the host for the mussel glochidia) and effects to sediment.

Environmental Consequences

Direct/Indirect Effects

Direct/Indirect effects analysis considers how the alternatives would affect the aquatic habitat parameters. The potential type of effect to the aquatic habitat is dependent on the activity that is proposed. The direct and indirect effects analysis considers the risk and intensity of the potential effects to the parameters listed in Table 33.

Cumulative Effects

The cumulative effects analysis considers past activity, current conditions, future foreseeable actions, non-Forest Service managed activity, as well as proposed actions, and addresses effects to habitat as well as populations. Information for this analysis comes from several areas.

Current conditions as described in Table 34 and Table 35.

Past activity, on-going activity, and future foreseeable action effects are described in Table 37.

- Information about the proposed action comes from the descriptions provided in the Charlie Preston EA and the descriptions of the Direct/Indirect effects of the individual drainages.
- The combination of this information will result in a determination of where the actions would trend the fish habitat within the streams, i.e., would the stream trend toward meeting the DFC.

Cumulative effects are considered in two ways:

- Individual named fish-bearing streams within the project area: A determination of whether effects of the proposed activities combined with effects past, present, and reasonably foreseeable activities would cause a change to the existing trend for that stream and its aquatic population.

- The section of Charlie Creek immediately downstream of the project area: Because the point of cumulative effects consideration is downstream of the National Forest System lands the effects to that area would primarily be limited to habitat parameters that are influenced by water quality: stream temperature, sediment, and road density. The effects from proposed activities could possibly shift downstream and alter those habitat parameters within Charlie Creek. The other habitat parameters: physical barriers, large woody debris (LWD), pool frequency/quality, and stream bank conditions are tied more directly to the sites where the project would occur and influences the downstream cumulative effects to Charlie Creek as to how it influences the aquatic species that move throughout the system.

Summary of Effects

Table 35summarizes the miles of fish habitat and populations by the expected long-term (greater than 20 years) trend by alternative based on cumulative effects. Table 36 summarizes the trend for the individual fisheries streams within the project area. Overall, both action alternatives would trend aquatic habitat toward desired conditions.

Table 35 – Overall Trend for Fish Habitat and Populations Within the Project Area

Status	Alt A	Alt B	Alt C
	Miles		
Trend toward improving/meets Desired condition	1.8	12.8	12.8
Maintains "not meeting Desired Condition"	11.0	0	0
Trend away from Desired Condition	0	0	0
Total Fish-Bearing Miles*	12.8	12.8	12.8

*East Fork Charlie Creek is not within the project area, only upslope acres are within the project area, therefore no stream length for EF Charlie Creek is included in the total.

Table 36 – Trend for Fish Habitat by Stream per Alternative

Stream	Existing	Alternative A	Alternative B	Alternative C
Charlie (within the project area)	Currently Does Not Meet DC	maintained	**improving**	**improving**
East Fork Charlie Creek	Currently Does Not Meet DC	maintained	maintained	maintained
Fagan Creek	Currently meets DC	maintained	maintained	maintained
Hume Creek	Currently Does Not Meet DC	maintained	**improving**	**improving**
Preston Creek	Currently Does Not Meet DC	maintained	**improving**	**improving**

Alternative A – No Action Direct, Indirect, and Cumulative Effects

Charlie Creek

The stream currently does not meet the desired condition for fish habitat or fish population densities. If no action is selected, that condition would continue. None of the identified limiting factors would be altered in the portion of Charlie Creek within the project area. Proposed management activities which could alleviate these concerns, road decommissioning and culvert removal or replacement, would not occur if this alternative were selected. Road maintenance would continue to occur which would ensure that culverts have a reduced risk of failure, thus reducing the risk of sediment increases from those locations. Projects proposed to enhance in-stream habitat, large woody debris (LWD) placement and riparian planting, would not occur, so the trend toward desired conditions would remain unfulfilled.

East Fork Charlie Creek

The stream currently does not meet the desired condition for fish habitat or fish population densities. If no action is selected, that condition would continue. This alternative would not correct negative impacts from past activities which are still causing the lower reach to not achieve desired condition. Parameters identified in Table 33 would not be altered in East Fork Charlie Creek. It would continue not meeting desired conditions for these parameters, and there would not be a trend toward those desired conditions under this alternative.

Fagan Creek

Fagan Creek currently meets desired condition for all parameters except for road density. If the no action were selected, Fagan Creek would continue to provide adequate aquatic habitat. However, road density, the only parameter which does not currently meet the desired condition, would remain high. Fish densities would remain the same as currently exists.

Hume Creek

The stream currently does not meet the desired condition for fish habitat or fish population densities, and that condition would continue. This alternative would not implement activities which would correct some of the negative effects from past activities. Limiting factors identified in Table 33 would not be altered in Hume Creek. Management activities which could alleviate these concerns, road decommissioning and culvert removal or replacement, would not occur if this alternative were selected. Road maintenance would continue to occur; this would ensure that culverts have a reduced risk of failure, thus reducing the risk of sediment increases from those locations. Projects proposed to enhance in-stream habitat like riparian planting and barrier removal would not occur, thus there would be no trend toward desired conditions for those parameters. This alternative would maintain Hume Creek in a condition that does not meet desired conditions and does not trend it toward meeting desired conditions.

Preston Creek

Alternative A does not implement activities which would correct negative effects from past activities. The stream currently does not meet the desired condition for fish habitat, and that condition would continue. Based on limited population data, Preston Creek is currently within Idaho DEQ's acceptable range for fish density, and this would continue. Limiting factors identified in Table 33 would not be altered in Preston Creek. Management activities which could alleviate these concerns, road decommissioning and culvert removal or replacement, would not occur if this alternative were selected. Road maintenance would continue to occur which would

ensure that culverts have a reduced risk of failure, thus reducing the risk of sediment increases from those locations. Projects proposed to enhance in-stream habitat (LWD placement and riparian planting) would not occur thus there would be no trend toward desired conditions the parameters of LWD, pool frequency or temperature. This alternative would maintain the lowest reach in a condition not meeting desired condition and does not trend it toward meeting desired condition. The upper reaches of the stream would remain in adequate condition.

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Due to the lack of implementation of restoration activities, the implementation of alternative A would maintain Charlie Creek in a condition of not meeting desired conditions for the parameters of: stream temperature, sediment, physical barriers, LWD, pool frequency/quality, streambank conditions, or road density. Aquatic species would continue the current population trend of not meeting expected densities.

Alternatives B and C Direct Indirect Effects

Charlie Creek

Migration Barrier Remove/Replace: This activity would have a direct positive effect on the trend for fish habitat and for populations of westslope cutthroat trout and western pearlshell mussel because the physical barrier parameter would trend toward the desired condition. The four migration barriers on Road 1950 would be corrected. The culvert on mainstem Charlie Creek and the culvert in section 22 would be replaced with culverts which provide aquatic species passage. The culverts on Road 1950 in section 27 and 28 would be removed during the long-term storage process. These projects would create a short-term pulse of increased sediment during project implementation which could potentially have short-term negative effects (for example, disruption of juvenile feeding behavior due to turbidity, increase in substrate fines which would be resuspended during the next channel adjusting flow, change of macroinvertebrate community due to turbidity), but would not trend the fish species away from the desired condition of increased densities. In the long-term, the project-would benefit the fishery by providing connectivity and increasing the amount of suitable habitat (USDA Forest Service 2005).

Large Woody Debris (LWD) Placement: This activity would have a direct positive effect on the trend for fish habitat and for populations of westslope cutthroat trout and western pearlshell mussel because the project would trend the LWD and pool frequency parameters toward the desired condition. LWD would be placed in Charlie Creek between the private land and the culvert under Road 1950. This project would create a short- term pulse of increased sediment when logs are dug into the streambanks, which could potentially displace fish but which would not cause a trend away from increased densities. This project would have long-term benefits in creating greater habitat diversity, increasing the number of pools, creating shade, and reducing cattle access to streambanks (Whiteway and others 2010; Roni and others 2008). This project was also identified in the Charlie Tyson EIS (1995) but funding was not obtained, so it is proposed with the Charlie Preston project because we have confirmed that the activity is still needed.

Riparian Planting: This activity would have a direct positive effect on the trend for fish habitat and for populations of westslope cutthroat trout and western pearlshell mussel because the project would trend the stream temperature, large woody debris, pool frequency, streambank stability, and RHCA toward the desired condition. There would be long term benefits to the fish population due to their influence on habitat. The riparian planting would occur along the same section of Charlie Creek as the large woody debris (LWD) project. As the trees and shrubs grow, they would provide shading to the stream which would lower stream temperatures, potentially fall

into the stream increasing LWD within the channel thus increasing habitat diversity, and potentially increase pool frequency. As the trees and shrubs grow their root systems would help stabilize the streambanks. Riparian planting has been found to have moderate to high success (Roni et al 2002).

Road Long-term Storage and Decommissioning: This activity would have an indirect positive effect on the trend for fish habitat and for populations of westslope cutthroat trout and western pearlshell mussel. This project would trend the sediment and road density parameters toward the desired condition of reduced stream crossings and reduced road densities. There would be short term negative effects when sediment is put into suspension but it would not reduce the trend toward increasing population densities. Approximately 1.9 miles of Road 1950 would be placed into long-term storage. This road is located in the headwaters of Charlie Creek. As mentioned previously, the storage of this road would remove migration barriers but it also would remove four culverts on non-fishing-bearing streams. The removal of these crossings would reduce the potential for sediment introduction to the stream, trending the stream crossings parameter toward the desired conditions.

Approximately 0.2 miles of road would be decommissioned in the headwaters of Charlie Creek. This mileage occurs in two 0.1 mile segments of the 377JA road. These segments each include a stream crossing of a non-fish-bearing stream section. The removal of the crossings would reduce the potential for sediment introduction to the stream, trending the stream crossing parameter toward the desired condition. These road segments would be replaced with new road segments (see road construction discussion below).

Road density would be reduced due to the long-term storage and decommissioning of roads. Although these activities would benefit the trend toward desired condition, road densities would remain high, (1.7 miles/sq. mile)

Prescribed Burning and Off-Site Ponderosa Pine Replacement: This activity would have no effect on the trend for fish habitat or for populations of westslope cutthroat trout or western pearlshell mussel because it will not alter the trend for the parameters: stream temperature, sediment, LWD, Pool frequency, streambank conditions, peak flows, or RHCAs. There is a potential for hand fireline construction. Design Feature # IA1 would ensure that stream buffers protect riparian areas. Design feature # III.D.4 would be utilized to reduce the potential for sediment generation from the firelines. This project is not likely to affect fisheries or fish habitat.

Planting: Planting of conifers within the regeneration units and the off-site ponderosa pine unit would benefit the fish habitat and fish populations in the long term. Planting increases the rate of revegetation which returns water yields to pre-harvest conditions more rapidly (Troendle et al 2010).

Bald Mountain Fuel Reduction: This activity would have no effect on the trend for fish habitat or for populations of westslope cutthroat trout or western pearlshell mussel because it does not affect the parameters: stream temperature, LWD, pool frequency, streambank condition, or peak flows. The activity involves handwork which is located near the top of the ridge that divides Charlie/Preston creek drainages from the Palouse River drainage; therefore there is no potential for impacts to the fishery.

Roadside Fuel Treatment: This activity would have no effect on the trend for fish habitat or for populations of westslope cutthroat trout or western pearlshell mussel because the activity would not affect the trend toward desired condition for the Riparian Habitat Conservation areas (RHCA). This activity would remove small conifers up to 6 inches in diameter and brush from within 100 feet of the road edge of FS Road 1479. RHCA conditions would be maintained through the use of standard interim buffers except potentially on intermittent streams. Along

intermittent streams the fisheries biologist or hydrologist would review the site to determine the appropriate no-entry buffer which would protect the Riparian Management Objectives. INFS guidelines allow for the decrease of interim widths if the prescribed distances are not needed to attain RMOs or avoid adverse effects. This no-entry buffer could lie within a range up to 50 feet.

Girdling and Inoculating Live Trees: This activity would have no effect on the trend for fish habitat or for populations of westslope cutthroat trout or western pearlshell mussel because it would have no effect on the trend toward desired condition for the parameters which potentially could be affected by this activity; stream temperature, LWD, pool frequency, streambank condition, peak flow or RHCA. The number of trees which would become snags as a result of this project would not be a sufficient quantity to alter water yield or peak/base flow conditions, stream temperatures, or RHCA conditions. If trees are inoculated near the riparian zone, the dead trees could be recruited to the stream as large woody debris, and in the very long term could create pool habitat. No other parameters could potentially be affected.

Opening Roads for Firewood Collection: This activity would have no effect on the trend for fish habitat or for populations of westslope cutthroat trout or western pearlshell mussel because it would have no effect on the trend toward desired condition for the parameters which could potentially be affected by this activity: LWD, pool frequency, streambank stability, stream temperature, and RHCAs. Firewood collectors would be required to adhere to firewood permit direction which does not permit cutting firewood within 150 feet of a live stream.

East Fork Charlie Creek

Roadside Fuel Treatment: This activity would have no effect on the trend for fish habitat or for westslope cutthroat trout or western pearlshell mussel populations because it would have no effect on the trend toward desired condition for the riparian habitat conservation areas (RHCAs). It would remove small conifers up to 6 inches in diameter and brush from within 100 feet of the road edge of FS Road 1954. RHCA conditions would be maintained through the use of standard interim buffers except potentially on intermittent streams. Along intermittent streams the fisheries biologist or hydrologist would review the site to determine the appropriate no-entry buffer which would protect the Riparian Management Objectives. INFS guidelines allow for the decrease of interim widths if the prescribed distances are not needed to attain RMOs or avoid adverse effects. This no-entry buffer could lie within a range up to 50 feet.

Opening Roads for Firewood Collection: This activity would have no effect on the trend for fish habitat or for westslope cutthroat trout or western pearlshell mussel populations because it would have no effect on the trend toward desired condition for the parameters which could potentially be affected by this activity: LWD, pool frequency, streambank stability, stream temperature, and RHCAs. Only Road 1954 would be opened seasonally for firewood collection. Firewood collectors would be required to adhere to firewood permit direction which does not permit cutting firewood within 150 feet of a live stream.

Fagan Creek

Roadside Fuel Treatment: This activity would have no effect on the trend for fish habitat or for westslope cutthroat trout or western pearlshell mussel populations because it would have no effect on the trend toward desired condition for the RHCAs. It would remove small conifers up to 6 inches in diameter and brush from within 100 feet of the road edge of FS Road 1954. INFS RHCA interim buffers would be maintained except potentially on intermittent streams. INFS guidelines allow for the decrease of interim widths if the prescribed distances are not needed to attain RMOs or avoid adverse effects. Along intermittent streams the fisheries biologist or hydrologist would review the site to determine the appropriate no-entry buffer which would

protect the Riparian Management Objectives. This no-entry buffer could lie within a range of up to 50 feet.

Opening Roads for Firewood Collection: This activity would have no effect on the trend for fish habitat or for populations of westslope cutthroat trout or western pearlshell mussel because it would have no effect on the trend toward desired condition for the parameters which could potentially be affected by this activity: LWD, pool frequency, streambank stability, stream temperature, and RHCAs. Only Road 1954 in the Fagan Creek drainage would be opened seasonally for firewood collection. Firewood collectors would be required to adhere to firewood permit direction which does not permit cutting firewood within 150 feet of a live stream.

Road Density: Road density would remain the same for all alternatives, which is a high density of roads. This is the only parameter that does not meet the desired condition. The number of stream crossings would remain the same. The stream crossing rating is "good".

Hume Creek

Migration Barrier Removal/Replacement: This activity would have a direct positive effect on the trend for fish habitat and for populations of westslope cutthroat trout or western pearlshell mussel because the physical barrier parameter would trend toward the desired condition. The migration barrier on Road 1950 would be corrected. This project would create a short-term pulse of increased sediment during project implementation which could potentially have short term negative effects but which would not trend the fish species away from the desired condition of increased densities. In the long term the project-would benefit the fishery by providing connectivity and increasing the amount of suitable habitat (USDA Forest Service 2005).

Stream Crossings: There would be no effect on the trend for fish habitat or for populations of westslope cutthroat trout or western pearlshell mussel. The sediment parameter, as determined by the number of stream crossings, would not be altered following the implementation of either of these alternatives. The parameter would still be considered as not meeting desired condition.

Opening Roads for Firewood Collection: This activity would have no effect on the trend for fish habitat or for populations of westslope cutthroat trout or western pearlshell mussel because it would have no effect on the trend toward desired condition for the parameters which could potentially be affected by this activity: LWD, pool frequency, streambank stability, stream temperature, and RHCAs. Only Road 1950 would be opened seasonally for firewood collection. Firewood collectors would be required to adhere to firewood permit direction which does not permit cutting firewood within 150 feet of a live stream.

Preston Creek

Migration Barrier Removal/Replacement: This activity would have a direct positive effect on the trend for fish habitat and for populations of westslope cutthroat trout or western pearlshell mussel because the physical barrier parameter would trend toward the desired condition. The migration barrier on Road 1955A would be removed during the long-term storage of Road 1995A. That would create a short-term pulse of increased sediment during project implementation, which could potentially have short term negative effects but which would not trend the fish species away from the desired condition of increased densities. In the long term the project-would benefit the fishery by providing connectivity and increasing the amount of suitable habitat (USDA Forest Service 2005). The migration barrier on FS Road 1954 would remain in place. Following discussions with Idaho Fish and Game (IDFG) (Fredericks, personal communication) it was determined that this culvert should be left in place for the current time. Limited electrofishing surveys of Preston Creek found only westslope cutthroat trout (WCT) upstream of this site, while WCT and brook trout, a non-native species, were found downstream.

This culvert barrier may be providing WCT refugia upstream of the culvert. IDFG will be developing a management direction regarding barriers that are preventing invasion of isolated streams by brook trout. Until that direction in finalized this culvert will be kept as a barrier. The culvert on Road 1955A would be removed because it is upstream of the culvert on Road 1954 therefore the removal of the 1955A culvert would connect additional stream miles in the section which may only contain WCT.

Bald Mountain Fuel Reduction: This activity would have no effect on the trend for fish habitat or for populations of westslope cutthroat trout or western pearlshell mussel because it does not affect the parameters: stream temperature, LWD, pool frequency, streambank condition, or peak flows. The activity would be hand work which is located near the top of the ridge that divides Charlie/Preston Creek drainages from the Palouse River drainage; therefore there is no potential for impacts to the fishery being generated.

Road Density: There would be an indirect positive effect on the trend for fish habitat or for westslope cutthroat trout or western pearlshell mussel populations. Road density would be reduced thus trending this parameter toward the desired condition, however the density would continue to be in the high range. Approximately 1.3 miles of road would be decommissioned and 1.1 miles of road would be placed into long-term storage.

Stream Crossings: There would be an indirect positive effect on the trend for fish habitat or for westslope cutthroat trout or western pearlshell mussel populations. The decommissioning and long-term storage projects would trend the sediment parameter (as related to stream crossings) toward desired condition of less than 0.5 stream crossings/stream mile. Four stream crossings would be removed. The removal of stream crossings could potentially have short term negative effects but would not trend the fish species away from the desired condition of increased densities. In the long term the project would benefit the fishery by reducing potential sediment sources.

Effects of Past, Present, and Foreseeable Activities Common to Alternatives B and C

Several natural events have influenced the stream systems of the project area as well as the entire Charlie Creek drainage. Major flood events in the 1890s, 1933, and 1936 followed large fires in 1887 and 1928. Other floods occurred in 1948, 1961, 1974, 1996, and 2002 (Charlie Tyson FEIS p. III-3: CT5, project file doc F- 4). Historic fires are known to have impacted the project area in 1889, 1910, 1927, and 1929 (see 1933 aerial photos and Fire History Map). The stream systems and fishery evolved with disturbances like fires and floods. These disturbances have influenced the habitat parameters of stream temperature, LWD, pool frequency streambank conditions, peak/base flows and riparian habitat conditions.

Human use and management of the Charlie Preston area has occurred for many decades and extends back before records were kept. Protection of the streams and the riparian zones was not a priority during those early days of timber harvesting and road building. These activities have resulted in the current conditions and the current limiting factors to fish production. The watershed report states that; Charlie Creek, within the downstream privately owned lands, had some bedload aggradation and small lateral movements following the 1996 floods but overall has not change greatly since 1933. Brook trout, a non-native fish species, were not present in Charlie Creek or Santa Creek in 1935 or in 1940 (Fields 1935, Maclay 1940). They have been found in the streams since at least the 1970s. Brook trout compete with native species for food and space (Peterson et al 2004).

A summary of the history of the Charlie Preston area is presented beginning on page 47. Table 37summarizes the effects of the past, present, and reasonably foreseeable future activities to aquatic organism habitat and populations. These activities and their effects were taken into

consideration during the cumulative effects analysis for the individual drainages. Explanations for why other activities would not affect aquatic organisms are given in the Aquatic Organisms Report Table 19.

Table 37 – Summary of Effects of Past, Present, and Future Activities on Aquatic Organisms

Action	Past	Present	Future	Explanation of Possible Continuing Effect
Timber Harvest	X			The most recent timber harvest in the project area happened in 1996-2005. During this period there were approximately 498 acres treated with regeneration harvest prescriptions (project file doc ACT-24). The amount of influence from this harvest on sediment rates has probably decreased and is no longer affecting the stream. No-entry riparian buffers were implemented during these timber sales. See individual drainage discussion for additional information regarding effects of prior harvest.
Tree Planting	X			Minimal ground disturbance. Growth of new trees improves watershed condition. Near RHCAs, it improves temperatures and potential for LWD recruitment
Road Construction	X			Increases in road densities have negative effects on utilization of streams by fish (Quigley and others 1997). See individual drainage discussion for site specific effects analysis.
Road Decommissioning	X			Short-term negative effects where culverts are removed due to introduction of sediment to channel but long-term positive effect because of decrease in road densities. See individual drainage discussion for site-specific effects analysis
Road Maintenance	X	X	X	IPNF Road Maintenance Programmatic Biological Assessment (2004). Identifies elements that can be negatively impacted by road maintenance: sediment, temperature, chemical and large woody debris; but if road maintenance were not done there is a greater threat for increased sediment reaching streams. The Forest Service enters into cost share agreements for road maintenance with other land owners in mixed ownership areas of the project area. Maintenance performed on "cost share roads" will comply with FS standards.
Public Activities: firewood cutting, driving roads, camping, snowmobiling, hunting, hiking, berry picking, fishing, Christmas tree cutting	X	X	X	Primarily due to influence of roads, see Programmatic Road Maintenance BA, 2004
Watershed & fisheries improvement projects	X			Projects have only been conducted in Charlie Creek and Hume Creek. See individual drainage discussions for site-specific effects analysis.
Grazing - cattle	X			See the 2004 St. Maries Grazing allotment EA. The Pacfish/INFS Biological Opinion Monitoring program

Action	Past	Present	Future	Explanation of Possible Continuing Effect
				includes a site along Charlie Creek. Monitoring of this site occurred in 2002 and 2007, for variables that are altered by livestock grazing, not other management activities.
Biotic Factors		X	X	Streams of project area have eastern brook trout, a non-native species which was introduced to western US streams.
Homesteads	X			Homesteading began in this area in the early 1900s. Homesteaders often would clear trees to create hay fields and grazing areas. The watershed report, through photo interpretation of 1933-2009 aerial photos, describes riparian vegetation moving toward a grass/sedge community and fewer woody species/trees.
Mining	X			Mining occurred in the lower reach of Preston Creek. See Preston Creek discussion for detailed effects.
Railroad grade construction and abandonment	X			Railroad grades were built up Charlie Creek, Hume Creek and part way up E. F. Charlie in the 1920s. See individual stream discussions for effects.
Splash dam in East Fork Charlie Creek	X			See East Fork Charlie for discussion of effects
Use of ATVs on Road 1954 and the lower part of Road 1950			X	This activity would occur on existing roads. Effects would be similar to other vehicle use of the road. Minor amount of dust generated, increases need for road maintenance on roads which are not open to over 50" vehicles. IPNF Road Maintenance Programmatic Biological Assessment (2004) identifies elements that can be negatively impacted by road maintenance: sediment, temperature, chemical, and large woody debris; but if road maintenance were not done there is a greater threat for increased sediment reaching streams.
Activities on Other Lands				
Wildfire	X		Unknown	
Timber Harvest	X	X	X	Must meet Idaho Forest Practices Act
Road Construction	X		X	Must meet Idaho Forest Practices Act
Home sites	X	X	likely	Impacts are primarily associated with agriculture, and range activity see those activities
Hay production	X	X	X	See Charlie Creek, EF Charlie and Hume Creek
Weed control	X	X	X	Must meet Idaho Forest Practice Act and State Weed Control standards
Stream channelization	X			See Hume Creek for effects
Grazing	X	X	X	See Charlie Creek, EF Charlie and Hume Creek

Charlie Creek (within the project area)

Almost the entire project area burned between 1928 and 1929. The 1933 aerial photographs depict an area that has no timber or at most smaller sized timber (**Figure 5** and ACT-3). This was a result of the past fires as well timber harvest, which occurred in the lower part of the drainage in

the 1920s and 1930s. These influences plus the increase in roading and logging over the next forty years, prior to the change in management emphasis, added sediment to the streams. The timber harvest since 1992 utilized the Idaho Forest Practices BMPs. Any timber harvest that occurred since 1995 adhered to INFS buffers in addition to the BMPs. Prior to these standards harvest units likely did not manage riparian areas differently than upland areas, therefore riparian conditions would not have been protected.

A railroad went up the main stem of Charlie Creek to transport the logs from timber harvest. The railroad and skid roads, which go up the majority of the smaller tributaries, affected streambank conditions, as well as riparian conditions, increased sediment to the streams, and reduced the potential for LWD recruitment.

Private lands comprise approximately 4% Charlie Creek drainage within the project area. Agricultural and rangeland management occurs on lands in the lower part of the drainage. Grazing (which is occurring both on private lands and on National Forest System lands under a grazing allotment permit) can produce negative impacts including streambank degradation, change to riparian vegetation communities, and shallower and wider streams (Meehan 1991). Based on photograph comparisons and the documented potential effects from grazing, it appears that grazing practices vary within the private lands of Charlie Creek. Some practices are not having a negative impact on the channel and some practices are. Grazing impacts on National Forest Systems lands were noted during stream surveys (F-8, 9, 10, 11, 12) but these impacts were generally associated with cattle crossings. A soil survey conducted in 2002, noted that streambanks were well vegetated (M-21).

Timber company lands occur mostly in the upper portion of the drainage. Private timber companies must adhere to Idaho Forest Practices. Due to the location of these lands and the required adherence to state practices there should be little potential for effects to have a negative impact on the fish habitat or fisheries downstream.

A comparison of the 1991 aerial photographs and the 1955 photographs reveals that a segment of Charlie Creek was straightened downstream of the confluence of East Fork Charlie Creek and Charlie Creek. Photograph comparisons between 1955, 1991, and 2002 photos (F-73) shows a change in the Charlie Creek riparian vegetation, especially downstream of the Charlie Creek and Hume Creek confluence. The photographs also show that some sections of Charlie Creek do have riparian vegetation that is similar between the years and that it has grown. Between the 1991 photographs and the 2002 photographs the section of Charlie Creek between the confluence with East Fork Charlie Creek and the confluence with Hume Creek has increased depositional areas which may be a result of the 1996 floods. The 1996 flood was the highest flood on record on the St. Maries gauge station near Santa (Project File document F-4).

Many of the above described activities increase sediment concentrations within the channel. The increase in sediment altered the channels from single thread channels (Charlie Tyson FEIS III-51) to braided channels. Stream surveys from 1988 identified extensive areas of braided channel within Charlie Creek. The 1993 stream surveys continued to identify braided areas; however, the hydrologist report from the Charlie Tyson EIS reported that the braided channel sections of the streams were becoming stabilized by riparian vegetation (Charlie Tyson FEIS III-51). There continues to be braided channels (Project File document F-8) and instream habitat is still altered in the lower reach of Charlie Creek within the project area. In 1995, 58 logs were placed at 20 locations in the stream and along the streambanks within approximately one mile length of stream. These structures were monitored in 2004. Structures were creating diversity to the section of stream; however this did not occur in a large enough quantity to achieve the desired condition for this section. It continues to have lower than expected numbers of LWD and pool habitat. Other activities within the last ten years which have begun the trend toward desired

conditions includes the decommissioning and long term storage of roads (Project file document F-14).

East Fork Charlie Creek

A railroad grade was built up East Fork Charlie Creek to Eena Creek prior to 1933 (Project file ACT-2: Road Construction History). The 1933 aerial photographs (ACT-3) indicate the railroad crossed East Fork Charlie one time, and for the most part was not immediately adjacent to the stream. However the aerial photographs show a riparian zone which was lacking in a timber component. This was likely due to the railroad, fires that burned 5,874 acres of the entire East Fork Charlie in 1887 and the harvesting of that timber. The removal of the coniferous riparian zone would affect fish habitat by increasing stream temperatures, reducing LWD, reducing the potential for future LWD recruitment, and reducing the stability of streambanks.

A splash dam was located on the East Fork Charlie upstream of the project area (1933 aerial photograph, ACT-3). Splash dams have negative effects on stream habitat for fish, destroying rearing habitat and scouring previously deposited eggs (Sedell and others 1991).

The lands adjacent to East Fork Charlie Creek within the project area are privately managed and are used for agriculture and range. Aerial photographs indicate the riparian area of East Fork Charlie within the project was returning to a timbered riparian condition in 1955 then management changed because the 2002 photographs again show a reduced coniferous riparian zone (F-73). This use will continue in the future.

On the acres which are currently under National Forest System management, the 1933 photographs show an area that is primarily void of conifers. The 1955 photographs show stands which are timbered, and this area was harvest in 2001 and 2002 under the Charlie Brown T.S. (approximately 95 acres). This timber harvest would have utilized BMPs and INFS guidelines for buffers on two small intermittent streams (Project file document M-6: Timber Sale Inspection Reports for Charlie Brown).

Fagan Creek

A portion of Fagan Creek burned between 1887 and 1929. The 1933 aerial photographs show a timbered riparian zone with areas of smaller timber on the slopes. Those photos indicate that the majority of human activity within the Fagan Creek drainage occurred near the confluence with the East Fork of Charlie Creek. A road was constructed across the lower portion of Fagan Creek sometime between 1965 and 1975 (ACT-2). This road was labeled 299UC for the Charlie Tyson FEIS. A survey was conducted of the road for that analysis and reported that there had been two native timber bridges across Fagan Creek. The lowest bridge had broken apart and was washed downstream; the second bridge had collapsed (ACT-2). In 2008 this bridge was removed during the obliteration of Road 299UC Figure 5 (Project File document F-14).

The stream survey in 2008 identified the presence of old logging stumps along the stream channel. This harvest occurred prior to 1950, the oldest harvest records for the Charlie Preston area. The majority of the harvest that has occurred since that time was between 2001 and 2005 (Charlie Brown T.S.). This recent harvesting implemented BMPs and INFS buffers which protect in-stream habitats. Stream surveys indicate that conifers are a primary component of the riparian zone. This drainage had less historic management than other drainages within the project area, and this is reflected in the fact that the habitat parameters meet desired conditions, except for road density.

The entire drainage is National Forest System lands; therefore there is no privately owned management activity which is considered for cumulative effects.

Hume Creek

The upper 1/3 of the Hume Creek drainage burned in 1927. To assist in the harvest of the timber a railroad was constructed within the riparian zone of Hume Creek. In addition to the railroad, the channel was impacted by channelization which likely occurred in the mid 1920s based on aerial photograph reviews of the 1933 aerial photographs (ACT-3) and the timing of railroad construction in the area. The 1955 aerial photographs (F-73) show the channel paralleling the railroad grade. The new channel is the lowest section of Hume Creek. The new straight segment of Hume Creek is approximately 2200 feet long and enters Charlie Creek at a different location much further downstream than the natural channel, which was about an 1100-foot segment of stream. This channelization is located primarily on privately owned lands. The channel is lined with shrubs.

The majority of the railroad grade became FS Road 1479. The lower portion was not used for the road, and in 1993 a watershed improvement project ripped/tilled the old railroad grade, armored it with woody debris, and seeded over four acres. Relief culverts and a wooden stream crossing were removed (Charlie Tyson EIS page III-57).

Hume Creek lies within a Forest Service grazing allotment. Cattle damage to the stream channel was identified in both the 1991 and 2008 habitat surveys. Damage is sporadic with areas of heavy damage (1991 stream survey) and areas with little damage (project file M-21, Hume – Charlie Grazing monitoring). Grazing can produce negative impacts including streambank degradation, change to riparian vegetation communities, shallower/wider streams (Meehan 1991).

The culvert on Road 1950 is a migration barrier which has been in place since the 1960s (Project File document ACT-2).

Timber harvest and road building has occurred in the Hume Creek drainage at least since the 1930s (1933 aerial photographs, ACT-3). Forest Service records identified timber harvest in Hume Creek in 1960 (oldest harvest in the database), 1963, 1967, 1969, 1970, 1992, 1994, and 2002. The harvest that occurred in the '60s and '70s was prior to INFS and before BMP protections were put in place, therefore it is likely that these units did not protect streams with no-entry buffers. This early harvest was primarily selective logging which did not remove all timber from the stand. Based on the type of harvest and a review of the 1983 aerial photographs it does not appear that the riparian zones were extensively harvested. The timber harvest since 1992 would have utilized the Idaho Forest Practices BMPs. The harvest in 2002, in addition to the BMPs, would have had to adhere to INFS buffers.

Preston Creek

The majority of Preston Creek burned between 1928 and 1929, although the 1933 aerial photographs show a riparian zone with larger trees, upstream of the railroad grade. The photographs show some form of road (railroad or motor vehicle road) went up the riparian area of Preston Creek approximately 0.5 miles. Later in the 1940s, the lower ¼ of Preston Creek was mined for gold. Both of these activities can have long-term effects to stream channel conditions. The mining, especially, can have negative effects to instream habitat reducing habitat diversity, removing LWD and increasing sediment loads. The channelization also negatively affects streambank conditions. The channel continues to be entrenched and straight. Abandoned diversion ditches are still visible in the riparian area of this section.

Timber harvest and road building has occurred in the Preston Creek drainage at least since the 1930s (1933 aerial photographs). Forest Service records identified timber harvest occurred in the headwaters of Preston Creek in the 1950s (oldest record harvest). This harvest was prior to INFS and BMP protections were put in place, therefore it is likely that if a unit crossed a stream the

harvest likely did not protect the stream with a no entry buffer. The timber harvest, approximately 190 acres) associated to the Preston Knob T.S. in 1990, was also in the headwaters. The Idaho Forest Practices were established in 1974 (Seyedbagheri 1992) however they did not apply to national forest lands until 1991 (Belt et al 1992). Several of the harvest units associated to this timber sale crossed headwater streams. It is unknown what size stream protection buffers, if any, were implemented on these units. The Charlie Brown T.S. included a 10- acre unit in the Preston drainage in 2000, this unit was near the ridge that divides Preston Creek from the Palouse and did not include any headwater streams.

Road decommissioning occurred within the Preston Creek drainage in 2006 and 2008. This activity reduced the road density within the drainage as well as the number of stream crossings.

Alternative B Direct and Indirect Effects

Charlie Creek

Timber harvest: The implementation of timber harvest in Charlie Creek would not affect the current trend for fish habitat or for populations of westslope cutthroat trout or western pearlshell mussel because the parameters: stream temperature, LWD quantities, pool frequency, water yield, peak flows, stream bank stability or RHCA condition would not be affected. The 710 acres of timber harvest, and associated logging methods and fuel reduction methods would have no direct or indirect effects to the fishery of Charlie Creek due in part to the implementation of INFS no-entry buffer widths. INFS buffer widths (50 feet, 150 feet or 300 feet, depending on stream) have been shown to be effective methods for reducing the potential for sediment from harvest units entering streams (Rashin 2006, Jackson et al 2001) and for preventing increases in stream temperatures (Clinton 2011, Groom et al 2011). Implementation monitoring of buffers has occurred on the IPNF over the past decade and a half (Roper, personal communication 3/23/11, Dekome, personal communication 3/23/11). Implementation of buffers on the IPNF has, in general, followed recommendations in the environmental documents or improved upon those in the NEPA (project file documents M-4, M-5).

The majority of the timber harvest (601 acres) would be commercial thinning. Approximately 109 acres of overstory removal are proposed on previously harvested acres lower in the drainage. Forty-two percent of the total ECA increase would come from the harvest within the portion of the Charlie Creek drainage within the project area. The watershed report concludes that harvest would likely increase water yields but not to a detectable level. The watershed report also states that any increase in peak flows would be short term and would have little to no effect on stream channels.

Road Construction: New road construction would not alter the trend for fish habitat or for westslope cutthroat trout or western pearlshell mussel populations. This would occur because the selection of Alternative B would maintain the road density parameter in a high density status which would not improve the trend toward desired condition. The road construction which would occur in the Charlie Creek drainage under this alternative would install two culverts on new road NC2, one culvert on new road NC6, two on new road NC10 and two on new road NC11. None of these culverts would be installed on fish-bearing streams. NC 2, NC 6, and NC 7 would lie near the top of the ridge that divides Charlie Creek from Hume Creek. NC 9, NC 10, and NC 11 would be mid-slope roads. Road segments NC 10 and NC 11 would replace segments of the existing Road 377JA. The current segments are located lower on the slope in areas which are increasing sediment loads to the streams. Following the use of the new roads, the culverts would be removed and the roads would be put into long-term storage. The entire length of Road 377JA, including the new segments NC 9, NC 10 and NC 11 would be placed into long-term storage. Thus this construction would not add to the number of stream crossings within Charlie Creek

drainage. The culverts would add some sediment increase during installation and removal but following removal and stabilization would not be chronic sources of sediment (USDA 2005). Foltz et al 2008 found that following culvert removal sediment concentrations 810m downstream of the outlet returned to near background levels. Based on GIS measurements, three of the culverts along Road 377JA and its replacement sections (NC9, NC 10, and NC 11) are over 800m away from a fish-bearing section of stream, one culvert is approximately 700m away, and two culverts are approximately 550m away. Foltz also reported that the use of mitigation measures, which were not incorporated into the 810m distance, would substantially reduce the sediment yield and transport. Therefore due to the use of BMPs and the distance to the fish-bearing section of stream, the culvert installation and removal would not impact the fish-bearing reach.

The temporary road would not impact the trend for the sediment or the road density parameter. Temporary road construction would be needed for Unit 139. This temporary road would include one stream crossing on a first order tributary to Charlie Creek. Following the harvest the culvert would be removed and the road would be decompacted. The culvert would add some sediment increase during installation and removal but following removal and stabilization it would not be a chronic source of sediment (USDA 2005).

East Fork Charlie Creek

Timber Harvest: The implementation of timber harvest in East Fork Charlie Creek would have no effect on the trend for fish habitat or for populations of westslope cutthroat trout or western pearlshell mussel because the parameters; stream temperature, LWD quantities, pool frequency, stream bank stability and RHCA condition parameters would not be effected by this alternative.. The 64 acres of timber harvest with associated logging methods and fuel reduction methods would have no direct or indirect effects to the fishery of East Fork Charlie Creek due in part to the implementation of INFS no-entry buffer widths. INFS buffer widths (50 feet, 150 feet or 300 feet, depending on stream) have been shown to be effective methods for reducing the potential for sediment from harvest units entering streams (Rashin 2006, Jackson et al 2001) and for preventing increases in stream temperatures (Clinton 2011, Groom et al 2011). Implementation monitoring of buffers has occurred on the IPNF over the past decade and a half (Roper, personal communication 3/23/11, Dekome, personal communication 3/23/11). Implementation of buffers on the IPNF has, in general, followed recommendations in the environmental documents or improved upon those in the NEPA (project file documents M-4, M-5).

The harvest prescriptions would be overstory removal and shelterwood final removal within previously harvested units. These types of harvest prescriptions are used to release established regeneration from competition with the overstory. The regeneration that would remain is between 7 feet and 15 feet tall, approaching hydrologic recovery height. Six percent of the total ECA increase for the entire project area would come from the harvest within the East Fork of Charlie Creek drainage within the project area. The watershed report concludes that harvest would likely increase water yields but not to a detectable level. The watershed report also states that any increase in peak flows would be short term and would have little to no effect on stream channels.

Road Construction: No new road construction is proposed within this drainage.

Fagan Creek

Timber Harvest: The implementation of timber harvest in Fagan Creek would not affect the trend for fish habitat or for populations of westslope cutthroat trout or western pearlshell mussel because the parameters: stream temperature, LWD quantities, pool frequency, water yield, peak flow, stream bank stability or RHCA would not be effected

The 270 acres of timber harvest with associated logging methods and fuel reduction methods would have no direct or indirect effects to the fishery of Fagan Creek due in part to the implementation of INFS no-entry buffer widths. INFS buffer widths (50 feet, 150 feet, or 300 feet, depending on stream) have been shown to be effective methods for reducing the potential for sediment from harvest units entering streams (Rashin 2006, Jackson et al 2001) and for preventing increases in stream temperatures (Clinton 2011, Groom et al 2011). Implementation monitoring of buffers has occurred on the IPNF over the past decade and a half (Roper, personal communication 3/23/11, Dekome, personal communication 3/23/11). Implementation of buffers on the IPNF has, in general, followed recommendations in the environmental documents or improved upon those in the NEPA (project file M-4, M-5).

The majority of the harvest acres would be commercial thins which retain in general 80-110 sq ft of basal area. Eighteen percent of the total ECA increase for the entire project would come from the harvest within Fagan Creek drainage. The watershed report concludes that harvest would likely increase water yields but not to a detectable level. The watershed report also states that any increase in peak flows would be short term and would have little to no effect on stream channels.

Road Construction: There would be no change to the trend for fish habitat or for westslope cutthroat trout or western pearlshell mussel populations because there would be no change to the road density parameter. The new road construction (Road NC3) which would occur in the Fagan Creek drainage would not require the installation of culverts. This road would be placed into long-term storage following harvest activities.

Planting: This activity would have an indirect positive effect on the trend for fish habitat and for westslope cutthroat trout or western pearlshell mussel populations. Planting of conifers within the regeneration units, 39 acres, would benefit the watershed in the long term. Planting increases the rate of revegetation which returns water yields to pre-harvest conditions more rapidly (Troendle and others 2010).

Pocket Gopher Control: This activity would have no effect on the trend for fish habitat or for populations of westslope cutthroat trout or western pearlshell mussel because it would not trend the chemical contamination parameter away from desired condition. Four units may receive pocket gopher control treatment: Units 3, 6a, 6b and10 (39 acres). Pocket gopher control methods include the use of zinc phosphide or strychnine treated bait. Design feature #IV. C. provides measures to protect aquatic species, including no treatment within INFS buffers. Implementation monitoring conducted in 2002 on the St. Joe Ranger District determined that pocket gopher control did not occur within the INFS buffer, as required by the BA, on 80% of the units (project file F-1). On the one unit that treatment occurred within the buffer no fish mortalities were observed. Stricter adherence to the buffer widths was recommended

Hume Creek

Timber Harvest: The implementation of timber harvest in Hume Creek would not impact the trend for fish habitat or for populations of westslope cutthroat trout or western pearlshell mussel because the parameters: stream temperature, LWD quantities, pool frequency, water yield, peak flow, stream bank stability and RHCA condition would not be affected.

The 176 acres of timber harvest with associated logging methods and fuel reduction methods would have no direct or indirect effects to the fishery of Hume Creek due in part to the implementation of INFS no-entry buffer widths. INFS buffer widths (50 feet, 150 feet or 300 feet, depending on stream) have been shown to be effective methods for reducing the potential for sediment from harvest units entering streams (Rashin 2006, Jackson et al 2001) and for preventing increases in stream temperatures (Clinton 2011, Groom et al 2011). Monitoring of buffers has occurred on the IPNF over the past decade and a half (Roper, personal communication

3/23/11, Dekome, personal communication 3/23/11). Implementation of buffers on the IPNF has, in general, followed recommendations in the environmental documents or improved upon those in the NEPA (project file M-4, M-5).

About half of the harvest prescriptions for these acres would retain 10 ft^2 of basal area; the other half of the acres would retain 80-100 ft^2 of basal area. Ten percent of the total ECA increase for the entire project would come from the harvest within Hume Creek drainage. The watershed report concludes that harvest would likely increase water yields but not to a detectable level. It also states that any increase in peak flows would be short term and would have little to no effect on stream channels.

Planting: This activity would have an indirect positive effect on the trend for fish habitat and for westslope cutthroat trout or western pearlshell mussel populations. Planting of conifers within the regeneration units, 53 acres, would benefit the watershed in the long term. Planting increases the rate of revegetation which returns water yields to pre-harvest conditions more rapidly (Troendle and others 2010).

Road Construction: There would be no change to the trend for fish habitat or for westslope cutthroat trout or western pearlshell mussel populations because there would be no change to the road density parameter. The new road construction 0.8 miles (road NC7), which would occur in the Hume Creek drainage, would not require the installation of culverts. The road is located near the ridge between Hume Creek and Charlie Creek. This road would be placed into long-term storage following harvest activities.

Roadside Fuel Treatment: This activity would not impact the trend toward desired condition for fish habitat or for populations of westslope cutthroat trout or western pearlshell mussel because the parameter the riparian habitat conservation areas would not be affected. This activity would remove small conifers up to 6 inches in diameter and brush from within 100 feet of the road edge of FS Road 1479. This would be done along approximately 3.69 miles of road (0.59 acres) in the Hume Creek drainage. INFS buffers would be maintained except potentially on intermittent streams. INFS guidelines allow for the decrease of interim widths if the wider distances are not needed to attain RMOs or avoid adverse effects. Along intermittent streams the fisheries biologist or hydrologist would review the site to determine the appropriate no-entry buffer which would protect the Riparian Management Objectives. This no-entry buffer could lie within a range up to 50 feet.

Pocket Gopher Control: This activity would have no effect on the trend for fish habitat or for populations of westslope cutthroat trout or western pearlshell mussel because it would not impact the trend for the chemical contamination parameter. Four units may receive pocket gopher control treatment: Units 96, 105, 136A, 136B (53 acres). Units 105 and 136A do not have streams within their boundaries. Units 96 and 136B have streams which would be buffered. Pocket gopher control methods include the use of zinc phosphide or strychnine treated bait. Design feature #IV. C. would provide measures to protect aquatic species, including no treatment within INFS buffers. Implementation monitoring conducted in 2002 on the St. Joe Ranger District determined that implementation of pocket gopher control was restricted to areas outside of the INFS buffer on 80% of the units (project file F-1).

Preston Creek

Timber Harvest: The implementation of timber harvest in Preston Creek would not impact the trend for fish habitat or for populations of westslope cutthroat trout or western pearlshell mussel because the parameters: stream temperature, LWD quantities, pool frequency, water yield, peak flow, stream bank stability and RHCA condition would not be affected.

The 326 acres of timber harvest with associated logging methods and fuel reduction methods would have no direct or indirect effects to the fishery of Preston Creek due in part to the implementation of INFS no-entry buffer widths. INFS buffer widths (50 feet, 150 feet, or 300 feet, depending on stream) have been shown to be effective methods for reducing the potential for sediment from harvest units entering streams (Rashin 2006, Jackson et al 2001) and for preventing increases in stream temperatures (Clinton 2011, Groom et al 2011). Implementation monitoring of buffers has occurred on the IPNF over the past decade and a half (Roper, personal communication 3/23/11, Dekome, personal communication 3/23/11). Implementation of buffers on the IPNF has, in general, followed recommendations in the environmental documents or improved upon those in the NEPA (project file M-4, M-5).

About a third of the acres of proposed timber harvest would retain 10 ft^2 of basal area and two thirds of the acres would retain 80-100 ft^2 of basal area. Twenty-four percent of the total ECA increase for the entire project would come from the harvest within Preston Creek drainage. The watershed report concludes that harvest would likely increase water yields but not to a detectable level. It also states that any increase in peak flows would be short term and would have little to no effect on stream channels.

Planting: This activity would have an indirect positive effect on the trend for fish habitat and for westslope cutthroat trout or western pearlshell mussel populations. Planting of conifers within the regeneration units, 89 acres, would benefit the watershed in the long term. Planting increases the rate of revegetation which returns water yields to pre-harvest conditions more rapidly (Troendle and others 2010).

Road Construction: There would be no change to the trend for fish habitat or for westslope cutthroat trout or western pearlshell mussel populations because there would be no change to the road density parameter. Two new segments of road construction NC 5 (0.3 miles) and NC 8 (0.5 miles) would occur in the Preston Creek drainage. Each segment would require the installation of one culvert on non-fish-bearing streams. Road NC8 would be located near the ridge dividing Preston Creek from the Palouse River. Road NC5 would be located in the upper quarter of the Preston Creek drainage. These roads would be placed into long-term storage following harvest activities.

Roadside Fuel Treatment: This activity would not reduce the trend toward desired condition for the fish habitat or for westslope cutthroat trout or western pearlshell mussel populations because the parameter riparian habitat conservation areas would not be affected. It would remove small conifers up to 6 inches in diameter and brush from within 100 feet of the road edge along approximately 3.69 miles of FS Road 1479 (0.59 acres). INFS buffers would be maintained except potentially on intermittent streams. INFS guidelines allow for the decrease of interim widths if the wider distances are not needed to attain RMOs or avoid adverse effects. Along intermittent streams the fisheries biologist or hydrologist would review the site to determine the appropriate no-entry buffer which would protect the Riparian Management Objectives. This no-entry buffer could lie within a range of up to 50 feet.

Pocket Gopher Control: This activity would have no effect on the trend for fish habitat or populations of westslope cutthroat trout or western pearlshell mussel because it would not impact the current trend of meeting desired condition for the chemical contamination parameter. Six units (89 acres) may receive pocket gopher control treatment: Units13A, 13B, 14A, 14B, 15, and 138. Units 13A, 14A, 14 B and 138 do not incorporate streams within their boundaries. Units 13B and 15 have streams which would be buffered. Pocket gopher control methods include the use of zinc phosphide or strychnine treated bait. Design feature #IV. C. provides measures to protect aquatic species, including no treatment within INFS buffers. Implementation monitoring conducted in 2002 on the St. Joe Ranger District determined that implementation of pocket

gopher control was restricted to areas outside of the INFS buffer, as required by the BA, on 80% of the units. On the one unit that treatment occurred within the buffer no fish mortalities were observed. Stricter adherence to the buffer widths was recommended (project file F-1).

Alternative B Cumulative Effects

Charlie Creek (in the project area)

There would be a trend toward the desired condition of better fish habitat and a trend for increased populations of westslope cutthroat trout and western pearlshell mussel on National Forest System lands. When the potential direct and indirect effects of all projects proposed under Alternative B are added to the effects of past, present, and reasonably foreseeable activities (page 95), there is low potential for habitat parameters to trend away from desired condition. There is high potential for proposed projects to trend the habitat parameters of temperature, sediment, physical barriers, large woody debris, pool frequency, streambank conditions, and road density toward the desired condition and to maintain the parameters of peak/base flow, chemical contamination, and riparian conservation areas in the condition to meet desired conditions.

East Fork Charlie Creek

There would be no change in the trend toward desired condition for fish habitat or in the trend for populations of westslope cutthroat trout and western pearlshell mussels on National Forest System lands. Conditions would remain in the current condition of deteriorated habitat, high temperatures, migration barriers, and the presence of non-native species. When the potential direct and indirect effects of all projects proposed under Alternative B are added to the effects of past, present, and reasonably foreseeable activities (page 47), there is low potential for habitat parameters to be deteriorated or to be improved because of the minimal amount of activity proposed.

Fagan Creek

The potential direct and indirect effects from Alternative B when combined with the past, present, and future activity effects would not impact the trend toward desired condition, and would maintain the fish habitat in an adequately functioning condition.

Hume Creek

There would be a trend toward the desired condition of better fish habitat, and a trend toward increased populations of westslope cutthroat trout and western pearlshell mussels on National Forest System lands. When the potential direct and indirect effects of all projects proposed under Alternative B are added to the effects of past, present, and reasonably foreseeable activities (page 47), there is low potential for habitat parameters to trend away from desired conditions. There is high potential for proposed projects to trend the habitat parameters of temperature, physical barriers, large woody debris, and streambank conditions toward the desired condition, and to maintain the parameters of peak/base flow, chemical contamination, and riparian conservation areas in the condition to meet desired conditions. The parameters of road density and sediment would not be altered by the implementation of this alternative. Due to the retention of the existing high road density and the high number of stream crossings (sediment parameter) the conditions of this stream would improve, but they would continue to be considered “Highly altered/high risk”.

Preston Creek

There would be a trend toward the desired conditions of better fish habitat, and a trend toward increased populations of westslope cutthroat trout and western pearlshell mussels on National Forest System lands. When the potential direct and indirect effects of all projects proposed under Alternative B are added to the effects of past, present, and reasonably foreseeable activities (page 47), there is low potential for habitat parameters to trend away from desired conditions. There is high potential for proposed projects to trend the habitat parameters of temperature, sediment, physical barriers, large woody debris, pool frequency, streambank conditions, and road density toward the desired condition and to maintain the parameters of peak/base flow, chemical contamination, and riparian conservation areas in the condition to meeting desired conditions.

Charlie Creek HUC 6

When considering all the effects that potentially could occur with the implementation of Alternative B there would be a trend for the aquatic habitat of Charlie Creek toward meeting the desired conditions of improved fish habitat and increased populations of westslope cutthroat trout and western pearlshell mussel. This would occur in part due to the limited effects of the timber harvest and associated road building; however, it would primarily be due to the proposed projects that would directly or indirectly benefit the aquatic habitat: migration barrier correction, LWD placement, riparian planting, and road storage. These activities would benefit mainstem Charlie Creek downstream of the project area by reducing sediment (due to reduced stream crossings) and reduce stream temperatures (cooler water entering Charlie from the tributaries). The improvement in upstream habitat would potentially increase aquatic populations throughout Charlie Creek.

Alternative C Direct and Indirect Effects

Charlie Creek

Timber Harvest: The implementation of timber harvest in Charlie Creek would not affect the current trend for fish habitat or for populations of westslope cutthroat trout or western pearlshell mussel because the parameters: stream temperature, LWD quantities, pool frequency, water yield, peak flows, stream bank stability or RHCA condition would not be affected. The 477 acres of timber harvest with associated logging methods and fuel reduction methods would have no direct or indirect effects to the fishery of Charlie Creek due in part to the implementation of INFS no-entry buffer widths. All of this timber harvest would be commercial thins which would leave a greater number of trees on the site than do regeneration harvests. Fifty-five percent of the total ECA increase would come from the harvest within the portion of the Charlie Creek drainage within the project area. The watershed report concludes that harvest would likely increase water and sediment yields in the short term but not to a detectable level (EA p. 71-72, 83).

Road Construction: New road construction would not alter the trend for fish habitat or for westslope cutthroat trout or western pearlshell mussel populations. Alternative C would maintain the road density parameter in a high density status which would not improve the trend toward desired condition. The road construction which would occur in the Charlie Creek drainage under this alternative would install one culvert on new road NC6, on a non-fishery stream. NC 6 would lie near the top of the ridge that divides Charlie Creek from Hume Creek. Following the use of the new road the culvert would be removed and the road would be put into long-term storage. Thus, this construction would not add to the number of stream crossings within Charlie Creek drainage. The culvert would add some sediment increase during installation and removal, but following removal and stabilization it would not be a chronic source of sediment (USDA 2005). Foltz et al. 2008 found that following culvert removal sediment concentrations 810m downstream

of the outlet returned to near background levels. Based on GIS measurements, three of the culverts along Road 377JA and its replacement sections (NC9, NC 10, and NC 11) are over 800m away from a fish-bearing section of stream, one culvert is approximately 700m away, and two culverts are approximately 550m away. Foltz also reported that the use of mitigation measures, which were not incorporated into the 810m distance, would substantially reduce the sediment yield and transport. Therefore due to the use of BMPs and the distance to the fish-bearing section of stream, the culvert installation and removal would not impact the fish-bearing reach.

East Fork Charlie Creek

Alternative C does not propose any timber harvest or road construction within this drainage, so the only effects would be those common to both action alternatives.

Fagan Creek

Timber Harvest: The implementation of timber harvest in Fagan Creek would not affect the current trend for fish habitat or for populations of westslope cutthroat trout or western pearlshell mussel because the parameters: stream temperature, LWD quantities, pool frequency, water yield, peak flows, stream bank stability or RHCA condition would not be affected. The 117 acres of timber harvest and associated logging methods and fuel reduction methods would have no direct or indirect effects to the fishery of Fagan Creek due in part to the implementation of INFS no-entry buffer widths. INFS buffers widths (50 feet, 150 feet, or 300 feet, depending on stream) have been shown to be effective methods for reducing the potential for sediment from harvest units entering streams (Rashin 2006; Jackson and others 2001) and for preventing increases in stream temperatures (Clinton 2011; Groom and others 2011). Monitoring of buffers has occurred on the IPNF over the past decade and a half (Roper, personal communication 3/23/11, Dekome, personal communication 3/23/11). Implementation of buffers on the IPNF has, in general, followed recommendations in the environmental documents or improved upon those in the NEPA (project file M-4, M-5).

In addition to the buffers, the harvest prescriptions for these acres would retain approximately one third of the trees. Sixteen percent of the total ECA increase would come from the harvest within the Fagan Creek drainage. The watershed report concludes that harvest would likely increase water yields but not to a detectable level. The watershed report also states that any increase in peak flows would be short term and would have little effect on stream channels.

Hume Creek

Timber Harvest: The implementation of timber harvest in Hume Creek would not affect the current trend for fish habitat or for populations of westslope cutthroat trout or western pearlshell mussel because the parameters: stream temperature, LWD quantities, pool frequency, water yield, peak flows, stream bank stability or RHCA condition would not be affected. The 104 acres of timber harvest with associated logging methods and fuel reduction methods would have no direct or indirect effects to the fishery of Hume Creek due in part to the implementation of INFS no-entry buffer widths. INFS buffer widths (50 feet, 150 feet, or 300 feet, depending on stream) have been shown to be effective methods for reducing the potential for sediment from harvest units entering streams (Rashin 2006; Jackson and others 2001) and for preventing increases in stream temperatures (Clinton 2011; Groom and others 2011). Implementation monitoring of buffers has occurred on the IPNF over the past decade and a half (Roper, personal communication 3/23/11, Dekome, personal communication 3/23/11). Implementation of buffers on the IPNF has, in general, followed recommendations in the environmental documents or improved upon those in the NEPA (project file M-4, M-5). In addition to the buffers, the harvest prescriptions for these acres would retain 80-100 ft^2 of basal area (approximately one third of the trees). Twelve percent

of the total ECA increase would come from the harvest within the Hume Creek drainage. The watershed report concludes that harvest would likely increase water yields but not to a detectable level. The watershed report also states that any increase in peak flows would be short term and would have little effect on stream channels.

Road Construction: New road construction would not alter the trend for fish habitat or for westslope cutthroat trout or western pearlshell mussel populations. This would occur because the selection of Alternative C would maintain the road density parameter in a high density status which would not improve the trend toward desired condition. The new road construction 0.5 miles (Road NC7), which would occur in the Hume Creek drainage, would not require the installation of culverts. The road is located near the ridge between Hume Creek and Charlie Creek. This road would be placed into long-term storage following harvest activities.

Roadside Fuel Treatment: This activity would not reduce the trend toward desired condition for the fish habitat or for westslope cutthroat trout or western pearlshell mussel populations because the parameter riparian habitat conservation areas would not be affected. This activity would remove small conifers up to 6 inches in diameter and brush from within 100 feet of the road edge along 3.7 miles (0.66 acres) of FS Road 1479. INFS buffers would be maintained except potentially on intermittent streams. INFS guidelines allow for the decrease of interim widths if the wider distances are not needed to attain RMOs or avoid adverse effects. Along intermittent streams the fisheries biologist or hydrologist would review the site to determine the appropriate no-entry buffer which would protect the Riparian Management Objectives. This no-entry buffer could lie within a range of up to 50 feet.

Preston Creek

Timber Harvest: The implementation of timber harvest in Preston Creek would not affect the current trend for fish habitat or for populations of westslope cutthroat trout or western pearlshell mussel because the parameters: stream temperature, LWD quantities, pool frequency, water yield, peak flows, stream bank stability or RHCA condition would not be affected. The 152 acres of timber harvest with associated logging methods and fuel reduction methods would have no direct or indirect effects to the fishery of Preston Creek due in part to the implementation of INFS no-entry buffer widths. INFS buffer widths (50 feet, 150 feet, or 300 feet, depending on stream) have been shown to be effective methods for reducing the potential for sediment from harvest units entering streams (Rashin 2006; Jackson and others 2001) and for preventing increases in stream temperatures (Clinton 2011; Groom and others 2011). Implementation monitoring of buffers has occurred on the IPNF over the past decade and a half (Roper, personal communication 3/23/11, Dekome, personal communication 3/23/11). Implementation of buffers on the IPNF has, in general, followed recommendations in the environmental documents or improved upon those in the NEPA (project file M-4, M-5).

Harvest prescriptions for these acres would retain 80-100 ft^2 of basal area (approximately one third of the trees). Seventeen percent of the total ECA increase would be from the harvest within the Preston Creek drainage. The watershed report concludes that harvest would likely increase water yields but not to a detectable level. The watershed report also states that any increase in peak flows would be short term and would have little effect on stream channels.

Alternative C Cumulative Effects

Charlie Creek (in the project area)

There would be a trend toward desired condition for fish habitat and for populations of westslope cutthroat trout and western pearlshell mussel on National Forest System lands. When the

potential direct and indirect effects of Alternative C are added to the effects of the past, present, and reasonably foreseeable future activities (page 47), there is low potential for habitat parameters to trend away from the desired condition due to very limited road construction and minimal change to stand densities; and there is high potential for proposed projects to trend the habitat parameters of temperature, sediment, physical barriers, large woody debris, pool frequency, streambank conditions, road density toward the desired condition and to maintain the parameters of peak/base flow, chemical contamination and riparian conservation areas in the condition of meeting desired conditions.

East Fork Charlie Creek

There would be no change in the trend toward desired condition for fish habitat, or for populations of westslope cutthroat trout and western pearlshell mussels on National Forest System lands and the current conditions of degraded habitat, high temperatures, migration barriers, and the presence of non-native species would remain. When the potential direct and indirect effects from the very minimal activities proposed under Alternative C are added to the effects of the past, present, and future activities (page 47) there would be no change to the current condition of East Fork Charlie Creek.

Fagan Creek

The potential direct and indirect effects from Alternative C when combined with the past, present, and future activity effects (page 47) would not reduce the trend toward desired condition for fish habitat and westslope cutthroat trout and western pearshell mussel populations. This is due to the current condition of Fagan Creek primarily meeting all desired conditions and the lack of potential effects from the implementation of Alternative C.

Hume Creek

There would be a trend toward desired condition for fish habitat, and for populations of westslope cutthroat trout and western pearlshell mussel on National Forest System lands. When the potential direct and indirect effects of all projects proposed under Alternative C are added to the effects of past, present, and reasonably foreseeable future activities (page 47), there would be a low potential for habitat parameters to trend away from desired conditions due to very limited road construction and there is high potential for proposed projects to trend the habitat parameters of temperature, physical barriers, large woody debris, streambank conditions, toward the desired condition and to maintain the parameters of peak/base flow, chemical contamination and riparian conservation areas in the condition to meeting desired conditions. The parameters of road density and sediment would not be altered by the implementation of this alternative. Due to the retention of the existing high road density and the high number of stream crossings (sediment parameter) the conditions of this stream would improve, but they would continue to be considered “Highly altered/high risk”.

Preston Creek

There would be a trend toward desired condition for fish habitat, and for populations of westslope cutthroat trout and western pearlshell mussel on National Forest System lands. When the potential direct and indirect effects of all projects proposed under Alternative C are added to the effects from the past, present, and reasonably foreseeable activities (page 47), there would be low potential for habitat parameters to trend away from desired conditions due to very limited road construction and minimal change to stand densities. There is high potential for proposed projects to trend the habitat parameters of temperature, sediment, physical barriers, large woody debris, pool frequency, streambank conditions, and road density toward the desired condition and to

maintain the parameters of peak/base flow, chemical contamination, and riparian conservation areas in the condition to meeting desired conditions.

Charlie Creek HUC 6:

When considering all the effects that potentially could occur with the implementation of Alternative C, the fish habitat and westslope cutthroat trout and western pearlshell mussel populations of Charlie Creek would trend toward meeting desired conditions. This would occur in part due to the limited effects of the timber harvest and associated road building; however, this would primarily be due to the proposed projects that would directly or indirectly benefit the aquatic habitat: migration barrier correction, LWD placement, riparian planting, and road storage. These activities would benefit mainstem Charlie Creek downstream of the project area by reducing sediment (due to reduced stream crossings) and reducing stream temperatures (cooler water entering Charlie from the tributaries). There is a potential for increasing the fish population in Charlie Creek by increasing the habitat diversity and accessibility of spawning and early rearing habitat within the project area tributaries. The improvement in upstream habitat would potentially increase aquatic populations in Charlie Creek.

Forest Plan and Regulatory Consistency

IPNF Forest Plan and INFS Guidelines

Compliance with the IPNF Forest Plan and INFS Guidelines apply to activity implemented or authorized by the Forest Service.

Inland Native Fish Strategy (Replacing previous Standards 1 and 2): This standard would be met in Alternatives B and C. Riparian management objectives would be met through project design, including design features specific to aquatic resources. A Travel Analysis Process (TAPS) was utilized to determine the transportation system needed for the area and proposals from that process were incorporated into the alternative designs. Both alternatives propose improvement of fish passage.

Standard 3 does not apply to this project because none of the streams identified in that standard are located in this project area.

Standard 4 would be met. New road construction would provide for fish passage and known passage problems on Forest Service roads would be corrected.

Standard 5 was met. The information contained in this report uses fisheries surveys to coordinate activities with other resources. Road decommissioning culvert replacement, large woody debris placement and riparian planting would benefit the fishery when they are implemented.

Standard 6. The intent of this standard is being met due to the extensive review of the stream systems and the implementation of standards described in INFS.

National Forest Management Act (NFMA)

Both action alternatives would meet NFMA requirements by providing and improving habitat for a diversity of fish communities and other organisms. Bull trout do not currently occur in the watersheds of the project area and westslope cutthroat trout are present. The improvements to the in-stream habitat would benefit westslope cutthroat trout and western pearlshell mussel. In the long term, the improvements could benefit bull trout if they ever become reestablished within the St. Maries drainage.

Endangered Species Act (ESA)

Neither of the action alternatives would jeopardize the continued existence of bull trout, which historically occurred in the project area but which does not currently occur there. There is no designated bull trout critical habitat within the analysis area. The selection of either action alternative would result in a "No Effect" determination for both the species and the critical habitat.

Executive Order 12962

All alternatives would maintain habitat and the fishery potential, which in turn would maintain the potential for recreational fishing opportunities. All alternatives include as a part of their proposals, culvert replacements/removals, LWD placement, riparian planting, and road decommissioning. These activities would increase recreational fishing opportunities by improving habitat thus improving the carrying capacity of the streams.

Regional Directive 2670/1950 (August 17, 1995)

Information provided in this document is the basis for the determinations of effects to westslope cutthroat trout and the western pearlshell mussel documented on Biological Evaluation forms (Aquatic Organism Report Appendix A).

Cultural Resources (see Cultural Resources Report)

Alternative A (No Action) Direct, Indirect, and Cumulative Effects

Under Alternative A, current management practices would continue. This would result in no effects to the historic or cultural sites within the Charlie Preston Project Area. Cumulative effects occur when past, present and foreseeable activities overlap with the proposed activities. In this case, the no-action alternative of continuing current management practices would not cause effects to the cultural resources in the project area, so there would be no cumulative effects.

Alternatives B and C Direct and Indirect Effects

Activity implemented under either action alternative would not adversely affect any known cultural resources, or historic properties. Although there are known cultural sites and historic properties within the project boundary, this project has been designed to avoid damaging those areas by completely eliminating potentially damaging activity in areas where known cultural resources are located.

Alternatives B and C Cumulative Effects

Past activities in the project area have caused damage and/or deterioration to some cultural sites in the area; however, the activities proposed under either action alternative would not contribute to any new or continued damage to said sites.

Forest Plan and Regulatory Consistency

All alternatives adhere to the forest plan which calls for the preservation of significant cultural resources in place whenever possible. All significant cultural resources in the project area would be preserved in accordance with the Forest Plan. Alternatives A and C would not cause effects to cultural resources, and Alternative B includes design features that would protect and preserve all cultural resources in the project area from adverse effects.

Section 106 of the National Historic Preservation Act (NHPA) directs all Federal agencies to take into account the effects of their undertakings (actions, financial support, and authorizations) on properties included in or eligible for the National Register. Advisory Council on Historic Preservation regulations at 36 CFR part 800 implement NHPA section 106. Qualified archaeologists systematically inventoried and analyzed the Charlie Preston Project Area. All appropriate design criteria and mitigation measures are in place. No cultural resources would be adversely affected by this project. Consultation with Native American groups has been completed as in accordance with the NHPA, and consultation with the State Historic Preservation Office will be completed as in accordance with the NHPA.

Economics (see Economics Report)

Project Salability

Estimation of project salability is based on a transaction evidence appraisal model, which considers the cost of harvest operations, timber species value and quantity, tree planting, slash disposal costs, system road and temporary road construction costs, road maintenance, and other variables. The estimated high bid for each alternative is displayed in Table 38. Estimated high bid for Alternatives B and C indicate a positive salability. The revenue estimates from the salability analysis are discussed in Financial and Economic Efficiency analysis.

Financial and Economic Efficiency

Table 38 summarizes the project feasibility and financial efficiency, including the estimated net stumpage revenue, and total PNV for each alternative. The timber sale value is shown as positive revenue unless the predicted bid would not adequately fund activities associated with timber harvest. The overall project PNV includes all costs and revenues associated with timber sale activities in addition to financial expenditures not associated with timber sale activities such as aquatic improvement projects. Table 38 indicates that harvest activities associated with all action alternatives are economically viable at this time. The No-Action Alternative, Alternative A (not shown), has no costs or revenues associated with it. Of the action alternatives, Alternative C has the highest timber sale PNV.

Many factors influence and affect the local economies, including changes to industry technologies, economic growth, international trade, and the economic diversity and dependency of the counties. The jobs and income associated with the action alternatives may bring the local economy some increased relative stability during the life of the project. In addition, fuel reductions within the project area may decrease the chances of economic losses caused by wildfire.

Table 38 – Project Feasibility and Financial Efficiency Summary (2010 dollars).

		Alternative B	Alternative C
Timber Harvest Information	Acres	1,546	850
	Volume (CCF)	42,734	24,117
	Appraised Stumpage Value [1/]	-$6.18	$7.38
	Base Rate [2/]	$5.67	$3.23
	Predicted High Bid ($/CCF)	$13.03	$26.59
	Predicted Sale Revenue	$556,824	$641,271
Timber Sale Preparation, and Other Project Costs		-$943,710	-$736,186

		Alternative B	Alternative C
not Associated with Timber Sales			
Present Net Value		-$418,195	-$130,972
Benefit Cost Ratio		0.56	0.82

1/ Stumpage value minus all associated logging cost and including brush disposal and reforestation costs.
2/ Minimum bid rate per CCF. For Alternative B an increase of the base rate was needed to cover essential regeneration and brush disposal costs.

Environmental Justice

All alternatives comply with Environmental Justice Executive Order 12898. No disproportionate impacts to minority or low-income populations were identified through public involvement efforts over the course of this analysis. Acting District Ranger Kimberly Johnson discussed the project with representatives of the Coeur d'Alene Tribe during a meeting on June 2, 2010 (PI-1), and they did not express concerns.

Forest Vegetation (see Forest Vegetation Report)

Summary of Direct and Indirect Effects

Table 39 – Comparison of Vegetation Components in the Charlie Preston Project Area by Alternative

Measurement Parameters	Alternative A		Alternative B		Alternative C	
	Acres	%	Acres	%	Acres	%
Composition in Project Area of long-lived, early-seral tree species: WL/WWP/PP forest types	1,489	23	1,999	31	1,628	25
Stand Structure in Project Area						
brush/seedlings/sapling	1231	19	1389	21	1231	19
pole/small/medium	4843	74	4719	72	4843	74
large/mature	448	7	414	6	448	7
Stand Density (Acres)						
Reduction in stand density through intermediate harvests	0	-	1134	32	850	13

Alternative A (No Action) Direct and Indirect Effects

Forest Composition

There has been a decline in the shade-intolerant, early-seral species and an increasing dominance of shade-tolerant species within the project area. For this area and associated potential vegetation, these early-seral species are western larch, western white pine and on more dry sites, ponderosa pine. Alternative A, which proposes no vegetation treatment, would maintain the trends of the forest stands proposed for treatment in other alternatives. This alternative would continue the current trend of decreasing representation of western larch and western white pine in the project area.

Under Alternative A, stand composition is expected to change over time with a continued reduction in the existing component of shade-intolerant, early-seral species (western larch,

western white pine, and ponderosa pine) and continued increase in more shade-tolerant mid- and late-seral species (Douglas-fir, grand fir, western hemlock). As a result of this shift in species composition, the risk of loss to fire, insect and disease would increase. Potential losses would be expected because of existing insects and disease in the stands.

The occurrence of root disease is currently at endemic levels within the project area. With declining growth and vigor, these stands are expected to have increasing effects from root disease. Increased mortality from root disease and other agents can be expected in the larger sized, more susceptible trees. This would create small opening due to losses of individual and small groups of medium and large trees throughout the project area. These openings would regenerate with shade-tolerant, susceptible species.

The shift in stand composition to more shade-tolerant species (predominantly Douglas-fir, grand fir and western hemlock) would also increase the risk and extent of disturbance from fire if suppression efforts are not successful. These species are less adapted to surviving fire than are the more shade-intolerant seral species. As these more fire-sensitive species increase as a percent of stand composition, the risk of losing entire stands increases if fire occurs.

Forest Structure

Alternative A would result in no direct management induced changes to forest structure.

Forest structure would continue to change over time. Approximately 74% of forest stands in the project area can generally be classified as in stem-exclusion stage of stand development, where the canopy is moderately closed, trees are crowded (moderately to heavily stocked), and live crowns are beginning to decline in both crown width and height.

In the majority of the stands, trees are competing for growing space and self thinning is occurring. Without treatment or disturbance, the susceptibility to disease and insect attack would increase over time as both diameter and height growth increase for all trees in the stands.

Stands will transition slowly from the pole/small/medium size class to the large/mature size class. This occurs as mortality in single or groups of trees occur due to competition for resources (water, nutrients, light) and minor disturbances (insect, disease, and wind throw). This development trend is expected to occur at a relatively slow rate due to reduced growth rate, loss of vigor resulting from increased stocking levels. Little change in growth rates, stand densities, or other stand characteristics would be expected in the foreseeable future in the absence of disturbance associated with the action alternatives.

The mature trees in the larger size classes would be expected to increase over time in the absence of disturbance. Wildfire is a potential to cause change in the size class, however, the current fire suppression policy would continue, which reduces the probability of fire as a primary vector for change (Charlie Preston Fuels and Air Quality Report). The potential exists for other natural disturbance, more particularly insect or disease endemics or epidemics, to act as tree/stand replacing agents and influence a shift of impacted stand towards younger/smaller size classes.

Alternative A Cumulative Effects

Forest Composition and Structure

Alternative A of this project would cumulatively maintain the current composition trends in this project area. There would be an incremental reduction of seral species over time within the project area. The number and extent of western larch, western white pine and to a lesser extent ponderosa pine would continue to decrease where it exists in the project area. The number and extent of grand fir, western hemlock, and Douglas-fir would continue to increase. An exception

to this would be those areas that were previously reforested and/or pre-commercially thinned to promote long-lived, early seral species composition.

The effects of Alternative A on species composition would only differ by the incremental changes within the project area. This would be predominantly through losses in the existing western larch and western white pine components, and increase in the grand fir and Douglas-fir component.

Over the next 25 to 30 years, stands throughout the project would continue to grow bigger trees and move towards larger size classes in the absence of disturbance of fire or other disturbance agents. Due to species composition and the expected increase in the incidence of root disease and insect damage, this trend towards larger tree sizes is expected to begin a subsequent decline as a result of mortality.

Alternative B Direct and Indirect Effects

Forest Composition

Proposed regeneration harvest (clearcut w/reserves, shelterwood cut, seed tree cuts) in Alternative B would regenerate potentially long-lived, seral species, primarily western larch and western white pine, on 181 acres currently occupied predominately by grand fir, Douglas-fir, and western redcedar. Openings as a result of these proposed regeneration treatments would range from eight to seventy-five acres in size. This would result in an increase of 181 acres of long-lived, early-seral species through natural and artificial regeneration (planting). In general, western larch and western white pine (improved rust-resistant stock) would be the predominate species planted. Some mortality in reserve trees would be expected from prescribed fire; however mitigation measures would be implemented to reduce those effects. Reserve trees killed during site preparation operations would be left on site. They would contribute to course woody debris and snag needs in the stands.

In areas proposed to be planted with conifer seedlings, the need for pocket gopher control (gopher baiting) activities is anticipated. Pocket gophers can adversely impact stocking and reestablishment of new stands by foraging on the roots of the new trees and causing mortality. When the opportunity exists, pocket gophers seem to prefer foraging on the roots of planted long-lived, early-seral, western larch and western white pine over native/natural regenerated species present. The control activities reduce the overall mortality of planted seedlings, and in particularly early-seral western larch and western white pine. The direct effect of this activity on forest composition is improved retention of these preferred species as a component of the new, establishing stand.

Figure 6 – Proposed overstory removal showing understory regeneration

Proposed final entry harvests (overstory final removal and shelterwood final removal; see Figure 6) in Alternative B would reduce competition on 231 acres. These treatments would be completed in stands that are fully stocked and certified as regenerated (FV-3). These treatments would leave existing snags, recruitment snags and course woody debris recruitment to meet soils, hydrology and wildlife concerns. Preference would be given to long-lived, early-seral western larch and western white pine due to their longevity on the

site. Removal of other overstory trees would release the established regeneration (mostly western larch and western white pine) from competition from the overstory. This would increase the amount of available light, nutrients, and water.

Commercial thinning would maintain and/or increase the presence of long-lived, shade-intolerant species. There would be a slight increase in early-seral representation, predominantly western larch, on approximately 699 acres where this species is present but in a minor/lesser stand component because more trees of the other species would be removed with the timber harvest. On an additional 146 acres where western larch has a higher representation and the retention of the existing western larch component and the reduction of more shade tolerant species, the forest type is expected to change from grand fir, Douglas-fir, and western redcedar to western larch. Approximately 289 acres of existing western larch proposed for treatment would be maintained in the forest type in the long term through preferential removal of species other than western larch and western white pine.

The proposed stand treatments have a potential to increase the current incidence of root and stem decays in susceptible species within the treatment areas. However, increased representation of western larch and western white pine is expected to reduce the impacts of root and stem decays in the treated stands. Impacts would be reduced by reducing the presence of susceptible species Douglas-fir, grand fir, and western hemlock. Stand loss to insects and other disease is expected to remain at endemic levels as a result of increase representation of long-lived, early-seral species as well as improved growth and vigor in the areas proposed for treatment.

Prescribed fire is proposed for treatment of approximately 82 acres of off-site ponderosa pine around Preston Knob. The seed source used to plant this site was from areas that are not well-adapted to this site. These trees are showing signs of regenerating and could possibly allow for a genetic influence in the native stock, which is not desirable. The entire off-site ponderosa pine population would be eradicated. Mortality of less fire-adapted species is expected and would increase growing space for more desirable long-live, early-seral species.

Proposed roadside fuel reduction treatment would reduce densities of understory (less than 6 inches d.b.h.) trees on approximately 120 acres. Shade-tolerant species such as grand fir, Douglas-fir, western redcedar, and western hemlock and shrubs would be preferentially removed. This treatment would not change the existing forest composition of stands in which treatment occurs.

Fuels reduction activities around Bald Mountain Lookout would not change forest composition within the 30 acres proposed. Some mortality in trees adjacent to slash piles is expected when piles are burned. This mortality would not change the forest composition in the treatment areas.

Personal-use firewood removal within the project area would not have an impact on the forest composition within the project area. Firewood would be limited to existing dead trees (snags) and trees that have fallen to the forest floor. Removal of firewood is typically limited to corridors adjacent to existing roads within the project area.

Forest Structure

Alternative B would directly change forest structure on all proposed harvest units.

Regeneration harvests (clearcut w/reserves, shelterwood cut, and seed tree cut) would directly change the forest structure on 181 acres within the project area. This treatment would result in even-aged stands of regeneration (planted and natural) with larger reserves trees scattered throughout the treatment area as an overstory. The larger trees would remain the dominant structure in these stands until the regeneration is fully established. These treatments would directly change stand size class in as much as the primary size class would shift from the

pole/small/medium and large/mature size classes to the brush/seedling/sapling size class. These treatments would decrease the vertical structure and increase the horizontal structure on 181 acres through creation of openings (ranging in size from 8 to 75 acres) in the existing homogeneous stand density.

Commercial thin treatment units would reduce stand density by an average of 57 percent and open the canopy cover. This harvest treatment would remove smaller trees and favor retention of larger diameter and more vigorous trees and would increase individual tree growth and vigor. This would result in developing mature/large sized trees over a shorter period than would be expected with no treatment as shown in Table 40. The vertical structure would have less variation because of the removal of smaller tree classes. Additionally, stand density and crown closure would be reduced. Commercial thinning harvest activities would affect up to 1,134 acres. Figures 2 and 3 in the Forest Vegetation report show the expected change in stand densities with the proposed commercial thinning. These treatments would not directly change stand size class because most of the trees are in the same size class, and there are few trees currently in the large/mature size class currently present in these stands.

The tree diameter and overall stand size classes in intermediate harvest areas are expected to increase due to harvest of generally smaller trees and retention of larger trees. Also, over time the remaining trees would grow faster than they would if left untreated. Stands that were modeled utilizing the FVS growth and yield model show an increase in the quadratic mean diameter (QMD) when compared to the same stand modeled without any treatment. An increase in growth, tree vigor, and resistance to disturbance is expected for the treated stands. Based on the model, resulting stand conditions in proposed commercial thinning stands would have fewer trees with a larger QMD compared to the same stand modeled with no treatment. Proposed treatments would also shift these stands closer to the desired condition and would meet the purpose and need of the project. Table 40 illustrates an example of this growth response for three of the stands that were modeled using FVS. The table shows a comparison of trees per acre (TPA) and quadratic mean diameter (QMD) for modeled stands (treated compared to untreated). Trees greater than 6 inches d.b.h. were modeled over a fifty year period to illustrate this growth. For the stands displayed below the quadratic mean diameter of stands 45 years after treatment would be approximately 3-4 inches bigger than if the stands were left untreated over the same time period.

Table 40 – Comparison of Three Stands: Treated with Commercial Thins vs. No Treatment

Stand Number	Year	QMD (Treated)	QMD (Untreated)	TPA (Treated)	TPA (Untreated)
417020013	2011	14	14	216	216
	2016	14	14	77	210
	2021	15	13	75	203
	2026	15	14	74	195
	2031	16	14	73	176
	2036	16	15	71	166
	2041	18	16	54	131
	2046	19	16	48	105
	2051	20	16	43	91
	2056	20	17	41	85
417020018	2011	12	12	302	302
	2016	14	13	89	306
	2021	14	13	92	282
	2026	15	14	91	269
	2031	15	13	89	267
	2036	16	13	81	244
	2041	16	14	80	232
	2046	17	13	78	228
	2051	18	14	73	208

Stand Number	Year	QMD (Treated)	QMD (Untreated)	TPA (Treated)	TPA (Untreated)
	2056	18	14	72	185
417030010	2011	11	11	330	330
	2016	13	11	101	299
	2021	14	12	98	302
	2026	14	13	96	265
	2031	15	14	80	219
	2036	16	14	74	224
	2041	17	14	71	209
	2046	174	14	67	196
	2051	18	14	62	175
	2056	19	15	59	156

QMD = quadratic mean diameter
TPA = trees per acre

In regeneration harvest units the trees and size classes would be smaller because the larger, overstory trees would be removed. The resulting stand condition would have a few larger diameter trees as the residual stand. This residual stand condition would consist of individual trees or clumps of trees and would average approximately 10 trees per acre. These stands would be planted with early seral western larch and western white pine which would move these stands closer to the desired stand condition and meet the purpose and need of this proposal.

Root and stem decays are expected to still be present in the treated stands after treatment but would remain at low (endemic) levels due to increased stand vigor. Reduced effects from root and stem decay is expected due to the decreased representation of susceptible species.

The use of prescribed fire as a treatment on approximately 82 acres around Preston Knob would change structure in the treatment area. It is anticipated that some of the larger diameter trees (typically trees greater than 20" d.b.h.) would survive. These larger trees would remain as part of the dominant structure in these stands with survival of the larger trees that are resistant to fire. Trees of all size classes that experience mortality would remain standing as snags for 2 to 10 years (or longer), providing habitat for some animal species and future course woody debris. A change in structure would be the reduction of mid-story and understory tree species, dominated by shade tolerant grand fir and Douglas-fir and shrubs. Desired species would be planted to replace these vegetative layers.

The areas proposed for roadside fuels reduction would directly change forest structure on the 120 acres proposed for treatment. These treatments would occur on small portions of larger stands adjacent to existing roads. Effects from these treatments would have a direct effect on trees that are less than six inches d.b.h., and would simulate a thinning from below. The treatment would retain all trees larger than six inches in d.b.h. Another result of this fuels treatment would include a reduction in competition, thus increasing the following resources: water, nutrients, and light to the residual trees. This change in structure would also reduce the potential for a stand-replacing event where this treatment is implemented.

Fuels reduction activities around Bald Mountain Lookout would not change forest structure within the 30 acres. Some trees adjacent to slash piles may die when the piles are burned. This mortality would not change the forest structure within the treatment area.

Personal-use firewood removal within the project area would not have an impact on the overall forest structure within the project area. Firewood removal is typically limited to corridors adjacent to roads within the project area; the removal would consist of only standing snags and down trees.

Alternative B Cumulative Effects

Forest Composition and Structure

Cumulatively, there would be an increase (approximately 8 percent) in the composition of long-lived, early-seral species from vegetation management activities within this project area. Harvest activities of the recent past in adjacent to the project area (last 10 to 20 years) have resulted in some stands having a higher percent of early seral species present (specifically western larch, western white pine and some ponderosa pine). Other past vegetation management activities include pre-commercial thinning over the last 10 to 15 years which has also promoted a higher percentage of early seral species in some stands by removing the mid to late seral species (which includes Douglas-fir, grand fir, western redcedar, western hemlock, Engelmann spruce and subalpine fir).

In areas not treated, it is expected that root and stem decays would continue to impact stands at current levels or potentially increase. Overall tree mortality from insects and diseases is expected to decrease due to the improved growth and vigor resulting from management activities. An exception to this is the loss of western white pine due to blister rust that is expected to continue at or near current rate in untreated stands. In unmanaged stands a slight decrease in the average tree size class as it relates to vertical structure is expected due to natural regeneration. A small increase in horizontal structure is also expected due to self thinning and continued tree mortality. On sites with a mixed species composition seral and climax species have the potential to prolong the seral phase (Rippy and others 2005). Cumulatively, in untreated stands the effects of insects and disease on vertical and horizontal structure as well as tree/stand size class would be incremental. However, in treated stands the effects from insect attack and infection by disease is expected to be lower and less impactive on the residual stand when compared to the unmanaged stands.

Alternative C Direct and Indirect Effects

Forest Composition

Commercial thinning would maintain and/or increase the presence of long-lived, shade-intolerant species in stands proposed for intermediate treatment in Alternative C. There would be a slight increase in early-seral representation, predominantly western larch, on approximately 625 acres where this species is present but in a minor/lesser stand component because more trees of the other species would be removed with the timber harvest. On an additional 66 acres where western larch has a higher representation the retention of the existing seral component and the reduction of more shade-tolerant species, the forest type is expected to change from grand fir, Douglas fir, and western redcedar to western larch. Approximately 159 acres of existing western larch proposed for treatment would be maintained in the forest type in the long term through preferential removal of species other than western larch and western white pine.

The proposed stand treatments have a potential to increase the current incidence of root and stem decays in susceptible species within the treatment areas. However, increased representation of western larch and western white pine is expected to reduce the impacts of root and stem decays in the treated stands. Impacts would be decreased, reducing the presence of susceptible species; Douglas-fir, grand fir, and western hemlock. Stand loss to insects and other disease is expected to remain at endemic levels as a result of increased representation of long-lived, early seral species as well as improved growth and vigor in the areas proposed for treatment.

On 127 acres proposed for roadside fuel reduction densities of understory tree species (less than 6 inches d.b.h.), typically shade-tolerant species such as grand fir, Douglas-fir, western redcedar,

and western hemlock and shrubs would be reduced. This treatment would not change the existing forest composition of stands in which it occurs.

Effects of other proposed treatments on forest composition would be the same as those described for Alternative B.

Forest Structure

Alternative C would directly change forest structure on all proposed harvest units. Commercially thinned treatment units would reduce stand density by an average of 55 percent along with reducing the canopy cover by a similar percentage. See Figures 2 and 3 in the Forest Vegetation report. This harvest treatment would remove smaller trees and favor the retention of the larger diameter trees for the residual stand. This would result in stands having more vigorous trees having a larger average diameter. There would be an increase in individual tree and stand growth. In addition these stands would develop mature/large sized trees over a shorter period of time when compared to no treatment as shown in Table 40. The vertical structure would have less variation because of the removal of smaller tree classes. These stand characteristics would be expected to increase (stand density and vertical structure) over time following the implementation of the proposed activity. These stands would increase in stand density and vertical structure as natural regeneration occurred. Commercial thinning harvest activities would affect up to 850 acres. These treatments would directly change the average stand size class due to the removal of trees in the smaller diameter classes (thin from below).

The areas proposed for roadside fuels reduction would directly change the forest structure on the 127 acres proposed for treatment. These treatments would occur on small portions of larger stands adjacent to existing roads and would only have an effect on trees that are less than six inches d.b.h., and would act as a thinning from below. The treatment would retain trees larger than six inches in d.b.h. and reduce competition, thus increasing resources of water, nutrients, and light to the residual trees.

Effects of other proposed treatments on forest structure would be the same as those described for Alternative B.

Alternative C Cumulative Effects

Forest Composition and Structure

Cumulatively, there would be an increase (approximately 2 percent) in the composition of long-lived, early-seral species from vegetation management activities within this project area. Harvest activities of the recent past in the project area (last 10 to 20 years) have resulted in some stands having a higher percent of early seral species present (specifically western larch, western white pine, and some ponderosa pine). Other past vegetation management activities include pre-commercial thinning over the last 10 to 15 years which has also promoted a higher percentage of early seral species in some stands by removing the mid to late seral species (which includes Douglas-fir, grand fir, western redcedar, western hemlock, Engelmann spruce and subalpine fir).

In areas not treated, it is expected that root and stem decays would continue to impact stands at current levels or potentially increase. Overall tree mortality from insects and disease is expected to decrease due to the improved growth and vigor resulting from management activities. An exception to this is the loss of western white pine due to blister rust which is expected to continue at or near current rate in untreated stands. In unmanaged stands a slight decrease in the average tree size class as it relates to vertical structure is expected due to natural regeneration. A small increase in horizontal structure is also expected due to self thinning and continued tree mortality. Cumulatively, in untreated stands the effects of insects and disease on vertical and horizontal

structure as well as tree/stand size class would be incremental. However, in treated stands the effects from insect attack and infection by diseases are expected to be lower and less impactive on the residual stand when compared to the unmanaged stands.

Forest Plan and Regulatory Consistency

Forest Plan

Specific goals, objectives and standards for timber management are described in the Forest Plan on pages II-2, II-8, and II-32. All alternatives are consistent with these guidelines. Both action alternatives comply with Forest Plan Appendix A, Summary of Timber Information and Vegetation Management, providing direction for silvicultural practices on the Idaho Panhandle National Forests. The activities described for the action alternatives are consistent with this direction.

Proposed management activities are designed to improve stand health and vigor, and maintain or enhance species composition and stand structure. This would minimize risk of stand loss from forest insects and disease as well as reduce risk of stand loss to weather, fire or other disturbances.

National Forest Management Act (NFMA)

All proposed openings are within size limitations directed by NFMA, and Forest Service Manual direction would be followed for units 13A, 13B and 14A, 14B (1921.12e). Stands proposed for clearcutting have reached culmination of mean annual increment as defined in Forest Service Manual (1921.12f). Clearcutting and Even-aged Management would be in compliance with NFMA regulation (16 USC 1604(g)(3)(F)): which states; Insure that clearcutting, seed tree cutting, shelterwood cutting, and other cuts designed to regenerate an even-aged stand of timber will be used as a cutting method on National Forest System lands only where:

- For clearcutting, it is determined to be the optimum method, and for other such cuts it is determined to be appropriate, to meet the objectives and requirements of the relevant land management plan (16 USC 1604(g)(3)(F)(i)). Stands proposed for clearcutting have reached culmination of mean annual increment. These stands have also been identified as having an undesirable species mix that can be altered to meet the desired future condition and the purpose and need of this proposal by planting early seral western white pine and western larch after the harvest operation is complete.
- The interdisciplinary review as determined by the Secretary has been completed and the potential environmental, biological, esthetic, engineering, and economic impacts on each advertised sale area have been assessed, as well as the consistency of the sale with the multiple use of the general area (16 USC 1604(g)(3)(F)(ii)). The interdisciplinary review has been completed and is documented in this environmental assessment.
- Cut blocks, patches, or strips are shaped and blended to the extent practicable with the natural terrain (16 USC 1604(g)(3)(F)(iii)). Unit layout would be accomplished utilizing existing terrain features along with meeting the necessary riparian habitat conservation area (RHCA). See design features.
- Cuts are carried out according to the maximum size limit requirements for areas to be cut during one harvest operation, provided, that such limits shall not apply to the size of areas harvested as a result of natural catastrophic conditions such as fire, insect and disease attack, or windstorm (FSM R1 supplement 2400-2001-2 2471.1, 16 USC 1604(g)(3)(F)(iv)). Units that exceed the maximum size limit for a regeneration harvest

would only be implemented with Regional Office authority and permission. All other units as proposed do not exceed the maximum size limit for a regeneration harvest.

- Such cuts are carried out in a manner consistent with the protection of soil, watershed, fish, wildlife, recreation, and esthetic resources, and the regeneration of the timber resource (16 USC 1604(g)(3)(F)(v)). All proposed units have been designed to meet the needs and protection of the listed resources or the protection of these resources would be met by implementing the design features as defined in this document.

Openings would be naturally or artificially regenerated. Review of regeneration indices for the District and project area (project file FV-3 and FV-18) display adequate ability to regenerate these openings within a five-year period as directed in NFMA and the Forest Plan. The Forest Service is required by law to reforest per the Knutson-Vandenberg Act (16 USC 576b, 6/9/30).

All proposed vegetative treatments integrated other resource needs through project design during alternative development and analysis. Vegetative treatments would be in compliance with NFMA regulation: Timber Harvest on National Forest Lands (16 USC 1604(g)(3)(E)) which states: A Responsible Official may authorize site-specific projects and activities to harvest timber on National Forest System lands only where:

- Soil, slope, or other watershed conditions will not be irreversibly damaged (16 USC 1604(g)(3)(E)(i)). Harvest methods were designated for each stand proposed for treatment and would not cause irreversibly damage or design features where defined to correct any potential irreversible damage.
- There is assurance that the lands can be adequately restocked within five years after final regeneration harvest (16 USC 1604(g)(3)(E)(ii)). As stated above regenerating stands as required by this law display within a five-year period is evident in this Forests' regeneration records (project file, FV-3 and FV-18). Regeneration would be accomplished through artificial and natural regeneration.
- Protection is provided for streams, streambanks, shorelines, lakes, wetlands, and other bodies of water from detrimental changes in water temperatures, blockages of water courses, and deposits of sediment, where harvests are likely to seriously and adversely affect water conditions or fish habitat (16 USC 1604(g)(3)(E)(iii)). Unit layout would be accomplished utilizing existing terrain features along with meeting the necessary riparian habitat conservation area (RHCA) standards. See design features and Aquatics sections.
- The harvesting system to be used is not selected primarily because it will give the greatest dollar return or the greatest unit output of timber (16 USC 1604(g)(3)(E)(iv)). Harvest systems were determined with a combination of factors which include the method that has the least adverse impacts to the environment, the best method to get the volume out of the woods, and economic return.

All proposed units within the project area fall within Management areas 1 and 4, and are suitable for timber production (16 USC 1604(K)).

Fuels and Air Quality (See Fuels and Air Quality Report)

Alternative A (No Action) Direct and Indirect Effects

Beneficial fuel management activities would not take place in the project area with this alternative. The fuels purpose and need for the project would not be met. Instead, the following effects would occur:

- Mid- to late-seral, shade-tolerant species (GF/DF) would continue to dominate sites. Early-seral species restoration would be limited to plantations established between 5 and 30 years ago. Early-seral trees in those stands are at risk for long-term survival because of heavy competition from GF/DF/C/LP natural regeneration, although many of these stands are scheduled for pre-commercial thinning activities that seek to retain early-seral species on site.
- Forests would get more crowded. Hazardous fuels would continue to increase due to the continued growth of trees, natural breakage, and the ongoing mortality associated with insects and disease that deteriorate stand conditions.
- Fire regime condition class (FRCC) would not change. Fuel Models with higher fire behavior potential would continue to dominate fuel structures within stands. The risk of lethal wildfire in the form of crown fire would increase because of missing the opportunity to alter fuels, stand density, and species composition.
- More stands would move into Condition Classes 2 and 3 because of the increasing stand densities dominated by the non-early-seral component.
- Fire risk for a severe wildfire event would continue and increase over time. Fuels located adjacent to the numerous values-at-risk would go untreated, further increasing the risk of a fire of unacceptable proportion in a WUI. The community of Emida, the recreation/natural resource-based economy, local infrastructure, private property, and other values-at-risk would continue to be at increased risk from a potential wildfire event.
- Safety along travel routes would not be improved. Suppression capabilities would not be aided with regard to egress safety, anchor point creation, or minimizing fire behavior. Suppression capability could be challenged with the increase in potential fire behavior associated with ongoing fuel buildup in the area.

Alternative A Cumulative Effects

This alternative would have no new vegetation management activities. The cumulative effects of this would be that long-term trends in fuel accumulation and departure of fire regime condition class through continued fuel buildup and species composition changes would continue over the majority of the analysis area. The current dense and homogeneous forest cover would persist, which could increase the potential for more extensive and more severe fire behavior in the future. Fire risk in the WUI would not be mitigated or lessened; rather it would increase as a result of the on-going fuel accumulations. Policy recommendations of the National Fire Plan, Healthy Forests Restoration Act, or the Benewah or Latah County Wildfire Mitigation Plans would not be addressed.

Alternative B Direct and Indirect Effects

This alternative would best meet the stated purpose and need concerning fuel treatments across the Charlie Preston project area because of the amount, type, and spatial arrangement of treatments. Fuels objectives would be addressed on a total of 1778 acres. This alternative mixes the components that comprise effective fuel treatments: surface and ladder fuel reduction, increase in canopy base height, decrease in canopy bulk density, and emphasis on early-seral retention to enhance overall stand resiliency to fire. Additionally, biomass may be removed and utilized under this alternative. The following effects would occur:

- Species composition would be beneficially altered to include more fire-resilient, long-lived, early-seral species in areas that would be reforested like the regeneration harvests and the off-site ponderosa pine unit. In thinned areas, these species would be

preferentially retained where they exist. The fire-resilient component would increase because the undesired species would be thinned out.

- Changes in species composition and stand density would beneficially begin to move fire regime condition classes away from Condition Class 2 and 3 towards Condition Class 1.
- The arrangement of the treatments would help protect values-at-risk in the project area, including the community of Emida, Bald Mountain Lookout and communication infrastructure, private property, forestry investments like plantations, etc. When combined with past management activities, the size and distribution of these activities would emulate a mixed-severity wildfire pattern across the landscape. This would reduce the potential for large wildfires to grow unchecked, and impact those values-at-risk. These activities would also reduce effects of wildfire spreading onto National Forest lands from private lands, and vice versa.

Alternative C Direct and Indirect Effects

This alternative provides some of the similar treatments as Alternative B, but at a smaller and different scale. Fuels objectives would be addressed on a total of 1089 acres. The net acre change is approximately 689 fewer acres being treated overall. This limits the spatial effectiveness of benefits. This alternative mixes components that comprise effective fuel treatments: surface and ladder fuel reduction, increase in canopy base height, decrease in canopy bulk density, and emphasis on early-seral retention to enhance overall stand resiliency to fire. Biomass may be removed and utilized under this alternative. The following effects would occur:

- Species composition would be altered to include more fire-resilient, long-lived, early-seral species in areas that would be thinned areas and in the off-site ponderosa pine unit. In thinned areas, these species would be preferentially retained where they exist; by thinning out the undesired species, the fire-resilient component would increase. No new plantations would be established; limiting alteration of species composition within the project area.
- There is less focus on areas designated by Benewah County as WUI.
- Changes to fire regime condition class would be addressed on acres treated.
- This alternative would emulate a mixed-severity wildfire pattern across the landscape, albeit with no areas of stand replacement. Proposed treatments would modify vegetation and fuel loadings such that potential fire behavior would be reduced on acres treated and, to some extent, between treatment areas. Activities planned in this alternative would also curtail large fire growth and spread potential. Treatments would still provide some level of protection to values-at-risk from potential fire.

Direct and Indirect Effects Common to Alternatives B and C

High stand densities would be reduced, and some thinned areas would have substantial reductions in basal area. This would reduce crown bulk density and could also increase canopy base height, which would reduce potential fire behavior.

Areas with reduced potential fire behavior would be more common because proposed activities would treat both naturally occurring surface and ladder fuels as well as activity fuel generated by harvest.

Safety along travel routes would be improved for the public and fire management, facilitating fire suppression efforts. Suppression efforts benefit by the fuel modifications by providing safe travel

routes, potential anchor points from which to begin suppression activities, and decreasing the potential fire behavior within and between treatment areas.

Both alternatives would begin to implement fuel treatment recommendations that are part of national laws and policies (the National Fire Plan, the Healthy Forests Restoration Act, and the Benewah or Latah County Wildfire Mitigation Plans), as well as scientific recommendations (Agee and others 2000; Agee and Skinner 2005; Bonnickson 2007; Burns and Chang 2007; Daily and others 2008; Finney and Cohen 2003; Graham and others 2004; Graham and others 1999; King 2007; Laverty and Williams 2000; Martinson and Omi 2003; Noss and others 2006; Omi and Linda 2003).

Prescribed burning activities would be conducted according to the requirements of the Montana/North Idaho Smoke Management guidelines. Multiple methods to reduce and redistribute emissions generated by proposed activities would be incorporated by design into project implementation. This would have the effect of eliminating or minimizing impacts to air quality.

The spatial arrangement of treatment would disrupt the homogeneity of the current fuel strata. The amalgam of units either begins to approach the large patches common for the fire regimes present prior to the FRCC departures, or begins to form the boundaries of those patches that may aid in containment of future patch size creation. The large patches would begin to resemble historic fire regime V (associated with over 90% of the project area) which had large, infrequent, stand-replacing fire events. Patches created through thinning (either with harvest or without) would trend the area toward mixed-severity regimes that were normally part of fire regime III areas typified on approximately 10% of the project area. Managing larger patches mimics the natural ecology of the area, as well as promotes an economy-of-scale for fuel treatments (fireline construction, machine move-in/move-out costs, and post-treatment prescribed burning). Spatial arrangement of those larger patches in a way that mimics the natural ecology and historic disturbance is beneficial in limiting potential large fire growth and spread.

When we overwinter slash to provide soil nutrients, fine material in the form of needles is generally lost from the fuel layer and is unavailable during prescribed burns to carry fire. This can restrict prescribed burn windows if larger fuels are expected to carry fire because fuel moisture of the larger fuels reacts more slowly than fine fuel to changing conditions. This means that units may need to be burned on the drier end of the prescription in order to achieve fuel reduction objectives. This may conflict with other design features to protect soils. Burning under drier conditions generally necessitates more resources or additional treatments (for example grapple piling in strategic locations) due to the increased risk of escape. Costs would go up accordingly (project file FAQ-11).

When we overwinter slash in the commercial thinning units a similar cost increase would be experienced in order to adequately dispose of hazard fuels generated in those units because the opportunity to perform slash treatment along with harvest activities would not be available. Machines would need to be brought in again after harvest activities are completed; that would add extra mobilization costs, extra administrative costs, and extra time spent covering the same ground again.

Design features that set parameters for soil and duff moisture reduce the number of potential burn days for prescribed burning. This may reduce our ability to achieve site objectives. However, when these moisture parameters can be met while meeting other prescribed burn parameters that meet burn objectives, smoke emissions from burning tend to be reduced because less fuel is available for consumption.

Streamside buffers and wildlife screens could reduce the effectiveness of fuel treatments because fuel accumulation trends would continue, rather than being abated, in those areas. As a result, these buffers could serve as conduits for fire movement through and around fuel treatments. Roadside fuel treatments may be applied within 50-foot riparian habitat conservation areas (RHCAs) after review by a fisheries biologist or hydrologist and an archaeologist. Additionally, there may be costs associated with maintaining snags or other structural requirements through a prescribed burn.

The effects of maintaining buffers adjacent to camping sites would be similar to those of buffers left at RHCAs and for wildlife. Depending on the scope and extent of the buffers left for visual concerns, fuel treatment effectiveness could be affected to a small degree or a large degree.

In general, road storage and decommissioning reduce access for fire suppression activities. Reduced access could cause fire suppression response time to increase. When response time increases, fires can grow, and be more difficult and take longer to suppress. These roads would not be in a condition to provide anchor points or egress routes for firefighters. Access to treatment areas for initial treatment, biomass removal, and maintenance treatment could be reduced, especially when the timing of roadwork activities does not account for other planned activities. Costs for those treatments could rise. Biomass utilization may be reduced if treatments become too costly.

Cumulative Effects Common to Alternatives B and C

Fire suppression activities in the project area, due to the multiple values-at-risk, have had an effect on the existing fuel profile of the project area. Suppression activities have systematically eliminated most occurrences of wildfire from the analysis area, limiting the role that fire has had on landscape vegetation. Suppression promoted the current dense vegetative structure of mid-to-late-seral species. Fire suppression may change the way the ecosystem responds to fire in the future (Zach and Morgan 1994). Because future suppression is likely, dense vegetative structures with high amounts of surface and ladder fuel would continue to be promoted in the absence of active forest management.

The existing road network, as a result of previous road construction, has enhanced access for fire suppression efforts. Roads proposed under this project would be stored after activities are completed and would not affect fire suppression access over the long-term. It is unknown whether roads built on private lands with future projects would be accessible for fire suppression.

Early timber harvests tended to remove early-seral species because they had high value for timber production purposes. When combined with the effects of white pine blister rust, this has resulted in an under-representation of large, old, early-seral species on the landscape.

Timber harvest on National Forest System lands or on Potlatch or other privately-owned lands within the analysis area has impacted species composition and stand density and will continue to do so. Project activities in recent Forest Service sales under the Charlie Tyson EIS were designed ‘to promote important components of the vegetation patterns and natural variability found historically’ (Charlie Tyson EIS, IPNF, 1995). All vegetation management activities associated with that EIS have been completed (Charlie Preston Activities Report). With recent harvest in Benewah and Latah Counties, Potlatch Corporation has done regeneration harvests. Slash was treated through landing pile burning and some jackpot burning of fuel concentrations. Some sites have been left to regenerate naturally, but many sites were planted with early-seral species. Active forest management has assumed the role of vegetation manipulation in the absence of fire as a disturbance mechanism. Early-seral species would be promoted in proposed thinning activities because they would be preferentially left in the residual stands; they would be established through reforestation efforts following regeneration harvests and in the off-site

ponderosa pine unit. The combination of past harvest, slash treatment, site preparation, and reforestation activities, when combined with proposed activities under this project the size and distribution of these activities would emulate a mixed-severity wildfire pattern across the landscape. This would reduce the potential for large wildfires to grow unchecked, and impact those values-at-risk.

This project was affected by past management decisions regarding road decommissioning. Treatment areas were dropped from consideration due to lack of access. Future vegetation management in the area could be impacted if not having access to those areas makes action unreasonable due to economics or logistics.

Pre-commercial thinning and tree pruning increase fuel loads and fire hazard. However, long-term benefits include ensuring persistence of desired early-seral species on the site, and increase in growth and vigor of the residual stand. The plantations begin the transition from Fuel Model 5 to a Fuel Model 8 as the saplings grow into pole-sized timber, and these activities hasten that growth and transition. The long-term effect of these activities is beneficial because overall fire-resilience of residual stands is increased.

The continued occurrence of livestock grazing and hay production will result in continued vegetation manipulation. Fine fuels are reduced where cattle graze. This could reduce potential fire behavior in affected areas. Meadows created by grazing and hay production could still be potential fuelbreaks along the western boundary of the project.

There would not be any additional effects to the treatment of fuels from present and foreseeable actions Forest Service activities. These alternatives would continue to reverse the long-term trends in fuel accumulation and departure in fire regime condition class by treating dense stands and reducing fuel build-ups, and encouraging composition changes to more fire resilient species. Vegetation would become less homogeneous across the Forest Service lands within the project area. Potential fire behavior across the analysis area would be reduced, providing some measure of protection for values-at-risk.

Forest Plan and Regulatory Consistency

All alternatives would comply with the Clean Air Act. All alternatives would comply with the Idaho Panhandle National Forest Plan. Only the alternatives with vegetative action would implement any fuel treatment recommendations made by the National Fire Plan, the Healthy Forests Restoration Act, or the Benewah or Latah County Wildfire Mitigation Plans.

Noxious Weeds (see Noxious Weeds Report)

Alternative A (No Action) Direct, Indirect and Cumulative Effects

Noxious weeds will continue to be treated under the St. Joe Noxious Weed Project FEIS and district priorities. Approximately 38 acres of noxious weeds are treated yearly in the Charlie-Preston area (ten-year mean); though in 2011 we treated 187 acres. Additional acres could be treated if funding and man-power were available. While ongoing weed treatments are effectively reducing the number of noxious weed individuals at treated sites, vectors such as wind dispersal moving seeds from private lands, off-road vehicle use, cattle grazing, and other vectors allow for new sites to be established. The greatest direct threat from noxious weeds is from the introduction of new invader species. The following weeds are currently in the project area:

spotted knapweed	Canada thistle	St. Johnswort
oxeye daisy	common toadflax	houndstongue
meadow hawkweed		

Weed treatments in the Charlie Preston area have primarily been herbicide treatments with a small amount of mechanical removal. Herbicide has shown to be the most effective treatment. According to Clark and others (2009), "Herbicides have become the preferred management tool for controlling competing vegetation because alternative techniques (e.g., mechanical, fire) have a number of disadvantages, including increased soil compaction and erosion, greater energy consumption, non-selectivity, destruction of soil habitats, and medical costs" (injuries related to manual pulling/treating weeds).

Unauthorized or illegal OHV use in previously undisturbed areas causes soil disturbance and the spread of invasive weeds (Ingalsbee 2004). Other activities can also bring in new invaders, for example, livestock and other animals may have weed species in their digestive tracts. Weed species tend to maintain their viability even when passing through an animal's digestive system. Wildlife can transport noxious weeds in their digestive systems or entangled in fur (Sheley and others 1996). According to the USDA report (2007) "Meeting the Challenge: Invasive Plants in Pacific Northwest Ecosystems" wind is an effective dispersal method. The report cites several areas in the Pacific Northwest that have been infested by noxious weeds through the dispersal of seed by wind. Noxious weed parts can also easily be transported on all sizes of vehicles. Often stems and seeds are attached to wheels, spokes, and/or mud clinging to the undercarriage of vehicles (Sheley and others 1996). Weed treatments are on-going throughout the cumulative effects analysis area. Newly identified sites and new invaders are treated aggressively to halt spread and/or eradicate the new site. It should be noted that not every mile of the project area can be surveyed for noxious weeds every year, so newly identified sites may have existed for some time before the weeds crew can treat them. For this reason the no-action alternative is expected to result in either a static number of weeds acres or an increase in weeds acres within the cumulative effects analysis area over time.

Alternative B Direct and Indirect Effects

The greatest direct threat from noxious weeds under this alternative is from the introduction of new invader species by way of existing roads and from proposed ground-disturbing activities such as new roads, timber harvest, and other activities. The risk of weed invasion from timber harvest and associated activities in Alternative B is higher than in the existing condition because of the number of acres potentially disturbed and the decrease in the tree canopies from regeneration harvest and road construction. For some weed species such as bull thistle the number of individual thistles will decrease over time as the canopy again increases. Yet others such as St. Johnswort and hawkweed, once established, may persist underneath 50 percent or more canopy.

Alternative C Direct and Indirect Effects

The greatest direct threat from noxious weeds under this alternative is from the introduction of new invader species by way of existing roads and from proposed ground-disturbing activities such as new roads, timber harvest, and other activities. The risk of weed invasion from timber harvest and associated activities in Alternative C is also higher than the existing condition because of the number of acres potentially disturbed and the decrease in the tree canopies from road construction. Because this alternative has fewer acres of disturbed ground and less canopy opening activities compared to alternative B, this alternative would have less risk for an increase in noxious weed invasion.

Direct and Indirect Effects Common to Alternatives B and C

Indirect effects of project activities could be the establishment of new weed populations or the expansion of existing populations. Established weed populations along roads on National Forest System lands may provide a source of seeds for infestation. Effects associated with weed population enlargement may include declines in native plant diversity (Forcella and Harvey 1983, Tyser and Key 1988, Williams 1997), reductions in the aesthetic value of the landscape, encroachment upon rare plant populations and their habitats, potential reductions in soil stability and subsequent increases in erosion (Lacey et. al 1989), and an overall decline of ecosystem health. Native plant density is decreased in areas where weeds are established. At times some locations can become a monoculture of weeds. The Forest Service's goal is to treat infestation so that monocultures will not occur. Maintaining 50 percent or more canopy cover reduces the likelihood of a noxious weed monoculture occurring.

The timber harvest in Alternative C would be commercial thins which would not permanently break or open the tree canopy (EA p. 30), but it would open it more than 50%. Most species of noxious weeds will not persist in the harvest units as the canopy closes over time. Although noxious weeds may displace native species, the majority of this would occur along roadsides. No sensitive plant species populations would be threatened in this project area by noxious weeds.

Design features and mitigation can be expected to reduce the threat of weed expansion. However even with associated weed control methods, weed species may colonize disturbed areas. The extent of weed expansion may be small, but is dependent on so many factors that it is impossible to quantify.

Prescriptions and methods differ in the extent to which they might increase noxious weed colonization. In general, the smaller the openings created and the least amount of work done in the stand (disturbance and movement), the fewer the opportunities for colonization. If weed treatments are continued those small area infestation are expected to have 100 percent control where chemical treatments are used (1999 St. Joe Weeds EIS). In this respect, commercial thinning would pose the lowest risk of spreading weeds, while clearcutting would pose the highest. Ground-based log yarding may promote the spread of weeds more than any other yarding method due to the greater extent of ground disturbance and use of machinery. Track line harvest systems focus the ground disturbance primarily on ridge tops where impacts to soils are lower compared to slopes. Track line harvest and skyline yarding have less ground disturbance during harvest compared to ground-based harvest. Design features such as cleaning road construction and logging equipment prior to entering the project area would help to minimize these effects. However noxious weeds are established in the project area including:

spotted knapweed	Canada thistle	St. Johnswort
oxeye daisy	common toadflax	houndstongue
meadow hawkweed		

The probability of these weeds being further spread by machines into stands is likely where canopy reduction and ground disturbance occur. The greater the amount of ground disturbed the more soils that now become available for colonization by weed species. Thus the likelihood of further noxious weed encroachment into the analysis area is high. These areas are also more difficult to access and treat. The effectiveness of heavily infested sites using chemical control is 50-70 percent (1999 St. Joe weeds EIS).

Risk of increasing or establishing noxious weeds from fuel reduction and site preparation activities in proposed timber harvest units would be high as these treatments would occur in conjunction with other ground-disturbing activities. Burning has the most impact for increasing weed presence for fuels reduction and site preparation activities. Activities such as under-

burning, jackpot burning, and broadcast burning "can often promote plant invasions, potentially replacing one type of fire hazard represented by existing fuels with another type of hazard from new types of nonnative fuels" (Erickson and White, 2007). An indirect effect of burning would result in the addition of nitrogen to the soil, temporarily increasing plant growth. Often invasive/weedy species of plants gain the advantage from the localized nitrogen boost. The probability of noxious weeds establishing in burned areas is highly likely considering that there are seed sources present in the vicinity and the flush of nitrogen. Additionally knapweed, which is well established throughout the project area, can, according to Ferguson and Craig, be reduced by burning, but not controlled. In fact knapweed has allelopathic compounds that kill off competing vegetation. This compound, if still present in the soil after burning, will keep other plant species from establishing. In addition to knapweed, other invasive weeds currently present within the project area have allelopathic compounds, for example, meadow hawkweed and Canada thistle.

The probability of invasion/increase of noxious weeds from tree planting is very low and may be beneficial. Conifer seedlings would be planted on approximately 181 acres in areas proposed for regeneration harvest and on 82 acres in the off-site ponderosa treatment unit. Tree planting also reduces the available habitat for nonnative invasive species. The tree canopy would increase over time, shading out most invasive species. Only a few species of weeds can persist in shade. This activity also increases the density of native plants.

Roadside fuel reduction treatments would open up canopies along roads, some areas would have soil disturbance, and native plants would be reduced (cut) along roadsides, thus giving the invasive species an opportunity to establish. Design features would reduce this risk. There would be a small decrease in canopy in some of the younger stands treated, but in the mature stands, the overstory would remain relatively intact. Road side noxious weed infestations are the easiest locations to identify, treat, and monitor. So it is also highly likely that if funding is available early detection and treatment will keep the spread into previously uninfested roadsides low. The indirect effects of road construction (including temporary roads) and reconstruction would be an increase in the potential for the introduction and expansion of weed species, especially into newly accessible areas, and disturbance of established seed beds and soil. The development of new roads and increasing levels of traffic for recreation and commercial purposes may greatly increase the potential for seed dispersal of invasive species. Forest roads disrupt native species distributions and increase human access for logging and recreation, change landscape spatial patterns and, if constructed through closed-canopy forests, negatively affect species adapted to interior habitats (Kimberling and others, 2005). Roads also create changes in soil properties (e.g., pH) and nutrient availability (e.g., nitrogen and phosphorous) that favor invasive plants over natives. However as stated above access to infestations is easy and treatment is highly likely if funding is available. Temporary roads risk for infestation is limited in time as these roads would be slated for closure once the project has completed. Closed roads risk for maintaining most invasive species diminished over time as canopy returns in the forest types.

The risk of establishing or increasing noxious weeds from pocket gopher control would be very low.

Effects of biomass removal are considered under effects of timber harvest and fuel treatment, and biomass removal would have no additional risks of increasing or establishing noxious weeds.

The off-site ponderosa pine treatment would have a moderate risk of infestation by noxious weeds. None of the acres proposed for burning fall within parameters that would make them highly susceptible for noxious weed invasion (Rice and Toney), but prescribed fire can result in increased weed infestation. An indirect effect of burning would result from the addition of

nitrogen to the soil, temporarily increasing plant growth. Often invasive/weedy species of plants gain the advantage from the localized nitrogen boost.

The proposed Bald Mountain fuels reduction would have a moderate risk for increasing noxious weeds. An indirect effect of burning slash piles may result from the addition of nitrogen to the soil, temporarily increasing plant growth. Often invasive/weedy species of plants gain the advantage of the localized nitrogen boost. Slash pile burning would have a localized effect in and directly adjacent to the piles. Those areas would have the highest risk for invasion. Burn piles often act like a small but high-severity burn.

Firewood cutting would be a low risk to increase or establish noxious weeds. Invasive plants can be transported on clothing, tools, and machinery. Personal-use firewood collection, however, is a low-intensity activity with little ground disturbance and would be considered a low risk for noxious weed spread.

Snag creation and increasing cavity nesting habitat would have no risk of increasing or establishing noxious weeds because there would be no ground disturbance and tree canopies would not be opened enough to make a difference with the few snags that would be created.

Ground disturbance caused from replacing the culverts would have a low risk of establishing or increasing noxious weeds. These sites were previously disturbed when culverts were installed and the roads were built. Design features would be included for cleaning of machinery before and after use.

Ground disturbance caused from placing large woody debris would have a low risk of increasing noxious weeds. Planting would be done by hand and placement of structures would cause limited ground disturbance.

Dispersed campsites would be a moderate risk of increasing noxious weeds. The ground disturbance associated with these locations was analyzed under the effects of timber harvest and roads. Long-term road storage would have a positive effect by reducing risks of increasing and establishing invasive plants. Long-term storage would reduce the effectiveness of the road as a pathway for weed spread by reducing the amount of use and limiting the type of use on the road. The opportunities for weed seeds and parts to be moved along the road would decrease. Approximately 4.4 miles of road would be put into long-term storage. The road would be seeded and/or planted with native species as provided in the contract to establish a vegetative cover in the road prism. Seeding the road bed with natives increases the competition with invasive plants by taking up spaces where noxious weeds could grow. Long-term storage may eliminate unauthorized motorized access while still permitting stock and pedestrian access. The reductions in vehicular access would result in a decreased potential for weed transport.

Decommissioning roads has a positive effect by reducing risks and over time changing high-potential habitats at risk for weeds to habitats that would likely not have opportunities for invasive plants to establish. Approximately 0.6 miles of road would be decommissioned.

The road would be seeded and/or planted with native species as provided in the contract to establish a vegetative cover (design features). Seeding the road bed with natives increases the competition with invasive plants by taking up spaces where noxious weeds could grow. Any mulching agents would also be certified noxious weed free (design features) in order to reduce the risk of establishing new noxious weed sites. Decommissioning would eliminate potential vehicular access resulting in a decreased potential for weed transport. Seeds and plant parts may still be transported on clothing and fur as people and animals would still use the decommissioned roads until trees and brush establish on site. Over time canopy cover would increase, effectively eliminating several species of invasive plants that do not tolerate shade. Only a few species of weeds can persist in shade.

Cumulative Effects Common to Alternatives B and C

Past and ongoing activities have led to habitat modification and fragmentation. Road construction, grazing, recreational use, vehicular traffic, timber harvests, and natural events have all created possible vectors for weed introduction and encroachment. Noxious weed infestations are present on roads, meadows, and some small openings within the Charlie Preston project area. Some of these invasive species such as St. Johnswort have become widespread and are considered naturalized. St. Johnswort, oxeye daisy, and spotted knapweed are the most common invasive weeds in the Charlie Preston project area. Biological controls for both St. Johnswort and spotted knapweed are present within the project area.

Almost the entire habitat that would be harvested is in susceptible ground, and new road construction would cumulatively contribute to weed infestations. The St. Joe Ranger District would continue to conduct an annual program of noxious weed inventory and control, but current funding does not allow treatment of every infested site. In units where the cumulative effects of ground disturbance from harvest activities, fire, and grazing occur together, noxious weed risk would be the highest.

Current and reasonably foreseeable activities include grazing, timber harvest and related activities on other lands, recreational activities, road maintenance, noxious weed treatments, and fire suppression activities. These types of activities could result in new disturbed sites available for colonization by weeds, and they do offer the possibility of introduction of new species of weeds to the analysis area.

Design features are included to minimize noxious weed establishment and increase on federal lands. The US Forest Service does not have control over activities occurring on private lands where weed introduction and spread is also likely occurring. Noxious weed seeds and plant parts will continue to be moved across land ownerships by a variety of vectors including wind, vehicles, animals, and water, to name a few. However the State of Idaho and Benewah County has an on-going noxious weed control program. Private land owners adjacent to the Charlie Preston area treated areas of knapweed and other invasive plants in 2010. A grant to Benewah County to assist private land owners and county weed control efforts is available through 2012. Noxious weed control methods will become more effective through time as more data is collected and new treatments are developed. Weed control activities would be scheduled as funding and other priorities allow. Only a longer term schedule of treating all weed locations across all ownerships (multiple years) followed by monitoring and rehabilitation of those sites on all ownerships with native plants would greatly reduce the long- term presence of noxious weed species in the Charlie Preston area.

Consistency with Forest Plan and other Direction

According to the Idaho Panhandle Forest Plan (USDA Forest Service 1987) direction, infestations of many noxious weed species such as spotted knapweed, meadow knapweed, oxeye daisy, and St. Johnswort are so widespread that control would require major programs that are not possible within expected decreasing budget levels (USDA Forest Service 1987 p. II-7). Forest Plan direction is to "provide moderate control actions to prevent new weed species from becoming established" and to treat noxious weeds with an integrated pest management approach. All alternatives would meet the intent stated in the Forest Plan for moderate control, through the implementation of all noxious weed design features. Any weed control within the project area would be done in accordance with the principles of integrated pest management, which is also consistent with the Forest Plan and Forest Service Manual (Chapter 2080, as amended, 1995). Continued treatments of invasive plant species also meet the intent of The State of Idaho's Noxious Weed Act, Title 22, Chapter 24 Idaho Code.

Old Growth (see Old Growth Report)

Alternative A (No Action) Direct, Indirect and Cumulative Effects

There would be no direct/indirect or cumulative effects resulting from Alternative A, No Action, on either existing allocated old growth or other stands known to meet old growth criteria. Forest Plan standards for old growth retention would continue to be met.

There would be no direct/indirect effects from current and reasonably foreseeable activities including weed control, road and trail maintenance, pocket gopher control, fire suppression, and public recreation (i.e. berry picking, hiking, hunting, wood gathering and similar activities). No cumulative effects on allocated old growth are expected as a result of these other activities.

Direct, Indirect and Cumulative Effects Common to Alternatives B and C

No road construction, timber harvest or other activities are proposed within allocated old growth. Road management prescription changes may have indirect effects on old growth.

Within OGMU 6, approximately 3.4 miles of existing road go through or are adjacent to allocated old growth stands (code 9 and code 11) (project file OG-9, OG-11). Adjacent is defined as a road sharing a common boundary with stands allocated as old growth. Of those miles, 2.4 miles are open to the public, 0.8 miles are in road Rx A, and 0.2 are in road Rx B (project file OG-11). In both Alternative B and Alternative C, approximately 0.2 miles of road through old growth would be decommissioned (Road Rx D), and 0.6 miles of road through and adjacent would be put into long term storage (Road Rx C) (project file OG-10, OG-11).

Alternative B and Alternative C would have a direct effect of decommissioning 0.2 miles and long term storing 0.6 miles of roads. This would decrease the edge effect in stands due to these existing roads and the impact of motorized travel. Alternative B and Alternative C would have no indirect effect on allocated old growth. Forest Plan standards for old growth retention would continue to be met.

There would be no direct or indirect effects from current and reasonably foreseeable activities including weed control, road and trail maintenance, and public recreation (i.e. berry picking, hiking, hunting, wood gathering and similar activities). No cumulative effects on allocated old growth are expected as a result of these other activities.

Consistency with Forest Plan (Old Growth Report pages 6-8)

Specific goals, objectives and standards for old growth management as described in the Forest Plan on pages II-5 and II-29 are met with all alternatives in the project.

Old growth standard 10*a* in the Forest Plan states: "A definition for old growth is being developed by the Regional Task Force and will be used by the Forest when completed." In compliance with Forest Plan old growth standard 10*a,* the definition of old growth developed by the Regional Old Growth Task Force, documented in *Old-Growth Forest Types of the Northern Region* (Green and others 2008) has been incorporated into Forest Plan standard 10*a* and was used in the validation and analysis process of old growth in this project.

Old Growth standard 10*b* in the Forest Plan directs that we "Maintain at least 10 percent of the forested portion of the IPNF as old growth." The 2007, 2008, and 2009 IPNF Forest Plan Monitoring Report shows approximately 11.8% of the forested lands on the IPNF met old growth criteria using the Forest Inventory and Analysis (FIA) data. This estimate was derived after applying adjustments for years to grow to breast height (4.5 feet) to FIA data (Zack and others 2006). Additionally, the 2007, 2008, and 2009 IPNF Forest Plan Monitoring Report showed that the mapped allocated old growth stands were 12.4% of the forested acres on the IPNF. In May of

2007, an updated report of estimates of Old Growth in the Northern Region and the component National Forests (Bush and others 2007) disclosed that the IPNF had approximately 11.8% old growth. Although these studies were developed at different landscape scales, they demonstrate consistency in estimates of old growth on the IPNF and compliance with Forest Plan Old Growth standard 10*b*.

Old Growth standard 10*c* in the Forest Plan states: "Select and maintain at least five percent of the forested portion of those old-growth units that have five percent or more existing old growth." The Charlie Preston project involves one Old Growth Management Unit (OGMU): OGMU 6 (St. Maries, 04). An old growth validation was completed for this analysis, discussed earlier. This old growth management unit has approximately 8,006 acres in National Forest System lands (project file, OG-4). The current condition and the condition proposed in Alternative B and Alternative C, 422 acres (approximately 5.3%) is allocated to Old Growth Management (project file, OG-4). With any alternative the old growth allocation within this OGMU meets Forest Plan Old Growth standard *10c.*

Old Growth standard 10*d* states: "Existing old-growth stands may be harvested when there is more than 5 percent in an old-growth unit, and the Forest total is more than 10 percent." Timber harvest is not proposed in any allocated old growth. None of the stands proposed for timber harvest meet minimum criteria for old growth defined by Old Growth standard 10*a*. All alternatives in this project are in compliance with the Forest Plan Old Growth standard 10*d*.

Old Growth standard 10*e* states: "Old growth stands should reflect approximately the same habitat type series distribution as found on the IPNF." Compliance with this Forest Plan standard is disclosed on paged 132 and 133 in the Old Growth section of the 2007, 2008, and 2009 IPNF Forest Plan Monitoring Report. The habitat type series for allocated old growth within this OGMU is generally represented by the habitat type series available within this project area. See Table 1 in the Forest Vegetation Report. All alternatives comply with the Forest Plan Old Growth standard 10*e*.

Old Growth standard 10*f* describes desirable patch size stating: "One or more old-growth stands per old-growth unit should be 300 acres or larger. … The remaining old-growth management stands should be at least 25 acres in size. Preference is 80 plus acres." A patch, as used here, is defined as a group of adjacent stands. The use of patches in the discussion for Old Growth standard 10*f* is needed due to the definition of a stand. A stand defined by *The Dictionary of Forestry* (Helms, 1998) is "a contiguous group of similar plants or a contiguous group of trees sufficiently uniform in age-class distribution, composition, structure, and growing on a site of sufficiently uniform quality, to be a distinguishable unit". Stands are relatively small areas of forest, mapped individually because mapping at this scale is useful for a variety of management purposes. Stand size commonly ranges from 1 acre to 100 acres depending on stand characteristics. It's quite common for adjacent stands to both be old growth, but be delineated into separate stands because they have different slopes, aspects, habitat types, species composition, or density. For this analysis, old growth stands were first analyzed to determine if they meet minimum criteria for old growth discussed in Old Growth standard 10*a* and whether they should be allocated for old growth. Stands were then grouped together based on position on the landscape and proximity to adjacent old growth stands to create contiguous old growth patches and a smaller set of other old growth areas within one mile of each other. These contiguous and nearby old growth patches are what is analyzed to determine compliance for Forest Plan standard 10*f*. All patches are comprised of multiple stands. Patch size for the OGMU involved with this project is discussed below.

In Alternative A, Alternative B, and Alternative C, in OGMU 6 (St. Maries, 04), the allocated old growth occurs in six patches of stands (project file OG-7, OG-8). These patches range in size

from 13 to 236 acres. Three patches are greater than 25 acres. Of those patches, two are greater than 80 acres and one patch is greater than 100 acres. The largest patch in the OGMU is 236 acres. Due to the occurrence of past disturbance, such as fire and previous timber harvest (see forest vegetation report for more information), patches of old growth within the project area are confined to areas that were not impacted by disturbances. These areas that were not disturbed by fire and previous timber harvest have been allowed to progress and meet the definition of old growth as discussed in Old Growth standard 10*a*. All patches identified within the OGMU do have adjacent forested stands in earlier stages of stand development and succession. As discussed above, OGMU 6 (St. Maries, 04) is in compliance with the Forest Plan Old Growth standard 10*f*.

Old Growth standard 10*g* states: "Roads should be planned to avoid old-growth management stands to maintain unit size criteria." In Alternative B and Alternative C, no road construction is proposed within allocated old growth stands. All alternatives in this project are in compliance with Forest Plan Old Growth standard 10*g*.

Old Growth standard 10*h* states: "Existing grazing allotments will be honored; …New allotments in old-growth will not be issued." The proposed activities fall within one pre-existing grazing allotment. This allotment is addressed in the Environmental Assessment for the St. Maries Grazing Allotments (USDA 199a), as well as the approved Allotment Management Plans. No new grazing allotments are proposed, and none are planned, within the Charlie Preston project area or the analysis area (OGMU 6). Grazing permits are restricted to the historical allotments within this analysis area. All alternatives comply with Forest Plan Old Growth standard 10*h*.

Old Growth standard 10*i* states: "Goals for lands to be managed as old-growth within those lands suitable for timber production are identified in the management area prescriptions." Compliance with this Forest Plan Old Growth standard is disclosed on pages 133 and 134 of the 2007-2009 IPNF Forest Plan Monitoring Report. As disclosed in the Forest Plan Monitoring Report, the IPNF is not only meeting but is exceeding the Forest Plan Old Growth standard 10*i*.

Plants: Threatened, Endangered, Sensitive, and Species of Concern (TES) (see Botanical Biological Evaluation and Assessment Report)

The sub-basins of northern Idaho contain varied and diverse habitats and plant communities. Of the estimated 1,500 plant species known or thought to occur here, only about ten percent are considered rare or uncommon. District plant records and Idaho Department of Fish and Game Conservation Data Center (ICDC) Element Occurrence records were reviewed for known species locations. In addition, site-specific information from timber stand examination records, aerial photographs, topographic position, personal knowledge, and professional judgment were used to identify possible habitat, and on-the-ground surveys were used to verify habitat suitability.

No federally listed endangered plants are suspected to occur on the Idaho Panhandle National Forest and none were found in the project area (Botanical BE and BA p. 2). No threatened plants are suspected to occur in the project area and none were found. Habitat for water howellia and Spalding's catchfly does not occur within the affected environment of the Charlie Preston project area (Botanical BE and BA p. 2-4). If any sites are found in the future that are deemed necessary to ensure species recovery, those sites would be protected.

Five occurrences of *Buxbaumia viridis* (Bug-On-A-Stick Moss), a regional sensitive plant, were found during project surveys. All sites are protected by eliminating units or using buffers around the sites.

Two occurrences of Forest Species of Concern (FOSC) plant Leiberg's tauschia (*Tauschia tenuissma)* are within the analysis area but are outside of activity areas and are not on National Forest lands. They will not be impacted by the project.

The importance of a population is based on a variety of factors such as size of the population, number of known sites, ranking of the species, and sensitivity to disturbance. Cumulative effects to listed plant species and suitable habitat from proposed activities are generally described as very low, low, moderate, or high with the following definitions:

- **very low** = no measurable effect on individuals, populations, or habitat
- **low** = individuals, populations and/or habitat not likely affected
- **moderate** = individuals and/or habitat may be affected, but populations would not be affected, and habitat capability would not be reduced below a level that could support plant species over the long term
- **high** = populations would likely be affected and/or habitat capability may over the long term be reduced below a level that could support that plant species

Alternative A (No Action) Direct, Indirect, and Cumulative Effects

The no action alternative of current management plans would continue to guide management of the project area. No activities would be planned in or near sensitive plant locations.

Alternatives B and C Direct and Indirect Effects

The risk for sensitive plants would be low because design features (Design Features II.C) would protect sensitive plants.

There is always a chance that plants were not visible at the time of surveys, so there is very low risk that proposed activities could affect sensitive plants even though they were not located during surveys. Design Feature I. E. would protect those plants discovered during implementation. The following analysis is based on the risk that plants could be affected.

Timber Harvest:

Some isolated *Buxbaumia viridis* may be affected by activities; however, in the Charlie Preston project area these disjunct individuals are part of a larger "meta-population" and are not deemed critical to population viability. It is highly likely that if an individual is damaged that the meta-population will not be adversely impacted.

Two small populations of *Buxbaumia viridis*, a regional sensitive species, are known to exist in proposed harvest units. Small populations are those having 50 or fewer individuals. Other populations of *Buxbaumia viridis* occur in the project area. *Buxbaumia viridis,* green bug-on-a-stick moss, is a non-vascular plant especially sensitive to forest management (Anderson et al 2007). Design features include buffers around the populations to protect them from most impacts of harvest activities (see Design Feature II. C).

Indirectly canopy reduction could affect certain sensitive plants including *Buxbaumia viridis* by changing light and moisture regimes. The effects threshold for canopy reduction has not been quantified for most sensitive plants, but is generally thought to be about 50 percent. When canopy reduction is less than 50 percent effects could be minimal; over 50 percent, effects could be evident. The higher the percent canopy removed, the greater the potential risk to suitable habitat. The limited data and observations available indicate that many species in the moist and wet forest guilds are intolerant of major canopy removal (Lichthardt 1998; Greenlee 1997). Nearly all the high-potential habitat proposed for harvest is in the moist forest guild (99 percent

or 1,546 acres in Alternative B and 100 percent (850 acres) in Alternative C. Other plant guilds that exist in the Charlie Preston Project Area are outside of harvest units.

The timber harvest would be commercial thins which would not permanently break or open the tree canopy (EA p. 30), but it would open it more than 50%. Most species of noxious weeds will not persist in the harvest units as the canopy closes over time. Although noxious weeds may displace native species, the majority of this would occur along roadsides. No sensitive plant species populations would be threatened in this project area by noxious weeds.

Skyline yarding poses a moderate risk of killing or damaging sensitive and FSOC plants depending on the amount of ground disturbance. Weather conditions, slope, soil type, and experience of the equipment operator can cause variations in amount of ground disturbance. Skyline yarding has fewer indirect effects from compaction and repeated use of skid trails than tractor skidding. Some ground-based harvest would be done by track-line machines that come in various sizes and can vary in their impact. A track-line machine's impact would be less than other ground-based disturbances because the machine is smaller and is used primarily on ridge tops. Trees are yarded up to the machine similar to the skyline method. Track-line would have a moderate risk of affecting sensitive and FSOC plants. Ground-based tractor skidding has a greater risk to sensitive and FSOC plants due to direct physical impacts, soil compaction, and soil displacement.

Table 41 – Acres of Each Silvicultural Prescription and Logging Method by Alternative

	Alternative B	Alternative C
Silvicultural Prescription		
Commercial Thin	1134	850
Shelterwood	31	-
Seedtree	60	-
Clearcut w/Reserves	90	-
Final Removal	231	-
Logging Method		
Ground-Based	602	353
Track-Line Machine	131	75
Skyline	813	422

Fuel Treatment:

Burning could occur at any time of year, as prescription parameters and burn windows permit. The potential impacts from burning would be lower for fall burning after plants have already flowered and seeded. Yarding, leaving, or lopping and scattering limbs would have little to no additional effect beyond other harvest methods. When slash piles burn they would have localized areas of high intensity fire that would kill forbs growing in those areas. These sites are at risk for soil damage, loss of microbes, nutrients, and fungi that may benefit rare plants. Two sensitive plant sites of *Buxbaumia viridis*, green bug-on-a-stick moss occur in an area where burning is proposed as a possible treatment. Design features (DF-C & D) will be in place to protect these sites reducing the overall risk to plants.

Tree Planting:

Tree planting is of no risk to sensitive and FSOC plants because of the low amount of ground disturbance and the reduction of risk for spreading invasive species, while increasing native plants on the ground. Any effect on sensitive and FSOC plants or their habitats would be

considered beneficial over time as the canopy increases resulting in an indirect decrease of risk for weed invasion.

Pocket Gopher Control:

Pocket gopher control presents a very low risk to sensitive and FSOC plants because of the low amount of ground disturbance and lack of effect from the chemicals. Available research shows no consequential quantity of strychnine or zinc uptake in plants where similar treatments have taken place (see PF B-5).

Creation of Snags and Cavity Nesting Habitat:

Creating snags and potential cavity nesting habitat would pose no risk to sensitive and FSOC plant species because there would be no ground disturbance.

Biomass Removal:

Effects of biomass removal are considered under effects of timber harvest and fuel treatment and would have no additional risks to sensitive and FOSC plant species.

Prescribed Burn and Off-site Ponderosa Pine Treatment:

Surveys did not locate any sensitive or FSOC plants at this time in the 82 acres of Unit 18 to be treated. All of unit 18 is within dry and moist high potential habitat for sensitive and FOSC plants. This prescribed burn is not expected to have high ground temperatures so soil and seeds beyond the duff layer would not be adversely affected because of the low amount of ground fuels. It is unlikely that sensitive or FOSC plants are in the unit; and if they do occur, the prescribed burn is unlikely to result in adverse effects.

An indirect effect of burning would result from the addition of nitrogen to the soil, temporarily increasing plant growth. Often invasive/weedy species of plants gain the advantage of the localized nitrogen boost. Low- or even mixed-severity fire in suitable plant habitat can be beneficial to certain plants, yet detrimental to others depending upon a variety of factors like fire intensity, the ability of the species to survive the event, and competition in early successional habitat.

Roadside Fuel Reduction:

There are no known sensitive and FSOC plant sites within the roadside fuel reduction treatment areas. There would be a small decrease in canopy in some of the younger stands treated, possibly allowing for weed invasion until the canopy returns, but in the mature stands the overstory would remain relatively intact.

Fuel Reduction near Bald Mountain Lookout:

Lopping and piling would have little ground disturbance. Burning slash piles may impact a few individuals but would not likely contribute to a trend towards Federal listing or cause a loss of viability to the population or species of sensitive and FSOC plants as meta-populations persist. While no sensitive or FSOC plants were found in this unit at the time of surveys fire can, depending upon intensity of the fire, kill individual plants and the additional nitrogen may increase plant growth.

Personal-use Firewood Removal:

Sensitive plant species *Buxbaumia viridis* (green bug-on-a stick) can grow on down decaying wood. Decaying wood is rarely collected for firewood. Incidental removal could occur, but is unlikely with the design features. There is a chance of removal/damage of individuals of *Buxbaumia viridis*. The loss of some individuals would not cause a trend to federal listing (see

botany report). Firewood cutting would be excluded from areas where known sensitive plant locations exist.

Road Construction:

Botanical surveys in 2008, 2009, and 2010 found no occurrences of sensitive or FSOC plants in areas proposed for road construction (temporary or system roads); however, ground disturbance from new road bed creation would completely remove vegetation at these sites. The indirect effects of road construction would be an increase in the potential for the introduction and expansion of weed species, especially into newly accessible areas, and disturbance of established seed beds and soil. Road construction may directly eliminate individual plants or populations through physical disturbance and damage or eradicate soil mycorrhizae upon which many plant species depend. Indirectly, changes in fuel loading, duff levels, moisture regime, and light levels may impact plant habitat.

Road Reconstruction:

There are no known sensitive and FSOC plant sites in reconstruction areas. The indirect effects of road reconstruction would be an increase in the potential for the introduction and expansion of weed species, especially into previously inaccessible areas, with increased access.

Long-Term Storage:

Long-term storage would have a very low risk to sensitive and FSOC plant species as these areas have been previously disturbed and have no known plant occurrences. The reductions in vehicular access would result in a decreased potential for weed transport. Once the activities to put the road into storage are completed, the risk dissipates.

Road Decommissioning:

Decommissioning would have a low risk to sensitive and FSOC plant species as these areas have been previously disturbed and have no known sensitive and FSOC plants occurrences. Once the activities to decommission the road are completed, the risk dissipates. The elimination of unauthorized vehicular access (if any occurs) would result in a decreased potential for weed transport.

Fish Migration Barriers:

These sites have been previously disturbed when the roads were constructed and the culverts were installed. Ground disturbance caused from replacing or removing the culverts would have a very low risk to sensitive and FSOC plants. There are no known or suspected sensitive and FSOC plant occurrences at these locations.

Riparian Planting and Large Woody Debris Placement:

There are no known or suspected sensitive and FSOC plant occurrences along Preston and Charlie Creeks, and this activity would result in very limited ground disturbance.

Creation of Dispersed Camping Sites:

This would occur where ground is already disturbed or where the effects of disturbance are considered for timber harvest and road work. There are no known or suspected sensitive and FSOC plant occurrences in these areas.

Cumulative Effects Common to Alternatives B and C

Alternatives B and C may impact individuals of or habitat for *Buxbaumia viridis* (green bug-on-a-stick moss) but will not likely contribute to a trend toward federal listing or cause a loss of viability to the population or species because meta-populations would persist. Past and ongoing

activities within the project area and on other lands have led to habitat modification and fragmentation in and around the project area. Road construction, timber sales, recreational use, grazing, vehicular traffic, and natural events have all contributed to encroachment of weeds into the area and the reduction of native species density where weeds take over. Current and reasonably foreseeable activities within the project area include firewood collection; recreational use of roads, trails, and dispersed camping sites; road and trail maintenance, fire suppression, and grazing. These types of activities could result in new disturbed sites available for colonization by weeds, and they do offer the possibility of introduction of new species of weeds to the watershed.

The past, present, and reasonably foreseeable activities would not likely impact sensitive and FSOC plant species present in the area. Individuals of *Buxbaumia viridis* (green bug-on-a stick) do have a risk of being impacted; however, this should not put the species as a whole at risk across the range of the species. The current habitat condition would be affected because canopy would be reduced in some areas and canopy would increase as disturbance is reduced where roads are put into long-term storage and decommissioned. This would reduce the opportunities for weed invasion and expansion thus maintaining habitat for sensitive plants. Disturbance in other locations would increase the opportunities for weeds to establish and reduce the niches for potential sensitive and FSOC establishment.

Range (see Range Report)

Alternative A (No Action) Direct, Indirect, and Cumulative Effects

Livestock grazing would continue at current levels across the allotment. Eventually some grazing areas would be lost as regeneration continues in previously harvested units. This alternative meets the intent of the Forest Plan and follows Forest Service Manual direction because transitory range is compatible with the objectives and may still be used.

Alternatives B & C Direct, Indirect, and Cumulative Effects

Cattle use is expected to continue as it does currently. Forage production would be increased slightly in the short term. Eventually some grazing areas would be lost as regeneration continues in previously harvested units. These alternatives meet the intent of the Forest Plan and follow Forest Service Manual direction because transitory range is compatible with the objectives and may still be used and forage production would be increased slightly in the short term.

Recreation (see Recreation Report)

Alternative A (No Action) Direct, Indirect, and Cumulative Effects

Alternative A would have no direct or indirect effects to recreation-related resources, and existing recreation opportunities would not change. Recreation activities such as driving for pleasure, off–highway vehicle (OHV) riding, hunting, camping, hiking, gathering forest products (berries, firewood, mushrooms, etc.), and cross-country skiing would continue. Public motorized vehicle access would not change with this project, and the recreation opportunity spectrum (ROS) classes would remain the same. Post-activity firewood gathering would not occur and new dispersed sites would not be created. Fuel reduction activities providing fire safety along the main travel routes and below Bald Mountain Lookout would not occur.

Alternatives B and C Direct and Indirect Effects

There is very little difference between the action alternatives with respect to the recreation resource. Alternative B has some regeneration harvest and Alternative C does not. The regeneration harvests would create obvious modifications in to the natural environment, but since they would be located within the Roaded Modified portion of the project area, the ROS classification would not change. Alternative B includes more acres of commercial thinning than Alternative C. This type of harvest activity would meet the classification for both Roaded Natural and Roaded Modified.

Alternative B would have about twice as much log hauling traffic than Alternative C. Estimated log traffic would be about 3600 log trucks for Alternative B and 1800 for Alternative C. This traffic would head down the lower portion of Hume Creek Road, Palouse Divide Road 377, and Charlie Creek Road 299. This additional traffic could be spread over a four- to eight-year period and may not be concentrated on all of the roads at one time.

Public recreation access would remain an important recreational resource. Public access would not change with this project, but it may be temporarily affected during the implementation phase:

- Some roads open to public motorized access may be closed during implementation or traffic would be delayed to accommodate logging and other resource activities such as road improvements; skidders and log decks blocking the road; and replacing culverts, etc.
- All of the open roads would be affected by increased traffic due to the harvest activities, especially log hauling heading down the lower portion of Hume Creek Road, Palouse Divide Road 377, and Charlie Creek Road 299. Estimated log traffic would be between 1500 to 4000 log trucks, depending on alternative. This increased traffic would cover a two- to five-year period.

Fuel reduction activities would reduce potential for fire spread along the main travel corridors and below Bald Mountain Lookout. The type of fuel reduction activities are described below:

- Road-side fuel reduction would open up the areas adjacent to the roads and create a park-like corridor. It would create openings with scattered trees or clumps of trees greater than 6 inches in diameter. Screening to provide privacy around dispersed campsites would be maintained. The activity would not detract from the natural landscape in the areas with the ROS Roaded Natural classifications
- Fuels would be reduced in an old thinning unit near Bald Mountain Lookout to protect the structure. This activity would not affect the Roaded Natural ROS classification in this area.
- Landing piles generated from harvest units would either be burned or removed as biomass.

There would be several commercial thin units within the Roaded Natural ROS area along the Palouse Divide for both action alternatives. A design feature would require marked trees to be cut so that no painted trees would be left in areas adjacent to Palouse Divide Road 377 and Bald Mountain Road 377A. The forest canopy would be more open than the existing forest, and after slash treatment is completed the overall natural appearing landscapes would be maintained.

Illegal or unauthorized public motorized access would be reduced because road closures would be monitored to determine how effective they are at preventing motorized access (see page 46). If the closure methods are not preventing motorized access, another method would be used to increased effectiveness. For example, a gate may be moved to a better location or a guardrail

barrier may be replaced with road recontouring for the first sight-distance. Any user-created routes discovered would be blocked.

Trail 228 use would be impacted during implementation because the reconstruction on Road 337B would obliterate a section of trail where it intersects with the road. The trail tread would be replaced when the road is no longer needed for harvest activities (see page 31).

The public expressed interest in creating additional dispersed sites. Currently there are only two dispersed sites in the project area. There is the potential to add a few more small dispersed campsites by leaving areas at the beginning of roads that would be stored or decommissioned. If some of the log landings could provide a campsite, they would be left in a condition conducive for that use.

Some gated roads would be open from Memorial Day Weekend through Labor Day Weekend to provide extra roads open for public firewood gathering. They would be open for up to three seasons after the last timber sale contract closes on each road and would include: Road 1950 up to the second gate, Road 1954, and Road 1950C.

There would be no change to ROS characteristics in either action alternative and post activity public access would remain the same as the existing access in both action alternatives, with the exception of the additional access for firewood gathering discussed above.

Alternatives B and C Cumulative Effects

One outfitter has a special-use permit to operate in the project area. Outfitting and guiding services have been permitted in the project area for over 12 years, and this activity will continue in the future.

Firewood gathering is an activity that has been ongoing since settlement to the area and is expected to continue in the future. It has been a common practice over the last 10 years to open some gates during the summer for the purpose of providing areas to gather firewood. Before hunting season, the gates were again closed to provide wildlife security. Most of the roads in the project area have been opened up at some time or other for firewood cutting. As part of the Charlie Preston project, gates would be open for one to three years after the last timber sale contract closes on each road.

Driving for pleasure and auxiliary activities such as berry picking, firewood gathering, viewing wildlife, hunting, camping and gaining access to travel into the interior of the forest for exploring have been a popular activities since roads were built in the area during the 1930s and 1940s. These early roads were built in the stream bottoms and include Hume Creek Road 1479, Charlie Creek Road 299, and Road 1950. Driving for pleasure has been one of the most popular activities in the area and will continue to be in the future. OHV riding has become more popular in the last 10 years and use is expected to increase in the future.

Motorized recreation is addressed with the St. Joe Travel Management EA. A decision for that project is expected in the near future and it is anticipated that implementation will start in 2012. A Motor Vehicle Use Map (MVUM) will be published that will show roads and trails designated for motorized use by vehicle class and season of use. Once the travel plan is implemented, cross-country motorized travel will be prohibited. Generations of people had been driving on Road 1950 since it was built in the 1940s until it was closed to public motorized use in the 1990s. There have been problems with breaching the gate at the bottom of Road 1950, and some of the public has let the Forest Service know that they want to use this historic route again. The St. Joe Travel Plan proposal took into consideration the public desire to drive on Road 1950 and 1954 to access the interior of the area while still providing for elk security during hunting season. The St. Joe Travel Management EA proposes to designate the part of Road 1950 from the junction with

Hume Creek Road 1479 and all of Road 1954 for seasonal use by ATVs less than 50" wide (ACT-19). The motorized season would be Memorial Day weekend to Labor Day, and the routes would be closed to public motorized use by hunting season throughout the rest of the year. Until the MVUM is published, ATV use on Road 1950 and Road 1954 is prohibited.

The seasonal 1950/1954 ATV route would incur mixed traffic with full-size vehicles during the times that this road would be open for firewood cutting. It would be closed to public motorized access during some phases of the harvest activities.

With the implementation of the Charlie Preston project, illegal public motorized access would be reduced because road closures would be monitored to determine how effective they are at preventing motorized access. If the closure methods do not prevent motorized access, another method would be used to increased effectiveness. For example, a gate may be moved to a better location or a guardrail barrier may be replaced with road recontouring for the first sight-distance. Any user-created routes discovered would be blocked.

Some illegal OHV activity occurred in the past where OHVs traffic got around a gate. This access was stopped by placing upright culverts to block motorized access. Occasionally some motorized vehicles have driven in the few grassy openings along the lower part of Hume Creek Road 1479. As soon as the problem was discovered these areas were blocked to discourage further use, and the use generally did not cause any lasting damage. There are no known user-created trails within the project area.

Illegal motorized use would also be reduced by the implementation of the St. Joe Ranger District Travel Management Plan. The MVUM would only show routes designated for motorized use by vehicle type and season of use. It would be illegal to drive a motorized vehicle on any route not shown on the MVUM. The MVUM would be a legal binding document and would be the primary enforcement tool for vehicle regulations. The MVUM would be free to the public and would also be available on the internet. The map will make it easier for users to know where it is legal to ride and easier to enforce the rules.

Forest Plan and Regulatory Consistency

The action alternatives comply with the management direction for recreation provided in the forest plan and federal regulations and policies concerning the recreation resource. All alternatives provide for a diversity of recreational opportunities and provide opportunities for dispersed recreation in both MA-1 and MA-4. Some motorized access would be restricted to provide needed wildlife security in MA-4. Recreation Opportunity Spectrum classes and areas of Rural, Roaded Natural and Roaded Modified would remain unchanged in both action alternatives. Alternatives would meet the management area direction for both MA-1 and MA-4 to manage dispersed recreation primarily for Roaded Natural and Roaded Modified ROS classes. The Rural ROS class is located on private ground, and the Forest Service has no jurisdiction there.

Soils (see Soils Report)

Alternative A (No Action) Direct and Indirect Effects

No new management-induced detrimental direct and indirect impacts would occur in the Charlie Preston Project Area. There would be no compaction or displacement beyond the currently existing levels. Nutrients would continue to cycle, build up at current rates, and not be subject to removal due to harvest and fuel treatment activities.

Fuel buildup would continue to contribute to the risk of high-intensity wildfires. The introduction of weeds and unwanted flora following a fire could lead to higher competition between less

desirable and native vegetation. Weeds can increase erosion, reduce soil moisture, and deplete nutrient levels (DiTomaso 2000). Because the roots of many noxious weeds are deeper than native grasses, they also contribute less organic matter near the soil surface. Refer to the Charlie Preston Noxious Weeds Report for additional details.

Alternative A (No Action) Cumulative Effects

No cumulative effects to soils would take place as no harvest, and fuel treatments would be added. With no new activities, no new management-induced detrimental cumulative impacts would occur in the Charlie Preston Project Area.

Alternatives B and C Direct and Indirect Effects

The discussion for Alternatives B and C are combined to avoid repetition because effects described for timber harvest, fuel treatments, organic matter, coarse woody debris, nutrients, yarding tops, and soil movement would be the same or less for Alternative C (Table 42).

Detrimental Soil Disturbance

Design features and best management practices to protect soil and site productivity would be implemented as part of the action alternatives (See Design Features beginning on page 26 and Appendix B) to ensure that activities are consistent with Forest and Regional standards in terms of soil compaction, displacement, and nutrient retention. BMP and post-harvest monitoring is conducted annually by the IPNF to validate the implementation and effectiveness of BMPs and design features. Monitoring results show that acceptable productivity potential is maintained.

Table 42 displays the resulting comparison of soil disturbance levels between both alternatives. Alternatives B and C would meet Region 1 soil quality standards and IPNF Forest Plan standards because long-term detrimental disturbance is not expected to exceed 15% and 19% respectively in any proposed activity area (Table 42). Full productivity potential would be maintained on at least 85% under the Regional standards and 81% under the Forest Plan standards in every activity area.

Timber Harvest: Timber harvest activities have the potential to cause detrimental soil disturbance, such as compaction and displacement, and reduced productivity on an estimated 188 acres under the Regional standard and 195 under the Forest Plan standard with Alternative B and on and estimated 105 acres under the Regional standard and 107 acres under the Forest Plan standard in Alternative C. The level of soil disturbance increase depends primarily on the amount or lack of existing skid trails. Activity units that have had little prior disturbance would show a greater incremental increase in potential detrimental disturbance than those units that contain a network of already existing skid trails. Existing skid trails would be used for the proposed harvest (Design Features). Proposed skyline units that were previously yarded with the same logging system have little to no additional impacts because existing corridors are generally reused. The proposed action includes post-harvest monitoring of some units after completion of harvest and fuel treatment activities, especially Unit 136A and those activity areas that are elevated in potential disturbance levels. Proposed activities on units are expected to meet Forest and Regional soil quality standards but monitoring is included to verify expected results.

Table 42 – Summary of Existing Conditions and Potential Impacts of Management Activities under the Action Alternatives

Unit	Activity Area Acres* (Alt C in parenthesis)	Proposed Treatment	Proposed Logging System	Proposed Fuels Treatment	Existing and Potential Disturbance				Standards Regional-First Forest Plan in ()		Standards Regional-First Forest Plan in ()	
									Alternative B		Alternative C	
					Existing % Disturbance	Potential[1] % Disturbance	System[2] Road Acres	Temporary[3] Road Acres	Total Acres[4]	Unit Total[5] %	Total Acres[6]	Unit[7] Total %
1	25 (25)	CT	GB	RTL,S,GP,UB	0	3.25	0	0	3.25	13 (**13**)	3.25	13
2A	15 (15)	CT	GB	RTL,S,GP,UB	0	1.95	0	0	1.95	13 (**13**)	1.95	13
3	11 (0)	SW	S/FB	L,GP,S,BB	0	1.26	0.40	0	1.26 (**1.66**)	12 (**15**)	-	-
4	39 (0)	CT	S/FB	RTL, S, UB	0	3.90	0	0	3.90	10 (**10**)	-	-
5	84 (50)	CT	S/FB	RLT,S,GP,UB	0	9.24 (**5.50**)	0	0 (**.76**)	9.24	11 (**11**)	6.26 (**5.50**)	13 (**11**)
6A	16 (0)	SWF	GB	RLT,S,GP,UB	5	1.28	0	0	2.08	13 (**13**)	-	-
6B	4 (0)	SWF	S/FB	BB,L,S	0	0.40	0	0	0.40	10 (**10**)	-	-
7A	1 (0)	CT	GB	RTL	0	0.13	0	0	0.13	13 (**13**)	-	-
7B	2 (0)	CT	S/FB	RTL	0	0.20	0	0	0.20	10 (**10**)	-	-
8	102 (80)	CT	GB	L,LS,S,GB,UB	3	10.2 (**8**)	2.55 (**0**)	0 (**.76**)	13.26 (**15.81**)	13 (**16**)	11.16 (**10.4**)	14 (**13**)
9	10 (0)	OR	S/FB	RTL	2	1.00	.31	0.28 (**0**)	1.48 (**1.51**)	15 (**15**)	-	-
10	8 (0)	ST	S	L,S,GP,BB	0	.16	0	0.83 (**0**)	.99 (**0.16**)	12 (**2**)	-	-
11A	6 (0)	OR	GB	RTL,GP	2	0.66	0	0	0.78	13 (**13**)	-	-
11B	6 (0)	OR	S/FB	RTL	0	0.60	0	0	0.60	10 (**10**)	-	-
12	19 (0)	CT	S	RLT,S,GP,UB	8	0.46	0	0	1.98	10 (**10**)	-	-
13A	12 (0)	ST	GB	L,S,GP,UB	3	1.20	0.17	0	1.56 (**1.73**)	13 (**14**)	-	-
13B	40 (0)	ST	S/FB	L,S,GP,UB	3	4.32	0.35	0	5.52 (**5.87**)	14 (**15**)	-	-
14A	14 (0)	CC	GB	L,S,GP,UB	7	0.84	0	0	1.82	13 (**13**)	-	-
14B	8 (0)	CC	S	L,S,GP,UB	5	0.20	0	0	0.60	8 (**8**)	-	-
15	15 (0)	CC	GB	L,S,GP,UB	1	1.80	0.91	0	1.95 (**2.86**)	13 (**19**)	-	-
16A	11 (11)	CT	GB	RTL,S,GP,UB	2	0.22	0	0	1.43	13 (**13**)	1.43	13 (**13**)
16B	76 (76)	CT	S/FB	RTL,S,GP,UB	1	8.20	0.51	0	8.96 (**9.47**)	12 (**13**)	8.96 (**9.47**)	12 (**13**)
17	16 (16)	CT	GB	RTL,S,GP,UB	0	2.08	0	0	2.08	13 (**13**)	2.08	13 (**13**)
19	8 (8)	CT	GB	RTL,S,GP,UB	0	1.04	0	0	1.04	13 (**13**)	1.04	13 (**13**)
23A	20 (20)	CT	GB	RTL,S,GP,UB	0	2.60	0	0	2.60	13 (**13**)	2.6	13 (**13**)
23B	104 (104)	CT	S/FB	RTL,S,GP,UB	2	11.04	0	0	13.12	13 (**13**)	13.12	13 (**13**)
25A	21 (0)	CT	GB	RTL,S,GP,UB	0	2.73	0	0	2.73	13 (**13**)	-	-
25B	22 (0)	CT	S	RTL,S,GP,UB	7	0.56	0	0	2.10	10 (**10**)	-	-
26	13 (13)	CT	S/FB	RTL,S,GP,UB	2	1.38	0	0	1.64	13 (**13**)	1.64	13 (**13**)
27A	12 (12)	CT	GB	RTL,S,GP,UB	0	1.56	0	0	1.56	13 (**13**)	1.56	13 (**13**)
27B	62 (62)	CT	S/FB	RTL,S,GP,UB	0	6.56	0	0	6.56	13 (**13**)	6.56	13 (**13**)
28	11 (11)	CT	GB	RTL,S,UB	0	1.43	0.60	0	1.43 (**2.03**)	13 (**18**)	1.43 (**2.03**)	13 (**18**)
29A	10 (0)	CT	GB	RTL,S,GP,UB	0	1.30	0	0	1.30	13 (**13**)	-	-
29B	10 (0)	CT	S/FB	RTL,S,GP,UB	0	1.08	0	0	1.08	11 (**11**)	-	-
30	10 (0)	CT	S/FB	RTL,S,GP,UB	0	1.08	0	0	1.08	11 (**11**)	-	-
31	9 (9)	CT	S/FB	RTL,S,GP,UB	2	1.01	0	0	1.19	13 (**13**)	1.19	13 (**13**)
32	3 (3)	CT	S/FB	RTL,S,UB	0	0.30	0	0	0.30	10 (**10**)	0.3	10 (**10**)
33A	17 (17)	CT	GB	RTL,S,GP,UB	5	1.36	0	0	2.21	13 (**13**)	2.21	13 (**13**)
33B	26 (26)	CT	S	RTL,S,UB	6	0.52	1.20	0	2.08 (**4.00**)	8 (**15**)	2.08 (**4.0**)	8 (**15**)
34	12 (12)	CT	S/FB	RTL,S,GP,UB	0	1.32	0	0	1.32	11 (**11**)	1.32	11 (**11**)
38	16 (16)	CT	S/FB/GB	RTL,S,GP,UB	2	1.75	0	0	2.07	13 (**13**)	2.07	13 (**13**)
68A	2 (0)	CT	GB	RTL,S,GP,UB	12	0.02	0	0	0.26	13 (**13**)	-	-
68B	27 (0)	CT	S	RTL,S,UB	12	0.54	0	0	3.78	14 (**14**)	-	-
71A	14 (0)	CT	GB	L,LS,S,UB	7	0.84	0	0	1.82	13 (**13**)	-	-
71B	19 (0)	CT	S	L,LS,S,UB	6	0.54	0	0	1.68	9 (**9**)	-	-

Unit	Activity Area Acres* (Alt C in parenthesis)	Proposed Treatment	Proposed Logging System	Proposed Fuels Treatment	Existing and Potential Disturbance				Standards Regional-First Forest Plan in ()		Standards Regional-First Forest Plan in ()	
									Alternative B		Alternative C	
					Existing % Disturbance	Potential[1] % Disturbance	System[2] Road Acres	Temporary[3] Road Acres	Total Acres[4]	Unit Total[5] %	Total Acres[6]	Unit[7] Total %
78A	4 (0)	CT	GB	L,S,LS,GP,UB	6	0.28	0	0	0.52	13 (**13**)	-	-
78B	28 (0)	CT	S	L,LS,S,UB	8	0.56	0	0	2.80	10 (**10**)	-	-
83A	2 (2)	CT	GB	L,S,LS,GP,UB	0	0.26	0	0	0.26	13 (**13**)	0.26	13 (**13**)
83B	12 (12)	CT	S/FB	RTL,S,GP,UB	0	1.28	0	0	1.28	11 (**11**)	1.28	11 (**11**)
84	28 (28)	CT	GB	RTL,S,GP,UB	2	3.08	0	0	3.64	13 (**13**)	3.64	13 (**13**)
87A	19 (19)	CT	GB	L,S,LS,GP,UB	0	2.47	0	0	2.47	13 (**13**)	2.47	13 (**13**)
87B	8 (8)	CT	S/FB	L,S,LS,GP,UB	0	0.88	0	0	0.88	11 (**11**)	0.88	11 (**11**)
88	44 (44)	CT	GB	RTL,S,GP,UB	0	5.72	0	0	5.72	13 (**13**)	5.72	13 (**13**)
89	26 (26)	CT	GB	RTL,S,GP,UB	3	2.60	0.66	0	3.38 (**4.04**)	13 (**16**)	3.38 (**4.04**)	13 (**16**)
90A	2 (2)	CT	GB	RTL,S,GP,UB	0	0.26	0	0	0.26	13 (**13**)	0.26	13 (**13**)
90B	29 (29)	CT	S/FB	RTL,S,GP,UB	0	3.14	0	0	3.14	11 (**11**)	3.14	11 (**11**)
96	22 (0)	CC	S/GB	L,S,GP,UB	8	1.10	0	0	2.86	13 (**13**)	-	-
100A	8 (8)	CT	GB	RTL,S,GP,UB	0	1.04	0	0	1.04	13 (**13**)	1.04	13 (**13**)
100B	23 (23)	CT	S/FB	RTL,S,GP,UB	0	2.50	0	0	2.50	11 (**11**)	2.50	11 (**11**)
102A	6 (6)	CT	GB	RTL,S,GP,UB	3	0.60	0	0	0.78	13 (**13**)	0.78	13 (**13**)
102B	48 (48)	CT	S	RTL,S,GP,UB	5	1.36	0	0	3.76	8 (**8**)	3.76	8 (**8**)
105	8 (0)	CC	S	L,S,GP,BB	9	0.16	0	0	0.88	11 (**11**)	-	-
118A	3 (3)	CT	GB	RTL,S,GP,UB	3	0.30	0	0	0.39	13 (**13**)	0.39	13 (**13**)
118B	8 (8)	CT	S	RTL,S,GP,UB	3	0.84	0	0	1.08	14 (**14**)	1.08	14 (**14**)
136	13 (0)	SWF	S/FB	RTL	2	1.30	0	0	1.56	12 (**12**)	-	-
136A	6 (0)	SWF	GB	RTL	19	0	0	0	1.14	19 (**19**)	-	-
136B	23 (0)	CC	S/FB	L,S,BB	2	2.30	0	0	2.76	12 (**12**)	-	-
138	52 (0)	OR	GB	L,LS,GP	4	4.68	0	0	6.76	13 (**13**)	-	-
139	54 (0)	SWF	GB	L,LS,GP	2	5.94	0	1.02 (**0**)	8.04	15 (**15**)	-	-
140	29 (0)	SWF	S/FB/GB	L,LS,GP	3	3.24	0	0	4.11	13 (**13**)	-	-
141	55 (0)	OR	S/FB/GB	L,LS,GP	3	5.66	0	0	7.31	13 (**13**)	-	-
Total acres	1546 (**850**)				**3%**[8]	145.7 (**139.7**)	7.66 (**5.11**)	2.13 (**1.52**)	188 (**195**)	12.2 (**12.6**)	105 (**107**)	12.4 (**12.6**)

Fuels Treatment
UB – Underburn / Jackpot
GP – Grapple Pile
LS – Lop and scatter
RTL –Remove Tops and Limbs.
S-Slash Vegetation
L-Leave Tops
Harvest Treatments
CT – Commercial Thin
ST – Seed Tree
SWF – Shelterwood Final
CC/RES – Clearcut w/ Reserves
OR-Overstory Removal
GB – Ground Based
S-Skyline
FB-Feller Buncher

1 Potential Disturbance*-Acres of disturbance in bold and in parenthesis associated with Alternative C.*
2 System Roads*- Acres of system road disturbance in bold and in parenthesis associated with Alternative C.*
3 Temporary Roads*- Acres of system road disturbance in bold and in parenthesis associated with Alternative C.*
4 Total Acres*-Alternative B acres of disturbance with the Forest Plan in bold and in parenthesis.*
5 Unit Totals*-Percent disturbance for Alternative B with the percent in bold and in parenthesis associated with the Forest Plan.*
6 Total Acres*-Alternative C acres of disturbance with the Forest Plan in bold and in parenthesis.*
7 Unit Totals*-Percent disturbance for Alternative C with the percent in bold and in parenthesis associated with the Forest Plan.*
8 Average *detrimental disturbance over all the units.*

Results include existing conditions. Refer to Table Soil-3 for coefficients used to predict potential detrimental disturbance for proposed logging and slash treatment scenarios including burning and piling. The level of disturbance increase also depends on the amount or lack of existing skid trails. Activity units that have had little prior disturbance will show a greater incremental increase in potential detrimental disturbance than those units that already contain a network of existing skid trails. Little to no increase in disturbance is expected there because equipment would re-use existing skid trails and move on slash mats whenever possible.
*differences in acres due to rounding

Analysis followed the R1 and Forest Plan Soil Quality Standards. Total acres include existing conditions and disturbance from existing and proposed roads and units. Refer to Table Soil-3 for coefficients used to predict potential detrimental disturbance for proposed logging and slash treatment scenarios including burning and piling.

Mitigation Measures: Unit 136A in Alternative B is currently over the Regional Soil Quality Standards at 19%. Post harvest treatments for this unit include decompaction of skid trails to reduce the existing compaction levels, aid in recovery, and provide for net improvement. Monitoring data of decommissioning of roads and restoration of meadows and skid trail has found a reduction in detrimental disturbance from compaction of 30 to 60% (USDA FS, 2005-2009). This reduction in compaction should provide adequate protection from erosion and speed recovery of soils in this unit.

Road Decommissioning: Under both alternatives 0.6 miles of system road would be decommissioned (Road Management Rx D). This would include decompaction and some recontouring with the goal of restoring site productivity. Assuming 4.2 acres per mile of road, approximately 2.5 acres of National Forest System land would be on the path to recovery towards a productive land base.

Road Construction: Alternative B proposes approximately 4.5 miles of new system road and 0.6 miles of temporary road. Alternative C proposes 1.6 miles of new system road and 0.4 miles of temporary road. These activities would cause soil compaction, displacement, and effects to site productivity on approximately 21.4 acres under Alternative B and 8.4 acres under Alternative C. New system road construction is factored into effects for determining compliance with IPNF Forest Plan standards, but system roads are not incorporated to determine compliance with Regional soils quality standards. Temporary roads are considered for both Forest and Regional standards. After all sale activities have ended, the temporary roads would be recontoured, seeded with native grasses, and organic material would be redistributed over the surface. Road decommissioning and soil restoration would contribute to a reduction in compaction, thus improving infiltration and reducing surface runoff (Switalski and others 2004).

Road Maintenance: No additional soil impacts would occur from proposed road maintenance activities such as blading, drainage improvements, and surfacing on existing dedicated roads.

Fuel Treatments: Activity-fuel treatments that may affect soils under both alternatives include removal of tops and limbs, broadcast burning, underburning, and grapple piling followed by pile burning. Other fuel activities that may affect soils that are not associated with timber harvest include road side fuel treatment along 7.5 miles of road and prescribed burning on 82 acres of off-site ponderosa pine. Design features require piling machinery to utilize existing trails and stay on slopes less than 35 percent to prevent soil disturbance in excess of guidelines. Design features for grapple piling require operation of equipment over slash mats whenever enough material is available, preferentially re-using existing skid trails if present. Forest Plan monitoring and research (Eliasson and Wästerlund 2007; Han 2006; Niehoff 2002; USDA Forest Service 2001b, 2002-2004) indicates reduced soil disturbance if equipment is operated on a slash mat. Only areas that could be reasonably accessed would be treated and none of the trails would be excavated to facilitate access. Severe burning and ground disturbance could create bare soils and encourage noxious weed infestation. Design features to limit impacts from prescribed burning are included as part of both action alternatives.

Gopher Baiting: No detrimental impacts to the soil resource are expected from gopher baiting. A reduction in gopher activity would actually reduce the mixing and displacement of soils in localized areas. Gopher baiting is not discussed further in terms of soils.

<u>Organic Matter, Coarse Woody Debris, and Nutrient Levels</u>

Coarse woody debris would be maintained at recommended levels in all units so that preservation of ecological function is expected. Using Regional guidance for coarse woody debris retention would also comply with the Forest Plan Standard to maintain sufficient microorganism populations for site productivity. Where yarding of tops is proposed, design features, including

nutrient management recommendations, would ensure compliance with the standards to maintain sufficient nutrient capital.

Timber Harvest: Harvesting the tree bole (and bark) would remove about approximately 43 percent of the tree's potassium (Garrison-Johnston and others 2004) which may cause indirect effects to vegetation as nutrient sources are removed from site. In the majority of the units in both alternatives, tops and limbs would be removed to the landings as part of the fuel mitigation work. However, some of the logging slash from breakage, which includes tree limbs, tops, and un-merchantable pieces, would remain within all harvest units to maintain CWD levels. Current levels of CWD allows for some removal while still meeting the design features and recommended CWD levels based on Graham and others (1994) and would provide protection against soil erosion as well as a long-term source of nutrients and organic matter (Brown and others 2003). See Design Features on page 28 for coarse woody debris recommendations.

In units on poor parent geology (1, 8, 12, 13a, 13b, 14a, 14b, 25b, 27a, 26, 28, and 29a) slash would be left for longer periods of overwintering depending on the time of the season in which the harvest occurs. This would allow for a more complete leaching of primarily potassium back into the soils in order to compensate for the poor nutrient availability from the underlying parent geology.

Harvest activities are not expected to reduce soil organic matter within the proposed units because existing material would be not be removed from the forest floor. Harvest activities may actually increase organics that would contribute to the surface layer through limbs and tops left on-site. Existing organic matter would not be diminished by harvest activities, but organic matter recruitment would likely be less in those units identified for yarding tops. Commercial thinning units would leave an average residual stand of approximately 60 trees per acre and still benefit from the leave trees as some die and fall the ground, though the process would be slower.

Fuel Treatment: There could be a reduction in the current existing CWD levels in some areas as a result of fuel reducing activities. The amount of CWD would likely be kept at the lower end of the recommendations in several locations near main roads in order to meet fuels reduction requirements and objectives. The majority of harvest units currently display a mix of satisfactory coarse woody debris levels though presently some units are on the lower end of the recommendations.

No long-term measurable negative effects on organic matter and coarse woody debris are anticipated from post-harvest prescribed fire when soil moisture in the upper surface inch of mineral soil has a moisture content of 25% or more by weight or 60 to 100 percent duff moisture (Niehoff 1985 and 2002). When soils have adequate moisture conditions to retain their biological, chemical, and physical integrity, effects from the loss of forest floor can be minimized (Barnett 1989; Erickson and White 2008; Frandsen and Ryan 1985; Hungerford and others 1991; McNabb and Cromack 1990).

Burning small slash piles would have limited detrimental effects when executed in the late fall/winter or early spring. However, when burn piles are large, nutrient losses from heat and volatilization could be considerable. In some cases, burning of the slash piles may create localized patches of hydrophobic soils for a short period (as much as one to two years) but the areas are generally not large or extensive enough to alter slope hydrologic responses or long-term soil productivity (de Dios Benavides-Soloria and McDonald 2005; Ice 2003; Robichaud 2000; Swanson 1981).

On an unpredictable site-specific basis, some drier sites may burn at a severity level that removes all of the protective duff and litter layers, even under managed fire conditions. The duff and litter layer is important in protecting the soil horizons, both as reducing erosion potential and in

maintaining soil moisture. Direct effects of prescribed burning could potentially remove woody debris that would otherwise provide long-term nutrients to the soil as the decay process occurs (Page-Dumroese and others 2006a). In south- and southwest facing units, the prescribed burns would have limited detrimental effects when executed in the spring.

The fuel treatments along 7.5 miles of roads (377, 1479, 1947, and 1954) include removing smaller trees, slashing brush, pruning low branches, mulching, chipping, masticating, or piling and burning which could have short term effects on nutrient levels from the reduction of CWD and finer organic matter; however, no long-term measurable effects are anticipated. The residual trees left on-site would lose branches and fall to the forest floor to contribute material. Brush removed during fuel treatments would gradually return, adding organic matter as they cycle through the seasons.

Nutrient levels are not expected to decline sufficiently to irreversibly impair soil productivity because slash would be left over-winter (except where tops and limbs would be yarded) or left on site where fuels would be lopped and scattered in 27 of the 72 units in Alternative B and 4 of the 35 units in Alternative C. This would allow for leaching of nutrients from slash into the soil (Garrison and Moore 1998). In those units in which tops would be left other fuel treatments, such as lopping and scattering, jackpot burning, or grappled piling and burning would occur after over-wintering.

Yarding tops and limbs would take place in 45 of the 72 units under Alternative B, with 41 of those units proposed for commercial thinning. Alternative C would have tops and limbs yarded in 31 out of 35 commercially thinned units as part of the fuel treatments. This would remove nutrients, but residual timber in the commercially thinned units would remain onsite providing needle shed. Breakage of tops, limbs, and branches is expected and would remain in the unit then be overwintered to provide leaching of nutrients before any other fuel treatment would occur.

Soil Movement (Erosion and Mass Failure)

Timber Harvest: Harvest activities are proposed in landtypes rated with low surface erosion potential (97% of unit areas) and moderate potential (3% of unit areas). Soil erosion is not expected because of residual canopy and ground cover, operation of mechanical equipment on a slash mat when available combined with other BMPs, and the overall low risk of surface erosion. No harvest activities are proposed on landtypes rated with high mass failure potential. Proposed units are outside stream buffers or away from any streams with surface flow. No change in mass failure potential is expected from the proposed harvest activities (Megahan and King 2004 p. 207) because of low and moderate mass failure potential ratings in the activity areas (Table 43) and residual stocking. No harvest activities are proposed on landtypes rated with high sediment delivery potential. As part of project planning, all drainage courses and riparian zones would also have riparian habitat conservation area buffers that would have no harvest activities. With established buffer zones, the potential of sediment increases from fuel or timber management work is minimal.

Road Construction: None of the newly proposed road segments are located on landtypes with high hazard ratings (S-10). Megahan and King (2004 p. 209) attribute roads as having the greatest effect on mass failure of all practices associated with forest management.

Fuel Treatments: All acres associated with fuel treatments are on landtypes that are rated low to moderate for mass failure. With fuel treatments operating either on slash or from existing skid trails the risk of mass failure associated with the burning activities is low.

Alternatives B and C Cumulative Effects

Few cumulative effects are anticipated in the proposed activity areas because the majority of units have had little to no past disturbance or the disturbance has recovered to below detrimental conditions. Only one activity area (136A) in Alternative B currently exceeds the Regional Soil Standards with 19% detrimental disturbance. Here the reuse of existing skid trails and proposed post harvest decompaction work would reduce those compaction levels and initiate and speed soil recovery within this unit.

Combining the existing and predicted detrimental impacts of activities, long-term cumulative soil impacts would affect no more than 15% of the activity areas in Alternative B and 14% in Alternative C therefore meeting Region 1 Soil Quality Standards. When existing system roads are incorporated, cumulative soil impacts would affect no more than 19% (the majority less) of the activity areas, therefore meeting Forest Plan Soil Quality Standards in both alternatives. There are no current or reasonably foreseeable future activities beyond what is proposed with this project that would affect soils in the proposed treatment units.

Table 43 – Landtype Characteristics Associated with Activity Areas for Alternatives B and C

		Mass Failure Potential			Subsurface Erosion Potential			Surface Erosion Potential		
		Low	Mod	High	Low	Mod	High	Low	Mod	High
Alt B	Acres[1]	1320	213	0	1129	300	104	1451	82	0
	% of Area	86	14	0	73	20	7	94	6	0
Alt C	Acres[1]	722	123	0	744	82	19	826	19	0
	% of Area	85	15	0	88	10	2	97	3	0

		Sediment Delivery Potential			Productivity Potential				Landtype Sensitivity		
		Low	Mod	High	Low - Mod	Mod	Mod-High	High	Low	Mod	High
Alt B	Acres[1]	1221	312	0	90	535	881	27	1216	317	0
	%of Area	80	20	0	6	35	57	2	79	21	0
Alt C	Acres[1]	703	142	0	79	340	426	0	703	142	0
	%of Area	83	17	0	10	40	50	0	83	17	0

Forest Plan and Regulatory Consistency

Forest Plan

The proposed activities in both action alternatives would comply with Forest Plan Standards for maintaining soil productivity.

Forest Plan Soil Standard #1: Soil disturbing management practices will strive to maintain at least 80 percent of the activity area in a condition of acceptable productivity potential for trees and other managed vegetation. Unacceptable productivity potential exists when soil has been detrimentally compacted, displaced, puddled, or severely burned as determined in the project analysis.

> Alternatives B & C would comply with this standard because all proposed activity areas would be at or below soil quality limits for disturbance and would maintain the acceptable productivity potential for managed vegetation (see Table 42).

Forest Plan Soil Standard #2: Projects should strive to maintain sufficient large woody debris to maintain site productivity. Large woody debris is essential for maintenance of sufficient micro-organism populations.

Alternatives B and C would comply with this standard because logging slash from broken tree limbs and un-merchantable pieces would remain within all harvest units that already contain satisfactory coarse woody debris (CWD) levels. CWD retention would follow the research guidelines of Graham and others (1994) to ensure the maintenance of site productivity. CWD in units that currently have reduced amounts of CWD would be increased by several methods depending on how deficient the levels are. Methods would include: leaving tops and branches, no grapple piling, leaving logging residue of breakage and limbs, and slashing unmerchanable vegetation that range from 3 to 6 inches.

Forest Plan Soil Standard #3: In the event of whole tree logging, provision for maintenance of sufficient nutrient capital should be made in the project analysis.

Alternatives B & C would comply with this standard because provisions to maintain sufficient nutrient capital would be accomplished by various methods depending on harvest prescription. In non commercial thin harvest units associated with Alternative B (Units 9, 11a, 11b, 136,136a) breakage from felling and yarding along with existing levels of coarse woody debris would maintain sufficient nutrient capital within these units. In commercial thinning units, where tops and limbs would be removed, breakage along with the residual overstory that would remain (an average of approximately 60 trees per acre) would add to the nutrient capital through needle shed and the natural thinning of the remaining overstory.

Region 1 Soil Quality Standards

All alternatives would comply with Region 1 soil quality standards.

Design new activities that do not create detrimental soil conditions on more than 15 percent of an activity area. In areas where less than 15 percent detrimental soil conditions exist from prior activities, the cumulative detrimental effect of the current activity following project implementation and restoration must not exceed 15 percent. In areas where more than 15 percent detrimental soil conditions exist from prior activities, the cumulative detrimental effects from project implementation and restoration should not exceed the conditions prior to the planned activity and should move toward a net improvement in soil quality.

The proposed activities would comply with Regional Soil Quality Standards (USDA 1999) related to detrimentally disturbed soils (Table 42). All alternatives would comply with this standard because none of the proposed units are expected to surpass disturbance limits of 15%.

Unit 136A is currently over the Regional Soil Quality Standards at 19%, so proposed decompaction of all activity skid trails is part of the post harvest activities and would reduce compaction levels as well as provide for net improvement in Unit 136A. Monitoring data of decommissioning of roads and restoration of meadows and skid trail has found a reduction in detrimental disturbance from compaction of 30 to 60%. This reduction in compaction should provide adequate protection from erosion and speed recovery of soils in this unit (Soils Report p. 19).

The proposed activities have the potential to disturb a total of 188 acres with Alternative B and 105 acres with Alternative C. The greatest impacts are expected to be ~15% in Units 9 and 139 which means that at least 85% of the activity areas would retain their full productivity potential. The remaining units would maintain more area in conditions with full productivity potential due to fewer impacts from logging.

Organic matter layer thickness would be retained as appropriate for local conditions.

All alternatives would comply with this standard because the currently satisfactory levels of local organic matter would be maintained. Harvest activities may actually increase material that would contribute to the organic surface layer through limbs and tops left on-site. Existing organic matter would not be diminished by harvest activities, but organic matter recruitment would likely be less in those portions of units where tops and limbs would be removed.

Design features for prescribed burning would ensure organic matter layer thickness would be retained as appropriate.

Large woody debris would be maintained at recommended volumes (Graham and others 1994) in each proposed activity area.

All alternatives would comply with this standard because the coarse woody debris in units with satisfactory levels would be maintained. Coarse woody debris levels in those units (S-9) that currently contain reduced amounts would be increased by retaining logging residue to meet appropriate levels after harvest activities are completed.

Unique Characteristics of the Geographic Area

Cultural resources would not be affected by the alternatives (see Cultural Resources Report). The project area does not contain any parklands, prime farmlands, wild and scenic rivers, or ecologically critical areas.

Visual Quality (see Visual Quality Report)

Alternative A (No Action) Direct, Indirect, and Cumulative Effects

There would be no direct, indirect, or cumulative effects to visual quality. The visual characteristics of the area would constantly change as the natural vegetation proceeds through normal life cycles. The areas that have been previously harvested would continue to appear more natural as the trees and other vegetation develop.

Alternatives B and C Direct, Indirect, and Cumulative Effects

All proposed activities would meet Forest Plan visual quality objectives (VQOs) with the silvicultural prescription, with design features, or they would have no effect on visual quality and would therefore meet VQOs. The visual characteristics of the area would constantly change as the natural vegetation proceeds through normal life cycles. The areas that have been previously harvested would continue to appear more natural as the trees and other vegetation develop.

Wildlife (see Updated Wildlife Report)

Species for consideration in this analysis were identified from the U.S. Fish and Wildlife Service Species List provided to the Forest (USDI Fish and Wildlife Service 2009), the Regional Forester's Sensitive Species List (USDA 2011), and Management Indicator Species (MIS) from the Forest Plan applicable to the District (USDA 1987). Some species or elements of wildlife habitat require a detailed analysis and discussion to determine potential effects. Some wildlife habitat or species identified in lists at a Forest-wide scale (T&E, Sensitive, and MIS) may not occur in the analysis area; may not be affected; may be affected to a degree that does not change the level of use or occurrence; or potential effects can be adequately addressed through design of

the project. These species or habitats then do not necessarily require detailed analysis to determine potential effects. Wildlife species were reviewed for their relevancy to the proposed activities and the wildlife analysis areas. The following species were not analyzed further and the rational for this is given in the Updated Wildlife Report (pp. 7-19):

Woodland Caribou: The recovery area for the population is in the Selkirk Mountains of northern Idaho, northeastern Washington and southern British Columbia, Canada (USDI Fish and Wildlife Service 1994). This project is not within the Southern Selkirk Mountains Caribou Recovery Area, and there has been no caribou occupation of the St. Joe District for well over 100 years (Evans 1960). Consequently, this project would have no effect on woodland caribou.

Grizzly Bear: The U. S. Fish and Wildlife Service has surveyed in the North Fork of the Clearwater drainage and the upper St. Joe drainage to assess if there are any grizzly bears in the area. Although based on current knowledge the potential for grizzly bear occurrence on the St. Joe Ranger District and in the project area cannot be totally dismissed, there is nothing to suggest any occurrence other than the possibility of transient individuals; with even the potential for that considered to be unlikely. No grizzlies were detected via DNA or by cameras at 91 sites in the Bitterroots during the surveys in 2008-09 (Servheen and Shoemaker 2010). There is no known grizzly bear population occupying the St. Joe Ranger District; and the U.S. Fish and Wildlife Service has determined that a resident population of grizzly bears does not exist in the Bitterroot Ecosystem at this time (USDI Fish and Wildlife Service 2000). There is no evidence or reason to suspect that grizzly bears are present in the Charlie Preston project area or the St. Joe Ranger District. The land management objectives for the area, including timber production and motorized road/trail access and the resulting conditions (e.g. low amounts of secure habitat, higher road densities) mean the area is unlikely to be used by grizzly bears. The project area is not within any Bear Management Unit (BMU), linkage zone, or area of known grizzly bear use. Based on the above reasons, this project will have no effect on the grizzly bear.

Canada Lynx: Habitat analysis for lynx is based on the Northern Rockies Lynx Management Direction (NRLMD) (USDA 2007). Objectives, standards and guidelines for the maintenance of lynx habitat and populations apply only to lynx habitat on federal lands within Lynx Analysis Units (LAUs). The Charlie Preston project area is not within an LAU due to the low amounts of suitable habitat on the western half of the St. Joe Ranger District. The nearest LAU is about 30 miles away from the project area (WL28). The species is not known or suspected in the project area. Based on the lack of suitable habitat and occurrence there would be no effect on habitat or the species.

Bald Eagle: There are no large bodies of water in the project area and no bald eagle nesting habitat. Bald eagles are unlikely to make more than incidental use of any creeks in the project area. Based on the lack of potential habitat (i.e. lakes and rivers), and the design features of the proposed action and alternatives (e.g. Riparian Habitat Conservation Areas buffers), the potential for effects on bald eagle habitat in areas adjacent to water is negligible. Project activity would have no impact on the bald eagle or potential habitat under any alternative.

Black Swift: There are no waterfalls in the project area that may serve as suitable habitat. The species is not known or suspected in the project area. Therefore project activities would have no impact on black swifts or potential nesting habitat under any alternative.

Black-Backed Woodpecker: The Charlie Preston project area has not had any large fires in the past six years, or any recent extensive insect outbreaks. As there would be no treatment to post-fire or bark-beetle outbreak areas, the project would have little to no effect on BBWP; therefore a habitat assessment and detailed analysis is not needed (Bonn and others 2007). There is enough large timber in the project area to supply habitat that provides the tree mortality needed to sustain BBWP at low, endemic population levels (See Table WL1). With this level of habitat present the

proposed action or alternatives are unlikely to have an adverse effect on BBWP use of the project area. While there would be a loss of some dead and dying trees through the proposed logging, this should be partially offset by the expected and incidental tree mortality caused through the off-site pine burning and logging units slash reduction that is planned for fuels treatment. The retention of snags to meet the snag guidelines, and the protection of existing snags within the uncut Riparian Habitat Conservation Areas (RHCAs) also will reduce the impact of the project on potential BBWP habitat. The addition of snags through the snag creation project, as well as the expected continual low level of root rot and beetle kill in the project area will also help retain habitat features for BBWP over time. For the above reasons this project may impact individuals or habitat, but will not likely contribute to a trend towards Federal listing or cause a loss of viability to the population or species.

Coeur d'Alene Salamander: This project does not have any activity that would directly or indirectly affect Coeur d'Alene salamander habitat. There would be no change to conditions for Coeur d'Alene salamanders with any alternative. Based on the above reasons as well as the lack of suitable habitat and occurrence, the alternatives would have no impact on Coeur d'Alene salamanders, and no further analysis or discussion is warranted. Roadside noxious weed spraying is an activity with the potential to affect Coeur d'Alene salamanders, as they breathe through their skin and would be susceptible to impacts from contact with herbicides. Restrictions listed in the St. Joe Noxious Weed EIS on spraying in wet areas would protect their habitat due to the nature of the wet, rocky seeps where Coeur d'Alene salamanders have been located. The requirement for riparian habitat conservation area (RHCA) buffer zones means that any potentially suitable habitat associated with stream edges and waterfall spray zones would not be affected by timber harvest in any alternative. These riparian buffers would also protect any potential fractured rock seep habitat along the lengths of roads adjacent to the creeks.

Common Loon: There are no lakes in the wildlife analysis area or the St. Joe Ranger District that may serve as potential habitat. The species is not known or suspected in the project area. Based on the lack of suitable habitat and occurrence there would be no impact on habitat or the species.

Flammulated Owl: Potentially suitable habitat for flammulated owls was reviewed in the project area. Only 186 acres of marginally suitable habitat exist (WL6). There are no mature ponderosa pine stands in the project area. Given the low amount of suitable habitat present in the project area, only 2% of NFS lands, it is unlikely that flammulated owls are present here. The scarcity of the drier habitat types (110 ac., 1.7% of NFS lands) is the major factor in explaining the absence of flammulated owls (and other dry forest associated species) in the project area. The species is not known or suspected in the project area. Based on existing habitat capability and suitability, and lack of species occurrence there would be no impact on habitat or the species.

Fringed Myotis: The fringed myotis is not known or suspected to occur in the project area (Romin and Bosworth 2010). There are only four stands totaling 110 acres with habitat types capable of supporting the dry, mature Ponderosa pine or Douglas fir habitat these bats prefer. There is no mature Ponderosa pine in the project area, and only one of these four stands is in sawtimber size dry Douglas fir cover type (WL2a). At 13 acres this is 0.2% of the project area, and at this low level is unlikely to be able to support fringed myotis. There is no treatment proposed for this stand. There are also no known mines in the project area that may serve as potential habitat. The species is not known or suspected to occur in the area. Existing habitat capability and suitability, and the lack of species occurrence preclude the potential for effects on habitat or the species. This project will have no impact on this species.

Harlequin Duck: There are no streams in the project area listed in the Harlequin Duck Conservation Assessment and Strategy (Cassirer and others 1996) as having the potential to support harlequin ducks. None of the streams in the project area have the characteristics to serve

as suitable harlequin duck habitat. The species is not known or suspected in the project area. Based on the lack of suitable habitat and occurrence there would be no impact on habitat or the species.

Northern Bog Lemming: The northern bog lemming has a widespread distribution extending from Alaska to Labrador and south to portions of the northern U.S. This species reaches the southern extension of its range in northern Washington and Idaho, and are apparently relatively uncommon in this portion of their range. On the IPNF, they are only known to occur in the far northern ("Kaniksu" Zone) districts. Therefore, this project would have no impact on the northern bog lemming.

Peregrine Falcon: There are no known historic eyries in the project area or the St. Joe Ranger District. There is no cliff or cliff-like habitat present in the project area. The species is not known or suspected to occur in the area. Existing habitat capability and suitability, and the nature and scope of the project preclude the potential for effects on habitat or the species. This project will have no impact on this species.

Pygmy Nuthatch: There are no suitable mature, well-canopied ponderosa pine forest cover stands in the Charlie Preston project area. The species is not known or suspected to occur in the area. There are no Natural Heritage records from Benewah County where the project area is located (NatureServe 2011). Existing habitat capability and suitability preclude potential effects on habitat or the species. This project would have no impact on this species.

Townsend's Big-Eared Bat: Townsend's big-eared bats are only known to occur on the Kaniksu portion of the IPNF. Surveys on the St. Joe Ranger District have not caught or detected big-eared bats (Landreth 2002, Derusseau 2003, and Sherwin 2003). There are no known mines or caves in the project area that may serve as potential habitat. The species is not known or suspected in the project area. Based on the lack of species occurrence, and of any suitable habitat (i.e. adits, mineshafts, or caves), there would be no impact on habitat or the species.

Wolverine: Potential wolverine habitat was modeled based on persistent spring snow cover for the IPNF. A map with this coverage for the St. Joe Ranger district was reviewed for this project (WL7). There is no preferred wolverine denning habitat (at least 4 years persistent spring snow cover) in the Charlie Preston project area. Areas exterior to Copeland's (2010) area of spring snow do not contain reproductive populations (Schwartz and others 2009). Based on the lack of suitable habitat and occurrence there would be no impact on habitat or the species.

Moose: Moose are known to occur and are considered common in the project area (WL3). The population trend for moose is increasing in the state of Idaho (IDFG 2008c). The parameters used to evaluate effects on elk (e.g. road density, security) and mature and old growth associated species, are applicable and sufficient for addressing potential effects on moose. Riparian areas important for moose would be protected from treatment by the implementation of no-entry RHCA buffers.

This analysis is organized by habitat and/or species. The main sections are:

- Sensitive Wildlife Species
- Management Indicator Species – Indicator Species
- Management Indicator Species – Species Commonly Hunted, Fished or Trapped
- Other Wildlife Species

Sensitive Species

The determinations of effects on sensitive species from the proposed alternatives are summarized in Table 44 below.

Table 44 – Sensitive Species Biological Evaluation Summary Of Conclusion Of Effects**

Species	Alternative A	Alternative B	Alternative C
Bald eagle	NI	NI	NI
Black-backed Woodpecker	NI	MIIH	MIIH
Black Swift	NI	NI	NI
Coeur d'Alene Salamander	NI	NI	NI
Common Loon	NI	NI	NI
Fisher	MIIH	MIIH	MIIH
Flammulated Owl	NI	NI	NI
Fringed Myotis	NI	NI	NI
Gray Wolf	MIIH	MIIH	MIIH
Harlequin Duck	NI	NI	NI
Northern Bog Lemming	NI	NI	NI
Peregrine Falcon	NI	NI	NI
Pygmy Nuthatch	NI	NI	NI
Townsend's Big-Eared Bat	NI	NI	NI
Western Toad	MIIH	MIIH	MIIH
Wolverine	NI	NI	NI

NI = No Impact
MIIH = May Impact Individuals Or Habitat, But Will Not Likely Contribute To A Trend Towards Federal Listing Or Loss Of Viability To The Population Or Species
WIFV* = Will Impact Individuals Or Habitat With A Consequence That The Action May Contribute To A Trend Towards Federal Listing Or Cause A Loss Of Viability To The Population Or Species
BI = Beneficial Impact
Conditions: Include any actions or activities that are necessary to maintain the determination of effects.
Recommendations: Include any activities or opportunities that are optional.
Conditions: None.
Recommendations: The district biologist should be notified if any sensitive species are observed during project activity. Post project monitoring should be done to determine effects on habitat and wildlife use.
* Considered a trigger for a significant action in NEPA
** Note: The rationale for the conclusion of effects is contained in the Updated Wildlife Report.

Fisher (Updated Wildlife Report p. 22-31)

Methodology

To conduct the analysis, assess potential effects and compare alternatives, the analysis uses management guidelines from *Fisher Biology and Management in the Western United States* (Heinemeyer and Jones 1994) and *Habitat Conservation Assessments and Strategies for Forest Carnivores in Idaho (Draft)*, (IDFG 1995), to help determine habitat quality in an analysis area. This report also uses the latest science direction for the Northern Region found in *Habitat Estimates for Maintaining Viable Populations of the Northern Goshawk, Black-backed Woodpecker, Flammulated Owl, Pileated Woodpecker, American Marten, and Fisher* (Samson 2006b). The percent of the area by suitable forest structure (e.g. sawtimber, pole, etc.) habitat is displayed for each alternative and compared to the guidelines. Size class delineations and descriptions from the IPNF FSVEG Database are used in this analysis. These existing conditions are a result of past activities and natural conditions. Changes from the existing condition are displayed and discussed relative to guidelines for suitable forest structure habitat within an analysis area.

The goal at the scale of this analysis (i.e. the Charlie Preston project area) is to maintain functional home ranges (Heinemeyer and Jones 1994) and contribute to a spatial distribution of multiple home ranges that maintain population viability (IDFG 1995). The use of a cumulative effects area at this scale facilitates analysis and determination of effects, and allows the methodology recommended in the above scientific literature to be applied. The cumulative effects area used is based on a potential fisher home range. The size used in this project falls within the range of the home range sizes (9.8 km^2 – 82.6 km^2) from Samson, (2006b). Habitat estimates and potential effects are limited to NFS lands, as both timber industry and other private lands have been logged, roaded, and developed, or are expected to be in the future. These lands cannot be relied upon to provide habitat in the future, are not under FS jurisdiction, and so are not used in calculations. For this project the entire Charlie Preston project area totaling 6,534 (26.4 km^2) NFS acres is the cumulative effects area. Although fishers may use the adjoining private lands, for the purposes of this analysis they are not considered necessary to meet fisher suitable habitat requirements. There are enough NFS acres present to constitute a home range, without including adjacent private lands.

Current literature (including existing draft assessments and strategies) can be used to establish existing conditions, identify opportunities and direction for management, direct the analysis of potential effects, discuss tentative objectives for the wildlife analysis area, and establish some sideboards for management objectives.

Trapping is an activity with the potential to affect local populations of forest carnivores, but the Forest Service has no jurisdiction concerning trapping; and it is beyond the scope of this project analysis. However, open road densities affect vulnerability to local trapping and are addressed.

Vegetation/Habitat

Late successional habitat is an essential component of forest carnivore habitat. The physical structure of the forest appears to be more important for fisher than the species composition. Habitat management considerations for fisher emphasize maintaining late successional forest habitat. Mature riparian forest is especially important for denning sites and travel ways for fisher. Based on habitat requirements, the quality, amount and distribution of suitable late successional forest habitat within the drainage is considered the most important factor for fisher. Stand structure >14” d.b.h. (diameter at breast height) is considered to be late successional in this analysis. Guidelines for the composition of suitable forest structure within an analysis area are displayed in table 32a below. Analysis area quality is determined mainly by the percentage of capable habitat that has a large forest (for this analysis >14”d.b.h.) structure. For this analysis the terms large, mature, and late successional are considered equivalent; and refer to forest structure composed of the 14-20” d.b.h. Sawtimber size class and the >20’ d.b.h. Large Sawtimber size class. (A stand’s size class is determined by whichever size class has the majority of basal area present). Capable habitat is habitat that has the physical characteristics (e.g. habitat type) that would allow it to provide the timber cover and structure needed for suitable habitat. For fisher, this analysis uses the Northern Region habitat relationship model, which defines suitable habitat as large/mature size timber stands (≥14” d.b.h.) with 40% or greater canopy cover on mesic habitat types. Lodgepole pine dominated stands in the small sawtimber size class (majority of trees are 9-14” d.b.h.) with 40% or greater canopy cover are considered suitable summer habitat for fishers (Samson 2006b). (See Project file documents WL13, WL40 for details of suitable fisher habitat.) The amount of suitable habitat within a potential home range is also used to indicate habitat quality. While there is no specific guideline for the amount of suitable habitat required, changes in suitable habitat amounts and distribution are used to help display project effects. The U.S. Fish and Wildlife Service “expect that fishers’ use of lands managed for timber production or multiple uses will occur under conditions fostered by the continuance of current

management" (USDI 2011a). Therefore, direction for this project area would maintain or improve the existing home range habitat quality in order to provide sufficient habitat to support fishers. The retention of: 30-40%; >40%; and 65-75% suitable large forest habitat in a home range are guidelines for maintaining low; moderate; and high quality fisher habitat, respectively (IDFG 1995).

Access/Vulnerability Risk

Trapping-vulnerability risk has been cited as one of the factors affecting forest carnivores in Idaho (IDFG 1995). There is no legal season for trapping fisher in Idaho. Marten may be legally trapped between Nov. 1 and Jan. 31 statewide, and in the project area (IDFG 2010). Two fishers have been accidentally trapped on the St. Joe District during the winters of 2003 and 2004 (WL37). Roads are correlated with trapping vulnerability and human disturbance. For areas with fisher or marten trapping seasons, areas with greater than or equal to 1mi/mi^2 open road densities have a high risk to trapping-vulnerability for fisher and marten. Areas with 0.25 - 1mi/mi^2 open road densities have a moderate risk, and areas with $\leq$ 0.25mi/mi^2 open road densities have a low risk (Heinemeyer and Jones 1994). As the effects from roads are associated with access, roads that effectively (either physically or legally) restrict motorized use are not included in the road density. The open road density used for analysis includes all roads and trails open to all motorized vehicles (i.e. motorcycles, ATV's, automobiles, snowmobiles); during any time of year.

Affected Environment

The U.S. Fish and Wildlife Service recently concluded that fisher in the Northern Rocky Mountains are not likely to become endangered within the foreseeable future throughout all or a significant portion of its range USDI 2011a). The Coeur d'Alene Tribe (CDAT) and Forest Service (FS) have conducted hair snare surveys for fisher from 2006 – 2008 (Albrecht and Heusser 2009) and 2007 – 2010 respectively (WL36). Although no fisher have been detected in the Charlie Preston project area, widespread numerous detections (47 from CDAT and 8 from FS surveys) indicate there is a fisher population on the St. Joe Ranger District.

Guidelines for forest structure and the existing condition of capable forested habitat on NFS lands in the Charlie Preston project area are displayed in the following tables.

Table 45 – Analysis Area Guidelines for Forest Structure for Fisher

Forest Structure	High Quality	Moderate Quality	Low Quality
Large/mature forest**	65-75%	$\geq$40%	30-40%
Young forest***	10-25%	10-25%	10-25%
Pole/sapling	10-25%	10-25%	10-25%

* % of NFS capable habitat in the wildlife analysis area

** Large/mature forest equates to database size classes sawtimber (14-20" d.b.h.) & large sawtimber (>20" d.b.h.)

*** Young forest equates to database size class small sawtimber (10-14" d.b.h.)

Table 46 – Existing Forest Structure by Fisher/ Analysis Area

Forest Structure	6,424 acres of Capable Habitat	
	Acres	%*
Large/mature forest**	2857	44.5%
Young forest***	1595	24.8%
Pole/sapling	1339	20.8%

* % of NFS capable habitat in the wildlife analysis area
** Large/mature forest equates to database size classes sawtimber (14-20" d.b.h.) & large sawtimber (>20" d.b.h.)
*** Young forest equates to database size class small sawtimber (10-14" d.b.h.)

Based on the amount of large/mature forest structure regardless of canopy cover or forest type, the Charlie Preston project area has the potential to be at best moderate quality fisher habitat. The goal for this project area would be to maintain the existing moderate quality habitat condition for fisher.

Summary of Direct Effects

Table 47 shows the change in large forest structure by alternative. The amount of suitable large forest structure present is the overriding factor in determining analysis area habitat quality. 30% - 40% suitable large forest habitat equals low quality, 40% - 65% is moderate quality, and 65% - 75% is considered high quality fisher habitat (IDFG 1995). The proposed commercial thinning would remove mainly the smaller trees, in some cases leaving stands dominated (i.e. a majority of the basal area) by the larger timber. These stands would then be considered the large forest size class, and if ≥40% canopy cover remained; would still qualify as suitable habitat.

Table 47 – Acres and Percent of Suitable Large Forest Structure by Alternative

Charlie Preston Forest Structure	Alternative					
	A		B		C	
	Acres	%	Acres	%	Acres	%
Large/mature forest	2788	43.4	2524	39.3	2676	41.7

**The % figure shown is the percent of capable habitat (6,424 ac).*

The amount and distribution of suitable habitat present in an analysis area is an indicator of the quality of the area for fisher, and the ability of that subdrainage to provide a home range with the potential to support the animals. The following table displays the amount of suitable habitat present in the Charlie Preston project area by alternative. Alternative A (no action) shows the existing condition, the remaining alternatives show expected values after all project activities are completed.

Table 48 – Suitable Fisher Habitat Expressed as a Percent of the Total Capable Habitat

Alt. A		Alt. B		Alt. C	
acres	%*	acres	%*	acres	%*
2886	44.9	2563	39.9	2721	42.4

**The % figure shown is the percent of capable habitat (6,424 ac.).*

With over 40% of suitable large forest habitat, the analysis area is currently considered moderate quality for fishers (IDFG 1995). The amount of suitable habitat is 45% in the analysis area (WL18). This figure is greater than that from Table 45 as it includes suitable habitat from two small-sawtimber (10-14") lodgepole stands (Bush and Lundberg 2008). Fisher habitat is well distributed and largely contiguous within the project area, see project file map (WL18). The area is considered to have the potential to support fisher. Fisher hair snare surveys were conducted by the Forest Service in the project area in 2009 and 2010, and no fisher were detected (WL38). The maintenance of the existing moderate quality habitat levels for fisher in this home range would retain the potential for this project area to contribute to fisher populations on the District and Forest.

Due to their importance in supplying suitable habitat and providing preferred travel corridors, the condition of riparian zones also affects fisher habitat. The riparian buffers required to meet INFS guidelines would maintain this habitat during and after the proposed activities. All the action alternatives would treat some road within riparian areas to improve stream function. This project would restore more natural conditions to the streams and accompanying riparian vegetation by storing and decommissioning roads. This would begin the process of restoring and moving the riparian habitat closer to desired conditions, thereby improving habitat for fisher in the long term. The following table displays the amount of riparian road storage and decommissioning by alternative, along with the portion that is encroaching (within 50 feet) on the streams (WL35).

Table 49 – Road miles treated within Riparian Habitat Conservation Areas

Alternative	A	B	C
Road miles treated	0	1.2	1.2
Encroaching road miles treated	0	0.3	0.3

Table 50 displays the existing condition and the effects on open road densities and trapping-vulnerability risk by alternative. Alternative A is the No-Action Alternative. Alternatives B and C display post-project conditions after all planned road work has been completed. All alternatives show conditions with implementation of the St. Joe Travel Management Plan, which is expected before all activities from this project are completed.

Table 50 – Trapping Vulnerability Risk in the Charlie Preston Analysis Area

Existing Condition	Alt. A	Alt. B	Alt. C
Open road density/trapping-vulnerability risk			
0.84/moderate	1.27/high	1.27/high	1.27/high

Open road density is shown in miles per square mile.

The existing open road density in the wildlife analysis area is below 1 mi/mi^2 and classed as a moderate trapping/vulnerability risk. The Fish and Wildlife Service has concluded "that the potential exists for targeted or incidental trapping to negatively impact fisher populations, but based on the available information this potential does not rise to the level of threat at this time" (USDI 2011a).

Summary of Effects of Past, Present & Reasonably Foreseeable Activities for Fisher

Precommercial Timber Stand Improvement: Thinning young, small diameter trees is unlikely to have impacts on fishers. No suitable habitat would be altered, and there would be no off-road vehicle use associated with this activity. This treatment should reduce the time needed to reach suitable habitat conditions, (i.e. large size class w/closed canopy); although the positive effects would not be realized for several decades.

Fire Suppression: Continued fire suppression would not appreciably impact fisher habitat. The suppression of fires in large-sized, well-canopied stands would retain suitable habitat. Denser understories resulting from lack of fire could provide more cover for small mammals that are a source of prey. As a result, fire suppression may benefit fisher in the short term, although the longer term effect would be to contribute to ongoing fuel loading that may result in larger future wildfires. Since the occurrence of fire starts in the project area is uncertain, both short and long term effects of fire suppression are difficult to quantify.

Public Activities (firewood gathering, motorized vehicle use): Personal use firewood gathering and various recreation activities such as hunting, snowmobiling, and driving (excluding off-road motorized use) are not likely to impact fisher populations. With the exception of firewood gathering, these activities would not affect habitat. Potential modifications to forested habitat would be inconsequential because relatively few snags are cut, and these would be within 200 feet of open roads where snag habitat is not relied upon to provide microsites for fisher. While there is a risk of indirect mortality associated with these activities as a result of incidental trapping along open roads, these instances would be infrequent and isolated because most public use occurs during the drier months when trapping is less likely; and roads in the project area are not part of the groomed snowmobile route system. Off-road motorized use has the potential for greater impacts to habitat, however no off-road use would be allowed after the Motor Vehicle Use Map is published which is expected before the completion of the Charlie Preston project.

Use of ATVs on Road 1954 and the lower part of Road 1950: The seasonal use of these roads by ATVs from Memorial Day weekend through Labor Day weekend is proposed under the St. Joe Travel Management Plan (which is expected before the completion of the Charlie Preston project). This would add to the open road density within the project area, as well as the length of roads open along riparian areas that are potential travel corridors for fisher. This would increase the open road density to 1.27mi./mi.^{2} for all alternatives (see Table 50); and consequently, cause an increase in the local trapping-vulnerability risk from moderate to high.

Alternative A Direct and Indirect Effects for Fisher

There would be no direct change in habitat conditions for fisher under Alternative A. The amount of suitable habitat and overall analysis area habitat quality would not change from existing conditions. Current road management would continue, so there would be no change in the open road system or the amount of riparian roads present. There would be no treatment of roads encroaching on riparian areas, so no improvement to riparian habitat or conditions for fisher along potential riparian travel corridors. The local trapping-vulnerability risk would remain moderate in the project area.

Alternative A Cumulative Effects for Fisher

This alternative may impact individuals or habitat, but will not likely contribute to a trend towards Federal listing or cause a loss of viability to the population or species. The U.S. Fish and Wildlife Service recently concluded that fisher in the Northern Rocky Mountains are not likely to become endangered within the foreseeable future throughout all or a significant portion of its range USDI 2011a). Existing forest habitat information reflects conditions that are a result of previous management activities and natural conditions. Alternative A would not change habitat quality, the amount of suitable habitat, or the ability of the area to support fisher. However, because there would be no road storage or decommissioning to reduce open road densities, the cumulative effect of the implementation of the seasonal ATV routes under the St. Joe Travel Management plan would increase the current moderate trapping-vulnerability risk to high (see Table 50). The Fish and Wildlife Service has concluded “that the potential exists for targeted or incidental trapping to negatively impact fisher populations, but based on the available information

this potential does not rise to the level of threat at this time" (USDI 2011a). As this alternative would not affect any large/mature forest structure or suitable habitat, there would be no change to habitat quality for fisher in the project area. The amount of suitable habitat and the ability of the area to support fisher would also remain unchanged. The moderate quality condition of this project area for fisher would be continued. There would be no riparian road treatment and consequently no long-term improvement in the condition of these roaded riparian corridors as it relates to fisher.

Direct and Indirect Effects Common to Alternatives B and C for Fisher

Planting Conifer Trees: The planting of trees in regeneration units of Alternative B would have no consequential effects on existing fisher habitat. Recently created openings are not expected to provide habitat for many years. Tree planting would speed vegetative recovery, but not to a point useful for fisher in the short term. Alternative C has no regeneration units so the only planting would occur in the off-site ponderosa pine burn.

Pocket Gopher Control Baiting: This activity would not affect vegetation or suitable habitat and has a low probability of affecting other species (WL34). Fishers are not expected to make much use of newly created openings, and therefore are unlikely to come into contact with the poisoned oats bait. There should be no adverse effects from the potential gopher baiting activity on non-target wildlife species. A more detailed analysis of potential effects from gopher control is located in the project file (WL34a, WL34b).

Off-site Ponderosa Pine Burn: This unit is not suitable fisher habitat, and would likely only be used by fisher infrequently in transit to other areas. This proposed burn would have inconsequential effects on fisher habitat.

Bald Mountain Fuel Reduction: Lopping, piling and burning slash in an existing regeneration unit that was precommercial thinned ten years ago would have no effect on habitat for fisher. Existing high elevation openings far from streams are unlikely to be used by fisher, and the open unsuitable conditions would be maintained by this project.

Biomass Removal: Fisher may use slash piles as resting sites. Piles with the most habitat value would be within forested stands and not along open roads. This activity would have no effect on fisher as the removal and sale of material from piles along road edges and landings would not affect fisher habitat.

Open Gates for Firewood Access: The area within 200 feet of roads is not relied upon to provide snag habitat (USDA 1987 Appendix X). Standing snags are a component of fisher habitat and may be used by fishers. Any potential impacts to snag habitat within 200 feet of roads from up to three seasons of firewood cutting are likely to be inconsequential for fisher.

Snag and Cavity Habitat Creation: The creation of snag and cavity nesting habitat across 150 acres is expected to benefit species that use snags and trees with decay related characteristics. There would be little change to forested habitat conditions, but there would be a slight increase in available potential habitat for resting and denning.

Road Storage and Decommissioning: The five miles of proposed road decommissioning and storage of existing roads in the action alternatives may tend to decrease the trapping risk, especially along riparian areas; however, open road densities and the trapping vulnerability risk would remain unchanged in the project area since the roads to be stored are currently closed to public motorized use. Table 49 shows 1.2 miles of riparian road would be treated under these alternatives, contributing to an improvement in future riparian habitat conditions. Of this total approximately 0.3 miles of road encroaching on riparian areas (at creek crossings and within 50 feet of creeks) in the project area would be recontoured. This would begin the process of

restoring and moving the riparian habitat closer toward desired conditions, thereby improving habitat for fisher.

Fish Migration Barrier Culvert Removal/Replacement: The effects of replacing or removing six culverts (for aquatic organism passage and 100 year flood compliance, see Aquatic Organisms Resource Report) are also hard to quantify; but are expected to improve riparian habitat. Improved riparian habitat conditions are expected to be beneficial for fisher.

Fisheries Habitat Improvement Projects: The planting of conifer seedlings along and placement of large woody debris in streams would not directly affect fisher. The improved riparian conditions that are expected with increased vegetation and woody structure over time would improve habitat for fisher.

Creation of Dispersed Campsites: This activity would not affect fisher habitat, as log landings and open roads are not suitable habitat. As these potential campsites are on open roads, the use and disturbance from them is accounted for within the open road density, and would have little additional impact on wildlife habitat.

Alternative B Direct and Indirect Effects for Fisher

Timber Harvest and Activity Fuels Treatment: This alternative would remove 461 acres from suitable habitat conditions, and approximately 138 acres of formerly unsuitable habitat would become suitable as a result of the retention of adequate canopy cover and size structure while removing smaller diameter timber with the commercial thins. The commercial thins would develop larger trees over a shorter period of time when compared to no treatment as shown in Table 40. Approximately 323 net acres of suitable fisher habitat would become unsuitable through canopy reduction; and for regeneration harvest units, a change in size class from sawtimber to an early successional stage. Suitable habitat would be reduced to 2,563 acres or 39.9%, which is a 5% reduction in the suitable habitat compared to existing conditions (Table 46). This alternative would reduce the suitable large forest habitat size class by 264 acres. This would be a 4% decrease in the amount of suitable large forest structure in the analysis area to 39%. Since this is less than the guideline of >40% (Table 45), the project area would now be classed as low quality habitat for fishers.

Roadside Fuels Reduction: Cover would be reduced in 120 acres. As a design feature riparian vegetation within these treatment areas would be untreated, reducing potential impacts and maintaining cover on potential connections to upland habitat. All trees and snags over 6 inches d.b.h. would be retained in this treatment, so effects on fisher habitat would be minimal.

Road Construction: Road construction would affect about 21.4 acres of forest. It is expected there would be some loss of suitable fisher habitat as a result of this activity. However this would be an inconsiderable effect as almost all proposed roads occur within cutting units and over 2,500 acres of suitable habitat would remain intact. The loss of cover from road construction would be essentially masked by the vegetation change of the units containing proposed road construction. The disturbance from the use of these roads during timber sale activities is considered in the open road density effects. All newly constructed roads would be put into long-term storage (or decommissioned, for temporary roads), limiting the time disturbance effects would persist.

Alternative B Cumulative Effects for Fisher

The U.S. Fish and Wildlife Service has concluded “that the best available scientific and commercial information does not indicate that current or future forest management practices and timber harvest threaten the fisher now, or in the foreseeable future” (USDI 2011a). The protection of potential travel habitat along streams and only minor changes to suitable timbered habitat fisher may use, coupled with the change to low quality fisher habitat, means this

alternative may impact individuals or habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species. The impacts from proposed federal actions under this alternative would not contribute appreciably to existing impacts and would not affect the persistence of fishers on the St. Joe Ranger District.

Existing forest habitat conditions are a result of previous management activities and natural conditions. The effects of proposed activities when added to effects of past, present, and reasonably foreseeable activities (p.137 and updated wildlife report p.4) may reduce the ability of the project area as a whole to provide fisher habitat. There would be a four percent decrease to 39% in the suitable large forest structure size class after harvest activities (Table 46). This would reduce the existing habitat quality level of the analysis area from moderate to low (30%-40% suitable large/mature forest). By maintaining 40% of suitable habitat (Table 48), this alternative is considered capable of contributing to a fisher population on the district at a slightly reduced level. The degree of change in timbered vegetation is not expected to consequently affect the ability of the project area as a whole to provide fisher habitat. 76% of the suitable large/mature forest habitat in the project area would remain untreated. Although the proposed 1.2 miles of riparian road storage would start to improve riparian corridor conditions for fisher, the cumulative effect of the implementation of the seasonal ATV routes under the St. Joe Travel Management Environmental Assessment would increase the current moderate trapping-vulnerability risk to high (see Table 50). The Fish and Wildlife Service has concluded "that the potential exists for targeted or incidental trapping to negatively impact fisher populations, but based on the available information this potential does not rise to the level of threat at this time" (USDI 2011a).

Alternative C Direct and Indirect Effects for Fisher

Timber Harvest and Activity Fuels Treatment: This alternative would remove 266 acres from suitable habitat conditions. Approximately 101 acres of formerly unsuitable habitat would become suitable as a result of the retention of adequate canopy cover and size structure while removing smaller diameter timber in the commercial thins. This results in a net decrease of approximately 165 acres of suitable fisher habitat that would become unsuitable through canopy reduction. Suitable habitat would be reduced to 2,721 acres or 42.4%, which is a 2.5% reduction in total suitable habitat from existing conditions (see Table 48). Through commercial thinning this alternative would reduce the suitable large forest habitat size class by 112 acres. This would be roughly a 1% decrease in the amount of suitable large forest structure in the analysis area to 42% (Table 47). As the project area would still be above the >40% guideline (Table 45), it would continue to be classed as moderate quality habitat for fishers. The commercial thins would develop larger trees over a shorter period of time when compared to no treatment as shown in Table 40.

Roadside Fuels Reduction: Cover would be reduced in 127 acres along roads. Riparian vegetation within these treatment areas would be untreated, reducing potential impacts and maintaining cover on potential connections to upland habitat. All trees and snags over 6 inches d.b.h. would be retained in this treatment, so effects on fisher habitat would be minimal.

Road Construction: Road building would affect about 8.4 acres of forest. It is expected there would be some loss of suitable fisher habitat as a result of this activity. However this would be an inconsiderable effect as all proposed roads occur within cutting units (where canopy loss is accounted for), over 2,700 acres of suitable habitat would remain intact (Table 46), and the moderate quality habitat level would be maintained. The disturbance from the use of these roads is covered in the open road density effects. All newly constructed roads would be put into long-term storage (or decommissioned, for temporary roads), limiting the time disturbance effects would persist.

Alternative C Cumulative Effects for Fisher

The U.S. Fish and Wildlife Service has concluded "that the best available scientific and commercial information does not indicate that current or future forest management practices and timber harvest threaten the fisher now, or in the foreseeable future" (USDI 2011a). The protection of potential travel habitat along streams and only minor changes to suitable timbered habitat fisher may use, coupled with the low probability of fisher presence, means this alternative may impact individuals or habitat but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species. The impacts from proposed federal actions under this alternative would not contribute appreciably to existing impacts and would not affect the persistence of fishers on the St. Joe Ranger District as the existing moderate habitat quality of the project area would be maintained.

Existing forest habitat conditions are a result of previous management activities and natural conditions. The proposed activities, when added to the effects of past, present, and reasonably foreseeable future activities (EA p. 160-161; updated wildlife report p.4), are not expected to adversely affect the ability of the project area as a whole to provide fisher habitat. With a 1% reduction in suitable large forest structure habitat, the overall moderate quality of the analysis area is essentially unchanged with this alternative. The 3% reduction in the amount of suitable habitat is unlikely to affect the ability of the project area to support fisher. This degree of vegetation change is not expected to adversely affect the ability of the project area as a whole to provide fisher habitat. Approximately 81% of the suitable large/mature forest habitat in the project area would remain untreated. Although the proposed 1.2 miles of riparian road storage would start to improve riparian corridor conditions for fisher, the cumulative effect of the implementation of the seasonal ATV routes under the St. Joe Travel Management EA would increase the current moderate trapping-vulnerability risk to high (see Table 50). The Fish and Wildlife Service has concluded "that the potential exists for targeted or incidental trapping to negatively impact fisher populations, but based on the available information this potential does not rise to the level of threat at this time" (USDI 2011a).

Compliance with Forest Plan

As demonstrated in the preceding analysis, the Charlie Preston project area contains enough suitable fisher habitat (Table 46) to be classified at the moderate quality level (IDFG 1995). From the survey efforts cited above and in USDI 2011a, there is a fisher population on the IPNF. Based on the maintenance of the potential fisher home range as moderate quality habitat, the action alternatives in conjunction with past actions, ongoing activities and the reasonably foreseeable actions discussed above would not indicate a local or regional change in habitat quality or population status for the fisher.

Applicable Forest Plan Standards

9. Sensitive Species

a. Manage the habitat of species listed in the Regional Sensitive Species List to prevent further declines in populations which could lead to federal listing under the Endangered Species Act.

Based on the analysis displayed above, the implementation of either action alternative may impact individuals or habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species (Table 44; updated wildlife report Appendix A). In addition, the U.S. Fish and Wildlife Service recently concluded that fisher in the Northern Rocky Mountains are not likely to become endangered within the foreseeable future throughout all or a significant portion of its range (USDI 2011a). See wildlife project file document WL23 – Wildlife Forest Plan Standards Compliance Table.

Gray Wolf (Updated Wildlife Report pp. 31-37)

Summary of Direct Effects for Gray Wolf

Table 51 displays the effects on open road/trail density, security, and elk habitat potential (EHP) (prey availability) by alternative. Alternative A depicts the no-action alternative.

Table 51 – Conditions after Proposed Activities for Elk Habitat Unit 6

	Alternatives			
Analysis Criteria	**Existing Condition**	**A**	**B**	**C**
Open road/trail density	1.8	1.9	1.9	1.9
% Secure habitat	14.3	14.3	14.3	14.3
Elk habitat potential	.36	.36	.39	.40

** - includes seasonal use of roads for firewood access and then as ATV routes with implementation of the St. Joe Travel Management EA.*

Summary of Effects of Past, Present, and Future Activities for Gray Wolf

Precommercial Timber Stand Improvement: Thinning young, small diameter trees would increase the overall health and vigor of the stands. This activity would originate from existing roads, so while it may cause a minor disturbance to wolves during implementation, there would be no long-term effects.

Fire Suppression: Continued fire suppression would help retain forest cover, further contributing to reduction of foraging habitat for prey species (ungulates). However, the effects of fire suppression on ungulate habitat (and, consequently, wolf prey base) are difficult or impossible to quantify as some cover is required for thermoregulation and to reduce hunting vulnerability.

Public Activities (firewood gathering, motorized vehicle use): Personal use firewood gathering and various recreation activities such as hunting, snowmobiling, and driving (excluding off-road motorized use) would not significantly impact gray wolves since these activities have minimal effects on habitat and are not expected to increase mortality risk because wolves are unlikely to be encountered during these activities. The effects of potential hunting mortality are addressed by the analysis of motorized route densities.

Use of ATVs on Road 1954 and the lower part of Road1950: The seasonal use of these roads by ATVs from Memorial Day weekend through Labor Day weekend would occur with implementation of the St. Joe Travel Management EA (which is expected before the completion of the Charlie Preston project). This would add to the open road density within the project area, (see Table 51). As these roads are closed after Labor Day, they would provide secure habitat during hunting season and therefore maintain the ungulate prey base for wolves.

Alternative A Direct, Indirect, and Cumulative Effects for Gray Wolf

No timber harvest would occur, so there would be no change in the amount of forage habitat available for ungulates. Hiding cover would remain unaffected as there would be no roadside fuels reduction activities. Potential travel corridors would retain their existing cover. The amount of open roads and trails would remain unchanged, maintaining the amount of secure habitat available for elk and deer, and therefore wolves. There would be no new road construction, however no storage or decommissioning of roads would take place, and the elk habitat potential would remain below the desired target of .42. With no direct or indirect effects, there would be no cumulative effects to wolves.

Direct and Indirect Effects Common to Alternatives B and C for Gray Wolf

Both action alternatives would maintain the open road density and amount of secure habitat. Both alternatives would store and decommission roads, with a resultant increase in elk habitat potential (EHP). Each of these alternatives would improve conditions for wolves and wolf prey by varying degrees. There are no known dens or rendezvous sites in the project area; and the likelihood of direct effects is very low due to the nature of occurrence of wolves. The potential exists for disturbance from project activities to any wolves that may be in the project area. However there is inconsiderable potential for adverse effects due to the likely transitory occurrence of wolves in this project area as well as wolves ability to easily disperse long distances to areas with more secure habitat. With these alternatives ten of the fourteen EHU's on the St. Maries end of the district have EHP's at or above target levels (WL42). There would be no impact on any known wolf den or rendezvous site, no consequential increase in the likelihood of human wolf conflicts, and (based on the increase in EHP) the potential for a slight improvement to the prey base.

Planting Conifer Trees: The planting of trees in regeneration units of Alternative B would have no immediate effects on wolves. The establishment of the planted trees would shorten the time needed for the stands to provide hiding cover as well as how long forage habitat would persist. The slight positive and negative effects of this activity for big game species are considered to roughly balance out. Tree planting is essentially a neutral activity in terms of wolves. Alternative C has no regeneration units so the only planting would occur in the off-site ponderosa burn unit discussed below.

Pocket Gopher Control Baiting: This activity would not affect vegetation or suitable habitat and would have a low probability of affecting other species (WL34). Wolves feed primarily on ungulates and would not be expected to consume pocket gophers (especially when they die underground). There should be no adverse effects from the potential gopher baiting activity on non-target wildlife species. A more detailed analysis of potential effects from gopher control is located in the project file (WL34a, WL34b).

Off-Site Ponderosa Pine Burn: The enhancement of the shrub component would improve forage conditions for ungulates, thereby improving conditions for wolves.

Bald Mountain Fuel Reduction: Lopping, piling and burning slash in an existing regeneration unit that was precommercial thinned ten years ago would maintain open habitat conditions for big game. Effects on wolves would remain roughly unchanged.

Biomass Removal: This activity would have no effect on wolves as the removal and sale of material from piles along road edges and landings would not affect prey species habitat.

Open Gates for Firewood Access: The removal of snags for firewood would not appreciably affect habitat for big game species. These roads would be closed after Labor Day, they would provide secure habitat during hunting season and therefore maintain the ungulate prey base for wolves.

Snag and Cavity Habitat Creation: The creation of snag and cavity nesting habitat across 150 acres is expected to benefit species that use snags and trees with decay related characteristics. This activity would not directly affect conditions for deer, elk, or wolves.

Road Reconstruction: Existing roads are not considered suitable wildlife habitat, so their reconstruction would not affect wildlife species. Effects from the use of reconstructed roads are covered under the effects of the open road density. All reconstructed roads would be placed in long-term storage after project activities.

Road Storage and Decommissioning: Storage or decommissioning improves the effectiveness of the closures for wildlife. The elk habitat potential (EHP) of the project area would increase (see Table 51), improving conditions for elk and deer and therefore wolves.

Fish Migration Barrier Culvert Removal/Replacement: This would not have any effects on big game habitat; therefore, the proposed culvert work would not affect wolves.

Fisheries Habitat Improvement Projects: The planting of conifer seedlings along streams and placement of large woody debris in streams would not affect big game species; therefore, there would be no effect on wolves from this activity.

Creation of Dispersed Campsites: This activity would not affect habitat for big game (wolf prey species), as it would be confined to areas already cleared of vegetation along open roads. As these potential campsites are on open roads, the use and disturbance from them is accounted for within the open road density, and would have little impact on wildlife habitat.

Alternative B Direct and Indirect Effects for Gray Wolf

Timber Harvest and Activity Fuels Treatment: The majority of the proposed timber harvest would be commercial thinning (1133 acres) which could, over time cause a small increase in available forage for ungulates due to increased light to the understory vegetation while retaining overhead cover. Clearcut, seed tree, shelterwood, and overstory removal units (414 acres) would create future forage beneficial to big game and therefore wolves. Post-harvest activity fuels treatments would not appreciably change these effects.

Roadside Fuels Reduction: Hiding cover would decrease on 120 acres along roads that would be open during hunting season. Given the well-timbered condition of most of the project area (75% cover, WL24), this action is not expected to have consequential effects on the wolf prey base.

Road Construction: There would be no change to open road densities after project activities are concluded. Effects are measured by the open road densities (see Table 51). Travel corridors (WL33) would be maintained, however there would be a reduction in their effectiveness in two areas due to proposed units that would be adjacent to existing openings. This alternative has two proposed seedtree cuts (with a temporary road in one unit) that would affect approximately 2,200 feet of ridge-top travel corridor. While some cover would be retained with leave trees, these two lengths of corridor would have reduced quality for wildlife movement. Two roads would be built across a travel corridor with this alternative. Another 400 feet of road would be constructed within 100 feet of a potential ridge-top travel corridor. Given the relatively narrow width of these roads, their location in commercial thin units retaining over 30% canopy cover; and the fact that they would be put into long-term storage after use, effects are expected to be inconsequential.

Alternative B Cumulative Effects for Gray Wolf

Alternative B would not cause any adverse cumulative effects because of the maintenance or improvement of the prey base, (as shown by the maintenance or increase in EHP), design criteria which would avoid adverse impacts (e.g. by maintaining corridors/linkages, avoiding known den and rendezvous sites), lack of critical habitat, and no consequential change in the likelihood of human wolf interactions. The alternatives may impact individuals or habitat, but will not likely contribute to a trend towards Federal listing or cause a loss of viability to the population or species. Historically, gray wolf occurred throughout northern Idaho. Although there is evidence of occasional use of the area by wolves, there has not been the consistent, repeated amount of use that would indicate pack activity (Mack and others 2010). Existing conditions for wolves are a result of previous management activities and natural conditions, and the proposed activities are

unlikely to affect wolves due to their wide ranging nature and the relative lack of preference for special habitat.

Alternative C Direct and Indirect Effects for Gray Wolf

Timber Harvest and Activity Fuels Reduction: All of the proposed timber harvest would be commercial thins (896 acres) which could, over time cause a small increase in available forage for ungulates due to increased light to the understory vegetation while retaining overhead cover. No new openings to provide future forage would be created. Post-harvest activity fuels treatments would not appreciably change these effects.

Roadside Fuels Reduction: Hiding cover would be decrease on 127 acres along roads open during hunting season. Given the well-timbered condition of most of the project area (75% cover, WL24), this action is not expected to have consequential effects on the wolf prey base.

Road Construction: There would be no change to open road densities after sale activities are concluded. Effects are measured by the open road densities (see Table 51). Travel corridors would be maintained, however there would be a slight reduction in their quality in two areas due to proposed system road construction. One road would be built across a travel corridor with this alternative. Another 400 feet of road would be constructed within 100 feet of a potential ridge-top travel corridor. Effects are expected to be inconsequential given the relatively narrow width of these roads, their location in commercial thin units which would retain over 30% canopy cover; and the fact that they would be put into long-term storage after use.

Alternative C Cumulative Effects for Gray Wolf

Alternative C would not cause any adverse cumulative effects because of the maintenance or improvement of the prey base, (as shown by the maintenance or increase in EHP), design criteria which would avoid adverse impacts (e.g. by maintaining corridors/linkages, avoiding known den and rendezvous sites), lack of critical habitat, and no consequential change in the likelihood of human wolf interactions. The alternatives may impact individuals or habitat, but will not likely contribute to a trend towards Federal listing or cause a loss of viability to the population or species. Historically, gray wolf occurred throughout northern Idaho. Although there is evidence of occasional use of the area by wolves, there has not been the consistent, repeated amount of use that would indicate pack activity (Mack and others 2010). Existing conditions for wolves are a result of previous management activities and natural conditions, and the proposed activities are unlikely to affect wolves due to their wide ranging nature and the relative lack of preference for special habitat.

Western Toad (Updated Wildlife Report pp. 37- 41)

Effects of Past, Present & Reasonably Foreseeable Future Activities for Western Toad

Precommercial Timber Stand Improvement: Thinning young, small diameter trees is unlikely to have impacts on western toads. No breeding habitat would be altered and breeding would not be disrupted. There would be no off-road vehicle use associated with this activity. There is the possibility of an occasional adult mortality due to increased vehicle use on roads to access thinning areas, but this use would be of short duration in a given area, and direct mortality would be rare and inconsequential.

Fire Suppression: Continued fire suppression would not significantly impact western toad populations. These activities are unlikely to impact breeding habitat (most fire suppression activities take place outside the breeding season), and potential modifications to upland forested

habitat would be inconsequential since this species makes use of a variety of upland habitats. While there is a risk of mortality associated with fire suppression as a result of increased vehicular use of roads, these instances would be infrequent and isolated.

Public Activities (firewood gathering, motorized vehicle use): Personal-use firewood gathering and various recreation activities such as hunting, snowmobiling, and driving (excluding off-road motorized use), would not markedly impact western toad populations. These activities would not impact breeding habitat, and potential modifications to upland forested habitat (that toads may use) would be inconsequential because canopy cover would be essentially unchanged as relatively few snags are cut. While there is a risk of direct mortality associated with these activities as a result of vehicular use of roads, these instances would be infrequent and isolated because most public use occurs during the drier months when toads are less likely to be using open roadside habitat. Off-road motorized use has the potential for greater impacts to habitat, however no off-road use would be allowed after the Motor Vehicle Use Map is published which is expected before the completion of the Charlie Preston project.

Use of ATVs on Road1954 and the lower part of Road1950: The seasonal use of these roads by ATVs from Memorial Day weekend through Labor Day weekend would occur with implementation of the Motor Vehicle Use Map (which is expected before the completion of the Charlie Preston project). This would add to the open road density within the project area, as well as the length of roads open along riparian areas which is potential breeding habitat for western toads. This would increase the open riparian road miles to 3.9 for all alternatives (see Table 52) and, as a consequence, cause a slight increase in mortality risk.

Table 52 – Post-Activity Conditions for Western Toad in the Charlie Preston Project Area

Analysis Criteria	Alternatives			
	Existing Condition	A*	B*	C*
Open road/trail density	0.84	1.27	1.27	1.27
Open road miles in RHCAs/ potential breeding habitat	2.6	3.9	3.9	3.9
Acres canopy opening cuts	NA	0	414	0

**Includes seasonal use of roads for firewood access and then as ATV routes with implementation of St. Joe Travel Management EA.*

Alternative A Direct, Indirect, and Cumulative Effects for Western Toad

Alternative A would not have any direct or indirect effects on the western toad. There would be no change to forested habitat conditions for western toads. There would be no culvert replacement or removal, and no road decommissioning or road storage. Potential breeding habitat within RHCAs would also remain unchanged. With no direct or indirect effects, there would be no cumulative effects for western toad.

Direct and Indirect Effects Common to Alternatives B and C for Western Toad

Timber Harvest: Habitat alterations from timber harvest and recreation have not been shown to be causative agents for population declines (Loeffler 1998). Given the amount of mesic, timbered stands present, and the relative scarcity of any ponds or wetlands, it is likely that breeding habitat; and not summer habitat is limiting for western toads in the project area. Therefore, effects on breeding habitat would be of more consequence than effects on upland habitat. There would be no changes to potential breeding habitat because riparian areas would be protected with buffers. These no-entry buffers would also protect the portions of timbered stands near water that would be most likely to be used by toads. The predicted small, inconsequential, short-term changes in

water yield are not likely to adversely impact potential breeding habitat (see Updated Watershed Report).

Planting Conifer Trees: The planting of trees in regeneration units of Alternative B would have no consequential effects on existing toad habitat. Recently created openings are not expected to provide habitat for many years. Tree planting would speed vegetative recovery, but not to a point useful for toads in the short term. Alternative C has no regeneration units so planting would only occur in the off-site ponderosa pine burn discussed below.

Pocket Gopher Control Baiting: This activity would not affect vegetation or suitable habitat and has a low probability of affecting other species (WL34). Toads are not expected to make much use of newly created openings, and therefore are unlikely to come into contact with the poisoned bait. There should be no adverse effects from the potential gopher baiting activity on non-target wildlife species. A more detailed analysis of potential effects from gopher control is located in the project file (WL34a, WL34b).

Off-Site Ponderosa Pine Burn: This activity would burn about 82 acres to reduce the occurrence of off-site pine, create snags, and rejuvenate the shrub component of the stands. This unit is not breeding habitat, and would likely only be used by toads infrequently, if ever, in transit to other areas. This proposed burn would have inconsequential effects on western toad habitat.

Bald Mountain Fuel Reduction: Lopping, piling and burning slash in an existing regeneration unit that was precommercial thinned ten years ago would have no effect on habitat for toads. Existing high elevation openings far from water are unlikely to be used by toads, and the open unsuitable conditions would be maintained by this project.

Biomass Removal: This activity would have no effect on toads as the removal and sale of material from piles along road edges and landings would not affect riparian toad habitat.

Open Gates for Firewood Access: The area within 200 feet of roads is not relied upon to provide snag habitat (USDA 1987 Appendix X). Standing snags are not a major component of toad habitat. Any potential impacts to snag habitat from up to three seasons of firewood cutting are likely to be inconsequential for western toads.

Snag and Cavity Habitat Creation: There would be little change to forested habitat conditions, and therefore no consequential effects on potential toad habitat.

Road Reconstruction: Existing roads are not considered to be suitable western toad habitat, so their reconstruction would not affect western toads. Effects from the use of reconstructed roads are covered under the effects of the open road density.

Road Storage and Decommissioning: This species can breed in roadside ditches and can be found in upland habitat that would not have any special protection. Some mortality occurs to adults and metamorphs in these situations, but it is unlikely to be significant to the population as a whole because of the low level of traffic on forest roads and the high number of other opportunities for breeding habitat (e.g. wet meadows, ponds, etc.) throughout the forest. The highest potential for mortality would occur on existing open roads adjacent to potential breeding habitat. The five miles of proposed road decommissioning and storage of existing roads in the action alternatives may tend to decrease the risk of mortality, especially along riparian areas. This effect is difficult to evaluate in any meaningful way as all roads to be stored or decommissioned with this project are currently closed to public motorized use.

Fish Migration Barrier Culvert Removal/Replacement: The effects of replacing or removing six culverts (for aquatic organism passage and 100 year flood compliance, see Aquatic Organisms Resource Report) are hard to quantify, but are expected to be beneficial for riparian habitat, and therefore would be beneficial for western toads.

Fisheries Habitat Improvement Projects: The planting of conifer seedlings along streams and placement of large woody debris in streams would not directly affect toads. Stream habitat improvement work is generally done during the driest part of the year during periods of low water, after the breeding season, reducing the chances of directly affecting toads. The improved riparian conditions with increased vegetation and woody structure from this project would also improve habitat for toads.

Creation of Dispersed Campsites: This activity would not affect toad breeding habitat, as log landings and open roads are not suitable habitat. Potential campsites are on open roads, so the use and disturbance from them is accounted for within the open road density, and would have little additional impact on wildlife habitat.

Alternative B Direct and Indirect Effects for Western Toad

Timber Harvest and Activity Fuels Treatment: The majority of the proposed timber harvest would be commercial thins (1133 acres) which are unlikely to cause the mesic timbered habitat to become unsuitable. Some overhead cover would be retained in these units, which would keep the cool, moist forest conditions favored by toads. Clearcut, seed tree, shelterwood and overstory removal units (414 acres) would likely reduce upland timbered habitat quality for toads due to the drier, more open conditions that would be created.

Roadside Fuels Reduction: Cover would be reduced on up to 120 acres along roads, some of which would be adjacent to potential breeding habitat. Riparian vegetation within these treatment areas would be untreated, reducing potential impacts on toads and maintaining cover on potential connections to upland habitat.

Road Construction: Proposed roads are not located in riparian areas, so potential for effects to toads and toad habitat would be minimal. The disturbance from the use of these roads during project activities is covered in the open road density effects. Alternative B includes four creek crossings on new system and temporary road. These are crossings of small headwaters streams, however, where the potential for toad breeding habitat is low. The new system road would be put into long-term storage with the culverts removed, and the temporary road would be decommissioned after use.

Alternative B Cumulative Effects for Western Toads

The impacts from proposed federal actions would not contribute appreciably to existing impacts. Alternative B may impact individuals or habitat but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species because:

- toad mortality is unlikely,
- potential adverse effects would not substantially exceed existing levels of risks to the species from currently ongoing activities,
- potential breeding habitat along streams would be protected,
- changes to timbered habitat that toads may use would be minor, and
- there is a low probability of western toad presence (*Updated Wildlife Report p. 37*).

Alternative C Direct and Indirect Effects for Western Toad

Timber Harvest and Activity Fuels Treatment: The majority of the proposed timber harvest would be commercial thins (896 acres) that are unlikely to cause the mesic timbered habitat to

become unsuitable. Some overhead cover would be retained in these units which would keep the cool, moist forest conditions favored by toads. No new openings would be created.

Roadside Fuels Reduction: Cover would be reduced on 127 acres along roads, some of which would be adjacent to potential breeding habitat. Riparian vegetation would be untreated, reducing potential impacts on toads and maintaining cover on potential connections to upland habitat.

Road Construction: Proposed roads are not located in riparian areas, so potential for effects to toads and toad habitat would be minimal. The disturbance from the use of these roads during project activities is covered in the open road density effects. Alternative C proposes two creek crossings with the new system road construction. These would be crossings of small headwaters streams, however, where the potential for toad breeding habitat is low. This new system road would be put into long-term storage with the culverts removed after use.

Alternative C Cumulative Effects for Western Toads

The impacts from proposed federal actions would not contribute appreciably to existing impacts. Alternative C may impact individuals or habitat but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species because:

- toad mortality is unlikely,
- potential adverse effects would not substantially exceed existing levels of risks to the species from currently ongoing activities,
- potential breeding habitat along streams would be protected,
- changes to timbered habitat that toads may use would be minor, and
- there is a low probability of western toad presence (*Updated Wildlife Report p. 37*).

Management Indicator Species *(See Updated Wildlife Report pp. 41-69)*

The *Management Indicator Species Considerations for the Idaho Panhandle National Forests* (EA Appendix C) white paper discusses the management indicator species (MIS) process on the IPNF. Selection of MIS included three categories: (1) Threatened or endangered species on federal or state lists; (2) Species commonly hunted, fished, or trapped which have special habitat needs that are affected by planned management activities, and (3) Other species whose population changes are believed to indicate effects of management activities on a major biological group or on water quality. This category is referred to as “Indicator Species" and includes northern goshawk and pileated woodpecker.

The majority of the white paper focuses on northern goshawk and pileated woodpecker and provides a step down process, based on best available science, for these species. Existing condition, population, and habitat availability at various scales including National, Regional, State, and Forest-level are discussed for both species. The Regional and Forest trends discussed provide a larger context to these species. *Management Indicator Species Considerations for the Idaho Panhandle National Forests* also includes the potential threats to these species and their habitat, as well as the difficulties in monitoring. The following project level analysis is based on the scientific findings in this paper and provides a step-down process from the larger context covered in the white paper.

Threatened, endangered, and sensitive species are addressed separately. Those species from the IPNF Forest Plan that are applicable to the St. Joe District and project area are displayed in Table 53.

Table 53 – Wildlife MIS and Other Species for the St. Joe Ranger District

Species	Remarks	Existing Habitat / Need for Further Analysis
Management Indicator Species – Indicator Species		
Goshawk	Associated with late successional forest habitat.	Species and suitable nesting habitat present, further analysis is completed.
Pileated Woodpecker	Primary cavity excavator, dependent on large snags, associated with late successional habitat.	Habitat and species present, further analysis is completed.
Management Indicator Species – Species Commonly Hunted, Fished or Trapped		
Elk	Hunted, important big game species, affected by human disturbance and human use of roads.	Habitat and species present, public issue, further analysis is completed.
Moose	Hunted, relatively unique big game species, occurs in low numbers throughout the IPNF.	Habitat and species present, elk analysis meets analysis needs, no analysis specifically for moose is completed.
Other Wildlife Species – Species Commonly Hunted, Fished or Trapped		
Marten	Trapped, associated with late successional mesic conifer forest habitat.	Habitat exists, species presence unknown, further analysis is completed.

Management Indicator Species – Indicator Species

Northern Goshawk (Updated Wildlife Report p. 42-53)

Geographic Scope

A foraging area size of 5,000 to 6,000 acres is used on the IPNF to delineate potential goshawk territories and to provide an adequate cumulative effects area for project-level analysis (Brewer and others 2009). The 7,400 acre Charlie Preston project area is an appropriate size to contain a single territory or home range. For this project the entire Charlie Preston project area totaling 6,534 (26.4 km^2) NFS acres is the cumulative effects area. Although goshawks may use adjoining private lands, for the purposes of this analysis they are not considered necessary to meet goshawk suitable habitat requirements. There are enough NFS acres present to constitute a home range, without including adjacent private lands. Habitat estimates and potential effects are limited to NFS lands, as both timber industry and other private lands have been logged, roaded, and developed, or are expected to be in the future. These lands cannot be relied upon to provide habitat in the future, are not under FS jurisdiction, and so are not used in calculations. Based on reported densities of goshawk in the western U.S., suitable habitat for at least one pair should be provided within each approximate 10,000-acre area (USDA 1990). Therefore, each approximately 10,000-acre area should contain one suitable 5,000 – 6,000 acres home range. This is roughly equivalent to one suitable home range for every two home ranges. The desired condition for the Charlie Preston project area with would be to have the single home range in suitable condition.

Methodology

The analysis of effects on goshawks uses guidance from the “Northern Goshawk Northern Region Overview” (Brewer and others , 2009), “Old-Growth Habitats and Associated Wildlife Species in the Northern Rocky Mountains” (USDA 1990), “A Conservation Assessment of the Northern Goshawk, Black-backed Woodpecker, Flammulated Owl, and Pileated Woodpecker in the Northern Region, USDA Forest Service” (Samson 2006a) and “Management Recommendations for the Northern Goshawk in the Southwestern United States” (Reynolds and others, 1992) to determine potential effects.

Management recommendations for each home range include at least 240 acres of nesting habitat per 5,000 acre foraging area in stands of at least 40 acres. The minimum of 240 acres is to provide for five alternate nest stands in addition to the active nest stand. From (Brewer and others 2009), suitable nesting habitat is stands of at least 40 contiguous acres, with at least 40% canopy cover of any tree species, and a 10" or greater size class. For this analysis, a potential nest stand is a single stand of at least 40 acres with the canopy cover and tree size to meet suitable nest habitat criteria. A potential nest area is a group of stands that together make up 40 or more contiguous acres with the canopy cover and tree size to meet suitable nest habitat criteria. The home range should also include a mosaic of vegetation structural stages in both a Post-fledging Family Area (PFA) and a 5,000 - 6,000 acre foraging area. The PFA and foraging area (FA) should have a certain structural composition (e.g. seedling/sapling, pole, sawtimber, etc.), to meet the desired habitat conditions listed in the goshawk management recommendations, (Brewer and others 2009). This structural composition has the same size class percentages for the PFA and FA. Management direction is to conduct an analysis of PFA habitat on known or recently occupied nests (Brewer and others 2009). The goshawk home range in this project area is known to be active since 2008 (updated wildlife report p. 44). The post-fledging area (PFA) is an approximately 420 acre area centered on the nest (Brewer and others, 2009). For this analysis the PFA has been delineated as much as feasible along existing stand boundaries while remaining in the project area and excluding private lands. Direction for the desired size class composition for a PFA comes from (Reynolds and others, 1992); as modified by (Brewer and others, 2009); to better fit conditions in the Northern Region. The structural stages used have been adapted for this analysis to better fit the way size class information is presented in the IPNF FSVEG database.

Summary of Direct Effects

Table 54 – Northern Goshawk Post-Activity Nest Habitat Conditions

	Alt. A*	Alt. B	Alt. C
Active & alternate nest area acres/potential nest stands	297 ac./6	297 ac./6	297 ac./6
≥40 acre nest habitat/ potential nest stands	2,343 ac./59	2,051 ac./51	2,150 ac./54
Totals	2,640 ac./65	2,348 ac./57	2,447 ac./60

** Alternative A depicts the existing condition and is the No-Action Alternative.*

Table 55 – Northern Goshawk Post-Activity Foraging Area Diversity Matrix

Size Class by d.b.h.	% Desired	Alternative A*		Alternative B		Alternative C	
		%	Acres	%	Acres	%	Acres
SFG	10	10.5	612	14.7	852	11.9	694
0-5"	10	10.5	609	10.5	609	10.5	609
5-10"	20	12.0	695	10.1	584	10.9	633
10"+	60	67.0	3893	64.8	3764	66.7	3873
Totals	100	100	5809	100	5809	100	5809
5"+ w/40% CC	60	76.4	4437	63.7	3700	68.6	3985

**Alternative A depicts the existing condition and is the No-Action Alternative.*
CC = % canopy cover; SFG =shrub/forb/grass size class

Table 56 – Northern Goshawk Post-Activity Post-Fledging Area Diversity Matrix

		Alt. A*		Alt. B		Alt. C	
Size Class by d.b.h.	**% Desired**	**%**	**Acres**	**%**	**Acres**	**%**	**Acres**
SFG	10	4.2	18	9.6	41	4.2	18
0-5”	10	11.7	50	6.3	27	11.7	50
5-10”	20	4.0	17	4.0	17	4.0	17
10”+	60	80.1	343	80.1	343	80.1	343
Totals	100	100	428	100	428	100	428
5”+ w/>40% cc	60	84.1	360	84.1	360	84.1	360

**Alternative A depicts the existing condition and is the No-Action Alternative*.
CC = % canopy cover; SFG =shrub/forb/grass size class

Summary of Effects of Past, Present & Reasonably Foreseeable Future Activities for Northern Goshawk

Precommercial Timber Stand Improvement: Thinning young, small diameter trees would increase the overall health and vigor of the stands by improving species composition and structure, resulting in stands that are more ecologically stable in the face of potential disturbances. Consequently, thinning would help promote long-term stability of habitat conditions for goshawks by increasing sizes and proportions of long-lived seral species that, ultimately, would result in greater availability of large-diameter size classes of desired tree species. The creation of more open stands with larger average tree sizes would enhance potential foraging habitat.

Fire Suppression: Continued fire suppression would not appreciably impact goshawk habitat. The suppression of fires in large-sized, well-canopied stands would retain suitable habitat. Denser understories resulting from lack of fire could provide more cover for small mammals that are a source of prey; however, stands that become too dense are difficult for goshawk to hunt in. Fire suppression may benefit goshawk in the short term, although the longer term effect would be to contribute to ongoing fuel loading that may result in larger future wildfires. Since the occurrence of fire starts in the project area is uncertain, both short-term and long-term effects of fire suppression are difficult to quantify.

Public Activities (firewood gathering, motorized vehicle use): Personal-use firewood gathering along with various recreation activities such as hunting, snowmobiling, and driving (excluding off-road motorized use), would not have consequential effects on goshawk habitat. Personal-use firewood gathering is assumed to have removed snags within 200 feet of open roads on the IPNF, and is factored into the existing condition. Firewood cutting is anticipated to continue along open roads. Because of this, it is generally assumed that these roadside areas do not provide sufficient habitat for snag-dependent species. Snags are not a major component of goshawk habitat, and firewood cutting would have little effect on timbered conditions. Various recreation activities and routine road maintenance are unlikely to have any impacts on goshawks since they would not directly impact forested habitat. Off-road motorized use has the potential for some impacts to habitat, however no off-road use would be allowed after the Motor Vehicle Use Map is published which is expected before the completion of the Charlie Preston project.

Use of ATVs on Road 1954 and the lower part of Road 1950: The seasonal use of these roads by people on ATVs from Memorial Day weekend through Labor Day weekend would occur with implementation of the St. Joe Travel Management Plan (which is expected before the completion of the Charlie Preston project). This would add to the open road density within the project area. As this use would be confined to the roads, it would not add to any effects on goshawk habitat. The increased use could have a disturbance effect should any goshawks be nesting near these roads; however, there are no known nests in that area.

Alternative A Direct, Indirect, and Cumulative Effects for Northern Goshawk

This alternative does not include any vegetation treatment, and the existing forest structure and cover is expected to remain relatively unchanged in the near future. There would be no change to potential nesting or foraging habitat conditions. The ability of the project area to continue to provide a suitable goshawk home range would be unchanged with this alternative. This alternative would have no impact on goshawks or their habitat.

Direct and Indirect Effects Common to Alternatives B and C for Northern Goshawks

Planting Conifer Trees: The planting of trees in regeneration units of Alternative B would have no consequential effects on existing goshawk habitat. Recently created openings are not expected to provide habitat for many years. Tree planting would speed vegetative recovery, but not to a point useful for goshawks in the short term. Alternative C has no regeneration units so planting would only occur in the off-site ponderosa pine burn unit discussed below.

Pocket Gopher Control Baiting: This activity would not affect vegetation or suitable habitat and has a low probability of affecting other species (WL34). Goshawks are not expected to make much use of newly created openings, and therefore are unlikely to come into contact with the poisoned bait underground. There should be no adverse effects from the potential gopher baiting activity on non-target wildlife species. A more detailed analysis of potential effects from gopher control is located in the project file (WL34a, WL34b).

Off-Site Ponderosa Pine Burn: This activity would burn about 82 acres to reduce the occurrence of off-site pine, create snags, and rejuvenate the shrub component of the stands. About half of this unit is nesting habitat, and 34 acres would become unsuitable due to canopy loss after the burn for decades. With 62% (4,102 acres) of the home range meeting suitable nest habitat criteria (WL4), the 0.8% reduction in nesting habitat from this proposed burn would have inconsequential effects on goshawk habitat. These 82 timbered acres would be converted to a shrub/forb/grass structure, changing the foraging area composition by 1.4%; also an inconsiderable effect (see Table 55).

Bald Mountain Fuel Reduction: Lopping, piling and burning slash in an existing regeneration unit that was precommercial thinned ten years ago would have no effect on habitat for goshawks. Existing sparsely canopied openings are unlikely to be used by goshawks, and the open unsuitable conditions would be maintained by this project.

Biomass Removal: This activity would have no effect on goshawks as the removal and sale of material from piles along road edges and landings would not affect goshawk foraging habitat.

Open Gates for Firewood Access: The area within 200 feet of roads is not relied upon to provide snag habitat (USDA 1987 Appendix X). Standing snags are not a major component of goshawk habitat. Any potential impacts to snag habitat from up to three seasons of firewood cutting are likely to be inconsequential for goshawks.

Snag and Cavity Habitat Creation: The creation of snag and cavity nesting habitat across 150 acres is expected to benefit species that use snags and trees with decay related characteristics. There would be little change to forested habitat conditions, and therefore no consequential effects on potential goshawk habitat.

Road Reconstruction: Existing roads are not considered suitable goshawk habitat, so their reconstruction would not affect goshawk. Effects from the use of reconstructed roads are covered under the effects of the open road density.

Road Storage and Decommissioning: The storage and decommissioning of existing roads would not affect the northern goshawk. Forested habitat immediately adjacent to these roads is unlikely to be noticeably affected by this activity.

Fish Migration Barrier Culvert Removal/Replacement: The proposed culvert work would not affect goshawks because the activity areas are small and do not have trees.

Fisheries Habitat Improvement Projects: Planting conifer seedlings along streams and placing large woody debris in streams would not affect goshawks. Snags would not be cut for use as logs to be placed in streams. If any live trees are cut they would be dispersed so the forested character of adjacent stands would not be noticeably affected by these activities.

Creation of Dispersed Campsites: This activity would not affect goshawk habitat because log landings and open roads are not suitable habitat. Potential campsites are on open roads, so the use and disturbance from them is accounted for within the open road density, and it would have little additional impact on wildlife habitat.

Alternative B Direct and Indirect Effects for Northern Goshawk

Timber Harvest and Activity Fuels Treatment

Nesting Habitat: Approximately 302 acres of suitable nesting habitat stands >40 acres would become unsuitable for goshawk habitat. Of these, 74 acres would receive regeneration treatments and would be unsuitable for several decades based on a combination of canopy cover and size class. The remaining 228 acres would be commercial thinned which would maintain large structure, and canopy cover is expected to return to suitable levels (i.e. 40%) within five to thirty years. The commercial thins would develop larger trees over a shorter period of time when compared to no treatment as shown in Table 40 (based on FVS runs for these stands, see Forest Vegetation section and WL15).

There would be no treatment of the existing nest stand or the designated alternate nest stands (297 ac.), and 2,304 acres would remain in suitable nesting habitat condition. One 44-acre pole stand would be thinned and would meet suitable nest habitat characteristics for structure and canopy, bringing the post-treatment suitable acres to 2,348. This is a 4% decrease from the existing condition and is inconsequential as all alternate nest stands would remain intact. A minimum of 240 acres or 4% of suitable nest habitat in an average 6,000 acre home range is required for a suitable goshawk territory. With at least 36% of the home range meeting suitable characteristics, the ability of this home range to provide sufficient suitable nesting habitat to sustain a goshawk pair would not be compromised by this alternative.

Foraging Habitat: Approximately 158 acres of regeneration cuts would change timbered structure to the shrub/forb/grass (SFG) stage. In most cases commercial thins (CT) would maintain the current timber structure, and in some instances the size class would be increased. The commercial thins would develop larger trees over a shorter period of time when compared to no treatment as shown in Table 40. Of the 1,049 acres proposed for CT in the foraging area, 497 acres would be CT expected to go below 40% canopy cover. There would be no harvest proposed for sapling stands, so the 0-5” class would remain at 10.5%. The amount of the foraging area in both the >10” and >5” and >40% canopy cover size classes would still be above the desired 60% level after this alternative, see Table 55 above and WL16 for details.

Post Fledging Area (PFA): Two units in the PFA would be commercial thinned. Calculations of changed conditions is based on estimated canopy cover reduction and size class change from FVS runs on these stands (see Forest Vegetation section and WL15). In both units the average size of the residual stand would increase, and over 40% cover would be retained (WL2). The commercial thins would develop larger trees over a shorter period of time when compared to no

treatment as shown in Table 40. Approximately 23 acres of Unit 136 would be clearcut, essentially restarting the stand from the shrub/forb/grass (SFG) stage. Approximately 19 acres would be shelterwood cut, leaving the seedling/sapling understory as the residual stand. This alternative produces a small change in the PFA composition. The SFG stage would rise to nearly the desired 10%, however the 0-5" stage would be reduced from slightly over 10% down to about 6%. The larger proportion of the PFA in well-canopied, larger structure would not change quantitatively with this alternative.

Roadside Fuels Reduction

Cover would be reduced on 120 acres along roads. Only trees and snags under 6 inches d.b.h. would be removed in this treatment, so effects on goshawk habitat would be minimal.

Road Construction

Road building would affect about 21.4 acres of forest. It is expected there would be some loss of suitable goshawk habitat as a result of this activity. However, this would be an inconsiderable effect as almost all proposed roads occur within cutting units and over 2,300 acres (Table 54) of suitable nesting habitat would remain intact. The loss of cover from road construction would be essentially masked by the vegetation change of the units containing proposed road construction. The disturbance from the use of these roads during timber sale activities is covered in the open road density effects. All newly constructed roads would be put into long-term storage (or decommissioned, for temporary roads), limiting the time disturbance effects persist.

Alternative B Cumulative Effects for Northern Goshawk

For reasons discussed below, the existing suitable home range in the project area would be maintained. Potential adverse impacts from this project would not consequentially exceed effects from ongoing activities (e.g. road use, private logging). Therefore, the implementation of Alternative B may impact individual goshawks and goshawk habitat, but is not likely to adversely affect the use of the project area by goshawks. The retention of active, alternate, and potential nest stands (Table 54), the maintenance of desired levels of large timber structure and cover (Table 55, Table 56), and only minor changes (<5%) to the size class distribution (Table 55,Table 56) within the home range, along with active nest stand protection and PFA timing restrictions (see Design Features), means Alternative B may impact individuals or habitat, but would not indicate a local or regional change in habitat quality or population status for the northern goshawk . The impacts from proposed federal actions would not contribute appreciably to existing impacts.
Based on the best available science summarized in the *Management Indicator Species Considerations for the Idaho Panhandle National Forests* (Appendix C), the northern goshawk population trend appears to be stable and their habitat appears to be abundant and well-distributed across the Region. Additionally, the IPNF contains substantially more than enough habitat distributed throughout the Forest to support a minimum viable population of northern goshawk. Northern goshawks and active nest sites are documented across the Forest, including territories that have had multiple years of documented occupancy and reproductive success, and surveys periodically locate new territories and nest sites.

Existing goshawk habitat conditions are a result of previous management activities and natural conditions. Proposed activities, when added to the effects of past, present, and reasonably foreseeable activities (page 153, updated wildlife report pp.4-6), would not change the overall ability of the project area to support goshawk. Both suitable nesting and foraging habitat would be treated, see Table 54, Table 55. The changes resulting from these alternatives would not change the overall ability of the project area to support goshawk. There is an abundant amount of

nesting habitat in the project area. As a minimum, a suitable home range needs at least 240 acres in six suitable nest stands or areas (Brewer and others 2009). With enough suitable habitat for 51 potential nest stands, this home range has well over the necessary amount (Table 54). Given the retention of the six alternate nest stands and the amount of other suitable nesting habitat (2,051 ac.) present, the loss of a few potential nest stands is inconsequential. In addition, any active nest would receive a 40-acre no-activity buffer to comply with direction from the Northern Region Goshawk Overview (see EA, Design Features). There are approximately 32,967 acres of suitable nesting habitat on the IPNF (Samson 2006b, Bush, and Lundberg 2008); so this alternative would not noticeably affect forest-wide viability.

The proposed shelterwood cuts and commercial thinning would not change the existing size class structure of treated stands. Foraging habitat quality would be affected with some stands (especially those reduced to below 40% canopy cover) decreasing in quality; and in a few stands that were densely timbered, forage quality would be increased; however, all stands given intermediate treatments would remain forage habitat. The proposed clearcut and seedtree units would affect foraging suitability by converting timbered stands to the grass/forb/shrub stage. Both key values (amount of ≥10" trees and amount of trees ≥5" w/>40% cc) for foraging habitat would remain above the desired level. With the home range fully suitable, this alternative does not change the overall ability of the project area to support goshawk. The size class amounts would still be within a few percent of the desired levels of the foraging area diversity matrix; and as the two youngest size classes age these levels would be growing closer to desired conditions. Coupled with the maintenance of desired levels of canopy cover and larger trees (two bottom rows of Table 55, excluding Totals) it is expected that this foraging area would still be able to sustain the resident goshawks in this home range.

Alternative B would change the structure and composition in the two smallest size classes of the PFA. The SFG stage would be raised to nearly the desired 10%, however the 0-5" stage would be reduced from slightly over 10% down to about 6%. The commercial thinning of two stands would have a slight effect on habitat quality for goshawk. This alternative meets with direction from (Brewer and others 2009) in that post-treatment, the amount of high canopy cover (bottom row of Table 56) left in the PFA should fall within recommended ranges (≥ 60%), recognizing that managing at the lower end of the range is not supported by research specific to the Northern Region. Additionally, units proposed in the PFA would be subjected to an activity timing restriction to comply with direction from the Northern Region Goshawk Overview. This design feature would "allow no ground disturbing activities inside known occupied PFAs from April 15 through no sooner than August 15 to protect the goshawk pair and young from disturbance during the breeding season until fledglings are capable of sustained flight" (Brewer and others 2009). This includes Units 100, 102 and 136 for this alternative (see Table 12).

Alternative C Direct and Indirect Effects for Northern Goshawk

Timber Harvest and Activity Fuels Treatment

Nesting Habitat: Approximately 159 acres of suitable nesting habitat stands >40 acres would become unsuitable for goshawk habitat. These are all commercial thins, and canopy cover is expected to return to suitable levels (i.e. 40%) within five to thirty years. The commercial thins would develop larger trees over a shorter period of time when compared to no treatment as shown in Table 40. As with Alternative B, there would be no treatment of the existing nest stand or the designated alternate nest stands (297 ac.), and 2,447 acres would remain in suitable nesting habitat condition. The 3% decrease from the existing condition would be inconsequential because all alternate nest stands would remain intact. A minimum of 240 acres or 4% of suitable nest habitat in an average 6,000 acre home range is required for a suitable goshawk territory. At

least 37% of the home range would remain in suitable nesting condition, and it would continue to sustain the ability of the project area to provide nesting habitat for goshawks.

Foraging Habitat: Harvest types in this alternative are limited to commercial thins, so only the 82 acre prescribed burn would add to the shrub/forb/grass (SFG) layer, raising it to 11.9% As with Alternative B, no sapling stands are proposed for treatment, so the 0-5" class would remain at 10.5%. Alternative C proposes 795 acres of commercial thins in the foraging area. Of these, 370 acres are expected to go below 40% canopy cover; however, these areas would develop larger trees over a shorter period of time when compared to no treatment as shown in Table 40. Including the 82 acres of prescribed burn, 452 acres or 7.8% of the >5" and >40% canopy would be removed from this size and cover class. Existing size classes would be maintained or increased with the proposed commercial thins. The amount of the foraging area in both the >10" and >5" and >40% canopy cover size classes would still be above the desired 60% level after this alternative, see Table 55 above and WL16 for details.

Post-Fledging Area: Two units in the PFA would be commercial thinned. Calculations of changed conditions are based on estimated canopy cover reduction and size class change from FVS runs on these stands (see Forest Vegetation section and WL15). In both units the average size of the residual stand would increase, and over 40% cover would be retained (WL2); leaving the proportions of >10" timber and >40% cover amounts unchanged. The commercial thins would develop larger trees over a shorter period of time when compared to no treatment as shown in Table 40. The commercial thins would develop larger trees over a shorter period of time when compared to no treatment as shown in Table 40. Alternative C does not treat any other stands in the PFA, and conditions in the smaller size classes would be unchanged from the existing condition.

Roadside Fuels Reduction

There would be 127 acres of roadside fuel reduction occurring with this alternative, reducing cover along roads. Only trees and snags under 6" d.b.h. would be removed in this treatment, so effects on goshawk habitat would be minimal.

Road Construction

Road building would affect about 8.4 acres of forest with some loss of suitable goshawk habitat. This would be an inconsiderable effect, however, because all proposed roads occur within cutting units (where canopy loss is accounted for), and over 2,400 acres (Table 54) of suitable nesting habitat would remain intact. The disturbance from the use of these roads is covered in the open road density effects. All newly constructed roads would be put into long-term storage (or decommissioned, for temporary roads), limiting the time disturbance effects persist.

Alternative C Cumulative Effects for Northern Goshawk

For reasons discussed below, the existing suitable home range in the project area would be maintained. Potential adverse impacts from this project would not consequentially exceed effects from ongoing activities (e.g. road use, private logging). Therefore, the implementation of Alternative C may impact individual goshawks and goshawk habitat, but is not likely to adversely affect the use of the project area by goshawks. The retention of active, alternate, and potential nest stands (Table 54), the maintenance of desired levels of large timber structure and cover (Tables 40, 41), and only minor changes (<5%) to the size class distribution (Tables 40, 41) within the home range, along with active nest stand protection and PFA timing restrictions (see Design Features), mean Alternative C may impact individuals or habitat, but would not indicate a

local or regional change in habitat quality or population status. The impacts from proposed federal actions would not contribute appreciably to existing impacts.

Based on the best available science summarized in the *Management Indicator Species Considerations for the Idaho Panhandle National Forests* (Appendix C), the northern goshawk population trend appears to be stable and their habitat appears to be abundant and well-distributed across the Region. Additionally, the IPNF contains substantially more than more than enough habitat distributed throughout the Forest to support a minimum viable population of northern goshawk. Northern goshawks and active nest sites are documented across the Forest, including territories that have had multiple years of documented occupancy and reproductive success, and surveys periodically locate new territories and nest sites.

Existing goshawk habitat conditions are a result of previous management activities and natural conditions. Proposed activities, when added to the effects of past, present, and reasonably foreseeable future management activities (page 47, updated wildlife report pp.4-6), would not change the overall ability of the project area to support goshawk. Both suitable nesting and foraging habitat would be treated with this alternative, see Table 54, 53. The changes resulting from this alternative would not change the overall ability of the project area to support goshawk. There is an abundant amount of nesting habitat in the project area (WL16). As a minimum, a suitable home range needs at least 240 acres in six suitable nest stands or areas (Brewer and others 2009). With enough suitable habitat for 54 potential nest stands, this home range has well over the necessary amount (Table 54). Given the retention of the six alternate nest stands and the amount of other suitable nesting habitat (2,150 ac.) present, the loss of a few potential nest stands would be inconsequential. In addition, any active nest would receive a 40-acre no-activity buffer to comply with direction from the Northern Region Goshawk Overview (see EA, Design Features). There are approximately 32,967 acres of suitable nesting habitat on the IPNF (Samson 2006b, Bush, and Lundberg 2008); so this alternative would not noticeably affect forest-wide viability.

The proposed commercial thinning would not change the existing size class structure of treated stands. Foraging habitat quality would be affected with some stands (especially those reduced to below 40% canopy cover) decreasing in quality; and in a few stands that were densely timbered, forage quality would be increased; however, all stands given intermediate treatments would remain forage habitat. Both key values (amount of ≥10" trees and amount of trees ≥5" w/>40% cc) for foraging habitat would remain above the desired 60% level (Table 55). With the home range fully suitable, this alternative would not change the overall ability of the project area to support goshawk. The size class amounts would still be reasonably close to the desired levels of the foraging area diversity matrix, and as the two youngest size classes' age, these levels would be growing closer to desired conditions. Coupled with the maintenance of desired levels of canopy cover and larger trees, (two bottom rows of Table 55 excluding Totals row) it is expected that this foraging area would still be able to sustain the resident goshawks in this home range.

The structure and composition of the PFA would not be changed by this alternative. The commercial thinning of two stands would have a slight effect on habitat quality for goshawk. This alternative meets with direction from (Brewer and others 2009), in that post-treatment, the amount of high canopy cover (bottom row of Table 56) left in the PFA should fall within recommended ranges (≥60%), recognizing that managing at the lower end of the range is not supported by research specific to the Northern Region. Additionally, units proposed in the PFA would be subjected to an activity timing restriction to comply with direction from the Northern Region Goshawk Overview. This design feature would "allow no ground disturbing activities inside known occupied PFAs from April 15 through no sooner than August 15 to protect the goshawk pair and young from disturbance during the breeding season until fledglings are capable

of sustained flight" (Brewer and others 2009). This includes Units 100 and 102 for this alternative (see Table 12).

Conclusion of Effects

In addition, based on his review of the pertinent literature and synthesis of the best available science, as well as his habitat assessments, Samson (2006a) concluded that short-term viability of the goshawk in the Northern Region and IPNF is not an issue because:

- No scientific evidence exists that the northern goshawk is decreasing in numbers.
- Increases in the extent and connectivity of forested habitat have occurred since European settlement.
- Well-distributed and abundant northern goshawk habitat exists on today's landscape.
- Level of timber harvest is insignificant in the Northern Region (in 2009, 4,854 ha of 9,045,255 ha or 0.05% of the forested landscape) and on the IPNF (551 ha of 999,733 forested ha or 0.06% of the forested landscape) (USDA Forest Service 2010c). Over the last ten years, the Northern Region harvested 76,649 ha or 0.85% of the forested landscape and the IPNF harvested 15,367 ha or 1.54% of the forested landscape (USDA Forest Service 2010b). These figures include all types of harvest and does not indicate that all harvested hectares resulted in habitat loss or degradation for northern goshawks.

Consequently, the implementation of the action alternatives, in conjunction with the past actions, ongoing activities and reasonably foreseeable actions discussed above, may impact individuals or habitat, but would not indicate a local or regional change in habitat quality or population status for the northern goshawk.

Compliance with Forest Plan

As demonstrated in the proceeding analysis, the Charlie Preston project area contains both goshawks and their habitat. Specific to their designation as a MIS for old growth habitat, the Charlie Preston project would not be affecting old growth stands. The IPNF Forest Plan (USDA 1987) selected the northern goshawk as a management indicator species of old growth habitats and established guidance for managing old growth in part to provide for viable populations of this species. It states, "Approximately 10 percent of the Forest will be maintained in old growth as needed to provide for viable populations of old growth dependent and indicator management species." Although it has been shown since the 1987 Forest Plan that northern goshawks are not old growth dependent (Appendix C), old growth is addressed to illustrate continued compliance with the Forest Plan. To obtain the desired distribution, each designated old growth unit is managed to maintain approximately five percent old growth where it exists. The IPNF is meeting and exceeding the Forest Plan standard that calls for maintaining 10 percent of the forested portion of the IPNF as old growth (USDA 2010a). FIA data and stand-level allocated old growth also provides evidence that the old growth is well distributed across the IPNF (USDA 2010a). Additionally, neither of the action alternatives proposes treatment of any old growth stands in the project area.

<u>Applicable Forest Plan Standard</u>

7. Other Wildlife

> *a. Maintain at least minimum viable populations of management indicator species distributed throughout the Forest.*

Based on the best available science discussed in the *Management Indicator Species Considerations for the Idaho Panhandle National Forests* (Appendix C), the IPNF contains

substantially more than enough habitat distributed throughout the Forest to support a minimum viable population of northern goshawk. In addition, the best available science suggests that the goshawk population is, at a minimum, stable if not increasing slowly, and there has been no scientific evidence that the goshawk population is in decline.

Pileated Woodpecker (Updated Wildlife Report p. 53-63)

Methodology

Methodology for the analysis of project effects on pileated woodpeckers is taken from "A Conservation Assessment of the Northern Goshawk, Black-backed woodpecker, Flammulated Owl, and Pileated Woodpecker in the Northern Region, USDA Forest Service" (Samson 2006a), and "Old-growth Habitats and Associated Wildlife Species in the Northern Rocky Mountains" (USDA 1990).

Suitable habitat analysis for pileated woodpeckers is based on the R1 habitat model as described in Samson (2006a), and Bush and Lundberg (2008). This model was slightly modified to fit timber size class breaks used in the timber database for this project (e.g. 10" d.b.h. v. 9", 14" d.b.h. v. 15"). Model outputs were also supplemented with field data where available. A review of field data showed a good correlation between habitats identified as suitable in the field, and habitat that was determined to be suitable based on model parameters. The cumulative effects area is the project area, divided into individual home ranges of approximately 1,000 acres (Samson 2006b). Home ranges are delineated roughly along watershed boundaries, and need to provide enough nesting and foraging habitat to support a pair of woodpeckers. Winter foraging habitat is used as it is thought to be more limiting than foraging habitat at other times of year as most down logs, a foraging habitat component, are covered by snow.

Suitable nesting habitat are sawtimber (≥14" d.b.h.) and larger stands with at least 1 snag per acre ≥14" d.b.h. (Bush and Lundberg 2008). 200 acres of suitable or 100 contiguous acres of optimal nesting habitat should be included within the home range (USDA 1990). For this analysis optimal nesting habitat is defined as stands meeting suitable nesting criteria and allocated as old growth or recruitment old growth. The assumption is that these stands would provide higher quality habitat as they are among the oldest and largest in the area, and are therefore more likely to have the larger diameter dead and defective trees favored for nesting by pileated woodpeckers.

Suitable winter foraging stands are small sawtimber (≥10" d.b.h.) and larger stands with at least 1 snag per acre ≥10" d.b.h. (Bush and Lundberg 2008). The assumption is that the dead and defective trees used for feeding substrate will be present and will approximate the average diameter of the overall timber stand. Stands that meet criteria for suitable nesting habitat will also qualify as suitable foraging habitat (WL40). About 100 acres of suitable foraging habitat are required within a home range (Bonar 2001, in Samson 2006a). All forest types are considered suitable for foraging and nesting habitat, except for spruce, subalpine fir, mountain hemlock, lodgepole pine, and white pine. Suitable habitat stands must also be forested, that is have more than 10% canopy cover (Samson 2006b). Habitat estimates and potential effects are limited to NFS lands, as both timber industry and other private lands have been logged, roaded, and developed, or are expected to be in the future. These lands cannot be relied upon to provide habitat in the future, and are not under FS jurisdiction, and so are not used in calculations. Any suitable habitat occurring on private lands would serve to supplement conditions found on NFS lands.

To maintain populations of pileated woodpeckers, feeding and nesting habitat should be well distributed within each home range and throughout the project area. Warren (USDA 1990) recommends maintaining one suitable home range per 2,500 acres, to allow for recolonization of unoccupied habitat. For the approximately 7,400 acre Charlie Preston project area, this means

maintaining at least three suitable home ranges out of the potential six home ranges delineated on the 6,534 NFS acres within the project area.

Summary of Direct Effects

Pileated woodpeckers are known to exist in the project area through numerous observations and the presence of abundant feeding and roosting sign. Fifty-seven of the 77 (74%) stands that received wildlife field reviews during 2008-09 for determination of wildlife species habitat showed the presence of some level of use by pileated woodpeckers based on evidence of their distinctive feeding sign (WL10). Seven additional stands were reviewed in 2010; all had the distinctive pileated woodpecker feeding sign. The feeding sign was estimated to be fairly recent, perhaps less than 1 year old (WL10) in two of these stands. Signs of use spread over 76% of stands visited and seven observations of pileated woodpeckers between July 2008 and October 2010 (WL10 and project file map WL11) provide evidence the project area is able to support pileated woodpeckers. Pileated woodpeckers were also detected through surveys in 1994 (WL12). This evidence and current observations (WL10) show that pileated woodpeckers have been able to persist through ongoing management of NFS and nearby industrial timberlands as well as activities on private lands in and around the project area.

Six cumulative effects areas (CEAs) of at least 1,000 acres each were delineated within the project area. The table below shows the size of each CEA, its existing condition, and the effects of the alternatives on pileated woodpecker nesting and foraging habitat.

Table 57 – Pileated Woodpecker Suitable Habitat by Home Range (CEA) Expressed as a Percent of Capable Habitat

	Existing		Alt. B		Alt. C	
	Nesting	Foraging*	Nesting	Foraging*	Nesting	Foraging*
CEA 1 – 1103 ac.	327 ac.	592 ac.	314 ac.	592 ac.	336 ac.	592 ac.
CEA 2 – 1021 ac.	80 ac.	501 ac.	157 ac.	499 ac.	120 ac.	520 ac.
CEA 3 – 1022 ac.	464 ac.	625 ac.	390 ac.	629 ac.	464 ac.	699 ac.
CEA 4 – 1048 ac.	606 ac.	723 ac.	599 ac.	689 ac.	599 ac.	689 ac.
CEA 5 – 1057 ac.	397 ac.	721 ac.	397 ac.	721 ac.	397 ac.	721 ac.
CEA 6 – 1283 ac.	684 ac.	992 ac.	684 ac.	992 ac.	684 ac.	992 ac.

** - includes nesting habitat acres.*

A snag analysis of the project area found 68% of the NFS acres to be meeting Forest Plan snag standards, with 54% meeting recommendations from the R1 Snag Management Protocol (WL43). Five of the six CEAs have enough suitable nesting (≥200 acres) and foraging (≥100 acres) habitat to be considered suitable home ranges. This exceeds the recommendation for maintaining one suitable home range per 2,500 acres (USDA 1990). Suitable nesting (WL21) and foraging habitat is abundant and well distributed throughout the project area. When treatment of foraging habitat is discussed below, it refers to foraging habitat that does not meet nesting habitat criteria. The table above shows suitable habitat levels for each CEA and alternative.

Summary of Effects of Past, Present & Reasonably Foreseeable Activities for Pileated Woodpecker

Precommercial Timber Stand Improvement: Thinning young, small diameter trees would increase the overall health and vigor of the stands by improving species composition and structure, resulting in stands that are more ecologically stable in the face of potential disturbances. Consequently, thinning would help promote long-term stability of habitat conditions for snag-using species by increasing sizes and proportions of long-lived seral species that, ultimately, would result in greater availability of large-diameter snags of desired tree species.

Fire Suppression: Interrupting the periodic disturbances created by lethal wildfires through continued fire suppression probably has mixed impacts on species that use snags. High-intensity wildfire often sets stands back to an earlier successional stage, causing a loss of some snags while potentially creating other snags. In some cases, fire suppression would regenerate stands with high densities of small stems that may never produce snags of suitable size lacking disturbance. Fire suppression efforts may also protect existing mature stands and snags from stand-replacing fire. The amount of future fire and level of successful suppression is impossible to predict.

Public Activities (firewood gathering, motorized vehicle use): Personal-use firewood gathering along with various recreation activities such as hunting, snowmobiling, and driving (excluding off-road motorized use), would not have consequential effects on pileated woodpecker habitat. Personal-use firewood gathering is assumed to have removed snags within 200 feet of open roads on the District, and is factored into the existing condition. Firewood cutting is anticipated to continue along open roads. Because of this, it is generally assumed that these roadside areas do not provide sufficient habitat for snag dependent species. Various recreation activities and routine road maintenance are unlikely to have any impacts on pileated woodpeckers since they would not directly impact snag habitat. Off-road motorized use has the potential for some impacts to habitat, however no off-road use would be allowed after the Motor Vehicle Use Map is published which is expected before the completion of the Charlie Preston project.

Use of ATVs on Road1954 and the lower part of Road 1950: The seasonal use of these roads by ATVs from Memorial Day weekend through Labor Day weekend would occur with implementation of the St. Joe Travel Management Plan (which is expected before the completion of the Charlie Preston project). This would add to the open road density within the project area. As these roads would have already been opened for firewood cutting, it is not expected there would be many snags available within the road corridor for use as woodpecker habitat. ATVs are not generally used to gather firewood, so any potential impacts of snag habitat are likely to be inconsequential.

Alternative A (No Action) Direct, Indirect, and Cumulative Effects

This alternative does not include any vegetation treatment, and the existing forest structure and cover is expected to remain relatively unchanged in the near future. There would be no change to potential nesting or foraging habitat conditions with the No-Action Alternative. It would not reduce any suitable habitat, and the amount of higher quality habitat provided by old growth stands would persist in the project area. Succession would continue on mature stands and improve their suitability for pileated habitat, as tree size increases and snags continue to be produced. With over 200 and 100 acres of well distributed suitable nesting and foraging habitat respectively, 5 of 6 of the cumulative effects areas (CEAs) are considered suitable home ranges. CEA 2 has adequate amounts of foraging habitat, but less than 200 acres of suitable nesting habitat; and is therefore not considered to be a suitable home range. This CEA would remain an unsuitable home range. The ability of the project area to continue to provide suitable pileated woodpecker home ranges would be unchanged with this alternative. Alternative A would have no impact on pileated woodpeckers.

Direct and Indirect Effects Common to Alternatives B and C for Pileated Woodpecker

Planting Conifer Trees: The planting of trees in regeneration units of Alternative B would have no consequential effects on existing snag habitat. Alternative C has no regeneration units so the only planting would occur in the off-site ponderosa pine burn discussed below.

Pocket Gopher Control Baiting: This activity would not affect vegetation or suitable habitat and has a low probability of affecting other species (WL34). Pileated woodpeckers are insect eaters and are unlikely to eat the poisoned bait placed underground. There should be no adverse effects from the potential gopher baiting activity on non-target wildlife species. A more detailed analysis of potential effects from gopher control is located in the project file (WL34a, WL34b).

Off-Site Ponderosa Pine Burn: This activity would burn about 82 acres to reduce the occurrence of off-site pine, create snags, and rejuvenate the shrub component of the stands. The creation of various sizes and amounts of snags is expected to improve conditions for species that use snags.

Bald Mountain Fuel Reduction: Lopping, piling and burning slash in an existing regeneration unit that was precommercial thinned ten years ago would have no effect on snag habitat for woodpeckers. No treatment of snags is proposed and there are no snags present.

Biomass Removal: This activity would have no effect on woodpeckers as the removal and sale of material from piles along road edges and landings would not affect snag habitat.

Open Gates for Firewood Access: The area within 200 feet of roads (USDA 1987 Appendix X) is not relied upon to provide snag habitat. Any potential impacts to snag habitat adjacent to open roads from up to three seasons of firewood cutting are likely to be inconsequential for this species.

Snag and Cavity Habitat Creation: The creation of snag and cavity nesting habitat across 150 acres is expected to benefit species that use snags and trees with decay related characteristics. As these trees age and/or die the amount of habitat available for woodpeckers should increase.

Road Reconstruction: Existing roads are not considered to be suitable wildlife habitat, so their reconstruction would not affect wildlife species. Effects from the use of reconstructed roads are covered under the effects of the open road density.

Road Storage and Decommissioning: The storage and decommissioning of existing roads would not affect pileated woodpeckers. There is no snag habitat present immediately adjacent to these roads to be affected by this activity.

Fish Migration Barrier Culvert Removal/Replacement: This is a project with a small area of impact that does not have any snags. The proposed culvert work would not affect this species.

Fisheries Habitat Improvement Projects: Planting conifer seedlings along streams and placing large woody debris in streams would not affect woodpeckers. Snags would not be cut for use as logs to be placed in streams. Snag habitat would not be affected by these activities.

Creation of Dispersed Campsites: This activity would not affect snag habitat, except that snags adjacent to a potential dispersed campsite may be cut for firewood. These sites are on open roads. Personal-use firewood gathering is assumed to have removed snags within 200 feet of open roads on the District, and is factored into the existing condition. The use and disturbance from open roads are accounted for within the open road density, and would have little impact on wildlife habitat.

Alternative B Direct and Indirect Effects for Pileated Woodpecker

See Table 57 for effects of Alternative B on nesting and foraging habitat by home range (cumulative effects area).

Timber Harvest and Activity Fuels Treatment: The majority of the proposed timber harvest would be commercial thinning (1133 acres) and would be unlikely to cause the mesic timbered habitat to become unsuitable. In general, roughly half or more of the overhead cover would be retained in these units, which would keep the timbered conditions intact (WL2); although there

could be some incidental loss of snags through logging operations. The commercial thins would develop larger trees over a shorter period of time when compared to no treatment as shown in Table 40. Clearcut, seed tree, shelterwood and overstory removal units are proposed (414 acres). These would reduce timbered habitat quality for woodpeckers due to the maintenance or creation of openings with greatly reduced canopy. Timbered snag habitat (forested stands large enough to produce snags ≥10" d.b.h.) would be reduced from 4,562 to 4,148 acres (updated wildlife report, Table WL1). This would be a 7% reduction, leaving 63% of the project area as timbered snag habitat. Prescribed burning could damage snags, but it could potentially create snags as well. Snag guidelines would be met under both types of harvest (pages 34, 35), maintaining the most important aspect of woodpecker habitat in the project area. See the updated wildlife report (pages 58-61) for descriptions of effects on each home range (cumulative effects area).

Roadside Fuels Reduction: Cover would be reduced on 120 acres along roads. Riparian vegetation within these treatment areas would be untreated, reducing potential impacts and maintaining cover on potential connections to upland habitat. All trees and snags over 6 inches d.b.h. would be retained in this treatment, so larger snags that are preferred would remain; and effects on pileated woodpecker habitat would be minimal.

Road Construction: Road building would affect about 21.4 acres of forest. It is expected there would be some loss of snags as a result of this activity. However snag guidelines would be met overall for the project area (pages 34, 35), maintaining the most important aspect of woodpecker habitat. The disturbance from the use of these roads is covered in the open road density effects; and would not affect pileated woodpeckers much as there are adequate areas available to disperse to.

Alternative B Cumulative Effects for Pileated Woodpecker

Alternative B could potentially reduce suitable pileated woodpecker habitat through the incidental loss of snags and some canopy reduction, so it may impact individuals or habitat, but would not indicate a local or regional change in habitat quality or population status for the pileated woodpecker. The ability of the CEAs to provide suitable home ranges would not be changed by this project. The recommendation to maintain at least three suitable home ranges within this project area would continue to be met (p.184). The impacts from proposed federal actions would not contribute appreciably to existing impacts (e.g. from firewood cutting, private logging and road building) and would not affect population viability.

Based on the best available science summarized in the *Management Indicator Species Considerations for the Idaho Panhandle National Forests* (Appendix C), the pileated woodpecker population trend is increasing and their habitat appears to be abundant and well-distributed across the Region. The IPNF contains far more than enough large snag habitat than required by the Forest Plan and recommended by the scientific literature to support a minimum viable population of pileated woodpeckers (Samson 2006b). Pileated woodpeckers and their foraging sign are commonly seen and documented across the Forest.

Existing pileated woodpecker habitat conditions are a result of natural conditions and previous management activities, and pileated woodpeckers have been able to persist through ongoing management of NFS and nearby industrial timberlands as well as activities on private lands in and around the project area. Proposed activities, when added to the effects of past, present, and reasonably foreseeable activities (p. 184-185 and updated wildlife report pp. 4-6) and continuing timber growth and mortality, would not consequently impact pileated woodpecker populations. The majority (73%) of suitable habitat for pileated woodpeckers in the project area would not be treated with this project. Habitat quality and quantity is expected to increase over time as these stands continue to grow and age. Optimal nesting habitat (allocated old growth) would be

maintained at existing levels. The trend for continuing tree mortality through insect and disease agents is expected to persist (See Forest Vegetation section). The project area's ability to support pileated woodpeckers should improve over time on untreated stands. Most habitat treated would still remain suitable, although at a lower quality. The retention of moderate canopy levels, large timber structure, and the application of snag and leave tree guidelines means most treated stands could still provide suitable habitat. The ability of the CEAs to provide suitable home ranges would not be changed by this project. The recommendation to maintain at least three suitable home ranges within this project area would continue to be met (p.184). The amount of nesting and foraging habitat remaining, and the design features (e.g. snag retention levels, RHCA buffers) and prescriptions that would be used on treated stands (mainly commercial thinning) would maintain the overall suitability of the project area for pileated woodpeckers.

Areas outside of proposed treatment units would continue to provide snags at existing levels in the short term and the number of snags and down woody material in these areas would increase as stands age and grow. 76% of the project area is outside of the proposed treatment units and the existing snag and cavity habitat present there would be unaffected by Alternative B. Areas would be reserved from treatment within riparian buffers. Snags would be retained in treatment units unless they pose a safety hazard. If they do, they would be felled and left to contribute to the down wood component. Snags would be created with the prescribed burn unit. Snags would also persist in areas of the timber sale units physically unable to be logged, for example terrain breaks or out-of-reach spots. Cavity habitat formation would be enhanced through the fungal inoculation portion of the project. Green tree retention needs would be met as the commercial thin prescriptions (73% of the proposed harvest in Alternative B) call for thinning from below, leaving adequate numbers of larger leave trees on site.

Design features of the project were devised to ensure the retention and selection of snags at a level and distribution which has been shown to support viable populations of species that use snags and down logs (see design features on page 34). Snags and snag replacements would be retained at levels recommended by scientific literature based on recent studies (USDA 2000). Snag retention monitoring of a past timber sale in the project area found 82% of the treated acres monitored are meeting the snag guidelines required by that project (see project file document WL27). Snag retention objectives for the Charlie Preston project exceed Forest Plan standards.

Alternative C Direct and Indirect Effects for Pileated Woodpecker

See Table 57 for effects of Alternative C on nesting and foraging habitat by home range (cumulative effects area).

Timber Harvest and Activity Fuels Treatment: All of the proposed timber harvest would be commercial thins (896 acres) and is unlikely to cause the timbered habitat to become unsuitable. In general roughly half or more of the overhead cover would be retained in these units, which would keep the timbered conditions intact (WL2). The commercial thins would develop larger trees over a shorter period of time when compared to no treatment as shown in Table 40. No new openings would be created. The amount of timbered snag habitat would remain unchanged from the existing condition, although there could be some incidental loss of snags through logging operations. Prescribed burning could damage snags, but it could potentially create snags as well. Snag guidelines would be met, maintaining the most important aspect of woodpecker habitat in the project area (pages 34, 35). See the updated wildlife report (pages 58-61) for descriptions of effects on each home range (cumulative effects area).

Roadside Fuels Reduction: Cover would be reduced on 127 acres along roads. Riparian vegetation within these treatment areas would be untreated, reducing potential impacts and

maintaining cover on potential connections to upland habitat. All trees and snags over 6 inches d.b.h. would be retained, so effects on pileated woodpecker habitat would be minimal.

Road Construction: Road building would affect about 8.4 acres of forest. It is expected there would be some loss of snags as a result of this activity. However, snag guidelines would be met overall for the project area (pages 34, 35), maintaining the most important aspect of woodpecker habitat. The disturbance from the use of these roads is covered in the open road density effects and would not affect pileated woodpeckers much as there are adequate areas available to disperse to.

Alternative C Cumulative Effects for Pileated Woodpecker

Alternative C could potentially reduce suitable pileated woodpecker habitat through the incidental loss of snags; so it may impact individuals or habitat, but it would not indicate a local or regional change in habitat quality or population status for the pileated woodpecker. The ability of the CEAs to provide suitable home ranges would not be changed by this project. The recommendation to maintain at least three suitable home ranges within this project area would continue to be met (p.184-185). The impacts from proposed federal actions would not contribute appreciably to existing impacts (e.g. from firewood cutting, private logging and road building) and would not affect population viability.

Based on the best available science summarized in the *Management Indicator Species Considerations for the Idaho Panhandle National Forests* (Appendix C), the pileated woodpecker population trend is increasing and their habitat appears to be abundant and well-distributed across the Region. The IPNF contains far more than enough large snag habitat than required by the Forest Plan and recommended by the scientific literature to support a minimum viable population of pileated woodpeckers (Samson 2006b). Pileated woodpeckers and their foraging sign are commonly seen and documented across the Forest.

Existing pileated woodpecker habitat conditions are a result of natural conditions and previous management activities, and pileated woodpeckers have been able to persist through ongoing management of NFS and nearby industrial timberlands as well as activities on private lands in and around the project area. Proposed activities, when added to the effects of past, present, and reasonably foreseeable activities (p. 184-185 and updated wildlife report pp. 4-6) and continuing timber growth and mortality, would not consequently impact pileated woodpecker populations. The majority (73%) of suitable habitat for pileated woodpeckers in the project area would not be treated with this project. Habitat quality and quantity is expected to increase over time as these stands continue to grow and age. Optimal nesting habitat (allocated old growth) would be maintained at existing levels. The trend for continuing tree mortality through insect and disease agents is expected to persist (See Forest Vegetation section). The project area's ability to support pileated woodpeckers should improve over time on untreated stands. Most habitat treated would still remain suitable, although at a lower quality. The retention of moderate canopy levels, large timber structure, and the application of snag and leave tree guidelines means most treated stands could still provide suitable habitat. The ability of the CEAs to provide suitable home ranges would not be changed by this project. The recommendation to maintain at least three suitable home ranges within this project area would continue to be met. The amount of nesting and foraging habitat remaining and the design features (e.g. snag retention levels, RHCA buffers) and prescriptions (only commercial thinning) would maintain the overall suitability of the project area for pileated woodpeckers.

Areas outside of proposed treatment units would continue to provide snags at existing levels in the short term and the number of snags and down woody material in these areas would increase as stands age and grow. 76% of the project area is outside of the proposed treatment units and the

existing snag and cavity habitat present there would be unaffected by the proposed action and alternatives. Areas would be reserved from treatment within riparian buffers. Snags would be retained in treatment units unless they pose a safety hazard. If they do, they would be felled and left to contribute to the down wood component. Snags would be created with the prescribed burn unit. Snags would also persist in areas of the timber sale units physically unable to be logged, for example terrain breaks or out-of-reach spots. Cavity habitat formation would be enhanced through the fungal inoculation portion of the project. Green tree retention needs would be met as the commercial thin prescriptions call for thinning from below, leaving adequate numbers of larger leave trees on site.

Design features of the project were devised to ensure the retention and selection of snags at a level and distribution which has been shown to support viable populations of species that use snags and down logs (See design features on page 34). Snags and snag replacements would be retained at levels recommended by scientific literature based on recent studies (USDA 2000). Snag retention monitoring of a past timber sale in the project area found 82% of the treated acres monitored are meeting the snag guidelines required by that project (WL27). Snag retention objectives for the Charlie Preston project exceed Forest Plan standards.

Conclusion of Effects

In addition, based on his review of the pertinent literature and synthesis of the best available science, as well as his habitat assessments, Samson (2006a) concluded that short-term viability of the pileated woodpecker in the Northern Region and IPNF is not an issue because:

- No scientific evidence exists that the pileated woodpecker is decreasing in numbers.
- Increases in the extent and connectivity of forested habitat have occurred since European settlement.
- Well-distributed and abundant pileated woodpecker habitat exists on today's landscape.
- Level of timber harvest is insignificant in the Northern Region (in 2009, 4,854 ha of 9,045,255 ha or 0.05% of the forested landscape) and on the IPNF (551 ha of 999,733 forested ha or 0.06% of the forested landscape) (USDA Forest Service 2010c). Over the last ten years, the Northern Region harvested 76,649 ha or 0.85% of the forested landscape and the IPNF harvested 15,367 ha or 1.54% of the forested landscape (USDA Forest Service 2010b). These figures include all types of harvest and does not indicate that all harvested hectares resulted in habitat loss or degradation for pileated woodpeckers.

Consequently, the implementation of either action alternative, in conjunction with the past actions, ongoing activities and reasonably foreseeable actions discussed above, may impact individuals or habitat, but would not indicate a local or regional change in habitat quality or population status for the pileated woodpecker.

Compliance with Forest Plan

As demonstrated in the proceeding analysis, the Charlie Preston project area contains both pileated woodpeckers and their habitat. Specific to their designation as a MIS for old growth habitat, the Charlie Preston project would not be affecting old growth stands. The IPNF Forest Plan (USDA Forest Service 1987) selected the pileated woodpecker as a management indicator species for old growth habitats and established guidance for managing old growth to provide for viable populations of this species. It states, "Approximately 10 percent of the Forest will be maintained in old growth as needed to provide for viable populations of old growth dependent and indicator management species." Although it has been shown since the 1987 Forest Plan that pileated woodpeckers are not old growth dependent (Appendix C), old growth is addressed here to illustrate continued compliance with the Forest Plan. To obtain the desired distribution, each

designated old growth unit would be managed to maintain approximately five percent old growth where it exists. The IPNF is meeting and exceeding the Forest Plan standard that calls for maintaining 10 percent of the forested portion of the IPNF as old growth (USDA Forest Service 2010a). FIA data and stand-level allocated old growth also provides evidence that the old growth is well distributed across the IPNF (USDA Forest Service 2010a). In addition, there would be no treatment of any old growth stands within the project area.

Applicable Forest Plan Standards

7. Other Wildlife

> *a. Maintain at least minimum viable populations of management indicator species distributed throughout the Forest (see Appendix L for indicator species selection process Forest Plan, p. II-28).*

Based on the best available science discussed in the *Management Indicator Species Considerations for the Idaho Panhandle National Forests* (Appendix B), the IPNF contains substantially more than enough habitat distributed throughout the Forest to support a minimum viable population of pileated woodpecker. Pileated woodpeckers and their foraging sign are also seen and documented across the Forest. In addition, the best available science indicates that the pileated woodpecker population is increasing in the Northern Rockies and there has been no scientific evidence that the pileated woodpecker population is in decline.

> *b. Maintain habitat for cavity nesting species and foraging substrates by implementation of the IPNF Snag and Woody Down Timber Guidelines (Appendix X).*

Based on the best available science discussed in the *Management Indicator Species Considerations for the Idaho Panhandle National Forests* (Appendix C), the IPNF contains substantially more large snags per acre than are required by the IPNF Snag and Woody Down Timber Guidelines for maintaining a minimum viable population of pileated woodpeckers.

Management Indicator Species – Species Commonly Hunted, Fished or Trapped

Elk (Updated Wildlife Report pp. 63-69)

Elk are an important big game species within the analysis area. Elk were identified in the Forest Plan as a species commonly hunted and affected by planned management activities. They were selected as a management Indicator species for the Central and South Zones of the IPNF. They are an important economic species that are of common public interest and are monitored by the Idaho department of fish and game. The IDFG is responsible for setting the harvest regulations for elk. By having populations that support harvest levels, viability is not a concern for this species (Appendix C).

Methodology

The analysis area for elk was determined by considering the proposed action, the delineated Elk Habitat Unit (EHU), and logical topographic boundaries (i.e. ridges and streams) within the EHU. For the purpose of displaying effects from the proposed action and to display the differences between alternatives, the analysis area was broken into separate evaluation areas based on home range size. Smaller watershed drainages (timber compartments) within the EHU area are used to provide a logical delineation of these individual elk analysis areas. The Charlie Preston EHU Management Area map (WL29), shows the numbers and arrangement of the timber compartment areas used for this project.

To establish habitat management potential goals for the Forest, Elk Habitat Units (EHUs) were delineated across the Forest. There are 14 EHUs on the St. Maries portion of the St. Joe Ranger District. In 1993 the Forest Service and Idaho Department of Fish and Game established an elk habitat potential (EHP) target of .42 for EHU 6, to meet the Forest Plan EHP goal of .53 on the St. Maries portion of the St. Joe Ranger District. The weighted average EHP of the individual EHUs is used to calculate the overall elk habitat potential for the St. Maries portion of the St. Joe Ranger District. EHP targets are not assigned for the individual elk analysis areas within an elk habitat unit; however a higher individual area elk habitat potential provides a better chance that the overall EHU will meet the target EHP value.

The Charlie Preston project area is entirely in Elk Habitat Unit 6, the Charlie Creek and South Fork Santa Creek drainages. The South Fork Santa-Charlie EHU 6 is used as the cumulative effects area. The smaller home range-sized elk analysis areas are used to determine and display direct and indirect project level effects. One of these smaller areas, compartment 417 (Hume Creek and West Fork Charlie Creek) would cover the direct and indirect effects for the Charlie Preston Project Area.

To disclose how the proposed action and alternatives would affect elk and potential elk use of habitat, the *Guidelines for Evaluating and Managing Summer Elk Habitat in Northern Idaho* (Leege 1984) was used. The procedure evaluates various factors affecting elk habitat quality (e.g. road miles, security acres, cover, forage, and other factors) and assigns a numerical rating. (Forage and cover are evaluated within the analysis area for desired levels; see WL24 for a detailed analysis). This rating is used to determine elk habitat quality expressed as a percent of potential elk use, or Elk Habitat Potential (EHP).

If all habitat factors were in optimum abundance and distribution, habitat would be rated at 100% of potential. If the procedure calculates the habitat to be at 50% of potential, this indicates that the area can support 50% as many elk as it could if all factors were optimal. Optimum conditions are rarely met, especially if roads are present. The most important factor usually regulating use of habitat by elk is disturbance by people. Most disturbance (and hunting mortality) is related to roads (Leege 1984). The Elk Habitat Potential is largely determined by the open road density and amount of secure habitat (>.5 miles from open roads) available in the analysis area. For this analysis, any type of motorized use is considered an open road. If the amount of secure habitat is below 20% of an EHU, it decreases the elk habitat potential. Motorized trails contribute to the open road density of an analysis area. Roads and trails closed to motorized use during hunting season do not detract from the amount of secure habitat in this analysis. This is because the elimination of motorized use during hunting season is expected to reduce hunting pressure and the chances of elk being killed.

Due to the presence of large, nearly contiguous blocks of private lands (over which the Forest Service has no jurisdiction); EHUs on the St. Maries part of the District are calculated using only road/trail miles on and acres of National Forest System (NFS) lands (WL23). Habitat estimates and potential effects for this project are limited to NFS lands, as both timber industry and other private lands have been logged, roaded, and developed, or are expected to be in the future. These lands cannot be relied upon to provide habitat or security in the future, and are not under FS jurisdiction, and so are not used in calculations. Although elk may use adjoining private lands, for the purposes of this analysis they are not considered necessary to meet elk habitat requirements.

Affected Environment

Past disturbances, forest succession, the existing road systems, and present management of roads combine to affect existing elk habitat quality. A small portion (20%), of the project area is

identified in the Forest Plan as big game winter range (i.e. MA-4). However, elk use the area throughout the year. Goals for wildlife in MA-4 are to provide sufficient forage and cover. Forage habitat is supplied by past regeneration harvest units distributed throughout the area, riparian shrubfields which occur mainly along Hume Creek and Charlie Creek; and open timbered stands with a shrub component. Cover habitat is abundant, as 75% of the project area has timber cover, mainly in the 10-14" and 14-20" size classes. Cover, forage, and their availability are not thought to limit big game habitat in the project area. Areas that typically are used by wildlife (including elk) for travel include ridges, riparian areas, and saddles. Areas in the project area that provide suitable conditions for travel have been mapped (WL33) and considered in the development and design of the proposed action and alternatives.

The existing EHP of the 19,164-acre EHU 6 is .36, which is below the .42 minimum habitat level set by agreement between the Forest Service and the Idaho Department of Fish and Game. The existing open road density (ORD) is 1.8 mi./mi^2. About 14.3% of the EHU is secure habitat (WL17).

Elk are common in the project area. At least a dozen stands field reviewed for this project showed at least some signs of elk use, such as tracks, trails, pellets, rubs and browsed vegetation (WL3). Some areas are used heavily, as evidenced by deeper trailing and high browse amounts. The combination of forage openings and timber cover is providing good quality elk habitat in the project area (WL22). Travel corridor conditions are adequate within the project area. Timbered corridors exist in most locations; however there are a few spots where travel corridor quality and usefulness has been degraded by past activities. Elk continue to be commonly hunted in North Idaho. Population trends for elk are stable (IDFG 2008a).

Summary of Direct Effects

Table 58 displays the existing condition and the effects of the proposed activities on open road density, security and elk habitat potential (EHP) by alternative for the project area and the cumulative effects area. Conditions during the activities are not displayed for the individual elk analysis area compartment 417 or the elk habitat unit (EHU). This is because short-term reductions in habitat potential are allowed for within the entire EHU, as long as some security areas are provided during sale activities. Design features (p.34) would provide for some temporal and spatial separation of sale activities during project implementation. The total project would have to be logged as different individual sales, or sale subdivisions at different times. This would provide wildlife with other parts of the project area to disperse to when sales are ongoing in any one section of the project area.

Table 58 – Open Road Density, Security, and Elk Habitat Potential (EHP) for Elk Analysis Areas

Elk Analysis Area	Criteria	Ex. Con.	Alt. A	Alt. B	Alt. C
Compartment 417 Charlie-Preston 6,534 NFS acres	Open Road Density	0.84	1.27	1.27	1.27
	Secure acres	2701	2701	2701	2701
	% Security	41.3	41.3	41.3	41.3
	EHP	.50	.47	.58	.59
EHU 6	Open Road Density	1.8	1.9	1.9	1.9
	Secure acres	2737	2737	2737	2737
	% Security	14.3	14.3	14.3	14.3
	EHP	.36	.36	.39	.40

Open road densities are shown in miles per square mile. Alternative A is the No-Action Alternative. Figures depict post-activity conditions. Compartment 417 is the drainages within the Charlie Preston project area. Post-activity conditions include seasonal use of roads for firewood access and then as ATV routes w/travel mgmt. implementation.

Summary of Effects of Past, Present, and Reasonably Foreseeable Future Activities for Elk

Precommercial Timber Stand Improvement: Thinning young, small diameter trees would increase the overall health and vigor of the stands. It would reduce hiding cover somewhat, and extend the length of time the treated stands may provide forage habitat. This activity would originate from existing roads, so while it may cause a minor disturbance to elk during implementation, there would be no long-term effects.

Fire Suppression: Continued fire suppression would help retain forest cover, further contributing to reduction of foraging habitat for ungulates. However, the effects of fire suppression on ungulate habitat are difficult or impossible to quantify as some cover is required for thermoregulation and to reduce hunting vulnerability.

Public Activities (firewood gathering, motorized vehicle use): Personal-use firewood gathering along with various recreation activities such as hunting, snowmobiling, and driving (excluding off-road motorized use) would not consequently impact elk since these activities have minimal effects on habitat. The effects of snowmobiling, driving, and potential hunting mortality are linked to the open road system and are addressed by the analysis of motorized route densities.

Use of ATVs on Road 1954 and the lower part of Road 1950: The seasonal use of these roads by ATVs from Memorial Day weekend through Labor Day weekend would occur with implementation of the St. Joe Travel Management Plan (which is expected before the completion of the Charlie Preston project). This would add to the open road density within the project area, (see Table 58). As these roads are closed just after Labor Day, they would provide secure habitat during hunting season, and therefore maintain the existing level of security in the project area and EHU.

Alternative A Direct, Indirect, and Cumulative Effects for Elk

No vegetation management would occur, so there would be no change in the amount of forage habitat available for ungulates. Hiding cover would remain unaffected as there would be no roadside fuels reduction activities. Potential travel corridors would retain their existing cover. The amount of open roads and trails would remain unchanged, maintaining the amount of secure habitat available for elk. There would be no new road construction, however no storage or decommissioning of roads would take place, and the elk habitat potential of .36 would remain below the desired target of .42 (p.184). Population trends for elk would remain stable (IDFG 2008a).

Alternatives B and C Direct and Indirect Effects Common to Alternatives B and C for Elk

Both action alternatives would maintain the open road/trail density and amount of secure habitat. Both alternatives would store and decommission roads, with a resultant increase in EHP. Each of these alternatives would improve conditions for elk by varying degrees. The potential exists for disturbance from timber sale related activities to any elk that may be in the project area. However, there would be inconsiderable potential for adverse effects as elk would be able to disperse to other parts of the project area and elk habitat unit (EHU) during sale activities.

Planting Conifer Trees: Planting trees in regeneration units of Alternative B would have no immediate effects on elk. The establishment of the planted trees would shorten the time needed for the stands to provide hiding cover; as well as how long forage habitat would persist. The slight positive and negative effects of this activity for big game species are considered to roughly balance out. Therefore tree planting is essentially a neutral activity in terms of elk. Alternative C

has no regeneration units so planting would only occur in the off-site ponderosa pine unit discussed below.

Pocket Gopher Control Baiting: This activity would not affect vegetation or suitable habitat and has a low probability of affecting other species (WL34). Elk are herbivores and would not be expected to come into contact with the bait placed in underground burrows. There should be no adverse effects from the potential gopher baiting activity on non-target wildlife species. A more detailed analysis of potential effects from gopher control is located in the project file (WL34a, WL34b).

Off-Site Ponderosa Pine Burn: This activity would burn about 82 acres to reduce the occurrence of off-site pine, create snags, and rejuvenate the shrub component of the stands. Forage amounts would increase by 0.8% and the enhancement of the shrub component would improve forage conditions for ungulates.

Bald Mountain Fuel Reduction: Lopping, piling and burning slash in an existing regeneration unit that was precommercial thinned ten years ago would maintain open habitat conditions for big game. Effects on elk would remain roughly unchanged.

Biomass Removal: This activity would have no effect on elk as the removal and sale of material from piles along road edges and landings would not affect elk habitat. Uses of roads for this activity are incorporated into the open road density (see Table 58).

Open Gates for Firewood Access: The removal of snags for firewood would not appreciably affect habitat for big game species. As these roads are closed right after Labor Day, they would provide secure habitat during hunting season and therefore maintain the existing level of security.

Snag and Cavity Habitat Creation: The creation of snag and cavity nesting habitat across 150 acres is expected to benefit species that use snags and trees with decay related characteristics. This activity would not directly affect conditions for elk.

Road Reconstruction: Existing roads are not considered to be suitable wildlife habitat, so their reconstruction would not affect wildlife species. Effects from the use of reconstructed roads are covered under the effects of the open road density. All reconstructed roads would be placed in long-term storage after project activities, so they would not reduce elk security areas.

Road Storage and Decommissioning: The action alternatives propose to store and/or decommission five miles of existing roads. While these roads are currently not open for public motorized use, storage or decommissioning improves the effectiveness of the closures for wildlife. The EHP of the project area would increase (see Table 58), improving conditions for elk. (The .01 difference in EHP between alternatives B and C is due to slightly different amounts of road that would be stored in each alternative).

Fish Migration Barrier Culvert Removal/Replacement: This is a project with a small area of impact that does not have any effects on big game habitat; therefore, the proposed culvert work would not affect elk.

Fisheries Habitat Improvement Projects: Planting conifer seedlings along streams and placing large woody debris in streams would not affect big game species. Therefore, there would be no effect on elk from this activity.

Creation of Dispersed Campsites: This activity would not affect habitat for big game, as it would be confined to areas already cleared of vegetation along open roads. These potential campsites are on open roads, so the use and disturbance from them are accounted for within the open road density. They would have little impact on wildlife habitat.

Alternative B Direct and Indirect Effects for Elk

Timber Harvest and Activity Fuels Treatment: The majority of the proposed timber harvest would be commercial thins (1133 acres) which could, over time, cause a small increase in available forage for ungulates due to increased light to the understory vegetation while retaining overhead cover. Approximately 70% of the project area provides hiding cover and 30% provides thermal cover. Both hiding and thermal cover are over the minimum recommended amounts (40% and 15%, respectively) specified in the guidelines (Leege 1984). Well over 25% of each quadrant (62% - 84%) qualifies as cover, either hiding or thermal (WL24). Based on the amount and distribution of cover, there would be no reduction in elk habitat potential with this alternative. Clearcut, seed tree, shelterwood, and overstory removal units (414 acres) would create future forage beneficial to big game. Forage amounts would increase by 3.8% and would be adequate and present in all quadrants of the project area. Post-harvest activity fuels treatments would not appreciably change these effects. Travel corridors (WL33) would be maintained, however, their effectiveness would be reduced in two areas due to proposed units that are adjacent to existing openings. Two proposed seedtree cuts (with a temporary road in one unit) would affect approximately 2,200 feet of ridge-top travel corridor. While some cover would be retained with leave trees, these two lengths of corridor would have reduced quality for wildlife movement. This alternative would treat twenty-five units along travel corridors (WL33); the majority (20 of 25) with commercial thins. Although a design feature would retain a minimum level of canopy (30%) in designated travel corridors, the reduction in cover along the ridgetop portions of these proposed units could decrease travel corridor quality from the existing condition. The reduction in canopy in these proposed treatment units, particularly in the five adjacent to existing openings, is likely to decrease the travel habitat quality for elk over the short term (i.e. < 10 years).

Roadside Fuels Reduction: Cover would be decreased on 120 acres along roads, and some of this decrease would be along roads that are open during hunting season. Given the well-timbered condition of most of the project area (75% cover, WL24), this action is not expected to have consequential effects on elk.

Road Construction: 4.5 miles of new road and 0.6 miles of temporary road construction would occur under this alternative. All these roads would be either decommissioned (.6 miles of temporary roads), or put into long-term storage after timber harvest activities. As a result there would be no change to open road densities after sale activities are concluded. Effects are measured by the open road densities (see Table 58). Two roads would be built across a travel corridor with this alternative. Another 400 feet of road would be constructed within 100' of a potential ridge top travel corridor. Given the relatively narrow width of these roads, their location in commercial thin units retaining over 30% canopy cover; and the fact that they would be put into long-term storage after use, effects on elk are expected to be inconsiderable.

Alternative B Cumulative Effects for Elk

The federal actions evaluated in this proposal would not cause any adverse cumulative effects because of: the maintenance or improvement of conditions for elk, (as shown by the maintenance or increase in EHP), design criteria which would avoid adverse impacts (e.g. by maintaining travel corridor habitat, use of a seasonal rather than year-round ATV route), and no major changes in elk habitat. There would be a potential for a slight improvement in conditions for elk because of the increase in EHP. Alternative B may impact elk and elk habitat, but for the above reasons is not likely to result in persistent detrimental effects. Elk are expected to persist both in the project area and across the district, and population trends would remain stable (IDFG 2008a).

Existing elk habitat conditions are a result of previous management activities and natural conditions. As this project would only affect about 34% of the cumulative effects area (EHU6)

for elk (WL29), the overall EHP cannot be increased enough to meet the target of .42. The EHP for EHU 6 would increase but remain below the current target condition of .42 (see Table 58). The open road density would increase (0.84 to 1.27 mi./mi.^{2}) as a result of the implementation of the seasonal ATV route (currently a year-round closure) from the St. Joe Travel Management Plan. Potential travel corridors would be maintained, and the amount of secure habitat (2,737 ac., 14.3%), would continue unchanged. At the scale of the St. Maries portion of the district, the cumulative effect of the action alternatives on elk would increase the overall district wide EHP from .55 to .56 (WL42) (These figures are based on implementation of the St. Joe Travel Management Plan). This exceeds the .53 target set between the USFS and IDFG for the St. Maries end of the St. Joe Ranger District.

Alternative C Direct and Indirect Effects for Elk

Timber Harvest and Activity Fuels Reduction: All of the proposed timber harvest would be commercial thins (896 acres) which could, over time, cause a small increase in available forage for ungulates due to increased light to the understory vegetation while retaining overhead cover. 74.6% of the project area provides hiding cover and 34.0% provides thermal cover. Both hiding and thermal cover are over the minimum recommended amounts (40% and 15%, respectively) specified in the guidelines. Well over 25% of each quadrant (68% - 84%) would qualify as cover, either hiding or thermal (WL24). Based on the amount and distribution of cover, there would be no reduction in elk habitat potential with this alternative. No new openings to provide future forage would be created. Existing forage amounts would be adequate and present in all quadrants of the project area. Post-harvest activity fuels treatments would not appreciably change these effects. This alternative would treat sixteen units along travel corridors (WL33), all with commercial thins. Although a design feature would retain a minimum level of canopy (30%) in designated travel corridors, the reduction in cover along the ridgetop portions of these proposed units could decrease travel corridor quality from the existing condition. The reduction in canopy in these proposed treatment units, particularly in the two adjacent to existing openings, is likely to decrease the travel habitat quality for elk over the short term (i.e. < 10 years).

Roadside Fuels Reduction: Cover would be decreased on 127 acres along roads, and some of this decrease would be along roads that are open during hunting season. Given the well timbered condition of most of the project area (75% cover, WL24), this action is not expected to have consequential effects on elk.

Road Construction: 1.6 miles of new road and 0.4 miles of temporary road construction would occur under this alternative. All these roads would be either decommissioned (.4 miles of temporary roads), or put into long-term storage after timber harvest activities. As a result there would be no change to open road densities after sale activities are concluded. Effects are measured by the open road densities (see Table 58). Travel corridors (WL33) would be maintained, however there would be a slight reduction in their quality in two areas due to proposed system road construction. One road would be built across a travel corridor, and another 400 feet of road would be constructed within 100 feet of a potential ridge-top travel corridor. Effects on elk are expected to be inconsequential given the relatively narrow width of these roads, their location in commercial thin units that would retain over 30% canopy cover; and the fact that they would be put into long-term storage after use.

Alternative C Cumulative Effects for Elk

The federal actions evaluated in this proposal would not cause any adverse cumulative effects because of: the maintenance or improvement of conditions for elk, (as shown by the maintenance or increase in EHP), design criteria which would avoid adverse impacts (e.g. by maintaining travel corridor habitat, use of a seasonal rather than year-round ATV route), and no major changes

in elk habitat. There would be a potential for a slight improvement in conditions for elk because of the increase in EHP. Alternative C may impact elk and elk habitat, but for the above reasons it is not likely to result in persistent detrimental effects. Elk are expected to persist both in the project area and across the district, and population trends would remain stable (IDFG 2008a).

Existing elk habitat conditions are a result of previous management activities and natural conditions. As this project would only affect about 34% of the cumulative effects area (EHU6) for elk (WL29), the overall EHP cannot be increased enough to meet the target of .42. The EHP for EHU 6 would increase but remain below the current target condition of .42 (see Table 58). The open road density would increase (0.84 to 1.27 mi./mi.^{2}) as a result of the implementation of the seasonal ATV route (currently a year-round closure) from the St. Joe Travel Management Plan. Potential travel corridors would be maintained, and the amount of secure habitat (2,737 ac., 14.3%), would continue unchanged. At the scale of the St. Maries portion of the district, the cumulative effect of the action alternatives on elk would increase the overall district wide EHP from .55 to .56 (WL42) (These figures are based on implementation of the St. Joe Travel Management Plan). This exceeds the .53 target set between the USFS and IDFG for the St. Maries end of the St. Joe Ranger District.

Other Wildlife Species - Species Commonly Hunted, Fished or Trapped

Marten (Updated Wildlife Report pp. 70-79)

Marten are ranked "Secure: common, widespread, and abundant" in Idaho (IDFG 2005). Current marten information from the Idaho Department of Fish and Game indicates the species is stable throughout northern Idaho, and there continues to be a marten trapping season (IDFG 2008). Based on their population status and their identification as a species commonly hunted, fished, or trapped, viability is not a concern for the marten.

The effects of the project on marten are discussed and the appropriate management of their habitat is addressed. Due to some overlap in their habitat associations with fisher (Ruggiero and others 1994), the effects to the portion of marten habitat that is similar (e.g. lower elevation, late-successional, mesic) can be ascertained by referring to the fisher analysis. However, suitable marten habitat encompasses a broader spectrum of habitats than fisher based on the scientific literature (Ruggiero and others 1994, Samson 2006b), including stands with smaller diameter trees and a more open canopy. Additionally, marten have been shown to use higher elevation habitats and areas with more snow depth than are used by fisher (Ruggiero and others 1994, pers. comm. Albrecht 2011). Consequently based on their broader habitat associations than fisher, marten habitat is more abundant (Bush and Lundberg 2008) and does not appear to be limiting across the landscape. Based on DNA and remote camera surveys conducted over the past seven years in north Idaho (e.g. over 400 verified marten detections), marten appear to be abundant and well-distributed across the Forest.[1]

Methodology

To conduct the analysis, assess potential effects and compare alternatives, the analysis uses management guidelines pertaining to suitable habitat levels and trapping vulnerability from *Habitat Conservation Assessments and Strategies for Forest Carnivores in Idaho (Draft)*, (IDFG 1995). This report also uses the latest science direction for the Northern Region found in *Habitat Estimates for Maintaining Viable Populations of the Northern Goshawk, Black-backed*

[1] The marten data for this figure was provided by the Coeur d'Alene Tribe as a courtesy and are not on file with the USDA Forest Service.

Woodpecker, Flammulated Owl, Pileated Woodpecker, American Marten, and Fisher (Samson 2006b) to help determine habitat suitability in an analysis area. Size class delineations and descriptions from the IPNF FSVEG Database are used in this analysis. These existing conditions are a result of past activities and natural conditions. Changes from the existing condition are displayed and discussed relative to habitat and trapping vulnerability within the project area.

The goal at the scale of this analysis (i.e. the Charlie Preston project area) is to maintain functional home ranges and contribute to a spatial distribution of multiple home ranges that provide population viability (IDFG 1995). The use of a cumulative effects area at this scale facilitates analysis and determination of effects, and allows the methodology recommended in the above scientific literature to be applied. The cumulative effects areas used are based on a potential marten home range. The sizes used in this project approximate the midpoint (~15 km^2 or 3,707 ac.) of the home range sizes from Samson (2006b), as adjusted to fit logical drainage patterns within the project area. Habitat estimates and potential effects are limited to NFS lands, as both timber industry and other private lands have been logged, roaded, and developed, or are expected to be in the future. These lands cannot be relied upon to provide habitat in the future, and are not under FS jurisdiction, and so are not used in calculations.

For this project, timber subcompartments 417-1, 2, 3, 4 and 8 totaling 3,523 NFS acres is cumulative effects area 1(CEA 1); and subcompartments 417-5, 6, and 7 totaling 3,011 NFS acres is CEA 2. CEA 1 is the south and east portion of the project area, to the south of the West Fork of Charlie Cr. CEA 2 is the north and west portion of the project area to the north of the West Fork of Charlie Cr. Although martens may use adjoining private lands, for the purposes of this analysis they are not considered necessary to meet marten suitable habitat requirements. There are enough NFS acres present to constitute these home ranges, without including adjacent private lands.

Trapping is an activity with the potential to affect local populations of forest carnivores, but the Forest Service has no jurisdiction concerning trapping; and it is beyond the scope of this project analysis. However, open road densities affect vulnerability (to trapping) and are addressed.

Vegetation/Habitat

Late successional habitat is an important component of forest carnivore habitat (Ruggiero and others 1994). The physical structure of the forest appears to be more important for marten than the species composition. Habitat management considerations for marten emphasize maintaining large forest habitat. Mature riparian forest is especially important for denning sites and travel ways. Based on habitat requirements, the quality, amount and distribution of suitable habitat within the drainage is considered the most important factor for marten. Suitable habitat for marten was determined following the R1 model developed in Samson (2006b) and updated in Bush and Lundberg (2008). Suitable habitat is described as all forest types, with $\geq$30% canopy cover and all stand sizes greater than pole (WL40). For this project a 10” d.b.h. was used as the break between the pole and small sawtimber size classes. Stand structure >14” d.b.h. is considered to be late successional habitat in this analysis. Habitat conditions were determined from stand exam results, photo interpretation, and wildlife field reviews that focused on habitat conditions for species with the potential to occur in and be affected by management activities in the project area. (See Project file document WL8 for details of suitable marten habitat analysis). While there is no specific guideline for the amount of suitable habitat required, changes in suitable habitat amounts and distribution are used to display project effects. Direction for this project area would maintain or improve the existing home range habitat quality in order to provide sufficient habitat to support martens. The retention of: 30-40%; >40%; and 65-75% suitable large forest habitat in a home range are guidelines for maintaining low; moderate; and high quality marten habitat, respectively (IDFG 1995).

Access/Vulnerability Risk

Trapping-vulnerability risk has been cited as one of the factors affecting forest carnivores in Idaho (IDFG 1995). "Roads constructed along streams and other riparian areas increase access for trappers and trap vulnerability of marten because this species forages and selects resting sites in these areas" (IDFG 1995). Roads are correlated with trapping vulnerability and human disturbance. For areas with fisher or marten trapping seasons, areas with greater than or equal to 1mi/mi^2 open road densities have a high risk to trapping-vulnerability for fisher and marten. Areas with 0.25 - 1mi/mi^2 open road densities have a moderate risk, and areas with $\leq$ 0.25mi/mi^2 open road densities have a low risk (Heinemeyer and Jones 1994). As the effects from roads are associated with access, roads that effectively (either physically or legally) restrict motorized use are not included in the road density. The open road density used for analysis includes all roads and trails open to all motorized vehicles (i.e. motorcycles, ATV's, automobiles, snowmobiles); during any time of year.

Affected Environment

The Coeur d'Alene Tribe (CDAT) and Forest Service (FS) have conducted hair snare surveys for fisher from 2006 – 2008 (Albrecht and Heusser 2009) and 2007 – 2010 respectively (WL38). This survey method is also effective for marten as they are forest carnivores that use similar habitat to fisher. Although no marten have been detected in the Charlie Preston project area, widespread numerous detections (60 from CDAT and 11 from FS surveys) indicate there is a marten population on the St. Joe Ranger District (WL36).

Table 59 below shows the amount of larger timbered structure available to provide marten habitat for each CEA. Alternative A displays the existing condition. Marten suitable habitat can be composed of both young and large/mature forest, but in general the greater the proportion of late successional forest the better quality the habitat is. This is due to the greater occurrence of larger trees, snags, and downed wood available for denning, resting, and feeding substrate. For this analysis the terms large, mature, and late successional are considered equivalent; and refer to forest structure composed of the 14-20" d.b.h. Sawtimber size class and the >20" d.b.h. Large Sawtimber size class. (A stand's size class is determined by whichever size class has the majority of basal area present). Since all forest and habitat types are considered capable habitat, the entire amount of the NFS lands (6,534 ac.) in the project area is potential habitat.

Table 60 below shows the amount of suitable marten habitat for each potential home range or cumulative effects area (CEA). With 66% (CEA 1) and 71% (CEA 2) of the home ranges in suitable habitat conditions, marten habitat is abundant and widespread throughout the project area, see project file map (WL19). Both home ranges are considered to have the potential to support marten.

Table 62 below shows the existing open road density in the wildlife analysis area to be below 1 mi/mi^2 and classed as a moderate trapping/vulnerability risk (IDFG 1995).

Summary of Direct and Indirect Effects for Marten

Table 59 shows the change in forest structure by alternative for each CEA. The amount of large timber structure present is a major factor in determining analysis area habitat quality. The proposed commercial thinning would remove mainly the smaller trees, in some cases leaving stands dominated (i.e. a majority of the basal area) by the larger timber. These stands would then be considered the large forest size classes, and if $\geq$30% canopy cover remained; would still qualify as suitable habitat. The commercial thins would develop larger trees over a shorter period of time when compared to no treatment as shown in Table 40.

Table 59 – Acres and Percent of Forest Structure by Cumulative Effects Area (CEA) and Alternative

CEA 1 – 3523 acres Charlie Preston Forest Structure	ALTERNATIVE					
	A		B		C	
	acres	%*	acres	%*	acres	%*
Large/mature forest**	1328	37.7	1355	38.5	1423	40.4
Young forest	1046	29.7	920	26.1	931	26.4
Pole/sapling	809	23.0	698	19.8	747	21.2
Seedling/non-forest	340	9.7	550	15.6	422	12.0
Total	3523	100.1	3011	100	3523	100
CEA 2 – 3011 acres Charlie Preston Forest Structure	**ALTERNATIVE**					
	A		**B**		**C**	
	acres	%*	acres	%*	acres	%*
Large/mature forest**	1542	51.2	1572	52.2	1573	52.2
Young forest***	646	21.5	586	19.5	615	20.4
Pole/sapling	530	17.6	530	17.6	530	17.6
Seedling/non-forest	293	9.7	323	10.7	293	9.7
Total	3011	100	3011	100	3011	99.9

**The % figure shown is the percent of the cumulative effects area.*
***Large/mature forest is database size classes sawtimber (14-20" d.b.h.) & large sawtimber (>20" d.b.h.)*
****Young forest equates to database size class small sawtimber (10-14" d.b.h.)*

The amount and distribution of large size class suitable habitat present in an analysis area is an indicator of the quality of the area for marten and the ability of that subdrainage to provide a home range or ranges with the potential to support the animals. 30% – 40% suitable large forest habitat equals low quality, 40% - 65% is moderate quality, and 65% - 75% is considered high quality marten habitat (IDFG 1995). The following table displays the amount of suitable habitat present in the Charlie Preston project area by alternative. Alternative A (no action) shows the existing condition, the remaining alternatives show expected values after all project activities are completed.

Table 60 – Suitable Marten Habitat by Cumulative Effects Area and Alternative

	Existing		Alt. B		Alt. C	
	Suitable	% of CEA	Suitable	% of CEA	Suitable	% of CEA
CEA 1 – 3523 ac.	2333 ac.	66.2%	2193 ac.	62.2%	2303 ac.	65.4%
Large forest >14"	1287 ac.	**36.5%**	1299 ac.	**36.9%**	1384 ac.	**39.3%**
Young forest 10-14"	1046 ac.	29.7%	894 ac.	25.4%	919 ac.	26.1%
CEA 2 – 3011 ac.	2142 ac.	71.1%	2072 ac.	68.8%	2104 ac.	69.9%
Large forest >14"	1514 ac.	**50.3%**	1515 ac.	**50.3%**	1574 ac.	**52.3%**
Young forest 10-14"	628 ac.	20.9%	557 ac.	18.5%	530 ac.	17.6%
Charlie Preston	4475 ac.	68.5%	4265 ac.	65.3%	4407 ac.	67.4%

(Figures in bold are the main factor in determining marten habitat quality)

Due to their importance in supplying suitable habitat and providing preferred travel corridors, the condition of riparian zones also affects marten habitat. The riparian buffers required to meet INFS guidelines would maintain this habitat during and after the proposed activities. All the action alternatives would treat some road within riparian areas to improve stream function. This project would restore more natural conditions to the streams and accompanying riparian vegetation by storing and decommissioning roads. This would begin the process of restoring and moving the riparian habitat closer to desired conditions, thereby improving habitat for marten in

the long term. The following table displays the amount of riparian road storage and decommissioning by alternative, along with the portion that is encroaching (within 50 feet) on the streams (WL35).

Table 61 – Road Miles Treated within Riparian Habitat Conservation Areas

Alternative	A	B	C
Road miles treated	0	1.2	1.2
Encroaching Road miles treated	0	0.3	0.3

Table 62 below displays the existing condition and the effects on open road densities and local trapping-vulnerability risk by alternative. Alternative A is the No-Action Alternative. Alternatives B and C display post-project conditions after all planned road work has been completed. All alternatives show conditions with implementation of the St. Joe Travel Management Plan, which is expected before all activities from this project are completed.

Table 62 – Trapping Vulnerability Risk for Marten

	Existing Condition	Alternative A	Alternative B	Alt. C
Charlie Preston Project Area	Open road density/trapping-vulnerability risk			
	0.84/moderate	1.27/high	1.27/high	1.27/high

Open road density is shown in miles per square mile.

Summary of Effects of Past, Present & Reasonably Foreseeable Activities for Marten

Precommercial Timber Stand Improvement: Thinning young, small diameter trees is unlikely to have impacts on martens. No suitable habitat would be altered, and there would be no off-road vehicle use associated with this activity. This treatment should reduce the time needed to reach suitable habitat conditions, (i.e. large size class w/closed canopy); although the positive effects would not be realized for several decades.

Fire Suppression: Continued fire suppression would not appreciably impact marten habitat. The suppression of fires in large-sized, well-canopied stands would retain suitable habitat. Denser understories resulting from lack of fire could provide more cover for small mammals that are a source of prey. As a result, fire suppression may benefit marten in the short term, although the longer term effect would be to contribute to ongoing fuel loading that may result in larger future wildfires. Since the occurrence of fire starts in the project area is uncertain, both short and long term effects of fire suppression are difficult to quantify.

Public Activities (firewood gathering, motorized vehicle use): Personal-use firewood gathering along with various recreation activities such as hunting, snowmobiling, and driving (excluding off-road motorized use) are not likely to impact marten populations. With the exception of firewood gathering, these activities would not affect marten habitat. Potential modifications to forested habitat would be inconsequential because relatively few snags are cut, and these would be within 200 feet of open roads where snag habitat is not relied upon. While there is a risk of mortality associated with trapping along open roads, these instances would be infrequent and isolated because most public use occurs during the drier months when trapping is less likely; and roads in the project area are not part of the groomed snowmobile route system. Off-road motorized use has the potential for adverse impacts to habitat, however no off-road use would be allowed after the Motor Vehicle Use Map is published which is expected before the completion of the Charlie Preston project.

Use of ATVs on Road 1954 and the lower part of Road 1950: The seasonal use of these roads by ATVs from Memorial Day weekend through Labor Day weekend would occur with implementation of the St. Joe Travel Management Plan (which is expected before the completion of the Charlie Preston project). This would add to the open road density within the project area, as well as the length of roads open along riparian areas which are potential travel corridors for marten. This would increase the open road density to 1.27mi./mi.2 for all alternatives (see Table 62); and as a consequence, cause an increase in the local trapping-vulnerability risk from moderate to high.

Alternative A Direct and Indirect Effects for Marten

There would be no change in habitat conditions for marten under the No-Action alternative. The amount of suitable habitat and overall analysis area habitat quality would not change from existing conditions. Current road management would continue, so there would be no change in the open road system or the amount of riparian roads present. There would be no treatment of roads encroaching on riparian areas, so no improvement to riparian habitat or conditions for marten along potential riparian travel corridors. The local trapping-vulnerability risk would remain moderate in the project area.

Alternative A Cumulative Effects for Marten

Existing forest habitat information reflects conditions that are a result of previous management activities and natural conditions; and Alternative A would not change habitat quality, the amount of suitable habitat, or the ability of the area to support marten. As this alternative does not affect any large/mature or suitable habitat, there would be no change to habitat quality for marten in the project area. The amount of suitable large forest habitat and the ability of the project area to support two marten home ranges would also remain unchanged. The overall habitat quality in each home range would be maintained, see Table 60. There would be no riparian road treatment and consequently no long-term improvement in the condition of these roaded riparian corridors as it relates to marten. There would be no road storage or decommissioning to reduce open road densities, so the cumulative effect of the implementation of the seasonal ATV routes under the St. Joe Travel Management plan would increase the current moderate local trapping-vulnerability risk to high, see Table 62. Therefore, this alternative may impact individuals, but this increased opportunity for trapping is unlikely to indicate a change in species occurrence on the district or population across the Forest. Suitable habitat to support two marten home ranges within the project area would be maintained. Marten would remain common, widespread, and abundant in Idaho (IDFG 2005); and the species would remain stable throughout northern Idaho (IDFG 2008b).

Direct and Indirect Effects Common to Alternatives B and C for Marten

Planting conifer trees: The planting of trees in regeneration units of alternative B would have no consequential effects on existing marten habitat. Recently created openings are not expected to provide habitat for many years. Tree planting would speed vegetative recovery, but not to a point useful for marten in the short term. Alternative C has no regeneration units so no planting would occur.

Pocket Gopher Control Baiting: This activity would not affect vegetation or suitable habitat and has a low probability of affecting other species (WL34). Marten are not expected to make much use of newly created openings, and therefore are unlikely to come into contact with the poisoned bait. There should be no adverse effects from the potential gopher baiting activity on non-target wildlife species. A more detailed analysis of potential effects from gopher control is located in the project file (WL34a, WL34b).

Off-Site Ponderosa Pine Burn: This activity would burn about 82 acres to reduce the occurrence of off-site pine, create snags, and rejuvenate the shrub component of the stands. This unit is suitable but not large/mature timbered habitat, and is lower quality habitat due to existing openings within the unit. The loss of 3.5% of lower quality suitable habitat in CEA 1 through the proposed burn would have inconsiderable effects on marten habitat; because there would still be between 30% and 40% of suitable large forest habitat remaining to maintain the existing low quality habitat in CEA1.

Bald Mountain Fuel Reduction: Lopping, piling and burning slash in an existing regeneration unit that was precommercial thinned ten years ago would have no effect on habitat for marten. Existing openings far from streams are unlikely to be used by marten, and the open unsuitable conditions would be maintained by this project.

Biomass Removal: Marten may use slash piles as resting sites. Piles with the most habitat value would be within forested stands and not along open roads. This activity would have no effect on marten as the removal and sale of material from piles along road edges and landings would not affect marten habitat.

Open Gates for Firewood Access: The area within 200 feet of roads is not relied upon to provide snag habitat (USDA 1987 Appendix X). Standing snags are a component of marten habitat. Any potential impacts to snag habitat within 200 feet of roads from up to three seasons of firewood cutting are likely to be inconsequential for marten.

Snag and Cavity Habitat Creation: The creation of snag and cavity nesting habitat across 150 acres is expected to benefit species that use snags and trees with decay related characteristics. There would be little change to forested habitat conditions, and both a direct and indirect effect in available potential habitat for resting and denning.

Road Storage and Decommissioning: The five miles of proposed road decommissioning and storage of existing roads in the action alternatives may tend to decrease the trapping risk, especially along riparian areas. This effect is difficult to evaluate in any meaningful way as all roads to be stored or decommissioned with this project are currently closed to public motorized use. Open road densities and the trapping vulnerability risk would remain unchanged in the project area since the roads to be stored are currently closed to public motorized use. Table 61 shows 1.2 miles of riparian road would be treated under the action alternatives, contributing to an improvement in future riparian habitat conditions. Of this total, approximately 0.3 miles of road encroaching on riparian areas (at creek crossings and within 50 feet of creeks) in the project area would be recontoured. This would begin the process of restoring and moving the riparian habitat closer toward desired conditions thereby improving habitat for wildlife.

Fish Migration Barrier Culvert Removal/Replacement: The effects of replacing or removing six culverts (for aquatic organism passage and 100 year flood compliance, see Aquatic Organisms Resource Report) are also hard to quantify; but are expected to improve riparian habitat. Improved riparian habitat conditions are expected to be beneficial for wildlife species including marten.

Fisheries Habitat Improvement Projects: Planting conifer seedlings along streams and placing large woody debris in streams would not directly affect marten. The improved riparian conditions that are expected with increased vegetation and woody structure from this project would improve habitat for wildlife species including marten.

Creation of Dispersed Campsites: This activity would not affect marten habitat, as log landings and open roads are not suitable habitat. These potential campsites are on open roads, so the use and disturbance from them is accounted for within the open road density, and would have little additional impact on wildlife habitat.

Alternative B Direct and Indirect Effects for Marten

Timber Harvest and Activity Fuels Treatment: The majority of the proposed timber harvest would be commercial thins (1133 acres) and would be unlikely to cause the mesic timbered habitat to become unsuitable. Some overhead cover would be retained in these units, which would keep the timbered conditions intact; although there could be some incidental loss of snags through logging operations. The commercial thins would develop larger trees over a shorter period of time when compared to no treatment as shown in Table 40. Clearcut, seed tree, shelterwood, and overstory removal units (414 acres) would likely reduce suitable timbered habitat quality for marten due to the maintenance or creation of openings. Suitable habitat in CEA 1 would be reduced to 2,193 acres or 62%, which is a 4% change in suitable habitat from existing conditions. In CEA 2, suitable habitat would be reduced to 2,072 acres or 68.8%, which is a 2.3% change from existing conditions (see Table 60). This would change 3.2% of the suitable marten habitat in the project area to unsuitable. Through commercial thinning from below while retaining large structure, this alternative would add 12 acres in CEA 1 and 1 acre in CEA 2 to the suitable large/mature forest habitat size class which can provide higher quality suitable marten habitat. This would be a 0.4% increase in the amount of mature forest in CEA 1 and 1.0% increase in CEA 2 (see Table 59). These are all fairly small changes that would not affect the ability of either CEA to support marten; as the amount of suitable large forest habitat would remain at low and moderate levels, for CEA1 and CEA2 respectively. Post-harvest activity fuels treatments would not appreciably change these effects. Prescribed burning could damage snags, but it could potentially create snags as well. Snag guidelines would be met, maintaining an important aspect of marten habitat in the project area.

Roadside Fuels Reduction: Cover would be reduced on 120 acres along roads. Riparian vegetation within these treatment areas would be untreated, reducing potential impacts and maintaining cover on potential connections to upland habitat. All trees and snags over 6 inches d.b.h. would be retained in this treatment, so effects on marten habitat would be minimal.

Road Construction: Road building would affect about 21.4 acres of forest. It is expected there would be some loss of suitable marten habitat as a result of this activity. However this would be an inconsiderable effect as over 4,200 acres of suitable habitat would remain intact; which is enough to support existing habitat conditions (CEA1 - low quality, CEA2 – moderate quality) for marten. The disturbance from the use of these roads during timber sale activities is covered in the open road density effects. All newly constructed roads would be put into long-term storage (or decommissioned, for temporary roads), limiting the time disturbance effects persist.

Alternative B Cumulative Effects for Marten

The protection of potential travel habitat along streams, and only minor changes to suitable timbered habitat marten may use, coupled with the low probability of marten presence (Table 53), means this alternative may impact individuals or habitat, but would not likely indicate a local or regional change in overall habitat quality or population status. The impacts from proposed federal actions under this alternative would not contribute appreciably to existing impacts and would not affect the persistence of martens on the St. Joe Ranger District. Suitable habitat to support two marten home ranges within the project area would be maintained. Marten would remain common, widespread, and abundant in Idaho (IDFG 2005); and the species would remain stable throughout northern Idaho (IDFG 2008b).

Existing forest habitat conditions are a result of previous management activities and natural conditions. The proposed activities, when added to the effects of past, present, and reasonably foreseeable future activities (p.179 and updated wildlife report pp.4-6), are not expected to adversely affect the ability of the project area as a whole to provide marten habitat. There would

be a 0.4% increase for CEA 1 and a 2.8% increase for CEA 2 in the suitable large size class after harvest activities. The overall quality of the CEAs would not appreciably change with this alternative, and it is unlikely the 4% and 2% reduction in the amount of suitable habitat for each CEA would reduce the ability of the project area to support marten (Table 60). By maintaining current low and moderate habitat quality of CEA 1 and CEA 2 respectively, this alternative is considered capable of contributing to the marten population on the district. The degree of change in timbered vegetation is not expected to adversely affect the ability of the project area as a whole to provide marten habitat. Although the proposed 1.2 miles of riparian road storage would start to improve riparian corridor conditions for marten, the cumulative effect of the implementation of the seasonal ATV routes under the St. Joe Travel Management EA would increase the current local trapping-vulnerability risk from moderate to high (see Table 62).

Alternative C Direct and Indirect Effects for Marten

Timber Harvest and Activity Fuels Treatment: All of the proposed timber harvest would be commercial thins (896 acres) and would be unlikely to cause the mesic timbered habitat to become unsuitable. Some overhead cover would be retained in these units which would keep the timbered conditions intact; although there could be some incidental loss of snags through logging operations. No new openings would be created through timber harvest. Suitable habitat in CEA 1 would be reduced to 2,303 acres or 65.4%, which is a 0.8% change in suitable habitat from existing conditions. In CEA 2, suitable habitat would be reduced to 2,104 acres or 69.9%, which is a 1.2% change from existing conditions (See Table 60). This would change 1.1% of the suitable marten habitat in the project area to unsuitable. Through commercial thinning from below while retaining large structure, this alternative would add 97 acres in CEA 1 and 60 acres in CEA 2 to the large/mature forest habitat size class; which can provide higher quality suitable marten habitat. This would be a 2.8% increase in the amount of suitable large/mature forest in CEA 1 and 2.0% increase in CEA 2 (see Table 59). These are inconsequential changes and would not affect the ability of either CEA to support marten as the amount of suitable large forest habitat would remain at low and moderate levels, for CEA1 and CEA2 respectively. The commercial thins would develop larger trees over a shorter period of time when compared to no treatment as shown in Table 40. Post-harvest activity fuels treatments would not appreciably change these effects. Prescribed burning could damage snags, but it could potentially create snags as well. Snag guidelines would be met, maintaining an important aspect of marten habitat in the project area.

Roadside Fuels Reduction: Cover would be reduced on 127 acres along roads. Riparian vegetation within these treatment areas would be untreated, reducing potential impacts and maintaining cover on potential connections to upland habitat. All trees and snags over 6 inches d.b.h. would be retained in this treatment, so effects on marten habitat would be minimal.

Road Construction: Road building would affect about 8.4 acres of forest. It is expected there would be some loss of suitable marten habitat as a result of this activity, however, this would be an inconsiderable effect as over 4,400 acres of suitable habitat would remain intact, which is enough to support existing habitat conditions (CEA1 - low quality, CEA2 – moderate quality) for marten. The disturbance from the use of these roads is covered in the open road density effects. All newly constructed roads would be put into long-term storage (or decommissioned, for temporary roads), limiting the time disturbance effects persist.

Alternative C Cumulative Effects for Marten

The protection of potential travel habitat along streams, and only minor changes to suitable timbered habitat marten may use, coupled with the low probability of marten presence (Table 60), means this alternative may impact individuals or habitat, but would not likely indicate a local or

regional change in overall habitat quality or population status. The impacts from proposed federal actions under this alternative would not contribute appreciably to existing impacts and would not affect the persistence of martens on the St. Joe Ranger District. Suitable habitat to support two marten home ranges within the project area would be maintained. Marten would remain common, widespread, and abundant in Idaho (IDFG 2005); and the species would remain stable throughout northern Idaho (IDFG 2008b).

Existing forest habitat conditions are a result of previous management activities and natural conditions. The proposed activities, when added to the effects of past, present, and reasonably foreseeable future activities, are not expected to adversely affect the ability of the project area as a whole to provide marten habitat. There would be a 2.8% increase for CEA 1 and a 2% increase for CEA 2 in the suitable large size class after harvest activities. The overall quality of the CEAs would not appreciably change with this alternative, and it is unlikely the 1% reduction in the amount of suitable habitat for each CEA would reduce the ability of the project area to support marten (Table WL27). By maintaining current low and moderate habitat quality of CEA 1 and CEA 2 respectively, this alternative is considered capable of contributing to the marten population on the district. The degree of change in timbered vegetation is not expected to adversely affect the ability of the project area as a whole to provide marten habitat. Although the proposed 1.2 miles of riparian road storage would start to improve riparian corridor conditions for marten, the cumulative effect of the implementation of the seasonal ATV routes under the St. Joe Travel Management plan would increase the current local trapping-vulnerability risk from moderate to high (see Table 62).

Consistency with Forest Plan and other Regulations

The alternatives are consistent with applicable goals, direction, standards, and guidelines from the Forest Plan for the management of wildlife habitat and species populations (see WL23 – Forest Plan Standards Compliance document in the wildlife project file). All alternatives comply with other direction and recommendations regarding management of the various components of wildlife habitat. The alternatives comply with applicable conservation strategies for wildlife species. All alternatives are consistent with the Endangered Species Act (ESA), Migratory Bird Treaty Act (MBTA), National Forest Management Act (NFMA) and other direction and requirements for the management of wildlife species and habitat.

All alternatives are consistent with the Forest Plan direction to manage the habitat of species listed in the Regional Sensitive Species List to prevent further declines in populations which could lead to federal listing under the Endangered Species Act (USDA 1987). See Updated Wildlife Report Appendix A, or EA Table 44, p. 156.

All alternatives are consistent with the Forest Plan direction to maintain at least minimum viable populations of management indicator species distributed throughout the forest (USDA 1987). See Updated Wildlife Report MIS section, WL23, and EA Appendix C.

An Executive Order directs agencies to ensure that environmental analyses evaluate the effects of federal actions on migratory birds, with emphasis on species of concern. Migratory birds are included in the analysis for sensitive (p.132) and management indicator species (p.148), forest landbirds (WL44), and other species of potential concern.

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Glossary

Activity fuels: Woody pieces of trees left after timber harvest that may provide fuel for a wild or prescribed fire. Activity fuels are different from natural fuels because they result from our management practices.

Aquatic organism passage: Culverts which allow all forms of aquatic creatures to move through the culvert.

Barriered road (Road Management Prescription B): A road closed with a barrier. The use and need for the road is anticipated to occur at a lower frequency. The road may remain "closed" for a period of 5 to 15 years between uses but remains on the transportation system for future use. Culverts assessed to have a higher risk of failure would be removed or replaced, and the road surface may be water barred and seeded. Traffic is usually controlled with a physical static barrier (such as a guardrail or concrete barrier). Some administrative use would be expected.

Biomass removal: Harvesting the wood product obtained, usually from in-woods chipping, of all or some portion of trees including limbs, tops, and unmerchantable stems usually for energy production. It would be a by-product of the proposed fuel treatments. It would not involve any additional or special treatment in the proposed units. Piled material may be removed in dump trucks or be chipped then hauled. Chip trucks would only be used for the units accessed from the Hume Creek Road.

Broadcast burn (BB): A prescribed fire allowed to burn over a designated area within well-defined boundaries to achieve land management objectives.

Burn prescription: A written statement defining the objectives to be attained as well as the conditions of temperature, humidity, wind direction and speed, fuel moisture, and soil moisture under which a fire will be allowed to burn —note a prescription is generally expressed as acceptable ranges of the prescription elements and the limit of the geographic area to be covered; prescription criteria may include safety, economic, public health, environmental, geographic, administrative, social, or legal considerations.

Clearcut with reserves (CCw/R): A regeneration harvest that removes essentially all trees in a stand with reserve trees left to attain goals other than regeneration. Reserve trees would be any tree or group of trees left uncut and kept for the entire next rotation. Reserves would be safe snags; live culls; healthy, early-seral trees; and other individuals /groups of trees with specific resource value scattered throughout stand. This treatment would develop an even-aged stand structure and would include site preparation and reforestation.

Commercial thin (CT): Any type of thinning producing merchantable material at least equal to the value of the direct costs of harvesting. For Charlie Preston this would be used in an immature stands to increase tree vigor and growth rates and retain the trees with better form, without permanently breaking or opening the canopy. No site preparation or planting would be required. The purpose of the treatment is to regulate stand density to promote tree growth and vigor. Generally, smaller trees would be harvested and larger trees would be retained.

d.b.h.: diameter of a tree at breast height which is defined as 4.5 feet from the ground on the high side of the slope.

Decommission with full or partial recontouring (Road Management Prescription D): Roads "closed" at this level generally have a higher potential for failure than stored (Road Management Prescription C) roads, and they are not needed for management purposes. The road would be decompacted and major fills, embankments, and higher failure risk areas would be pulled up onto the roadbed and be stabilized. Drainage structures would be removed from stream channels, and

the adjacent slopes would be restored to resemble natural conditions. The goal of this prescription is to restore site productivity, eliminate the potential of road failures, and reestablish natural water infiltration and drainage patterns. Recontouring or partial pullback is based on site-specific conditions and could range from about 20 to 100 percent of the roads length. Decommissioning may require only partial recontouring, only pulling up the amount of fill necessary to stabilize the slope condition. Some cut and fill slopes or parts of cut and fill slopes may be evident in areas of recontouring. Following prescription implementation, roads would be removed from the National Forest Road System.

Early-seral, long-lived tree species: For Charlie Preston: western larch, western white pine, and possibly ponderosa pine. These are trees that grow well in sunny conditions. When their seeds are naturally available they are the first trees to occupy an area after it is opened up. They can live a long time after other trees grow and begin making shade.

Fish migration barrier culverts: Culverts that do not allow fish to move through the culvert. The culvert may be a barrier year-round or it may only be a problem when the streams are at low flows.

Grapple pile and burn piles (GP): To facilitate fuel reduction while protecting remaining trees, woody debris would be gathered and piled mechanically using an excavator. The piles would be burned in the late fall during periods of optimum smoke dispersal and soil moisture content. In order to protect leave trees or leave islands from possible ignition, the piles would not be placed next to them.

Ground-based skidding: A logging system that uses equipment on the ground to drag logs to the landing. It may have tracks or tires. This is different than a skyline system where the machine stays on the road.

Hydrologically neutral state: Conditions (soil, slope, vegetation, etc.) that can handle all precipitation and peak flows. Most water soaks into the ground, some returns to the atmosphere by evaporation and through plants and trees, and only a small amount flows off the site.

Intermix: A situation where structures are scattered throughout a wildland area. There is no clear line of demarcation, the wildland fuels are continuous outside of and within the developed area. The development density in the intermix ranges from structures very close together to one structure per 40 acres.

Jackpot burn (JB): A prescribed fire to break up and reduce fuel concentrations. Units with a remaining overstory composed primarily of desirable, long-lived, early-seral tree species that are large enough to endure low-intensity, surface fire could be jackpot burned to kill existing natural regeneration of mid- and late-seral, fire-intolerant tree species and reduce fuels generated by the timber harvest.

Leave tops: The unmerchantable tops of all harvested trees would be left in the unit to provide coarse woody debris, allow needles to release nutrients back into the soil, and provide organic matter for soils.

Logging system: The type of logging equipment used to harvest timber. In general ground-based equipment is used on flatter ground, and skyline equipment is required for steeper ground. Most of the slopes in the Charlie Preston Project Area go from flat to steep more than once on a given hillside. In these cases a combination of ground-based and skyline equipment is proposed. Logs may be yarded with a skyline machine in steeper sections then be ground-based (tractor) skidded to a landing or the other way.

Long-term storage (Road Management Prescription C): This is a long-term “storage” with no foreseeable use for the road in the next 15 to 25 years, but the road may be needed at some future

date. Some low impact roads that do not have a reasonably foreseeable need in the future, may also be closed at this level. The road would be out-sloped and have the drainage structures removed. The intent of this prescription is to put the road into "long-term storage" where the road is not a sediment source and does not channel water. The road prism is basically left intact but in a condition that would not require any maintenance. All water courses and problem areas would be stabilized. The roadbed may require light scarification, water bars, and/or decompaction. The road would be seeded and/or planted to establish a vegetative cover in the road prism. Roads would remain on the transportation system.

Lop: Lopped units would have limbs and unmerchantable tops of harvested trees left in units. These limbs and tops would be lopped to a maximum slash depth of 18 inches. The lopped limbs are more subject to compression by snow loads. This proximity to the ground increases the rate at which the slash decomposes.

Off-site ponderosa pine: Ponderosa pine trees that were seedlings from trees outside the seed zone recommended for this area.

Overstory removal (OSR): The cutting of trees from the upper canopy layer to release trees in an understory. For Charlie Preston this is used to describe the final cut in previously harvested seed tree units.

Personal-use firewood removal: After logging and biomass removal operations, some gates in the project area may be opened to allow the public to collect personal-use firewood. Valid personal-use firewood permits would be required. The public would be allowed to gather firewood in the dry, summer months through the end of Labor Day weekend except where prohibited as shown on maps and/or as posted.

Prescribed burn: Using fire to deliberately burn wildland fuels in either their natural or their modified state under specified environmental conditions, that would lead to a predetermined fire intensity and rate of spread required to attain planned resource management objectives.

Regeneration harvest: A timber harvest that creates a new age class of trees. For Charlie Preston it includes clearcutting, seed tree, and shelterwood.

Remove tops and limbs: Removing the entire tree in the yarding or skidding process. Top and limbs would be yarded with the logs to reduce fuel accumulations in harvest units. Depending on conditions, the tops and limbs may be removed with the entire tree in one piece or they may be removed with each log after the tree is bucked to log lengths.

Riparian areas: An area with different soils and vegetation between a stream (or other water body) and the adjacent upland area. They are sometimes called riparian habitat conservation areas (RHCAs) which are defined in the Inland Native Fish Strategy.

Road reconstruction: Some existing roads would require reconstruction to their approved traffic service level or would be improved to increase safety, operational efficiency or resource protection (improve drainage and improve water quality). For this project, reconstruction includes rebuilding roads to their original standards. Road drainage may be improved where needed. Reconstruction may include the installation of drain dips and culverts, grading, clearing, dust abatement, and resurfacing. All road reconstruction plans, standards and specifications would provide for minimum needed road width, drainage and safe operation while incorporating measures to protect resources.

The overall existing condition of roads to be reconstructed is generally inadequate for resource protection or anticipated use or the road is impassable for the design vehicle. Spot reconstruction on some roads would also occur, where the primary disturbance is confined to a limited area, such as culvert installations, rebuilding a shoulder or addition of turnouts. Areas between the spots

generally would need reconditioning (reshaping and processing the road surface and ditches and brushing the shoulders). Most of the work described as reconstruction and reconditioning would actually be maintenance (FSM 7705) to restore the road to its original condition.

Undersized culverts would be replaced on roads that would be reconstructed unless those roads would be stored or decommissioned after this entry. In that case, the culverts would not be upgraded because they would be removed when the road is stored or decommissioned.

Seed tree harvest (ST): A regeneration harvest in a mature, or near mature, stand to open its canopy to provide conditions suitable for regeneration. Trees are retained to provide seed for regeneration to create a desirable species mix. The majority of the standing crop trees would be removed. Natural regeneration is often supplemented with artificial regeneration to assure rapid stocking of the site and to provide for a desirable species composition.

Shelterwood final removal: A removal cut to release established regeneration from competition with the overstory. This is the final cut in a shelterwood system.

Shelterwood harvest (SW): A regeneration harvest in which most of the trees are cut, leaving those needed to provide enough seed and shade to produce a new age class. Additional harvest should be possible sometime in the future. The last or final removal cut would remove the remaining old age class after the new age class has established. This results in continuous coverage of large or small trees.

Silviculture: The art and science of controlling the establishment, growth, composition, health, and quality of forests and woodlands to meet the diverse needs and values of landowners and society on a sustainable basis.

Silvicultural prescription: A planned series of treatments designed to change current forest stand conditions to meets management goals —note the prescription normally considers ecological, economic, and societal constraints.

Skyline yarding: A logging system that uses cables to pull logs to the machine on the road and suspends at least the leading end of the logs above the ground. This method generally disturbs less ground than a ground-based logging system.

Slashing: Cutting of unwanted advanced regeneration up to 5.0 inch diameter at breast height. Slashing reduces competition for water and nutrients, controls the species composition of the developing understory, and removes ladder fuels that may contribute to torching in the event of a fire.

Temporary road: A road that is constructed just for this project and is obliterated when harvest operations are complete.

Underburn (UB): A prescribed fire to reduce fuels and aid in reforestation. It consumes surface fuels but not trees. Burning prescriptions would be designed to accomplish fuel reduction objectives while minimizing mortality to leave trees and probability of escape.